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https://doi.org/10.3310/pgfar05140

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PROGRAMME GRANTS FOR APPLIED RESEARCH

VOLUME 5 ISSUE 14 JULY 2017
ISSN 2050-4322

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Denise Kendrick, Joanne Ablewhite, Felix Achana, Penny Benford, Rose Clacy, Frank Coffey, Nicola Cooper, Carol Coupland, Toity Deave, Trudy Goodenough, Adrian Hawkins, Mike Hayes, Paul Hindmarch, Stephanie Hubbard, Bryony Kay, Arun Kumar, Gosia Majsak-Newman, Elaine McColl, Lisa McDaid, Phil Miller, Caroline Mulvaney, Isabel Peel, Emma Pitchforth, Richard Reading, Pedro Saramago, Jane Stewart, Alex Sutton, Clare Timblin, Elizabeth Towner, Michael C Watson, Persephone Wynn, Ben Young and Kun Zou

NHS
National Institute for Health Research

DOI 10.3310/pgfar05140

Keeping Children Safe: a multicentre programme of research to increase the evidence base for preventing unintentional injuries in the home in the under-fives

Denise Kendrick,[1]* Joanne Ablewhite,[1] Felix Achana,[2] Penny Benford,[1] Rose Clacy,[1] Frank Coffey,[3] Nicola Cooper,[2] Carol Coupland,[1] Toity Deave,[4] Trudy Goodenough,[4] Adrian Hawkins,[5] Mike Hayes,[6] Paul Hindmarch,[5] Stephanie Hubbard,[2] Bryony Kay,[7] Arun Kumar,[1] Gosia Majsak-Newman,[8] Elaine McColl,[9] Lisa McDaid,[8] Phil Miller,[3] Caroline Mulvaney,[1] Isabel Peel,[3] Emma Pitchforth,[10] Richard Reading,[8,11] Pedro Saramago,[12] Jane Stewart,[1] Alex Sutton,[2] Clare Timblin,[1] Elizabeth Towner,[4] Michael C Watson,[1] Persephone Wynn,[1] Ben Young[1] and Kun Zou[1]

[1]Division of Primary Care, University of Nottingham, Nottingham, UK
[2]Department of Health Sciences, University of Leicester, Leicester, UK
[3]Nottingham University Hospitals NHS Trust, Nottingham, UK
[4]Centre for Child and Adolescent Health, University of the West of England, Bristol, UK
[5]Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK
[6]Child Accident Prevention Trust, London, UK
[7]University Hospitals Bristol NHS Foundation Trust, Bristol, UK
[8]Norfolk and Norwich University Hospitals NHS Foundation Trust, Norwich, UK
[9]Clinical Trials Unit, Newcastle University, Newcastle upon Tyne, UK
[10]RAND (Europe), Westbrook Centre, Cambridge, UK
[11]Norfolk Community Health and Care NHS Trust, Norwich, UK
[12]Centre for Health Economics, University of York, York, UK

*Corresponding author

Declared competing interests of authors: Elaine McColl is a subpanel member for the National Institute for Health Research (NIHR) Programme Grants for Applied Research (PGfAR) journal, but in that capacity has already declared a conflict of interest in respect of this grant and has not been involved in any discussions or decisions thereon. Elaine McColl was a NIHR journal editor for the NIHR PGfAR journal at the time that this report was written and has a declared conflict of interest in respect of this report and will not participate in any discussions, work or decisions thereon. The Keeping Children Safe programme received Flexibility and Sustainability Funding from Nottinghamshire County Teaching Primary Care Trust, University Hospitals Bristol NHS Foundation Trust and Norfolk and Suffolk Comprehensive Local Research Network and Research Capability Funding from Nottinghamshire County Teaching Primary Care Trust and Nottinghamshire Healthcare NHS Foundation Trust to support NIHR Faculty members' salaries.

Published July 2017
DOI: 10.3310/pgfar05140

This report should be referenced as follows:

Kendrick D, Ablewhite J, Achana F, Benford P, Clacy R, Coffey F, *et al*. Keeping Children Safe: a multicentre programme of research to increase the evidence base for preventing unintentional injuries in the home in the under-fives. *Programme Grants Appl Res* 2017;**5**(14).

Programme Grants for Applied Research

ISSN 2050-4322 (Print)

ISSN 2050-4330 (Online)

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This report

The research reported in this issue of the journal was funded by PGfAR as project number RP-PG-0407-10231. The contractual start date was in April 2009. The final report began editorial review in November 2014 and was accepted for publication in February 2016. As the funder, the PGfAR programme agreed the research questions and study designs in advance with the investigators. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The PGfAR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, CCF, NETSCC, PGfAR or the Department of Health. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the PGfAR programme or the Department of Health.

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Abstract

Keeping Children Safe: a multicentre programme of research to increase the evidence base for preventing unintentional injuries in the home in the under-fives

Denise Kendrick,[1]* Joanne Ablewhite,[1] Felix Achana,[2] Penny Benford,[1] Rose Clacy,[1] Frank Coffey,[3] Nicola Cooper,[2] Carol Coupland,[1] Toity Deave,[4] Trudy Goodenough,[4] Adrian Hawkins,[5] Mike Hayes,[6] Paul Hindmarch,[5] Stephanie Hubbard,[2] Bryony Kay,[7] Arun Kumar,[1] Gosia Majsak-Newman,[8] Elaine McColl,[9] Lisa McDaid,[8] Phil Miller,[3] Caroline Mulvaney,[1] Isabel Peel,[3] Emma Pitchforth,[10] Richard Reading,[8,11] Pedro Saramago,[12] Jane Stewart,[1] Alex Sutton,[2] Clare Timblin,[1] Elizabeth Towner,[4] Michael C Watson,[1] Persephone Wynn,[1] Ben Young[1] and Kun Zou[1]

[1]Division of Primary Care, University of Nottingham, Nottingham, UK
[2]Department of Health Sciences, University of Leicester, Leicester, UK
[3]Nottingham University Hospitals NHS Trust, Nottingham, UK
[4]Centre for Child and Adolescent Health, University of the West of England, Bristol, UK
[5]Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK
[6]Child Accident Prevention Trust, London, UK
[7]University Hospitals Bristol NHS Foundation Trust, Bristol, UK
[8]Norfolk and Norwich University Hospitals NHS Foundation Trust, Norwich, UK
[9]Clinical Trials Unit, Newcastle University, Newcastle upon Tyne, UK
[10]RAND (Europe), Westbrook Centre, Cambridge, UK
[11]Norfolk Community Health and Care NHS Trust, Norwich, UK
[12]Centre for Health Economics, University of York, York, UK

*Corresponding author Denise.Kendrick@nottingham.ac.uk

Background: Unintentional injuries among 0- to 4-year-olds are a major public health problem incurring substantial NHS, individual and societal costs. However, evidence on the effectiveness and cost-effectiveness of preventative interventions is lacking.

Aim: To increase the evidence base for thermal injury, falls and poisoning prevention for the under-fives.

Methods: Six work streams comprising five multicentre case–control studies assessing risk and protective factors, a study measuring quality of life and injury costs, national surveys of children's centres, interviews with children's centre staff and parents, a systematic review of barriers to, and facilitators of, prevention and systematic overviews, meta-analyses and decision analyses of home safety interventions. Evidence from these studies informed the design of an injury prevention briefing (IPB) for children's centres for preventing fire-related injuries and implementation support (training and facilitation). This was evaluated by a three-arm cluster randomised controlled trial comparing IPB and support (IPB+), IPB only (no support)

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and usual care. The primary outcome was parent-reported possession of a fire escape plan. Evidence from all work streams subsequently informed the design of an IPB for preventing thermal injuries, falls and poisoning.

Results: Modifiable risk factors for falls, poisoning and scalds were found. Most injured children and their families incurred small to moderate health-care and non-health-care costs, with a few incurring more substantial costs. Meta-analyses and decision analyses found that home safety interventions increased the use of smoke alarms and stair gates, promoted safe hot tap water temperatures, fire escape planning and storage of medicines and household products, and reduced baby walker use. Generally, more intensive interventions were the most effective, but these were not always the most cost-effective interventions. Children's centre and parental barriers to, and facilitators of, injury prevention were identified. Children's centres were interested in preventing injuries, and believed that they could prevent them, but few had an evidence-based strategic approach and they needed support to develop this. The IPB was implemented by children's centres in both intervention arms, with greater implementation in the IPB+ arm. Compared with usual care, more IPB+ arm families received advice on key safety messages, and more families in each intervention arm attended fire safety sessions. The intervention did not increase the prevalence of fire escape plans [adjusted odds ratio (AOR) IPB only vs. usual care 0.93, 95% confidence interval (CI) 0.58 to 1.49; AOR IPB+ vs. usual care 1.41, 95% CI 0.91 to 2.20] but did increase the proportion of families reporting more fire escape behaviours (AOR IPB only vs. usual care 2.56, 95% CI 1.38 to 4.76; AOR IPB+ vs. usual care 1.78, 95% CI 1.01 to 3.15). IPB-only families were less likely to report match play by children (AOR 0.27, 95% CI 0.08 to 0.94) and reported more bedtime fire safety routines (AOR for a 1-unit increase in the number of routines 1.59, 95% CI 1.09 to 2.31) than usual-care families. The IPB-only intervention was less costly and marginally more effective than usual care. The IPB+ intervention was more costly and marginally more effective than usual care.

Limitations: Our case–control studies demonstrate associations between modifiable risk factors and injuries but not causality. Some injury cost estimates are imprecise because of small numbers. Systematic reviews and meta-analyses were limited by the quality of the included studies, the small numbers of studies reporting outcomes and significant heterogeneity, partly explained by differences in interventions. Network meta-analysis (NMA) categorised interventions more finely, but some variation remained. Decision analyses are likely to underestimate cost-effectiveness for a number of reasons. IPB implementation varied between children's centres. Greater implementation may have resulted in changes in more fire safety behaviours.

Conclusions: Our studies provide new evidence about the effectiveness of, as well as economic evaluation of, home safety interventions. Evidence-based resources for preventing thermal injuries, falls and scalds were developed. Providing such resources to children's centres increases their injury prevention activity and some parental safety behaviours.

Future work: Further randomised controlled trials, meta-analyses and NMAs are needed to evaluate the effectiveness and cost-effectiveness of home safety interventions. Further work is required to measure NHS, family and societal costs and utility decrements for childhood home injuries and to evaluate complex multicomponent interventions such as home safety schemes using a single analytical model.

Trial registration: Current Controlled Trials ISRCTN65067450 and ClinicalTrials.gov NCT01452191.

Funding: The National Institute for Health Research (NIHR) Programme Grants for Applied Research programme and will be published in full in *Programme Grants for Applied Research*; Vol. 5, No. 14. See the NIHR Journals Library website for further project information.

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List of abbreviations

AIC	Akaike information criterion
ANOVA	analysis of variance
AOR	adjusted odds ratio
ASSIA	Applied Social Sciences Index and Abstracts
BIC	Bayesian information criterion
BME	black and minority ethnic
CBA	controlled before-and-after study
CBQ	Child Behaviour Questionnaire
CFI	comparative fit index
CI	confidence interval
CINAHL	Cumulative Index to Nursing and Allied Health Literature
CMO	Chief Medical Officer
CRC	child-resistant cap
CrI	credible interval
DAG	directed acyclic graph
df	degree of freedom
ECBQ	Early Child Behaviour Questionnaire
ECCE	Evaluation of Children's Centres in England
ED	emergency department
EQ-5D	EuroQol-5 Dimensions
EU	European Union
GP	general practitioner
HADS	Hospital Anxiety and Depression Scale
HALO	Long Term Health and Healthcare Outcomes of Accidental Injury
HASS	Home Accident Surveillance System
HRQL	health-related quality of life
IBQ	Infant Behaviour Questionnaire
ICC	intraclass correlation coefficient
ICER	incremental cost-effectiveness ratio
IMD	Index of Multiple Deprivation
IPB	injury prevention briefing
IQR	interquartile range
IRR	incidence rate ratio
KCS	Keeping Children Safe
MCMC	Markov chain Monte Carlo
MCS	Millennium Cohort Study
MID	minimally important difference
MIU	minor injury unit
MRC	Medical Research Council
NICE	National Institute for Health and Care Excellence
NIHR	National Institute for Health Research
NMA	network meta-analysis
NNT	number needed to treat
NPV	negative predictive value
Ofsted	Office for Standards in Education
OQAQ	Overview Quality Assessment Questionnaire
OR	odds ratio
PAF	population attributable fraction
PARIHS	Promoting Action on Research in Health Services
PCC	poison control centre
PCG	primary care group
PCT	primary care trust
PDH	Parenting Daily Hassles
PedsQL	Pediatric Quality of Life Inventory
PH	public health guidance
PMA	pairwise meta-analysis
PPI	patient and public involvement
PPV	positive predictive value
QALY	quality-adjusted life-year
RCT	randomised controlled trial

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RMSEA	root-mean-square error of approximation
RoSPA	Royal Society for the Prevention of Accidents
SD	standard deviation
SE	standard error
SEM	standard error of measurement
SHA	strategic health authority
SRMR	standardised root-mean-square residual
SSLP	Sure Start Local Programme
SSPAU	short-stay paediatric assessment unit
TBI	traumatic brain injury
TBSA	total body surface area
TLI	Tucker–Lewis Index
TMV	thermostatic mixer valve
VAS	visual analogue scale

Plain English summary

Burns, scalds, falls and poisoning are major causes of death, disability and health service use in the under-fives. We undertook 13 studies to explore factors associated with injuries, what prevents injuries, the cost of the injuries to the NHS and parents, and what parents and children's centres (which provide families with information, support and co-ordinated services from a range of professionals) were doing to prevent injuries. We used evidence from these studies to design a resource [an injury prevention briefing (IPB)] for children's centres to use with parents for preventing house fire injuries. We gave 12 children's centres the IPB, with training and support to implement it, (IPB+ group) and 12 centres the IPB without training or support (IPB-only group). A further 12 centres were not given the IPB (usual-care group). Children's centres in both IPB groups used the IPB and increased injury prevention activity, more markedly in the IPB+ centres. The IPB did not increase how many families had a fire escape plan in either IPB group, but did increase some fire escape behaviours in both groups. Providing the IPB without training and support cost less and was slightly more effective than not providing the IPB. Providing the IPB with training and support cost more but was only slightly more effective than not providing the IPB. Children's centres can increase some fire safety behaviours in families with young children if they are provided with evidence-based resources such as the IPB. A further IPB has been produced for the prevention of fire-related injuries, falls, poisonings and scalds.

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Scientific summary

Introduction

Unintentional injuries at home in the under-fives are a major public health problem, incurring substantial NHS, individual and societal costs. However, evidence on the effectiveness and cost-effectiveness of preventative interventions is lacking. The Keeping Children Safe (KCS) programme of research aimed to enhance the evidence base for preventing the most common types of child home injury.

Work stream 1

Research question

What are the associations between modifiable risk and protective factors and medically attended injuries resulting from five common injury mechanisms in children under the age of 5 years?

Methods

Five multicentre case–control studies were undertaken (study A), one each for falls from furniture, falls on one level, stair falls, poisonings and scalds. Cases were 0- to 4-year-olds attending secondary care with one of these injuries, matched with primary care recruited control subjects (controls). Exposures were measured using parent-completed questionnaires, validated by home observations in 162 participants (study B). Odds ratios (ORs) were estimated using conditional logistic regression.

Results

Comparisons between self-report and home observations found sensitivities of $\geq$ 70% for 19 out of 30 exposures and specificities of $\geq$ 70% for 20 out of 30 exposures.

Case–control studies recruited between 338 (scalds) and 672 (falls from furniture) cases and between 1438 (scalds) and 2658 (stair falls) controls.

Comparing cases with controls, for falls from furniture, case households were more likely not to use safety gates [adjusted odds ratio (AOR) 1.65, 95% confidence interval (CI) 1.29 to 2.12] and not to teach children rules about climbing on kitchen objects (AOR 1.58, 95 % CI 1.16 to 2.15). Cases aged 0–12 months were more likely to have been left on, had nappies changed on or been put in car/bouncing seats on raised surfaces (AOR 5.62, 95% CI 3.62 to 8.72; AOR 1.89, 95% CI 1.24 to 2.88; and AOR 2.05, 95% CI 1.29 to 3.27, respectively). Cases aged > 36 months played or climbed on furniture more frequently (AOR 9.25, 95% CI 1.22 to 70.07).

No significant associations were found for any exposures and falls on one level.

For stair falls, compared with controls, case households were more likely not to use stair gates (AOR 2.50, 95% CI 1.90 to 3.29) and to leave gates open (AOR 3.09, 95% CI 2.39 to 4.00), not to have carpeted stairs (AOR 1.52, 95% CI 1.09 to 2.10), not to have landings part-way up stairs (AOR 1.34, 95% CI 1.08 to 1.65) and to report stairs not being safe to use (AOR 1.46, 95% CI 1.07 to 1.99) or needing repair (AOR 1.71, 95% CI 1.16 to 2.50).

For poisonings, compared with controls, case households were more likely not to store medicines out of reach (AOR 1.59, 95% CI 1.21 to 2.09) or safely (locked away or out of reach) (AOR 1.83, 95% CI 1.38 to 2.42) and not to put medicines (AOR 2.11, 95% CI 1.54 to 2.90) or household products (AOR 1.79, 95% CI 1.29 to 2.48) away immediately after use.

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For scalds, compared with controls, case households were more likely to leave hot drinks within children's reach (AOR 2.33, 95% CI 1.63 to 3.31) and to not teach children rules about climbing on kitchen objects (AOR 1.66, 95% CI 1.12 to 2.47), about behaviour when parents are cooking (AOR 1.95, 95% CI 1.33 to 2.85) or about hot kitchen objects (AOR 1.89, 95% CI 1.30 to 2.75).

Conclusions

Modifiable risk factors were found for falls from furniture and on stairs, poisonings and scalds in children aged 0–4 years.

Work stream 2

Research question

What are the NHS, child and family costs of falls, poisonings and scalds? Is the Pediatric Quality of Life Inventory [PedsQL™; see www.pedsql.org/ (accessed 6 January 2017)] an acceptable and psychometrically sound measure of health-related quality of life (HRQL) in children aged ≥ 2 years in an emergency medicine setting?

Methods

Health-related quality of life was measured using the toddler version of the PedsQL with parents completing questionnaires immediately post injury, 2 weeks post injury, and 1, 3 and 12 months post injury. Instrument acceptability, internal consistency reliability, construct validity and responsiveness to change were measured. Resource use and expenditure questions were included in the HRQL questionnaire. Resource use data were combined with unit costs to calculate health-care and non-health-care costs (study C).

Results

Internal consistency reliability was adequate (Cronbach's $\alpha > 0.70$). Retrospectively reported pre-injury scale, summary and total scores were (except for the nursery/school subscale) higher than previously reported in healthy UK toddlers and among study A community controls. Children with long-term health conditions had poorer pre-injury PedsQL scores than those without long-term health conditions, and hypotheses regarding post-injury physical functioning scores for groups defined by injury severity were supported. There were reductions from pre injury to post injury in physical functioning for children with more severe injuries, with most effect sizes being large (≥ 0.8).

In total, 344 parents completed resource use questionnaires. Over 95% of children recovered within 2 weeks of injury and almost 99% recovered within 1 month. Mean NHS costs across injury mechanisms ranged from £2588 to £2989 for admissions of ≥ 2 days, from £719 to £1011 for admissions of 0–1 days and from £97 to £178 for those only attending the emergency department (ED). NHS costs were highest for scalds for admissions of 0–1 days and for ED attendances. Small numbers prevented comparisons between injury mechanisms for longer admissions. Mean family costs across injury mechanisms ranged from £99 to £399 for admissions of ≥ 2 days, from £38 to £200 for admissions of 0–1 days and from £18 to £68 for those only attending the ED. Family costs were highest for scalds for admissions of 0–1 days and for falls from furniture for ED attendances. Family costs mainly consisted of costs for informal child care and time off work.

Conclusions

The PedsQL was a feasible and acceptable measure of HRQL in this population, showing internal consistency reliability, discrimination between varying levels of injury severity and sequelae and responsiveness to change. Findings relating to construct validity were equivocal.

Injuries result in high NHS costs for admissions lasting ≥ 2 days, but these are uncommon. More common injuries requiring shorter inpatient stays incur moderate costs, and common injuries requiring only ED attendance incur small costs. Costs to families can be substantial, especially for injuries requiring admission.

Work stream 3

Research question

What interventions are undertaken by children's centres to prevent thermal injuries, falls and poisoning?

Methods

Two national postal surveys of children's centre managers were undertaken (study D). Surveys covered injury prevention activity, knowledge and attitudes, barriers and facilitators, and partnership working. The first survey (2010) covered fire-related injuries and the second (2012) covered falls, poisoning and scalds.

Results

Response rates were 56% in 2010 and 61% in 2012. In both surveys, around 60% of children's centres identified unintentional injuries as one of their three main priorities, but fewer than half had written injury prevention strategies. Attitudes were positive towards injury prevention, but gaps in knowledge were reported. Two-thirds of centres had access to safety equipment schemes in 2010, but only 42% had access in 2012. Common barriers limiting injury prevention were staff capacity, funding and engaging 'hard-to-reach' groups. Common facilitators were good relationships with families, partnership working, safety equipment schemes, and trained and knowledgeable staff.

Conclusions

Most children's centres lack an evidence-based strategic approach to child injury prevention and need support to deliver effective injury prevention.

Work stream 4

Research question

What are the barriers to, and facilitators of, implementing thermal injury, falls and poisoning prevention interventions among children's centres, professionals and community members?

Methods

This work stream consisted of three studies.

1. *Study E*. Quantitative papers were identified from the systematic review carried out in study I, supplemented with a systematic review of qualitative evidence. Bibliographic databases and other sources were searched (May 2009 for quantitative papers, March 2010 for qualitative papers). Data were explored using framework analysis and synthesised narratively.
2. *Study F*. Semistructured interviews were conducted with children's centre staff across four study sites. Interviews explored health and safety promotion programmes including injury prevention, barriers and facilitators. Data were analysed using framework analysis.
3. *Study G*. Semistructured interviews were conducted with parents of injured and uninjured children. Interviews explored injury prevention beliefs and strategies, control over injury prevention actions, and barriers and facilitators. Data were analysed using a thematic analysis.

Results

The review included 64 papers (57 quantitative, seven qualitative). Interviews were conducted with 33 children's centre staff and 64 parents. A range of barriers and facilitators were found consistently across studies E–G. These included the need for trust between families and those delivering interventions, tailoring interventions to family needs and child development, focusing on specific injury prevention topics, and providing simple and reinforced messages. Parents felt that 'real-life' stories of how injuries had happened may help to raise awareness.

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Conclusions
Facilitators of and modifiable barriers to children's centres and parents undertaking injury prevention were identified. The effect of addressing barriers and facilitators within interventions requires evaluation.

Work stream 5

Research question
How cost-effective are strategies for preventing thermal injuries, falls and poisonings?

Methods
This work stream consisted of four studies.

- *Study H*. Systematic overviews were carried out, with bibliographic databases and other sources searched (fires, March 2009; falls, October 2010; poisoning, January 2012; scalds, October 2012). Data were synthesised narratively.
- *Study I*. A systematic review was carried out, with bibliographic databases and other sources searched to May 2009. Random-effects pairwise meta-analyses (PMAs) were used to estimate pooled ORs and incidence rate ratios.
- *Study J*. Random-effects network meta-analyses (NMAs) were used to estimate pooled effect sizes for all combinations of interventions.
- *Study K*. Decision analyses were used to estimate incremental cost-effectiveness ratios (ICERs) and probabilities of interventions being cost-effective.

Results
There was little evidence about the impact of home safety interventions on risk of injury or death from fires, scalds, falls or poisonings.

Fire prevention
Most evidence related to smoke alarms. Several case–control studies found that smoke alarm ownership was associated with a lower risk of house fire death and injury. PMA showed that interventions increased functional alarm ownership (OR 1.81, 95% CI 1.30 to 2.52). NMA found that education plus home safety inspection plus providing and fitting low-cost/free equipment was most effective in increasing functional alarm ownership [OR 7.15, 95% credible interval (CrI) 2.40 to 22.73; probability (p) best = 0.66]. Education plus providing and fitting low-cost/free equipment was the most cost-effective intervention [£34,200 per quality-adjusted life-year (QALY), reducing to £4500 per QALY assuming 1.8 children aged < 5 years per household].

Scald prevention
Most evidence related to 'safe' hot bathwater temperatures. Narrative reviews and PMA found that interventions promoted 'safe' temperatures (OR 1.41, 95% CI 1.07 or 1.86). NMA found that education plus providing and fitting low-cost/free equipment [thermostatic mixer valves (TMVs)] was the most effective intervention (OR 38.82, 95% CrI 3.58 to 599.10; p best = 0.97). However, this was the most cost-effective intervention only if TMVs were fitted during major refurbishment or in new builds for families in social housing, in which case money was saved.

Falls prevention
Most evidence related to safety gates and baby walker use. Narrative reviews and PMA found that interventions increased safety gate use (OR 1.61, 95% CI 1.19 to 2.17). NMA found that education plus home safety inspection plus providing and fitting low-cost/free equipment was the most effective intervention (OR 7.80, 95% CrI 3.18 to 21.3; p best = 0.97). Usual care (p = 0.999) had the highest probability of being cost-effective (at £30,000 per QALY). Education had the lowest ICER (£284,068 per QALY). Narrative reviews and PMA found that interventions reduced baby walker use (OR 1.57, 95% CI

1.18 to 2.09). NMA found that education was most effective (OR for walker use 0.48, 95% CrI 0.31 to 0.84). Decision analyses were not undertaken for interventions to reduce baby walker use.

Poisoning prevention

Most evidence related to safe storage of medicines and household products. Narrative reviews and PMA found that interventions increased the safe storage of medicines (OR 1.53, 95% CI 1.27 to 1.84) and household products (OR 1.55, 95% CI 1.22 to 1.96). NMA found that education plus providing and fitting low-cost/free equipment was the most effective intervention for medicines (OR 2.51, 95% CrI 1.01 to 6.00; p best = 0.39) and that education plus home safety inspection plus providing and fitting low-cost/free equipment was the most effective intervention for household products (OR 2.59, 95% CrI 0.59 to 15.16; p best = 0.37). Usual care ($p = 0.83$) had the highest probability of being cost-effective (at £30,000 per QALY) for the safe storage of medicines. Education had the lowest ICER compared with usual care, at £41,330 per QALY, reducing to £19,315 per QALY if education was targeted at families in the most disadvantaged areas where injury rates were higher. For safe storage of cleaning products, all interventions were more costly and less effective than usual care.

Conclusions

In general, more intensive interventions (e.g. education plus providing and fitting low-cost/free equipment and in some cases home safety inspection) were more effective than less intensive interventions, but the most effective interventions were not necessarily the most cost-effective.

Work stream 6

Research question

How effective and cost-effective is implementing an injury prevention briefing (IPB) for one exemplar injury prevention intervention?

Methods

Work stream 6 consisted of a review of reviews of implementation and facilitation of health promotion interventions (study L) and a randomised controlled trial (RCT) of an IPB for preventing fire-related injury (study M). The findings were incorporated into a second IPB covering fire-related injury, falls, poisoning and scalds.

Study M was a three-arm multicentre cluster RCT in 36 children's centres. Participants were families with a child aged 0–2 years. Children's centres were randomly allocated to (1) IPB plus support (training and facilitation) (IPB+), (2) IPB without support (IPB only) and (3) usual care (control). IPB+ children's centres received training and four facilitation contacts over the 12-month intervention period. The primary outcome was the proportion of families with a fire escape plan. Secondary outcomes included other fire safety behaviours, measures of IPB implementation, resource use and expenditure. Random-effects modelling was used to compare outcomes between treatment arms and for the economic analysis. Qualitative data were analysed thematically.

Results

In study L, 10 reviews were identified. Common themes emerged about factors affecting the implementation of community prevention programmes. The Promoting Action on Research in Health Services (PARIHS) framework and Carroll *et al.*'s fidelity framework were identified and informed intervention design and measurement of fidelity and implementation.

In total, 36 children's centres and 1112 families participated in study M. Follow-up data were obtained from all children's centres and from 751 (68%) families.

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The IPB was implemented by children's centres in both intervention arms, with greater implementation in the IPB+ arm. Compared with the usual-care arm, more IPB+ families received fire prevention advice and more families in each intervention arm attended fire safety sessions. Compared with the usual-care arm, the intervention did not increase fire escape plan prevalence (AOR IPB only 0.93, 95% CI 0.58 to 1.49; AOR IPB+ 1.41, 95% CI 0.91 to 2.20) but did increase other fire escape behaviours (AOR IPB only 2.56, 95% CI 1.38 to 4.76; AOR IPB+ 1.78, 95% CI 1.01 to 3.15). Fewer IPB-only families reported match play by children (AOR 0.27, 95% CI 0.08 to 0.94) and IPB-only families reported more bedtime fire safety routines (AOR for a 1-unit increase in number of routines 1.59, 95% CI 1.09 to 2.31). The IPB-only intervention was less costly and marginally more effective than usual care. The IPB+ intervention was more costly and marginally more effective than usual care.

Conclusions

Neither intervention increased fire escape planning by parents, but both interventions increased fire prevention activity by children's centres and improved some family fire escape behaviours.

Overall conclusions

The KCS programme has enhanced the evidence base for preventing falls, poisoning and thermal injuries in the under-fives. Our findings suggest that some falls, poisonings and scalds may be prevented by incorporating specific safety advice into child health contacts. Children's centres can increase some safety behaviours in families if provided with evidence-based resources. The KCS programme findings, including evidence of effectiveness and activities for use with parents, are summarised in an IPB covering the prevention of fire-related injuries, falls, poisonings and scalds. This is freely available from www.nottingham.ac.uk/research/groups/injuryresearch/projects/kcs/index.aspx (accessed 29 September 2016).

Further studies are required to evaluate the effectiveness and cost-effectiveness of home safety interventions, including other injury prevention interventions within children's centres and IPBs implemented by different professional groups and in different settings. Further meta-analyses (NMAs if possible) and decision analyses of home safety intervention studies are required, if possible incorporating covariates to evaluate the impact of targeting interventions at specific population groups.

Trial registration

This trial is registered as ISRCTN65067450 and NCT01452191.

Funding

Funding for this study was provided by the Programme Grants for Applied Research programme of the National Institute for Health Research.

Chapter 1 Introduction to the Keeping Children Safe programme of research

Why are child injuries important?

Unintentional injuries are a major public health challenge facing children in England today. Injuries are a particular problem in young children, with death and hospital admission rates being higher in the under-fives than at other ages in childhood. Unintentional injuries resulted in 311 deaths in the under-fives in England between 2008 and 2012, making injuries the most common cause of death in the 1–4 years age group.[1] More than 45,000 children aged < 5 years were admitted to hospital in England in 2012/13,[2] and approximately 450,000 under-fives attended an emergency department (ED) in the UK following an unintentional injury in 2002[3] (the latest year for which detailed national data on unintentional injuries were collected in the UK). Childhood injuries, especially severe injuries, can also have long-term health, educational, social and occupational consequences. These include physical disability,[4–6] psychological morbidity,[7,8] cognitive or social impairment,[9] lower educational achievement[9,10] and poorer employment prospects.[9] In addition, injuries also impact psychologically on those caring for children.[7]

Unintentional injuries do not just result in death and injury. They also place burdens on the NHS and other care agencies and on injured children and their families. The Chief Medical Officer (CMO)'s report for England in 2012 highlighted the high cost of injuries to the NHS and the potential for prevention.[11] The annual cost of ED attendances was estimated to be £9M, and the cost of hospital admissions was estimated to be £16–87M, depending on injury mechanism.

Unintentional injuries disproportionately affect children living in socioeconomic disadvantage. The socioeconomic gradient in unintentional injury deaths is steeper than for any other cause of death in childhood,[12] with children living in the most disadvantaged households having a death rate that is 13 times higher than that for children living in the most advantaged households.[13]

Child injury prevention policy in England

Child injury prevention has had varying prominence in government policy in England over the past 25 years. The *Health of the Nation* White Paper[14] formed the central health policy in England between 1992 and 1997. It was the first attempt by a government in England to strategically improve the health of the population. Reduction in accidental injury was identified as one of five national targets for health improvement.

This was replaced by *Saving Lives: Our Healthier Nation* (1999)[15] under the Labour administration's health policy, which included accidental injury as one of its four key public health priorities. It set a target to reduce death rates from accidents by at least one-fifth and to reduce the rate of serious injury from accidents by at least one-tenth by 2010, describing this as a 'tough but attainable target'. It also recognised that injury was a leading cause of childhood admissions to hospital. The White Paper announced that an interdepartmental and expert task force would be set up to advise on how the targets should be achieved.

The Accidental Injury Task Force published a report for the CMO in 2002 to identify steps that would have the greatest impact on injury prevention.[16] One working group focused on child injury. Recommendations included cross-governmental co-ordination of initiatives, data collection and integration, developing the workforce for delivery and leadership, and research and dissemination of evidence. It highlighted the significance of deprivation in childhood injury. The task force recommended that a series of headline

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interventions should form the core of local implementation plans, giving focus and clarity to the somewhat fragmented approach to injury prevention at the time. It also advised targeting of interventions at areas of health inequality.

The *Every Child Matters*[17] policy arose with the Children Act 2004.[18] There were five outcomes that the policy sought to achieve for all children, one of which was 'stay safe', which included safety from unintentional injury.

A joint study by the Audit Commission and the Healthcare Commission, *Better Safe Than Sorry*, in 2007[19] examined the deployment of resources, arrangements for working in partnership and activities to prevent unintentional injury to children, especially the under-fives. The report contained a series of recommendations for the government, including re-emphasising the recommendations and strategy from the Accidental Injury Task Force and encouraging local organisations to take up and follow the evidence-based guidance contained within the report and commissioning the National Institute for Health and Care Excellence (NICE) to develop guidance on the prevention of unintentional injury for children aged < 15 years.

The *Staying Safe: Action Plan* was launched in 2008,[20] setting out the government's priorities for the period 2008–11. These included establishing the National Home Safety Equipment Scheme Safe at Home.[21] A review examining prevention practice at the time and making recommendations also arose from the action plan and led to the publication of *Accident Prevention Amongst Children and Young People: a Priority Review*.[22] The government also set a Public Service Agreement target (PSA 13) to improve children's and young people's safety that included four indicators, including one on a reduction in hospital admissions caused by unintentional and deliberate harm.

In 2010, the coalition government published the *Healthy Lives, Healthy People* White Paper,[23] setting out plans for a comprehensive reform of the public health system. The plans revolved around decentralising public health and giving local authorities more power over public health budgets in their area. The new system took effect from April 2013, when Public Health England was established and public health services formally transferred from the NHS to local authorities. The new system focuses on outcomes rather than targets, which are set out in the Public Health Outcomes Framework,[24] including one indicator to reduce hospital admissions from unintentional and deliberate injuries for the 0–4 years age group, with support from other partners in the public health system. Other indicators relate to reducing health inequalities.

In 2013, the CMO for England highlighted the issue of child accident prevention and has made a powerful economic case for preventing childhood injuries.[11]

Other major national health-related initiatives included the development by NICE of a series of guidance documents on the prevention of unintentional injuries in children aged < 15 years. NICE published public health guidance, *Strategies to Prevent Unintentional Injuries among Children and Young People Aged under 15* [public health guidance (PH) 29] in 2010.[25] Evidence published since the development of PH29 was reviewed in 2013 but did not result in any changes to the recommendations.[26] A further document, *Preventing Unintentional Injuries in the Home among Children and Young People Aged under 15* (PH30) was also published in 2010.[27] PH29 recommends that local and national plans and strategies for children and young people's health and well-being include a commitment to preventing unintentional injuries. Emphasis is also given to targeting injury prevention towards the most vulnerable groups to reduce inequalities in health.

Despite the policies described above, *Better Safe Than Sorry* also highlighted that there was little evidence of a systematic strategic approach to develop, implement and monitor programmes to prevent unintentional injuries in children within the NHS.[19] A report in 2012 from the European Child Safety Alliance and EuroSafe, the European Association for Injury Prevention and Safety Promotion, assessed evidence-based national-level child injury prevention policy measures in 31 European Union (EU) member states.[28] The report concluded that there was much scope for improvement in implementing child injury

prevention measures in England, stating that if England had the unintentional injury death rate in 2010 of the EU country with the lowest rate (the Netherlands), 198 deaths in children and young people would have been avoided. It identified some progress in addressing the issue of child injury, but also that stronger government leadership was needed to produce and implement a national evidence-based child injury prevention strategy including funding for injury prevention measures, co-ordination of child injury prevention activities, infrastructure and capacity building. Recommendations included the integration of evidence-based good practice strategies into national public health programmes, the adoption and implementation of evidence-based injury prevention strategies at national and local levels and capacity building for stakeholders working at all levels.[29]

The report also highlighted unintentional injuries as the leading cause of inequality in childhood deaths and acknowledged that the English government had supported studies examining inequities and provided time-limited funding for a home safety equipment scheme targeting disadvantaged families. However, it concluded that 'vacillating government support for the injury issue and related programmes has not resulted in a comprehensive coordinated approach that would ensure equitable coverage of children on safety issues' (p. 3).[29]

The Keeping Children Safe (KCS) programme of research was, therefore, undertaken over a period of time in which there was an increasing acceptance of the need for evidence-based injury prevention, development of national guidelines to facilitate this and the use of indicators to reduce admissions for injuries in children and young people. However, during this period of time there was no national strategy or widespread adoption and implementation of co-ordinated evidence-based child injury prevention.

The most important injuries to focus on

The KCS programme of research focused on the prevention of thermal injuries, falls and poisonings. In terms of injury-related deaths in the under-fives in England, deaths from falls are the third most common, deaths from smoke, fire and flames are the fourth most common and deaths from poisoning are the sixth most common.[1] Thermal injuries, falls and poisonings are three of the four most common types of injury resulting in hospital admission in the under-fives in England.[2] In 2012/13, > 18,300 under-fives were admitted to hospital in England following a fall, > 5100 were admitted with poisoning and > 2210 were admitted following a thermal injury, 1420 of which were scalds. Emergency admissions for falls, poisonings and scalds in the under-fives cost the NHS in England £19.1M in 2012/13.[30] There are no recent data available on ED attendances, but data from 2002 show that approximately 280,000 under-fives attended an ED following a thermal injury, fall or poisoning in the UK.[3] The cost of these visits to the NHS converted to 2012/13 prices is nearly £32M.[31] In total, 80% of all admissions in children aged 0–14 years for thermal injuries occur in the under-fives, as do 73% of all poisonings and 45% of all scalds, highlighting the importance of focusing on this age group. The majority of injuries in the under-fives occur at home,[32] hence the KCS programme focused on thermal injuries, falls and poisonings occurring at home in the under-fives.

The need to develop the evidence base for preventing thermal injuries, falls and poisonings

The NHS needs to be able to make evidence-based decisions about which interventions to fund to prevent home injury in childhood, but the lack of evidence on effectiveness and cost-effectiveness of interventions hampers decision-making. Systematic reviews and meta-analyses[33–42] show that home safety interventions increase safety behaviours and use of safety equipment, but also highlight the lack of evidence about whether these interventions reduce injury occurrence or are cost-effective. In addition, there is a lack of data on the cost of injuries to children, families and the NHS and on how to implement effective child injury prevention interventions within the NHS. The KCS programme, therefore, aimed to increase

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evidence-based thermal injury, falls and poisoning prevention by assessing risk and protective factors for these injuries, evaluating the effectiveness and cost-effectiveness of interventions to prevent these injuries, developing injury prevention briefings (IPBs) for effective and cost-effective interventions and evaluating the implementation of one IPB in children's centres. We have considered thermal injuries in two categories in this research programme – scalds and fire-related burns – because although the tissue injury and pathophysiology are similar, the mechanisms and potential safety measures are very different. Some work streams (e.g. work streams 1, 2 and 6) focus on specific types of thermal injuries (e.g. scalds or fire-related injuries) whereas others focus on all thermal injuries, depending on the existing evidence base. The programme of work to achieve the aims is outlined below.

The Keeping Children Safe programme of research

Research questions

The research questions addressed within six work streams in the KCS programme are outlined in the following sections and shown in *Figure 1*.

Work stream 1

This work stream addressed the question, 'What are the associations between modifiable risk and protective factors and medically attended injuries resulting from five common injury mechanisms in children under the age of 5 years?' This question was answered by a series of five case–control studies exploring risk and protective factors for each of the three most common types of medically attended falls (falls from furniture, stair falls and falls on one level), poisonings and scalds. These five studies are collectively referred to as study A. In addition, a study to validate the self-reported exposures was nested within the case–control studies in study A, and this is referred to as study B.

Work stream 2

This work stream addressed the question, 'What are the NHS and child and family costs of falls, poisonings and scalds?' This was answered by a cohort study measuring costs and injury outcomes nested within the case–control studies in study A. In addition, as there were no validated tools to measure health-related quality of life (HRQL) in the short term following a range of injuries in the under-fives, this study also validated the toddler version of the Pediatric Quality of Life Inventory (PedsQL™)[43] for this purpose. These two studies are referred to as study C, with the costs study referred to as the study C costs substudy and the validation of the PedsQL study referred to as the study C HRQL substudy.

Work stream 3

This work stream addressed the question, 'What interventions are being undertaken by children's centres to prevent thermal injuries, falls and poisonings?'. This question was answered by two national surveys of children's centre managers and staff. These studies are referred to as study D.

Work stream 4

This work stream addressed the question, 'What are the barriers to, and facilitators of, implementing thermal injuries, falls and poisoning prevention interventions among children's' centres, professionals and community members?'. This question was answered by three studies: first, a systematic review of the quantitative and qualitative evidence on barriers to, and facilitators of, injury prevention (study E); second, a qualitative study consisting of interviews with children's centres managers and staff to explore their views on barriers to, and facilitators of, implementing injury prevention interventions in children's centres (study F); and, third, a qualitative study of parents of injured and uninjured children to explore views on barriers to, and facilitators of, implementing home injury prevention nested in the case–control studies in study A (study G).

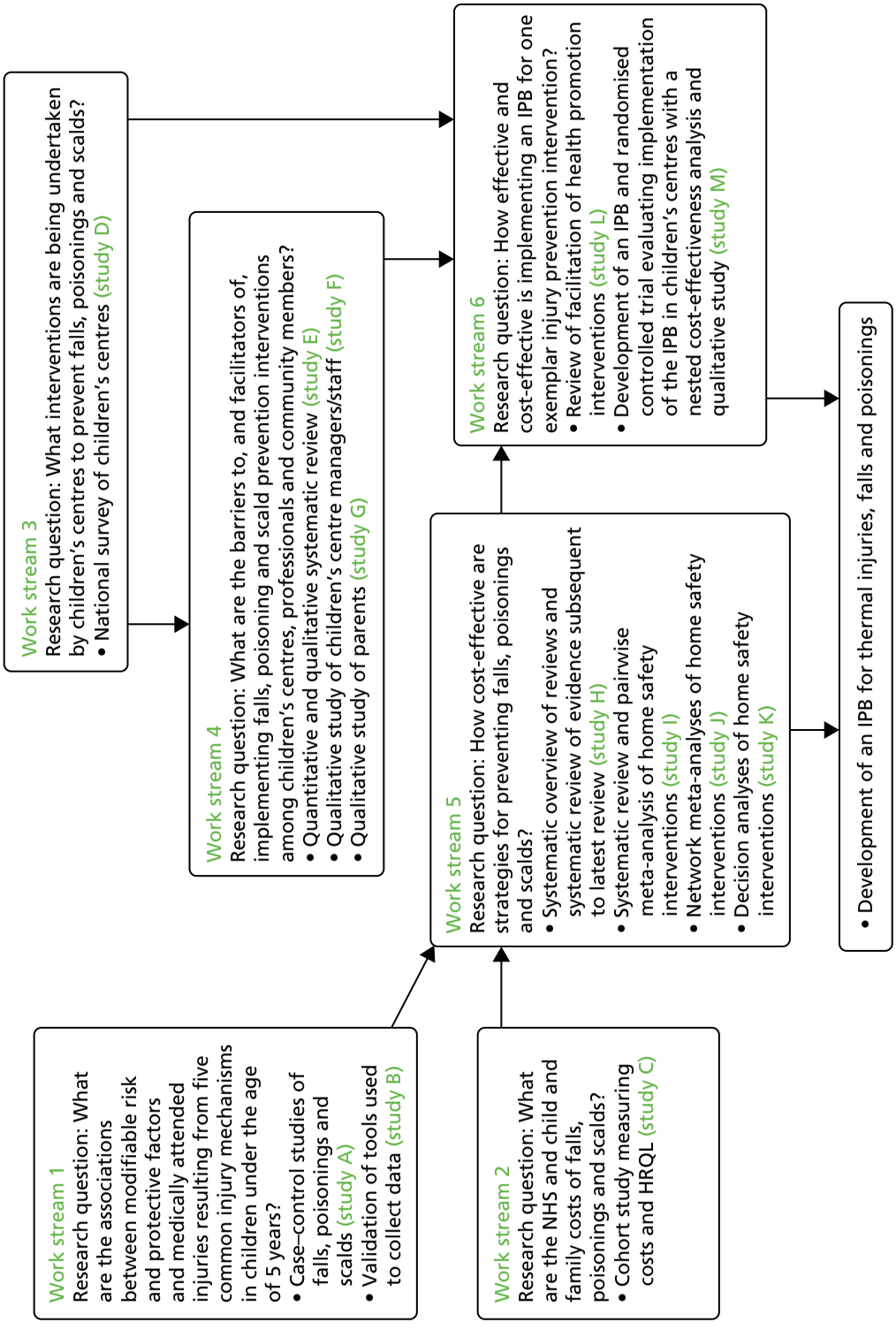


FIGURE 1 The Keeping Children Safe programme of research.

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Work stream 5

This work stream addressed the question, 'How cost-effective are strategies for preventing thermal injuries, falls and poisonings?'. This question was answered by systematic overviews and systematic reviews of the literature on preventing falls, poisonings, fire-related injuries and scalds (study H), a systematic review and pairwise meta-analysis (PMA) of home safety interventions (study I), network meta-analyses (NMAs) of interventions to promote smoke alarm use and promote falls prevention practices, poison prevention practices and scalds prevention practices (study J) and decision analyses of interventions found to be effective in the NMAs (study K).

Work stream 6

This work stream addressed the question, 'How effective and cost-effective is implementing an IPB for one exemplar injury prevention intervention?'. This question was answered by a randomised controlled trial (RCT), set in children's centres, which evaluated the effectiveness and cost-effectiveness of an IPB for the prevention of fire-related injury (study M). The trial was preceded by a review of the literature on the implementation and facilitation of health promotion interventions (study L) to inform the design of the intervention. Evidence from the trial was then incorporated into the development of a second IPB. This covered the prevention of fire-related injury, falls, poisonings and scalds, based on findings from studies A and D–M.

Structure of this report

Each work stream is reported in a separate chapter in the report. Each of these chapters includes the following sections: abstract, introduction, methods, results and discussion. This is followed by a chapter reporting the contribution of the lay research adviser who collaborated with the KCS programme from its inception to its completion. The report ends with three chapters drawing together the conclusions, implications and recommendations for research from the programme.

Chapter 2 What are the associations between modifiable risk and protective factors and medically attended injuries resulting from five common injury mechanisms in children under the age of 5 years? (Work stream 1)

Abstract

Research question

What are the associations between modifiable risk and protective factors and medically attended injuries resulting from five common injury mechanisms in children under the age of 5 years?

Methods

Five multicentre case–control studies were undertaken (study A). Cases were children aged < 5 years attending secondary care with a fall (three types: fall from furniture, fall on one level or a stair fall), poisoning or a scald. Control subjects (controls) were matched to cases on age, sex and calendar time, and were recruited from the register of the cases' general practice (or neighbouring general practice). Exposures (safety equipment use, safety behaviours and hazards) were measured using parent-completed questionnaires and were validated by home observations in a sample of cases and controls (study B). Odds ratios (ORs) were estimated using conditional logistic regression adjusted for confounding factors.

Results

Validation of exposures

In total, 162 home observations were conducted. Sensitivities of ≥ 70% were found for eight out of 12 exposures for falls, for eight out of 15 exposures for poisoning and for three out of three exposures for scalds. Specificities of ≥ 70% were found for 10 out of 12 exposures for falls, for eight out of 15 exposures for poisoning and for two out of three exposures for scalds.

Falls from furniture

In total, 672 cases and 2648 controls participated. Parents of cases were more likely not to use a safety gate [adjusted odds ratio (AOR) 1.65, 95% confidence interval (CI) 1.29 to 2.12], to leave children on raised surfaces (AOR 1.66, 95% CI 1.34 to 2.06) and not to have taught their children rules about climbing on objects in the kitchen (AOR 1.58, 95% CI 1.16 to 2.15), and their children were less likely to climb or play on garden furniture (AOR 0.74, 95% CI 0.56 to 0.97)*. For children aged 0–12 months, parents of cases were more likely to leave children on raised surfaces (AOR 5.62, 95% CI 3.62 to 8.72), change nappies on raised surfaces (AOR 1.89, 95% CI 1.24 to 2.88) and put children in car/bouncing seats on raised surfaces (AOR 2.05, 95% CI 1.29 to 3.27) than parents of controls. In the 13–36 months age group, parents of cases were less likely to put car or bouncing seats on raised surfaces than parents of controls (AOR 0.22, 95% CI 0.05 to 0.94)*. In children aged > 36 months, cases were more likely to climb or play on furniture (AOR 9.25, 95% CI 1.22 to 70.07) than controls.

Falls on one level

In total, 582 cases and 2460 controls participated. Parents of cases were less likely not to use furniture corner covers (AOR 0.72, 95% CI 0.54 to 0.94)* and not to have rugs/carpets firmly fixed to the floor (AOR 0.77, 95% CI 0.59 to 0.99)* than parents of controls.

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Stair falls

In total, 610 cases and 2658 controls participated. Compared with controls, parents of cases were more likely not to use safety gates on their stairs (AOR 2.50, 95% CI 1.90 to 3.29) or to leave them open (AOR 3.09, 95% CI 2.39 to 4.00) than to keep gates closed. Parents of cases were more likely not to have carpeted stairs (AOR 1.52, 95% CI 1.09 to 2.10) or not to have a landing part-way up their stairs (AOR 1.34, 95% CI 1.08 to 1.65). They were also more likely to consider their stairs not safe to use (AOR 1.46, 95% CI 1.07 to 1.99) or in need of repair (AOR 1.71, 95% CI 1.16 to 2.50). Case households were less likely than control households to have tripping hazards on their stairs (AOR 0.77, 95% CI 0.62 to 0.97)* or to not have handrails on all stairs (AOR 0.69, 95% CI 0.56 to 0.86)*.

Poisonings

In total, 567 cases and 2320 controls participated. Parents of cases were more likely not to store all medicines at adult eye level or above (AOR 1.59, 95% CI 1.21 to 2.09) and not to store all medicines safely (locked away or at adult eye level or above) (AOR 1.83, 95% CI 1.38 to 2.42). They were more likely not to put medicines (AOR 2.11, 95% CI 1.54 to 2.90) or household products (AOR 1.79, 95% CI 1.29 to 2.48) away immediately. Parents of cases were less likely not to store all household products safely (AOR 0.77, 95% CI 0.59 to 0.99)* and not to have taught children rules about what to do if medicines were left on the worktop (AOR 0.66, 95% CI 0.45 to 0.96)*.

Scalds

In total, 338 cases and 1438 controls participated. Parents of cases were more likely than parents of controls not to have taught their child rules about not climbing on things in the kitchen (AOR 1.66, 95% CI 1.12, 2.47), what to do or not do when parents are cooking on the cooker top (AOR 1.95, 95% CI 1.33, 2.85) or about hot things in the kitchen (AOR 1.89, 95% CI 1.30 to 2.75). They were also more likely than control parents to have left hot drinks within reach of their child (AOR 2.33, 95% CI 1.63 to 3.31). Cases were less likely than controls to have played or climbed on furniture (AOR 0.62, 95% CI 0.40 to 0.96)* or to have been left alone in the bath (AOR 0.47, 95% CI 0.30 to 0.75)*.

Conclusions

Despite a small number of apparently counterintuitive findings (indicated with an asterisk), a range of modifiable risk factors were associated with falls from furniture, falls on stairs, poisonings and scalds in children aged 0–4 years. These results provide evidence on which to base safety advice and recommendations.

Work stream 1 consisted of five case–control studies (study A) quantifying associations between modifiable risk factors and falls from furniture, falls on one level, falls on steps or stairs, poisonings and scalds. Work stream 1 also included a study to validate self-reported exposures in the case–control studies (study B). The findings from work stream 1 informed:

- the decision analyses undertaken in work stream 5
- the development of an IPB for the prevention of fire-related injuries, falls, poisonings and scalds undertaken in work stream 6 (see *Chapter 7*).

Introduction

The case–control studies focused on falls, poisonings and scalds as these are among the most common types of injury resulting in hospital admission and ED attendance in children aged 0–4 years in England and the UK. In 2012/13, > 26,000 children aged 0–4 years were admitted to hospital in England following a fall, poisoning or scald,[2] as described in more detail below. There are no recent data available on ED attendances, but data from 2002 show that approximately 280,000 children aged 0–4 years attended an ED following a fall, poisoning or thermal injury (burns and scalds) in the UK.[3]

Falls resulted in 19,569 hospital admissions in children aged 0–4 years in England in 2012/13. Of these, 18% were falls from furniture, 11% were falls down stairs or steps and 23% were falls on one level.[2] Falls also result in a large number of ED attendances in the UK; in 2002, there were 229,600 attendances in children aged 0–4 years following a fall. Of these, 18% were falls down stairs or steps and 31% were falls on one level.[3] Falls from furniture most commonly involve beds, chairs,[2,44] baby walkers, bouncers, changing tables and high chairs.[45,46]

Poisonings resulted in 5286 hospital admissions in children aged 0–4 years in England in 2012/3. The majority (74%) were medicinal poisonings, with 26% being non-medicinal poisonings.[2] Poisonings also result in a substantial number of ED attendances in the UK; in 2002, there were 24,887 attendances in children aged 0–4 years following a poisoning.[3]

Scalds accounted for 1811 hospital admissions in children aged 0–4 years in England in 2012/13.[2] Most (61%) were caused by drinks, food, fats and cooking oils, 13% were caused by hot tap water and 26% were caused by other hot fluids. The number of ED attendances for scalds is not routinely available, but there were 26,015 attendances for all thermal injuries in children aged 0–4 years in the UK in 2002.[3] A recent UK study found that 67% of thermal injuries in children aged 0–4 years attending six hospitals in the UK and Ireland resulted from scalds;[47] hence, it can be estimated that approximately 17,000 ED attendances occurred as a result of a scald in the UK in 2002.

Systematic overviews (study H)[48] and a systematic review and PMA (study I)[49] undertaken as part of the KCS programme of research found that home safety interventions providing education, some of which also provided safety equipment, can increase safety gate use and reduce baby walker use, increase safe storage of medicines and household products and availability of poison control centre (PCC) numbers and increase the proportion of families with a safe hot tap water temperature. However, little evidence was found showing whether such interventions reduced fall-related injuries, poisonings or scalds. These reviews highlighted the lack of adequately powered RCTs of interventions to prevent falls, poisoning or scalds that measured injury outcomes. One of the challenges is that, although on a population level injuries are a major public health problem, for individual children, specific injuries are relatively rare events. Hence, trials frequently require prohibitively large sample sizes and are extremely expensive and logistically difficult. Therefore, the best available evidence for effective interventions in the field of injury prevention often comes from rigorous case–control studies, for example those for smoke alarms[50] and cycle helmets.[51] Such evidence has had a major impact on policy and legislation. The NHS, local authorities and other organisations need to be able to make decisions about which home safety interventions to commission or provide, but at present such decisions lack an evidence base. We have therefore undertaken these case–control studies to quantify associations between modifiable risk factors and falls, poisonings and scalds in young children.

Methods

The methods for these studies are described in full in the published protocols.[52–54]

Objectives

The primary objectives of study A were to estimate associations between modifiable risk and protective factors and medically attended injuries resulting from five injury mechanisms in children aged < 5 years:

(a) falls from furniture
(b) falls on one level
(c) stair falls
(d) poisoning
(e) scalds.

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Our secondary objectives were to explore whether or not associations between risk and protective factors and injuries varied by child age, sex, ethnicity, single parenthood, housing tenure and unemployment and injury severity.[49]

Study design

We used five multicentre matched case–control studies [one for each of the injury mechanisms (a)–(e)].

Setting

We recruited participants from EDs, minor injury units (MIUs) and hospital wards from acute NHS trusts in Nottingham, Bristol, Newcastle upon Tyne, Norwich, Gateshead, Derby, Great Yarmouth and Lincoln, UK. Recruitment of cases commenced on 14 June 2010 for all studies and finished on (a) 15 November 2011 for the falls from furniture study, (b) 15 November 2011 for the falls on one level study, (c) 30 September 2012 for the stair falls study, (d) 18 January 2013 for the poisoning study and (e) 18 January 2013 for the scalds study. Recruitment of controls commenced with recruitment of the first case to each study and controls were recruited within 4 months of recruitment of cases.

Participants

Cases were children aged 0–4 years with:

(a) a fall from furniture
(b) a fall on one level
(c) a stair fall
(d) a poisoning or suspected poisoning from a medicinal or other household product or
(e) a scald, resulting in hospital admission or ED or MIU attendance.

Injuries had to have occurred at the address at which the child was registered with a general practitioner (GP) (hereafter referred to as the child's home). Intentional and fatal injuries were excluded, as were children living in residential care. Cases were eligible to be recruited only once to the study.

We used two sources of controls; community controls and hospital controls. For clarity and simplicity the findings relating to community controls (hereafter referred to as controls) are presented in the main text of the report. Findings relating to hospital controls are summarised in *Appendix 1*. Children living in residential care were excluded. Controls were children aged 0–4 years without a medically attended injury of the same mechanism as the case on the date of the case's injury. Controls were eligible to be recruited as a case or as a further control if their second recruitment occurred at least 12 months after their first recruitment. They were not eligible to be recruited more than twice to the study. We aimed to recruit an average of four controls per case, individually matched on age (within 4 months of age of case), sex and calendar time (within 4 months of case injury). To increase the study power and make the most efficient use of controls, when we recruited more than four controls per case (or when cases were later excluded), the extra controls were eligible to be matched to other cases who did not have four matched controls. These were matched on age (within 4 months of age of case), sex and calendar time (within 4 months of the case injury) and study centre, and were eligible to be used only once as an extra matched control.

The eligibility of putative cases to take part in the study was assessed from medical records by clinical staff prior to study invitations being issued. Research staff also assessed eligibility on receipt of completed study questionnaires. Potentially eligible cases were approached by clinical staff face to face during their medical attendance or by telephone or post within 72 hours of their attendance. Controls were recruited by post by general practice or primary care trust (PCT) staff, from the practice register of the case's GP or, when the case's practice was unable to participate, from that of a neighbouring practice. To minimise age differences between cases and controls resulting from the time taken to recruit practices and then recruit controls, study invites were sent to children born up to 4 months before and 2 months after the case's date of birth. Ten children were invited to participate for each case. One reminder was sent to case and control non-respondents 2 weeks after the original mailing.

Variables

Data on injuries

We collected data from parents of cases and hospital controls on the type of injury sustained and the treatment received. We did not seek consent to access medical records to assess injury severity as we considered that this might discourage study participation. We therefore used parent-reported data on treatment as a proxy for injury severity. This is described in more detail below.

Definition of exposures

The exposures of interest were safety equipment use and home hazards measured for the 24 hours prior to the injury for cases and for the 24 hours prior to completing the questionnaire for controls. Safety behaviours were measured over the week prior to the injury for cases and the week prior to completing the questionnaire for controls.

The exposures measured for each study were:

(a) falls from furniture – use of baby walkers, playpens (or travel cots while child awake) or stationary activity centres; use of safety gates anywhere in the house; use of harnesses in high chairs; changing nappies on a raised surface; leaving child unattended on a raised surface; placing car seats or bouncing cradles on a raised surface; having objects that children could climb on to reach high surfaces; frequency of children climbing or playing on furniture; and teaching children safety rules about falls
(b) falls on one level – use of baby walkers, playpens (or travel cots while child awake) or stationary activity centres; use of safety gates anywhere in the house; rugs/carpets firmly fixed to the floor; electric wires or cables trailing across floors; floors clear of tripping hazards; use of furniture corner covers; locking back doors to prevent access to the garden; unsupervised playing in the garden; and teaching children safety rules about falls
(c) stair falls – use of any safety gates; use of safety gates on stairs; leaving safety gate on stairs open; use of baby walkers, playpens (or travel cots while child awake) or stationary activity centres; presence of banisters and width of banister gaps; presence of handrails and tripping hazards on stairs; stairway characteristics (carpeted steps, lighting, steepness, width, landing part-way, winding stairs and steps, stair covering or handrails/banisters in need of repair); and teaching children safety rules about stairs
(d) poisonings – storage of medicinal and household products (analgesics, iron/vitamins, cough medicine, antidepressants/hypnotics and any other medicines, bleach, dishwasher products, oven cleaner, toilet cleaner, turpentine/white spirit and rat/ant killer, garden chemicals and other household products)[55,56] at adult eye level or above; storage of products in locked cupboards, drawers, fridges or cabinets; frequency of returning products to usual storage place immediately after use; use of child-resistant caps (CRCs) or blister packs on products; storage of medicines in a locked medicine box; not transferring products to other containers; use of a safety gate to prevent access to the kitchen; presence of things that child may climb on to reach high surfaces; use of baby walkers; and teaching children safety rules about poisonings.
(e) Scalds – use of safety gates; presence of things that child may climb on to reach high surfaces; drinking hot drinks while holding a child; holding child while using cooker; passing hot drinks over a child; keeping hot drinks out of reach of children; use of curly/short kettle flexes; storing kettles at back of worksurface; use of back rings on cooker; turning saucepan handles away from edge of cooker; use of tablecloths; hot tap water/thermostat temperature; using cold water first when running a bath; measuring bathwater temperature; checking bath water temperature with elbow/hand; leaving child without an adult in the bath or bathroom; children running baths; frequency of child climbing or playing on furniture; use of baby walkers, playpens (or travel cots while child awake) or stationary activity centres; and teaching children safety rules about hot liquids in the kitchen and bathroom.

Definition of potential confounding variables

The potential confounding variables that were measured consisted of sociodemographic and economic characteristics, out-of-home child care and validated measures of child behaviour and temperament

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[Infant Behaviour Questionnaire (IBQ),[57] Early Child Behaviour Questionnaire (ECBQ)[58] and Child Behaviour Questionnaire (CBQ)[59] activity and high-intensity pleasure subscales], safety rules,[60] Parenting Daily Hassles (PDH) scale (parenting tasks subscale),[61,62] parental mental health [Hospital Anxiety and Depression Scale (HADS)[63]] and proxy-reported child's HRQL [PedsQL and a general health visual analogue scale (VAS)[64]]. Eight questions, each with three-point Likert scale responses from 'not likely' to 'very likely', assessed perceptions of children's ability to climb; these were analysed as a categorical variable grouping responses into (1) all not likely, (2) at least one quite likely but none very likely and (3) at least one very likely. In addition, where plausible, some of the exposures listed above were also considered as potential confounders, for example use of a playpen may confound the relationship between use of a safety gate on stairs (as parents may be less likely to use a safety gate if they have a playpen) and the occurrence of a stair fall (as children may have less exposure to stairs if they spend time in a playpen).

As we were not able to recruit all controls from the same general practice as cases, area-level deprivation and distance from hopsital were included in all models as a priori confounders. Deprivation was measured using the 2010 version of the Index of Multiple Deprivation (IMD).[65] IMD scores for lower super output areas were matched to postcode using GeoConvert.[66] Distance from hospital was calculated based on postcodes and calculating straight line distances between two postcodes.[67] For cases we used the postcodes of the home address and the hospital that they attended. For controls we used the postcode of the home address and that of the hospital that the matched case attended. The choice of other confounders to include in multivariable models was determined through the use of causal directed acyclic graphs (DAGs), as described in *Statistical methods*.

Measurement of exposures and confounding variables

We developed age-specific questionnaires (0–12 months, 13–36 months and 37–59 months) for completion by parents or guardians using previously validated measures of exposure when possible[68] (see *Appendix 1*, *Case–control questionnaires*). Questionnaires, study information leaflets and study invitation letters were pre-piloted on families from local children's centres to assess face validity, comprehension, ease of completion and time taken to complete and were then piloted on 11 families of children who had attended EDs at participating NHS trusts and on 29 families from children's centres in study centres.

Validation of exposure measurement (study B)

We assessed the agreement between exposures reported by parents on study questionnaires and those observed on home observations in a sample of cases and controls. Parents of participants in all case–control studies were asked to express interest in other child safety research projects (studies B, C and G) nested within study A. Home observations were undertaken as soon as possible after parents agreed to participate to miminise the time between questionnaire completion and home observation. Observations were undertaken by trained researchers, blind to parents' responses on the study questionnaire, using a checklist of observations (see *Appendix 1, Home observation checklist for study B*). To assess whether or not recent changes to the home may account for differences between reported and observed exposures, participants were asked if changes to safety behaviours, safety equipment use or home hazards had been made in the preceeding 3 months and what the changes were, if any. We chose 3 months as the time period to allow for the time taken to recruit cases and controls to the home observation study (time between receipt of questionnaire and date of home visit: median 29 days, range 1–92 days). Participants were provided with a £5 gift voucher for use in local stores to thank them for their time.

Bias

We used several strategies to try to minimise bias. We aimed to minimise recall bias by inviting cases to participate in the study within 72 hours of the injury attendance and measured exposures over a short time period prior to the injury attendance (ranging from 24 hours to 1 week); for controls we measured exposures over the same time period prior to completing the study questionnaire. When possible, we validated the accuracy of self-reported exposures in cases and controls by home observations. To minimise non-response bias, we used methods shown in systematic reviews to increase response rates, including providing a small monetary incentive (£5) for the return of completed questionnaires, using personalised

letters, sending mail by first class post, providing Freepost reply envelopes, using reminders including the provision of further questionnaires, keeping the questionnaire as short as possible and using university logos on study documentation.[69,70]

Study size

Validation of exposures

For a sensitivity of 80%, assuming that a minimum of 20% of participants displayed the safety behaviour, used the safety equipment or had the hazard of interest, and a CI of ± 20%, 80 home visits were required. As it was plausible that sensitivity could vary between cases and controls, we aimed to recruit 80 cases and 80 controls.

Case–control studies

For the case–control studies, all sample size estimations were based on 80% power, a 5% significance level and a correlation between exposures in cases and controls of 0.1. Sample sizes were estimated to detect protective associations [i.e. an odds ratio (OR) of 0.7 for the falls studies and an OR of 0.63 for the poisoning and scalds studies]. These reductions were chosen as they were considered to be clinically important and required sample sizes that were feasible to achieve. For ease of interpretation of our results, we have presented ORs for risk factors for injury (i.e. not using safety equipment, not having a safety behaviour or having a hazard). The sample size estimations in the following sections therefore use the inverse of the protective ORs given above.

Falls

To detect an OR of 1.43, each case–control study would require 496 cases and 1984 controls for each type of fall (falls from furniture, falls on one level and stair falls), based on the exposure prevalence from previous studies[71,72] [not using safety gates on stairs (55%) or across doorways (70%), not using a playpen (58%), not using a stationary activity centre (76%), rugs not firmly fixed to floors (46%), floors not clear of tripping hazards (57%%), using a baby walker (36%) and leaving a child unattended on raised surfaces (35%)]. We chose the exposure prevalence from this list that required the largest sample size.

Poisoning

To detect an OR of 1.59, 266 cases and 1064 controls would be required. This is based on the exposure prevalence estimated from the first 428 controls recruited to the study, taking account of missing data on exposures and choosing the exposure prevalence that required the largest sample size from not storing all medicines safely (27%), all cleaning products safely (55%) or all products safely (65%), not putting medicines away immediately after use (23%), not putting cleaning products away immediately after use (21%) or not putting all products away immediately after use (29%).

Scalds

To detect an OR of 1.59, 259 cases and 1036 controls would be required. This is based on the exposure prevalance estimated from the first 428 controls recruited to the study, taking account of missing data on exposures and choosing the exposure prevalence that required the largest sample size from drinking hot drinks while holding a child (27%) and not using kettles with curly/short flexes (22%).

Quantitative variables

All exposures were categorical variables. For confounders measured on a continuous scale, we assessed the linearity of their relationship with outcome measures by adding higher-order terms to regression models and tested significance using likelihood ratio tests with a p-value of < 0.05 taken as significant. When the relationship between age and the outcome of interest was non-linear we grouped age into the three age groups consistent with the age groups for which we had developed age-specific questionnaires (0–12 months, 13–36 months, ≥ 37 months). When other relationships were non-linear, we examined distributions of the confounders and grouped values based on cut-off points that separated the distribution into groups of similar values while ensuring sufficient numbers in each group for analysis.

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When standard groupings had been used in previous research, for example quintiles of deprivation scores, we grouped values similarly to allow comparisons with previous research. The cut-off points for groupings are given in the results tables.

We devised a score representing parents' perceptions of their child's ability to climb by combining responses across eight questions asking about perceptions of ability to climb or reach a range of hazards. Each question had a three-point Likert scale response from 'not likely' to 'very likely', with a 'don't know' option. The score was created by categorising responses into (1) all not likely, (2) at least one quite likely but none very likely and (3) at least one very likely. Those with missing or 'don't know' responses to individual items were categorised as missing an overall score unless respondents had at least one 'very likely' response. We also devised a composite categorical variable describing parents' perceptions of their stair characteristics by combining responses across seven questions with a three-point Likert response from 'agree' to 'disagree' (stairs too steep, stairs too narrow, stairs poorly lit, steps in need of repair, banister/handrail in need of repair, stair covering in need of repair and stairs being safe to use). The categories of the composite variable were 'unsafe' (answered agree to any of the first six questions or disagree to last question), 'moderately safe' (answered combinations of agree, disagree and neither agree nor disagree) and 'safe' (answered disagree to all first six questions and agree to last question). Those with missing responses to individual items were categorised as missing a response on the composite variable unless they agreed with any of the first six questions or disagreed with the last question.

When the relationship between distance from hospital and the outcome of interest was non-linear, distance was grouped into quintiles. When the relationship between IMD and the outcome of interest was non-linear IMD was grouped into quintiles.

We used the treatment received as a proxy for injury severity. We created two categories: those who were seen and examined but who did not require any treatment and those requiring treatment in the ED, admitted to hospital or discharged with outpatient or primary care follow-up. We chose these groupings based on the number of cases in each group and combined hospital admissions, those treated in the ED and those discharged with outpatient or primary care follow-up as the numbers admitted to hospital and discharged with outpatient or primary care follow-up were small.

Statistical methods

We calculated kappa coefficients, sensitivities, specificities and predictive values (and 95% CIs) comparing each reported exposure with the observed exposure, with observations used as the 'gold standard'.

Characteristics of cases and controls have been described using frequencies and percentages for categorical variables and means [standard deviations (SDs)] or medians [interquartile ranges (IQRs)] for continuous variables dependent on their distributions. Conditional logistic regression was used to estimate unadjusted ORs and AORs and 95% CIs for the matched analysis. Analyses were adjusted for area-level deprivation[65] and distance from hospital and for confounders identified from DAGs. We developed separate DAGs for each exposure–outcome analysis. All variables that we considered as potential confounders were included in the DAG, and we used Dagitty software [see www.dagitty.net/ (accessed 2 October 2016)] to create a causal diagram for each exposure–outcome analysis and to identify the minimum adjustment set of variables. The regression model for each analysis was adjusted for the variables belonging to the minimum adjustment set for that exposure–outcome analysis by entering them on one step into the model. They were retained in the model regardless of statistical significance or effect on the OR for the exposure. Potential differential effects by child age, sex, ethnicity, single parenthood, housing tenure and unemployment were assessed by adding interaction terms to models. Significance was assessed using likelihood ratio tests with a p-value of < 0.01 taken as significant. When significant interactions were found, the results are presented stratified by socioeconomic variables. Differential effects by injury severity were assessed by stratifying analyses into those who were seen and examined but who did not require any further treatment and those who received treatment or who were admitted to hospital. For the unmatched analyses using hospital controls, unconditional logistic regression was used to estimate unadjusted ORs and AORs and 95% CIs.

Analyses were adjusted for age, sex, area-level deprivation[65] and distance from hospital, in addition to other confounders identified from DAGs. The population attributable fraction (PAF) per cent was calculated for exposures with statistically significantly raised AORs using a published formula.[73]

We followed standard guidance on missing data for the PedsQL score and did not compute mean scale scores when > 50% of the individual scale score responses were missing. When > 50% of questions were answered, mean scale scores were generated with imputation of missing values using the mean of the answered questions.[74] For the HADS score we imputed single missing item values for each subscale using the mean of the remaining six items. When more than one item was missing, subscale scores were not computed.[75] The IBQ, ECBQ and CBQ allowed missing values and were scored as the total score divided by the number of questions answered.[76] We were unable to find guidance for dealing with missing values for the PDH scale so we used the same approach as for the HADS. The main analyses are complete-case analyses, excluding cases and controls with missing data for the exposure or confounding variables. Complete-case analysis gives unbiased estimates when people with missing data are a completely random subset of the individuals in a particular study; the missing data are then called missing completely at random. If, however, missingness is related to other observed or participant data, for example age or sex, this is called missing at random. We undertook multiple imputation, which assumes that missing data are missing at random, to create 20 imputed data sets. These were combined using Rubin's rules.[77] The multiple imputation models included all sociodemographic characteristics, exposures and confounding variables considered in the analysis models, along with case–control status. The imputation models included interaction terms identified in the complete-case analyses when possible, but in some cases the imputation models would not converge when interaction terms were included so these were omitted. When exposures had > 5% of 'not applicable' responses, analyses were repeated coding these as a separate category.

For the validation of exposure measures, to assess whether differences between reported and observed practices may have arisen because of changes made to the home by families after completing questionnaires, we incorporated any changes made in the last 3 months as reported at the home visit to derive a modified value for each exposure. For any cell within the tables comparing reported and observed values, when the percentage of people reporting a change in the previous 3 months was > 20%, the numbers were adjusted to accommodate an assumed change from 'yes' to 'no' and vice versa, and positive predictive values (PPVs) and negative predictive values (NPVs) were recalculated.

Ethics

Approval for the case–control studies and the validation of exposures study was granted by Nottingham Research Ethics Committee 1 (reference number 09/H0407/14).

Results

Validation of exposures study (study B)

The process of recruitment to study B is shown in *Figure 2*. In total, 113 cases and 119 controls were contacted by the research team, of whom 81 (72%) and 81 (68%), respectively, received a home visit. This represents 3% of cases and 1% of controls eligible for study A. The period of time between receipt of questionnaire and the visit being carried out varied between 1 and 92 days, with a median of 29 days.

Table 1 shows the characteristics of families participating in the home observations and those returning completed questionnaires who were eligible to participate in any of the five case–control studies but who did not have a home observation. For most characteristics, there was no significant difference between families who participated and those who did not. Families for whom the questionnaire respondent was female or the participating child was male were more likely to participate; this was also the case for single-parent families or households with more adults out of work.

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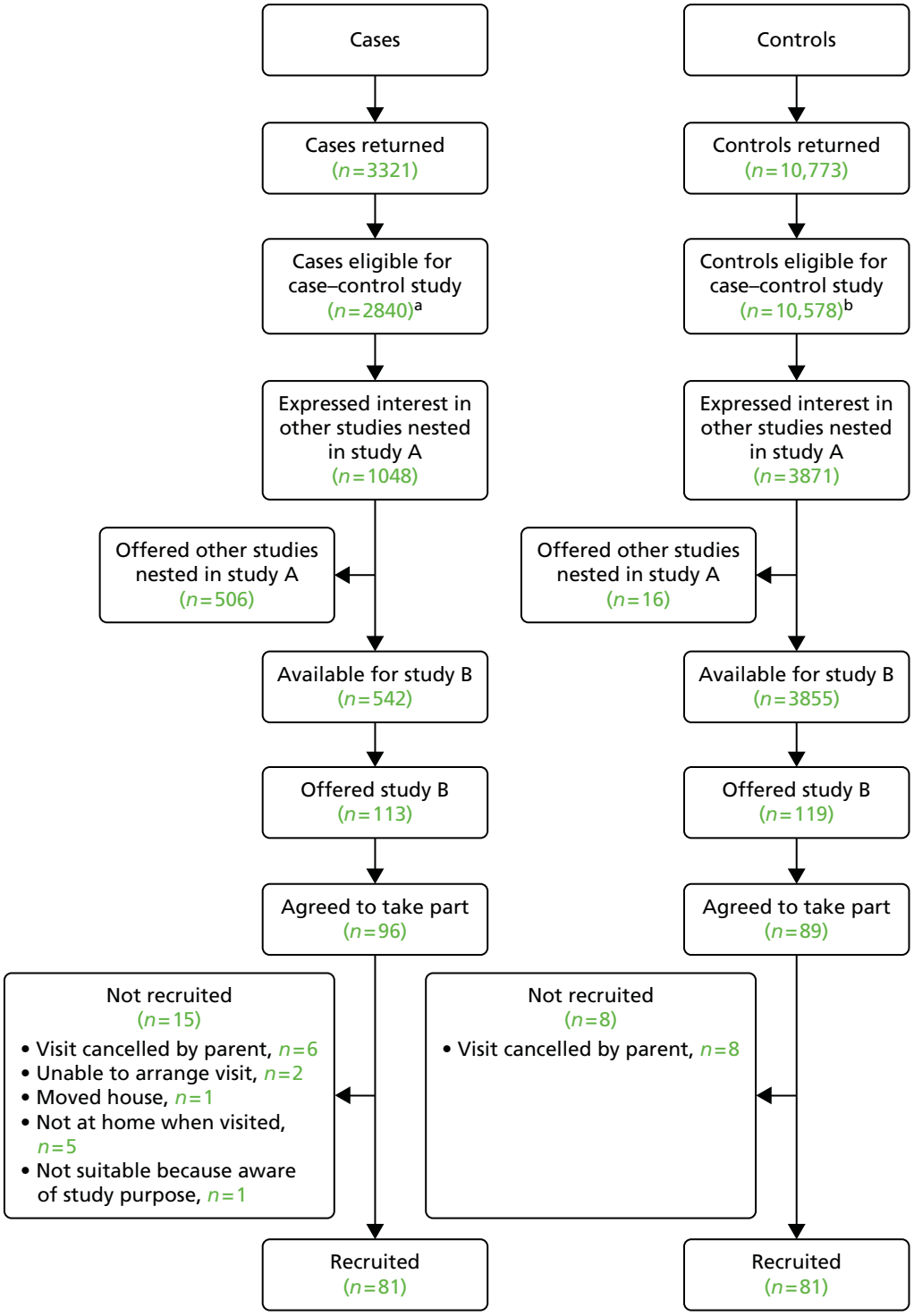


FIGURE 2 Recruitment to the validation of exposures study (study B). a, Includes eight cases subsequently found not to be eligible for study A (study C, $n = 7$; study G, $n = 1$). These eight were not used to compare characteristics of participants in study B. b, Includes 37 controls subsequently found not to be eligible for study A.

TABLE 1 Characteristics of families observed at home and case–control study participants not observed at home

Characteristic	Home observation ($n = 162$)	Cases/controls not observed at home ($n = 13,248$)	p-value
Age of child (months)			0.15
0–12	20 (12.3)	2329 (17.6)	
13–36	107 (66.0)	7883 (59.5)	
37–62	35 (21.6)	3036 (22.9)	
Sex of child: male	103 (63.6)	7232 (54.6)	0.022
Ethnic origin: white	150 (92.6)	11,860 (91.1) [225]	0.50
Number of children aged < 5 years in family		[204]	0.81
0	0	122 (0.9)	
1	91 (56.2)	7843 (60.1)	
2	64 (39.5)	4571 (35.0)	
≥ 3	7 (4.3)	508 (3.9)	
Case or control is first child	67 (43.2) [7]	5317 (43.9) [1136]	0.87
Sex of respondent: female	156 (96.3)	12,189 (92.0)	0.045
Maternal age ≤ 19 years at birth of first child[a]	21 (13.6) [1]	1328 (11.0) [112]	0.31
Single adult household	29 (17.9)	1505 (11.6) [313]	0.014
Adults out of work		[240]	< 0.001
0	77 (47.5)	7193 (55.3)	
1	44 (27.2)	4132 (31.8)	
≥ 2	41 (25.3)	1683 (12.9)	
Receipt of state benefits	63 (39.4) [2]	4754 (36.8) [331]	0.50
Overcrowding (more than one person per room)	10 (6.4) [6]	1004 (8.0) [775]	0.45
Non-owner occupier	64 (39.5)	4565 (35.2) [261]	0.25
Household has no car	26 (16.0)	1479 (11.3) [207]	0.061
Median IMD score (IQR)	17.1 (9.5–34.0) [1]	15.6 (9.3–27.6) [160]	0.18

a Applicable only if completed by mother.

Notes

Values are number (%) unless stated otherwise. Numbers in square brackets represent missing values.

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Table 2 shows the sensitivities, specificities and predictive values for exposures related to falls. NPVs were high (≥ 70%) for all 12 exposures relating to risk of falls. However, the PPV was ≥ 70% for only five of the fall exposures: safety gates at the top of the stairs; safety gates at the bottom of the stairs; use of safety gates elsewhere in the house; carpeted stairs; and the presence of a landing half-way up the stairs. The sensitivity for eight of the exposures was ≥ 70%. Exposures for which the sensitivity was < 70% were the presence of safety gates other than on the stairs and use of baby walkers, use of stationary play centres and use of travel cots as play pens. The specificity was ≥ 70% for 10 of the 12 exposures, being below this for banisters on stairs and handrails on stairs. Kappa coefficients ranged from 0.2 for use of baby walkers (slight agreement)[79] to 0.74 for carpeted stairs (substantial agreement).[79] There was no significant difference [$t = 1.77$, degrees of freedom (df) = 1.42, $p = 0.08$] in measured stair steepness (stair height-to-depth ratio) between those

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TABLE 2 Sensitivities, specificities, predictive values and kappa coefficients for agreement between the questionnaire and observations for exposures related to falls

Practice	Number (%) observed to have practice	Sensitivity (95% CI) (%)	Specificity (95% CI) (%)	PPV (95% CI) (%)	NPV (95% CI) (%)	Kappa coefficient[a] (95% CI)
Has stair gate at top of stairs[b] [3]	83 (52.2)	90.4 (81.9 to 95.7)	73.8 (61.5 to 84.0)	81.5 (72.1 to 88.9)	85.7 (73.8 to 93.6)	0.65 (0.53 to 0.78)
Has stair gate at bottom of stairs[b] [6]	59 (37.8)	91.5 (81.3 to 97.2)	82.6 (72.9 to 89.9)	78.3 (66.7 to 87.3)	93.4 (85.3 to 97.8)	0.72 (0.61 to 0.83)
Has other safety gates in the house[b] [0]	57 (35.2)	42.1 (29.1 to 55.9)	95.7 (89.5 to 98.8)	85.7 (67.3 to 96.0)	73.2 (64.4 to 80.8)	0.42 (0.28 to 0.56)
Stairs are carpeted[b] [1]	142 (88.2)	98.6 (95.0 to 99.8)	75.0 (34.9 to 96.8)	98.6 (95.0 to 99.8)	75.0 (34.9 to 96.8)	0.74 (0.49 to 0.98)
Presence of landing part-way up stairs[b] [2]	75 (46.9)	73.3 (61.9 to 82.9)	85.1 (75.0 to 92.3)	83.3 (72.1 to 91.4)	75.9 (65.3 to 84.6)	0.58 (0.46 to 0.71)
Presence of banisters on all stairs[b] [8]	78 (50.6)	91.0 (82.4 to 96.3)	36.9 (25.3 to 49.8)	63.4 (53.8 to 72.3)	77.4 (58.9 to 90.4)	0.29 (0.15 to 0.43)
Presence of handrails on all stairs[b] [6]	57 (36.5)	87.7 (76.3 to 94.9)	51.1 (40.2 to 61.9)	53.8 (43.1 to 64.2)	86.5 (74.2 to 94.4)	0.35 (0.22 to 0.48)
Use of corner covers on any furniture [0]	17 (10.5)	70.6 (44.0 to 89.7)	85.5 (78.7 to 90.8)	36.4 (20.4 to 54.9)	96.1 (91.2 to 98.7)	0.40 (0.21 to 0.58)
Use of baby walker[c] [1]	14 (8.7)	57.1 (28.9 to 82.3)	76.3 (67.4 to 83.8)	22.9 (10.4 to 40.1)	93.5 (86.5 to 97.6)	0.20 (0.03 to 0.38)
Use of stationary play centre[c] [2]	15 (9.4)	60.0 (32.3 to 83.7)	82.1 (73.8 to 88.7)	31.0 (15.3 to 50.8)	93.9 (87.1 to 97.7)	0.30 (0.10 to 0.50)
Use of play pen[c] [2]	5 (3.1)	80.0 (28.4 to 99.5)	95.9 (90.7 to 98.7)	44.4 (13.7 to 78.8)	99.2 (95.4 to 100)	0.55 (0.23 to 0.87)
Use of travel cot instead of a playpen[c] [1]	10 (6.2)	50.0 (18.7 to 81.3)	93.2 (87.1 to 97.0)	38.5 (13.9 to 68.4)	95.7 (90.1 to 98.6)	0.38 (0.11 to 0.65)

a Kappa coefficients: < 0 = poor agreement; 0.00–0.20 = slight agreement; 0.21–0.40 = fair agreement; 0.41–0.60 = moderate agreement; 0.61–0.80 = substantial agreement; 0.81–1.00 = almost perfect agreement.[79]
b Questions asked only of those with stairs ($n = 151$).
c These practices were asked only for children aged ≤ 36 months ($n = 129$).

Notes
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reporting that their stairs were too steep ($n = 23$; mean 0.87, SD 0.21) and those not reporting that their stairs were too steep ($n = 121$; mean 0.82, SD 0.09). Observed banister gaps were significantly larger than reported gaps ($n = 55$; $Z = 3.12$, $p = 0.002$). The median reported gap was 3.0 inches (IQR 2.0–4.0 inches) whereas the median observed gap was 3.8 inches (IQR 3.5–4.3 inches).

Table 3 shows the sensitivities, specificities, predictive values and percentage agreement for 16 exposures relating to poisoning. All PPVs were low, the highest being 68% for all medicines having CRCs or blister packs. For 11 of the exposures, the NPV was > 70%, whereas sensitivity was > 70% for eight exposures.

TABLE 3 Sensitivities, specificities, predictive values and kappa coefficients for agreement between the questionnaire and observations for exposures related to poisons

Practice	Number (%) observed to have practice	Sensitivity (95% CI) (%)	Specificity (95% CI) (%)	PPV (95% CI) (%)	NPV (95% CI) (%)	Kappa coefficient[a] (95% CI)
All medicines stored safely[b] [23]	68 (48.9)	83.8 (72.9 to 91.6)	31.0 (20.5 to 43.1)	53.8 (43.8 to 63.5)	66.7 (48.2 to 82.0)	0.15 (0.01 to 0.28)
All household products stored safely[b] [18]	29 (20.1)	75.9 (56.5 to 89.7)	60.9 (51.3 to 69.8)	32.8 (21.8 to 45.4)	90.9 (82.2 to 96.3)	0.25 (0.11 to 0.38)
All medicines and household products stored safely[b] [22]	16 (11.4)	68.8 (41.3 to 89.0)	68.5 (59.6 to 76.6)	22.0 (11.5 to 36.0)	94.4 (87.5 to 98.2)	0.19 (0.05 to 0.34)
All medicines stored in locked cupboard, cabinet, drawer or fridge [5]	3 (1.9)	0 (0.0 to 70.8)	87.7 (81.4 to 92.4)	0 (0.0 to 17.6)	97.8 (93.8 to 99.5)	–0.03 (–0.07 to 0.00)
All household products stored in locked cupboard, cabinet, drawer or fridge [8]	11 (7.1)	54.5 (23.4 to 83.3)	79.0 (71.4 to 85.4)	16.7 (6.4 to 32.8)	95.8 (90.4 to 98.6)	0.16 (0.00 to 0.33)
All medicines and household products stored in locked cupboard, cabinet, drawer or fridge [3]	0 (0.0)	Unable to calculate because of frequencies of 0 in some cells				
All medicines stored at adult eye level or above [27]	64 (47.4)	78.1 (66.0 to 87.5)	42.3 (30.6 to 54.6)	54.9 (44.2 to 65.4)	68.2 (52.4 to 81.4)	0.20 (0.05 to 0.35)
All household products stored at adult eye level or above [22]	10 (7.1)	90.0 (55.5 to 99.7)	88.5 (81.7 to 93.4)	37.5 (18.8 to 59.4)	99.1 (95.3 to 100)	0.48 (0.27 to 0.69)
All medicines and household products stored at adult eye level or above [18]	5 (3.5)	80.0 (28.4 to 99.5)	87.1 (80.3 to 92.1)	18.2 (5.2 to 40.3)	99.2 (95.5 to 100)	0.25 (0.04 to 0.47)
All medicines have CRCs or blister packs [1]	105 (65.2)	93.3 (86.7 to 97.3)	17.9 (8.9 to 30.4)	68.1 (59.8 to 75.6)	58.8 (32.9 to 81.6)	0.13 (0.00 to 0.27)
Any medicines put in a container different from the one they came in [1]	9 (5.6)	33.3 (7.5 to 70.1)	98.0 (94.3 to 99.6)	50.0 (11.8 to 88.2)	96.1 (91.8 to 98.6)	0.37 (0.05 to 0.69)
All medicines kept in a locked medicine box [1]	4 (2.5)	50.0 (6.8 to 93.2)	82.8 (76.0 to 88.4)	6.9 (0.8 to 22.8)	98.5 (94.6 to 99.8)	0.08 (–0.06 to 0.22)
Medicines kept in the fridge [1]	36 (22.4)	61.1 (43.5 to 76.9)	91.2 (84.8 to 95.5)	66.7 (48.2 to 82.0)	89.1 (82.3 to 93.9)	0.54 (0.38 to 0.70)
All household products have CRCs [1]	57 (35.4)	71.9 (58.5 to 83.0)	35.6 (26.4 to 45.6)	38.0 (28.8 to 47.8)	69.8 (55.7 to 81.7)	0.06 (–0.06 to 0.19)
Any household products put in a container different from the one they came in [0]	16 (9.9)	6.3 (0.2 to 30.2)	97.9 (94.1 to 99.6)	25.0 (0.6 to 80.6)	90.5 (84.8 to 94.6)	0.06 (–0.12 to 0.24)

continued

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TABLE 3 Sensitivities, specificities, predictive values and kappa coefficients for agreement between the questionnaire and observations for exposures related to poisons (*continued*)

Practice	Number (%) observed to have practice	Sensitivity (95% CI) (%)	Specificity (95% CI) (%)	PPV (95% CI) (%)	NPV (95% CI) (%)	Kappa coefficient[a] (95% CI)
Safety catch/lock on fridge[c] [1]	1 (0.6)	100 (2.5 to 100)	67.7 (48.6 to 83.3)	9.1 (0.2 to 41.3)	100 (83.9 to 100)	0.12 (–0.10 to 0.33)

a Kappa coefficients: < 0 = poor agreement; 0.00–0.20 = slight agreement; 0.21–0.40 = fair agreement; 0.41–0.60 = moderate agreement; 0.61–0.80 = substantial agreement; 0.81–1.00 = almost perfect agreement.[79]
b Considered safe if stored at adult eye level (or above) or in drawers and cupboards with catches or locks or if none stored in the house.
c Question asked only of those reporting storing medicines in the fridge ($n = 33$).
Notes
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Kappa coefficients varied from –0.03 for all medicines stored in locked cupboard, cabinet, drawer or fridge (poor agreement)[79] to 0.54 for medicines kept in fridge (moderate agreement).[79]

Table 4 shows the sensitivities, specificities, predictive values and percentage agreement for exposures relating to scalds. Sensitivity was > 70% for all three scald-related exposures. The PPV was high for two exposures (a kettle with a curly flex and kettle kept at the back of the kitchen surface), whereas the NPV was high for having a safety gate across the kitchen doorway and for having a kettle kept at the back of the kitchen surface. Kappa coefficients ranged from 0.13 (slight agreement) to 0.57 (moderate agreement).[79]

Over-reporting of safety practices was more common than under-reporting. We were able to calculate predictive values for 30 safety practices and found that, for 24 of these, more families over-reported than under-reported (NPV exceeds PPV) and, for the remaining six practices, more families under-reported than over-reported (PPV exceeds NPV).

TABLE 4 Sensitivities, specificities, predictive values and kappa coefficients for agreement between the questionnaire and observations for exposures related to scalds

Practice	Number (%) observed to have practice	Sensitivity (95% CI) (%)	Specificity (95% CI) (%)	PPV (95% CI) (%)	NPV (95% CI) (%)	Kappa coefficient[a] (95% CI)
Has cordless kettle or curly flex [2]	156 (97.5)	82.1 (75.1 to 87.7)	75.0 (19.4 to 99.4)	99.2 (95.8 to 100)	9.7 (2.0 to 25.8)	0.13 (– 0.02 to 0.28)
Kettle kept at back of kitchen surface [1]	121 (75.2)	94.2 (88.4 to 97.6)	42.5 (27.0 to 59.1)	83.2 (75.9 to 89.0)	70.8 (48.9 to 87.4)	0.42 (0.26 to 0.59)
Safety gate across kitchen doorway [0]	34 (21.0)	79.4 (62.1 to 91.3)	85.2 (77.8 to 90.8)	58.7 (43.2 to 73.0)	94.0 (88.0 to 97.5)	0.57 (0.43 to 0.72)

a Kappa coefficients: < 0 = poor agreement; 0.00–0.20 = slight agreement; 0.21–0.40 = fair agreement; 0.41–0.60 = moderate agreement; 0.61–0.80 = substantial agreement; 0.81–1.00 = almost perfect agreement.[79]
Notes
Numbers in square brackets represent missing values.
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We explored whether or not differences between reported and observed safety practices could be accounted for by families changing safety practices between completing the questionnaire and the home observation. This did not appear to explain the differences between reported and observed practices, as the findings were similar to those from the main analysis when using the adjusted figures.[78] The results are available from the authors on request.

Associations between observations and self-reports differed significantly between cases and controls for only one exposure, which was storage of household products in containers that were different from the ones in which they came ($\chi^2 = 4.91$, $p = 0.03$). The results are available from the authors on request.

Case–control study of risk and protective factors for falls from furniture (study A)

A total of 672 cases and 2648 controls participated in the study. The process of recruitment to the study is shown in *Figure 3*. In total, 35% of cases and 33% of controls agreed to participate. The age and sex of participants and non-participants in the falls from furniture study were similar, as shown in *Table 5*.

The mean number of controls per case was 3.94. The median time from date of injury to date of questionnaire completion for cases was 10 days (IQR 6–20 days).

Most cases sustained single injuries (86%), most commonly a bang on the head (59%), cuts/grazes not requiring stitches (19%) and fractures (14%). Most cases (60%) were seen and examined but did not

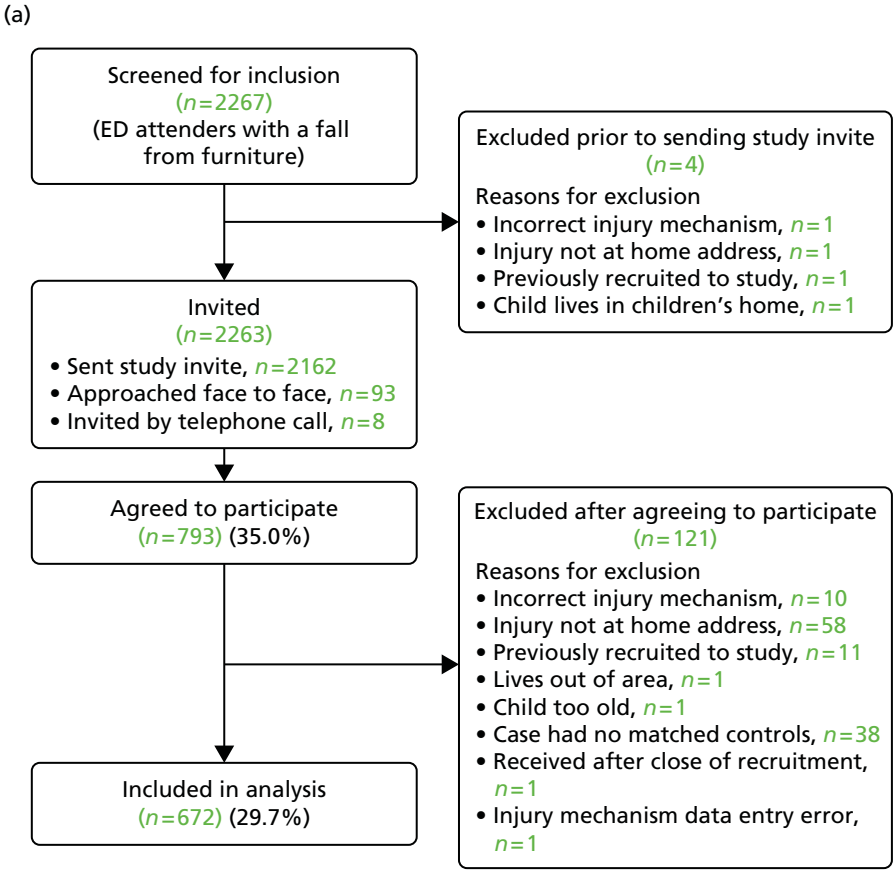


FIGURE 3 Flow of cases and controls through the falls from furniture study: (a) recruitment of cases; and (b) recruitment of controls. a, Assumed to be 10 times the number of cases as practices were asked to invite 10 controls for each case; b, controls for cases from the falls from furniture study for whom there were more than four controls and controls for fall from furniture cases who were not matched to the case (e.g. because the case was excluded); c, controls for cases from the other four ongoing case–control studies. Reproduced with permission of *JAMA Pediatrics* 2015;**169**(2):145–153.[80] Copyright 2015 American Medical Association. (*continued*)

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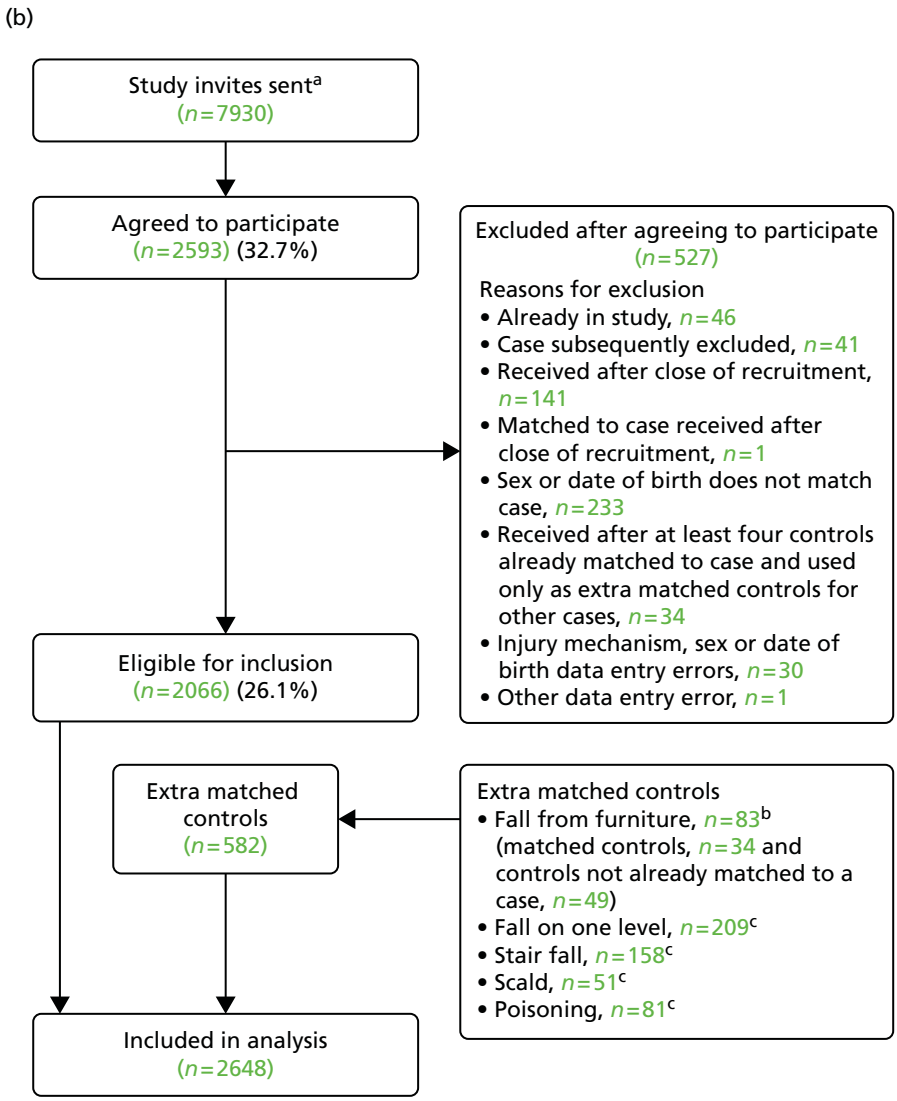


FIGURE 3 Flow of cases and controls through the falls from furniture study: (a) recruitment of cases; and (b) recruitment of controls. a, Assumed to be 10 times the number of cases as practices were asked to invite 10 controls for each case; b, controls for cases from the falls from furniture study for whom there were more than four controls and controls for fall from furniture cases who were not matched to the case (e.g. because the case was excluded); c, controls for cases from the other four ongoing case–control studies. Reproduced with permission of *JAMA Pediatrics* 2015;**169**(2):145–153.[80] Copyright 2015 American Medical Association.

TABLE 5 Age and sex of participants and non-participants

Characteristic	Participants ($N = 672$), *n* (%)	Non-participants ($N = 1470$), *n* (%)	Significance
Age group (months)			
0–12	223 (33.2)	451 (30.7)	$\chi^2_{(2)} = 4.05$, $p = 0.13$
13–36	296 (44.0)	716 (48.7)	
≥ 37	153 (22.8)	303 (20.6)	
Sex			
Male	365 (54.3)	788 (53.6)	$\chi^2_{(1)} = 0.09$, $p = 0.76$
Female	307 (45.7)	682 (46.4)	

require treatment, with 29% treated in the ED, 4% were admitted to hospital and 7% treated and discharged with a follow-up appointment.

Table 6 shows the sociodemographic characteristics of cases and controls. As expected, because controls were recruited after the matched cases, they were slightly older than cases (median age 1.91 vs. 1.74 years). Cases were slightly more likely than controls to live in a household with no adults in paid work (17.7% vs. 12.6%), in a household receiving state benefits (43.0% vs. 35.9%) and in non-owner-occupied housing (39.5% vs. 32.2%).

TABLE 6 Sociodemographic characteristics of cases and controls

Characteristic	Cases ($n = 672$)	Controls ($n = 2648$)
Study centre		
Nottingham	246 (36.6)	966 (36.5)
Bristol	215 (32.0)	832 (31.4)
Norwich	146 (21.7)	644 (24.3)
Newcastle	65 (9.7)	206 (7.8)
Age (years), median (IQR)[a]	1.74 (0.84–2.86)	1.91 (1.00–3.01)
Age group (months)		
0–12	223 (33.2)	741 (28.0)
13–36	296 (44.0)	1270 (48.0)
37–62	153 (22.8)	637 (24.1)
Male	365 (54.3)	1478 (55.8)
Ethnic origin: white	583 (88.9) [16]	2403 (92.2) [41]
Children aged 0–4 years in family	[6]	[40]
0	9 (1.4)	20 (0.8)
1	391 (58.7)	1563 (59.9)
2	231 (34.7)	927 (35.5)
≥ 3	35 (5.3)	98 (3.8)
First child	285 (45.4) [44]	1093 (44.9) [212]
Maternal age ≤ 19 years at birth of first child[b]	77 (12.5) [4]	219 (9.0) [19]
Single adult household	95 (14.5) [15]	263 (10.2) [61]
Weekly out-of-home child care (hours), median (IQR)	7.5 (0.0–18.0) [46]	12.0 (1.0–22.0) [179]
Adults in paid employment	[16]	[45]
≥ 2	319 (48.6)	1481 (56.9)
1	221 (33.7)	795 (30.5)
0	116 (17.7)	327 (12.6)
Household receives state benefits	280 (43.0) [21]	928 (35.9) [65]
Overcrowding (more than one person per room)	56 (8.8) [32]	173 (6.9) [146]
Non-owner occupier	262 (39.5) [9]	838 (32.2) [49]
Household has no car	95 (14.4) [10]	288 (11.0) [40]
IMD score, median (IQR)[c]	16.8 (10.0–31.9)	14.9 (9.0–26.8) [28]

continued

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TABLE 6 Sociodemographic characteristics of cases and controls (*continued*)

Characteristic	Cases ($n = 672$)	Controls ($n = 2648$)
Distance from hospital (km), median (IQR)	3.4 (1.9 to 5.4)	3.9 (2.4 to 7.4) [29]
CBQ score, mean (SD)[c]	4.68 (0.92) [45]	4.67 (0.88) [234]
Long-term health condition	60 (9.0) [5]	185 (7.0) [14]
Child health VAS score (range 0–10), median (IQR)[c]	9.9 (9.3–10.0) [6]	9.7 (8.5–10.0) [22]
HRQL in children aged ≥ 2 years (PedsQL score), median (IQR)[c,d]	93.1 (86.9 to 97.6), $n = 287$ [4]	90.0 (82.9 to 94.4), $n = 1270$ [21]
Parental assessment of child's ability to climb	[18]	[57]
All scenarios 'not likely'	166 (25.4)	536 (20.7)
One or more scenarios 'quite likely' and none 'very likely'	85 (13.0)	235 (9.1)
One or more scenarios 'very likely'	403 (61.6)	1820 (70.2)
PDH tasks subscale score, median (IQR)[c,e]	13 (10 to 17) [65]	14 (11 to 18) [168]
HADS score, mean (SD)[c,e]	10.7 (6.0) [8]	10.8 (6.0) [39]

a Age when questionnaire completed.
b Applicable only when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% of items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes
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Table 7 shows the frequency of exposures among cases and controls and unadjusted ORs, and *Table 8* shows ORs adjusted for a range of confounding variables. Adjusting for confounders had relatively little impact on most ORs; only one out of 13 ORs changed by > 10% after adjustment (had things child could climb on to reach high surfaces – OR 0.85, AOR 0.94). Compared with parents of controls, in the adjusted analyses parents of cases were more likely not to use a safety gate (AOR 1.65, 95% CI 1.29 to 2.12; PAF 15%), more likely to leave children on raised surfaces (AOR 1.66, 95% CI 1.34 to 2.06, PAF 23%) and more likely not to have taught their children rules about climbing on objects in the kitchen (AOR 1.58, 95% CI 1.16 to 2.15, PAF 16%) and their children were less likely to climb or play on garden furniture (AOR 0.74, 95% CI 0.56 to 0.97). Most of the ORs for the remaining nine exposures were close to 1, with seven being > 1 (ranging from 1.01 to 1.35) and two being < 1 (0.77 and 0.94). All had CIs indicating that associations could have occurred by chance.

There were significant interactions with child age. ORs for each age group are shown in *Table 9*. Comparing cases to controls, for children aged 0–12 months, parents of cases were more likely to leave children on raised surfaces (AOR 5.62, 95% CI 3.62 to 8.72; PAF 50%), change nappies on raised surfaces (AOR 1.89, 95% CI 1.24 to 2.88; PAF 34%) and put children in car/bouncing seats on raised surfaces (AOR 2.05, 95% CI 1.29 to 3.27; PAF 12%) than parents of controls. In the 13–36 month age group, parents of cases were less likely to put car or bouncing seats on raised surfaces than controls (AOR 0.22, 95% CI 0.05 to 0.94). The effect for children climbing or playing on furniture was only significant in children aged 3 years and older, with cases being more likely to climb or play on furniture (AOR 9.25, 95% CI 1.22 to 70.07; PAF 88%) than controls.

TABLE 7 Frequency of exposures and unadjusted ORs comparing cases with controls

Exposure	Cases ($n = 672$)	Controls ($n = 2648$)	Unadjusted OR (95% CI)
Did not use any safety gates[a]	227 (36.9) [56]	688 (27.7) [160]	1.68 (1.36 to 2.07)
Used high chair without harness at least some days[b,c]	118 (26.3) [11] ((213))	522 (29.6) [34] ((853))	0.82 (0.65 to 1.05)
Had things child could climb on to reach high surfaces[a]	248 (37.6) [12]	1075 (40.9) [22]	0.85 (0.70 to 1.04)
Left child on a raised surface at least some days[b,c]	357 (57.7) [13] ((40))	1221 (49.0) [33] ((121))	1.56 (1.29 to 1.88)
Changed nappy on raised surface at least some days[b,c]	297 (56.0) [10] ((132))	1106 (53.9) [30] ((565))	1.09 (0.89 to 1.33)
Put child in car/bouncing seat on raised surface at least some days[b,c]	59 (11.4) [11] ((142))	176 (8.8) [30] ((626))	1.33 (0.95 to 1.87)
Child climbed or played on furniture at least some days[b,c]	472 (78.1) [7] ((61))	1909 (77.9) [27] ((169))	0.95 (0.73 to 1.26)
Child climbed or played on garden furniture at least some days[b,c]	181 (34.4) [10] ((136))	816 (39.1) [28] ((532))	0.74 (0.62 to 0.98)
Had not taught child rules about climbing in kitchen	282 (44.5) [39]	1026 (40.0) [82]	1.52 (1.15 to 2.00)
Had not taught child rules about jumping on bed/furniture	283 (44.5) [36]	1079 (42.0) [80]	1.30 (0.97 to 1.73)
	Cases ($n = 519$)	**Controls ($n = 2011$)**	**Unadjusted OR (95% CI)**
Exposures measured only in children aged 0–36 months			
Did not use baby walker[a]	372 (73.5) [13]	1359 (68.8) [36]	1.27 (1.01 to 1.60)
Did not use playpen or travel cot[a]	411 (81.9) [17]	1628 (82.6) [41]	0.95 (0.73 to 1.23)
Did not use stationary activity centre[a]	375 (74.6) [16]	1469 (74.5) [39]	0.98 (0.78 to 1.24)

a In the last 24 hours.
b In the last week.
c Excludes 'not applicable' responses.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.
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TABLE 8 Adjusted ORs comparing cases with controls

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Did not use any safety gates[b]	1.65 (1.29 to 2.12)	PDH score, HADS score, hours of out-of-home care, ability to climb, first child
Used high chair without harness at least some days[c]	0.77 (0.57 to 1.03)	CBQ score, hours of out-of-home care
Had things child could climb on to reach high surfaces[b]	0.94 (0.75 to 1.24)	Hours of out-of-home care, ability to climb, first child, safety gate, safety rules on climbing in kitchen and jumping on furniture
Left child on a raised surface at least some days[c]	1.66 (1.34 to 2.06)[d]	CBQ score, hours of out-of-home care

continued

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TABLE 8 Adjusted ORs comparing cases with controls (*continued*)

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Changed nappy on raised surface at least some days[c]	1.10 (0.87 to 1.40)[d]	CBQ score, hours of out-of-home care
Put child in car/bouncing seat on raised surface at least some days[c]	1.35 (0.91 to 2.01)[d]	CBQ score, hours of out-of-home care
Child climbed or played on furniture at least some days[c]	1.03 (0.73 to 1.44)[d]	CBQ score, hours of out-of-home care, things child could climb on to reach high surfaces
Child climbed or played on garden furniture at least some days[c]	0.74 (0.56 to 0.97)	CBQ score, hours of out-of-home care, things child could climb on to reach high surfaces
Had not taught child rules about climbing in kitchen	1.58 (1.16 to 2.15)	HADS score, PDH score, first child, things child could climb on to reach high surfaces
Had not taught child rules about jumping on bed/furniture	1.21 (0.87 to 1.68)	HADS score, PDH score, first child, things child could climb on to reach high surfaces
Did not use baby walker[b]	1.22 (0.90 to 1.65)	HADS score, PDH score, hours of out-of-home care, ability to climb, first child, uses safety gate, uses playpen/travel cot, uses activity centre
Did not use playpen or travel cot[b]	1.01 (0.71 to 1.46)	HADS score, PDH score, hours of out-of-home care, ability to climb, first child, uses baby walker, uses safety gate, uses activity centre
Did not use stationary activity centre[b]	0.94 (0.69 to 1.27)	HADS score, PDH score, hours of out-of-home care, ability to climb, first child, uses baby walker, uses playpen/travel cot, uses safety gate

a All matched analyses adjusted for deprivation (IMD) and distance from hospital plus confounders in the table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c In the last week.
d Significant interaction with age; stratified results shown in *Table 9*.
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TABLE 9 Significant interactions in adjusted analyses between exposures and age comparing cases with controls

Exposure	AOR[a] (95% CI) by age group			*p*-value from test for interaction
	0–12 months	13–36 months	≥ 37 months	
Left child on raised surface at least some days[b]	5.62 (3.62 to 8.72)	1.05 (0.77 to 1.44)	1.00 (0.64 to 1.57)	< 0.001
Nappy changed on raised surface at least some days[b]	1.89 (1.24 to 2.88)	0.81 (0.59 to 1.11)	0.76 (0.31 to 1.92)	0.004
Put child in car/bouncing seat on raised surface at least some days[b]	2.05 (1.29 to 3.27)	0.22 (0.05 to 0.94)	0.72 (0.13 to 3.87)	0.001
Climbed or played on furniture at least some days[b]	0.96 (0.60 to 1.52)	0.75 (0.41 to 1.34)	9.25 (1.22 to 70.07)	0.007

a Adjusted for confounders as in *Table 8*.
b In the last week.
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Tables showing the results of the following sensitivity analyses are available from the authors on request. None of the AORs using the multiply imputed data differed by > 10% from those using the complete-case data for the main analysis. Five of the AORs for the interaction analyses differed by > 10% between the analysis using the multiply imputed data and the analysis using the complete-case data. All six exposures with a 'not applicable' response option had > 5% of 'not applicable' responses. Analyses were undertaken incorporating a separate category for 'not applicable' responses. None of the AORs for the six exposures differed by > 10% between the analyses with and the analyses without the 'not applicable' category.

Stratifying analyses by the treatment received (as a proxy for injury severity) resulted in AORs with fairly broad and overlapping 95% CIs for those seen and examined in the ED and those admitted/treated in the ED/discharged with follow-up for all exposures. The results from these analyses are available from the authors on request.

Case–control study of risk and protective factors for falls on one level (study A)

A total of 582 cases and 2460 controls participated in the falls on one level study. The process of recruitment to the study is shown in *Figure 4*. In total, 24% of cases and 24% of controls agreed to participate and were included in the analysis. *Table 10* shows that participants and non-participants were similar in terms of sex and age.

The mean number of controls per case was 4.23. The median time from date of injury to date of questionnaire completion for cases was 10 days (IQR 6–20 days).

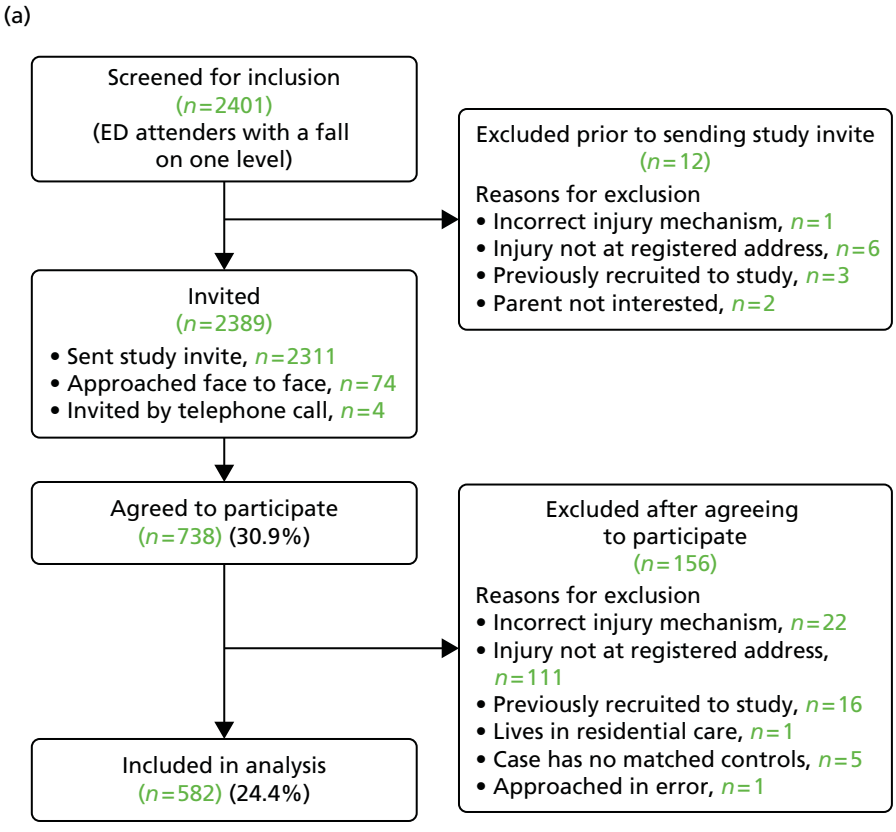


FIGURE 4 Flow of cases and controls through the falls on one level study: (a) recruitment of cases; and (b) recruitment of controls. a, Assumed to be 10 times the number of cases as practices were asked to invite 10 controls for each case; b, controls for cases from the other four ongoing case–control studies; c, controls for cases from the falls on one level study who had more than four controls and controls for falls on one level cases who were not matched to the case (e.g. because the case was excluded). Reproduced with permission from Benford P, Young B, Coupland C, Watson M, Hindmarch P, Hayes M, Goodenough T, Majsak-Newman G, Kendrick D. Risk and protective factors for falls on one level in young children: multicentre case–control study. *Injury Prevention* 2015;**21**:381–8.[81] Copyright © 2015 BMJ Publishing Group Ltd and Royal College of Paediatrics and Child Health. All rights reserved. (*continued*)

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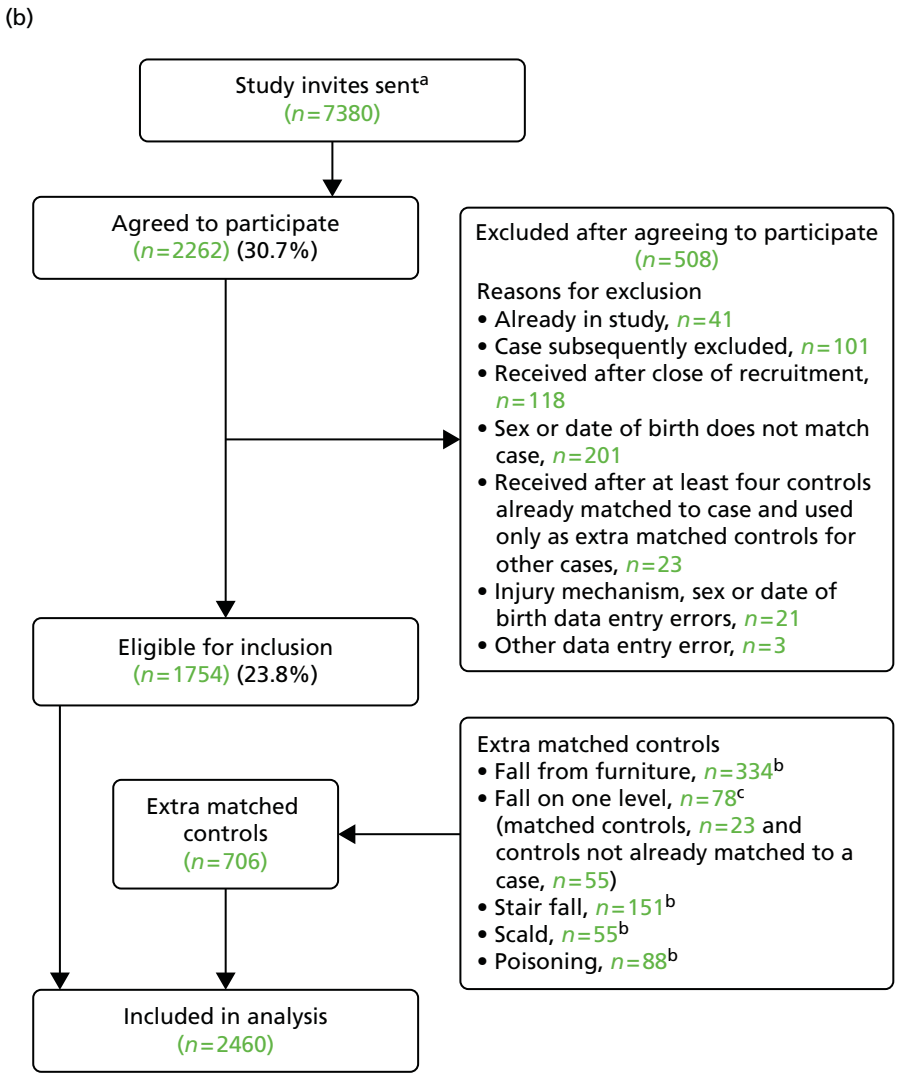


FIGURE 4 Flow of cases and controls through the falls on one level study: (a) recruitment of cases; and (b) recruitment of controls. a, Assumed to be 10 times the number of cases as practices were asked to invite 10 controls for each case; b, controls for cases from the other four ongoing case–control studies; c, controls for cases from the falls on one level study who had more than four controls and controls for falls on one level cases who were not matched to the case (e.g. because the case was excluded). Reproduced with permission from Benford P, Young B, Coupland C, Watson M, Hindmarch P, Hayes M, Goodenough T, Majsak-Newman G, Kendrick D. Risk and protective factors for falls on one level in young children: multicentre case–control study. *Injury Prevention* 2015;**21**:381–8.[81] Copyright © 2015 BMJ Publishing Group Ltd and Royal College of Paediatrics and Child Health. All rights reserved.

TABLE 10 Age and sex of participants and non-participants

Characteristic	Participants ($N = 582$), *n* (%)	Non-participants ($N = 1653$), *n* (%)	Total ($N = 2235$), *n* (%)	Significance
Age group (months)				
0–12	72 (12.4)	198 (12.0)	270 (12.1)	$\chi^2_{(2)} = 0.06$; $p = 0.97$
13–36	363 (62.4)	1036 (62. 7)	1399 (62.6)	
≥ 37	147 (25.3)	419 (25.3)	566 (25.3)	
Sex				
Male	360 (61.9)	1008 (61.0)	1368 (61.2)	$\chi^2_{(1)} = 0.14$; $p = 0.71$
Female	222 (38.1)	645 (39.0)	867 (38.8)	

The majority of cases had sustained single injuries (80%), most commonly a bang on the head (52%), cuts/grazes not requiring stitches (29%) and cuts needing stitches (17%). In total, 47% of cases were seen and examined but did not require treatment, 46% were treated in the ED, 3% were admitted to hospital and 4% were treated and discharged with a follow-up appointment.

Table 11 shows the sociodemographic characteristics of cases and controls. Controls were slightly older than cases (median age 2.16 vs. 2.08 years). Cases were slightly more likely than controls to have a mother who was aged ≤ 19 years when she had her first child (16.5% vs. 10.8%), to live in a household with no adults in paid work (19.1% vs. 12.4%), to live in a household receiving state benefits (44.3% vs. 37.0%) and to live in non-owner-occupied housing (42.5% vs. 32.7%).

TABLE 11 Sociodemographic characteristics of cases and controls

Characteristic	Cases (*n* = 582)	Controls (*n* = 2460)
Study centre		
Nottingham	192 (33.0)	765 (31.1)
Bristol	180 (30.9)	817 (33.2)
Norwich	137 (23.5)	614 (25.0)
Newcastle	73 (12.5)	264 (10.7)
Age (years), median (IQR)[a]	2.08 (1.42–3.13)	2.16 (1.53–3.22)
Age group (months)		
0–12	73 (12.5)	206 (8.4)
13–36	355 (61.0)	1591 (64.7)
37–62	154 (26.5)	663 (27.0)
Male	355 (61.0)	1507 (61.3)
Ethnic origin: white	512 (89.8) [12]	2232 (91.9) [32]
Number of children aged 0–4 years in family	[11]	[34]
0	2 (0.4)	20 (0.8)
1	365 (63.9)	1438 (59.3)
2	180 (31.5)	867 (35.7)
≥ 3	24 (4.2)	101 (4.2)
First child	244 (44.5) [34]	959 (42.5) [206]
Maternal age ≤ 19 years at birth of first child[b]	86 (16.5) [9]	244 (10.8) [15]
Single adult household	80 (14.0) [12]	263 (10.9) [49]
Weekly out-of-home child care (hours), median (IQR)	10 (0–20.0) [45]	15 (2.5–24.0) [132]
Adults in paid work	[12]	[33]
≥ 2	263 (46.1)	1381 (56.9)
1	198 (34.7)	745 (30.7)
0	109 (19.1)	301 (12.4)
Household receives state benefits	252 (44.3) [13]	893 (37.0) [48]
Overcrowding (more than one person per room)	51 (9.3) [32]	173 (7.4) [127]
Non-owner occupier	242 (42.5) [13]	792 (32.7) [38]

continued

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TABLE 11 Sociodemographic characteristics of cases and controls (*continued*)

Characteristic	Cases ($n = 582$)	Controls ($n = 2460$)
Household has no car	71 (12.3) [7]	252 (10.4) [29]
IMD score, median (IQR)[c]	17.1 (8.8–31.8)	15.1 (9.3–26.8) [26]
Distance from hospital (km), median (IQR)	3.3 (2.0–5.0)	3.7 (2.4–6.4) [25]
CBQ score, mean (SD)[c]	4.66 (0.98) [40]	4.60 (0.87) [213]
Long-term health condition	55 (9.7) [13]	187 (7.6) [14]
Child health VAS score (range 0–10), median (IQR)[c]	10 (9.3–10) [5]	9.6 (8.5–10) [23]
HRQL (PedsQL score), median (IQR)[c,d]	93.1 (86.1–97.6), $n = 308$ [12]	89.3 (82.1–94.0), $n = 1413$ [29]
PDH tasks subscale score, median (IQR)[c,e]	13.0 (9.0–16.0) [63]	13.7 (10.0–17.1) [132]
HADS score, mean (SD)[c,e]	10.7 (6.3) [14]	11.0 (6.2) [35]

a Age when questionnaire completed.
b Applicable only when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% of items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes

Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values.

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Table 12 shows the frequency of exposures among cases and controls and unadjusted ORs, and *Table 13* shows ORs adjusted for a range of confounding variables. Adjusting for confounders had relatively little impact on most ORs. Four out of 13 ORs changed by > 10% on adjustment (having tripping hazards on floors: OR 0.88, AOR 1.07; not using safety gate to prevent access to garden: OR 0.58, AOR 1.01; unsupervised playing in garden: OR 0.76, AOR 0.89; not using a playpen/travel cot: OR 0.76, AOR 0.90). Compared with parents of controls, in the adjusted analyses parents of cases were less likely not to use furniture corner covers (AOR 0.72, 95% CI 0.54 to 0.94) and less likely to have rugs/carpets not firmly fixed to the floor (AOR 0.77, 95% CI 0.59 to 0.99). ORs for most of the remaining 11 exposures were close to 1, with five being > 1 (ranging from 1.01 to 1.37) and six being < 1 (ranging from 0.73 to 0.97). All had CIs indicating that associations could have occurred by chance.

There was a significant interaction between the number of adults living with the child and rugs/carpets not being firmly fixed to the floor. ORs for each category are shown in *Table 14*. In households where the child lived with one parent, rugs/carpets were more likely not to be fixed firmly to the floor in cases than in controls (AOR 2.54, 95% CI 1.16 to 5.54, PAF 18%), whereas in households where the child lived with more than one adult they were less likely not to be fixed firmly to the floor in cases than in controls (AOR 0.69, 95% CI 0.52 to 0.90).

Tables showing the results of the following sensitivity analyses are available from the authors on request. Two of the AORs using the multiply imputed data differed by > 10% from those using the complete-case data for the main analysis (did not use safety gate to prevent access to garden: multiply imputed AOR 0.78, 95% CI 0.50 to 1.21; complete case AOR 1.01, 95% CI 0.58 to 1.74; not taught rules about running in the house: multiply imputed AOR 0.82, 95% CI 0.64 to 1.06; complete case AOR 0.73, 95% CI 0.54 to 1.00). One of the AORs for the interaction analyses differed by > 10% between analyses using the multiply imputed data and analyses using the complete-case data.

TABLE 12 Frequency of exposures and unadjusted ORs comparing cases with controls

Exposure	Cases ($n = 582$)	Controls ($n = 2460$)	Unadjusted OR (95% CI)
Did not use any safety gates[a]	134 (24.5) [36]	524 (22.8) [157]	1.10 (0.87 to 1.40)
No use of furniture corner covers[a]	443 (76.6) [4]	1982 (81.2) [20]	0.76 (0.61 to 0.95)
Rugs/carpets not firmly fixed to the floor[a]	151 (26.4) [11]	808 (33.1) [18]	0.72 (0.59 to 0.89)
Electric wires or cables trailing across the floor at least some days[b,c]	86 (15.6) [14] ((18))	475 (19.9) [16] ((63))	0.72 (0.56 to 0.93)
Things on floor that could be tripped over at least some days[b,c]	371 (66.8) [14] ((13))	1698 (70.1) [16] ((21))	0.88 (0.72 to 1.07)
Not locking back doors to prevent access to the garden at least some days[b,c]	193 (38.8) [17] ((68))	851 (41.8) [23] ((259))	0.98 (0.79 to 1.22)
Not using safety gate to prevent access to the garden at least some days[b,c]	364 (89.7) [16] ((160))	1631 (93.6) [36] ((682))	0.58 (0.38 to 0.88)
Unsupervised playing in the garden at least some days[b,c]	154 (29.6) [13] ((48))	770 (34.6) [27] ((207))	0.76 (0.61 to 0.96)
Had not taught child rules about slippery floors	218 (39.4) [28]	910 (38.0) [66]	1.07 (0.85 to 1.36)
Had not taught child rules about running in the house	198 (36.0) [32]	939 (39.2) [67]	0.77 (0.60 to 0.98)
Safety practices measured only in children aged 0–36 months			
Used baby walker[a]	117 (27.7) [5]	530 (29.9) [24]	0.90 (0.71 to 1.15)
Did not use playpen or travel cot[a]	345 (82.1) [8]	1521 (85.8) [24]	0.76 (0.57 to 1.02)
Did not use stationary activity centre[a]	350 (83.1) [7]	1391 (78.5) [25]	1.40 (1.05 to 1.86)

a In the last 24 hours.
b In the last week.
c Excludes 'not applicable' responses.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.
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TABLE 13 Adjusted ORs comparing cases with controls

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Did not use any safety gates[b]	1.12 (0.83 to 1.49)	HADS score, hours of out-of-home child care, PDH score, first child
Did not use furniture corner covers[b]	0.72 (0.54 to 0.94)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Rugs/carpets not firmly fixed to the floor[b]	0.77 (0.59 to 0.99)[c]	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Electric wires or cables trailing across the floor at least some days[d]	0.75 (0.55 to 1.02)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Things on floor that could be tripped over at least some days[d]	1.07 (0.82 to 1.38)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate

continued

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TABLE 13 Adjusted ORs comparing cases with controls (*continued*)

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Did not lock back doors to prevent access to the garden at least some days[d]	0.97 (0.75 to 1.27)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Did not use safety gate to prevent access to the garden at least some days[d]	1.01 (0.58 to 1.74)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Unsupervised playing in the garden at least some days[d]	0.89 (0.68 to 1.17)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Had not taught child rules about slippery floors	1.13 (0.83 to 1.52)	HADS score, PDH score, first child, uses safety gate
Had not taught child rules about running in the house	0.73 (0.54 to 1.00)	HADS score, PDH score, first child, uses safety gate
Used baby walker[b]	0.83 (0.59 to 1.16)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate, uses playpen/ travel cot, uses activity centre
Did not use playpen or travel cot[b]	0.90 (0.61 to 1.33)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate, uses baby walker, uses activity centre
Did not use stationary activity centre[b]	1.37 (0.95 to 1.97)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate, uses baby walker, uses playpen/travel cot

a All matched analyses adjusted for deprivation (quintiles of IMD: ≤ 7.77, 7.78–12.50,12.51–19.84, 19.85–31.92, > 31.92) and distance from hospital plus confounders in table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c Significant interaction with number of adults living with child; stratified results shown in *Table 14*.
d In the last week.

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TABLE 14 Significant interactions in adjusted analyses between rugs/carpets firmly fixed to the floor and number of adults living with the child, comparing cases with controls

Exposure	AOR[a] (95% CI) by number of adults living with child		*p*-value from test for interaction
	One	More than one	
Rugs/carpets not firmly fixed to the floor[b]	2.54 (1.16 to 5.54)	0.69 (0.52 to 0.90)	$p = 0.002$

a Adjusted for confounders as in *Table 13*.
b In the last week.

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Three exposures with a 'not applicable' response option had > 5% of 'not applicable' responses. Analyses were undertaken incorporating a separate category for 'not applicable' responses. One of the AORs for the three exposures differed by > 10% between the analyses with and the analyses without the 'not applicable' category (did not use safety gate to prevent access to the garden: AOR with 'not applicable' category 1.01, 95% CI 0.58 to 1.74; AOR without 'not applicable' category 0.89, 95% CI 0.54 to 1.48).

Stratifying analyses by the treatment received (as a proxy for injury severity) resulted in AORs with fairly broad and overlapping 95% CIs for those seen and examined in the ED and those admitted/treated in the ED/discharged with follow-up for all exposures. The results from these analyses are available from the authors on request.

Case–control study of risk and protective factors for stair falls (study A)

A total of 610 cases and 2658 controls participated in the stair falls study. The process of recruitment to the study is shown in *Figure 5*. In total, 33% of cases and 29% of controls agreed to participate and were included in the analysis. *Table 15* shows that participants and non-participants were similar in terms of sex, but a higher proportion of participants than non-participants were aged 0–12 months (19.0% vs. 12.3%).

The mean number of controls per case was 4.36. The median time from date of injury to date of questionnaire completion for cases was 11 days (IQR 7–21 days).

The majority of cases had sustained single injuries (85%), most commonly a bang on the head (66%), cuts/grazes not requiring stitches (14%) and broken bones (12%). Most cases (64%) were seen and examined but did not require treatment, 25% were treated in the ED, 5% were admitted to hospital and 6% were treated and discharged with a follow-up appointment.

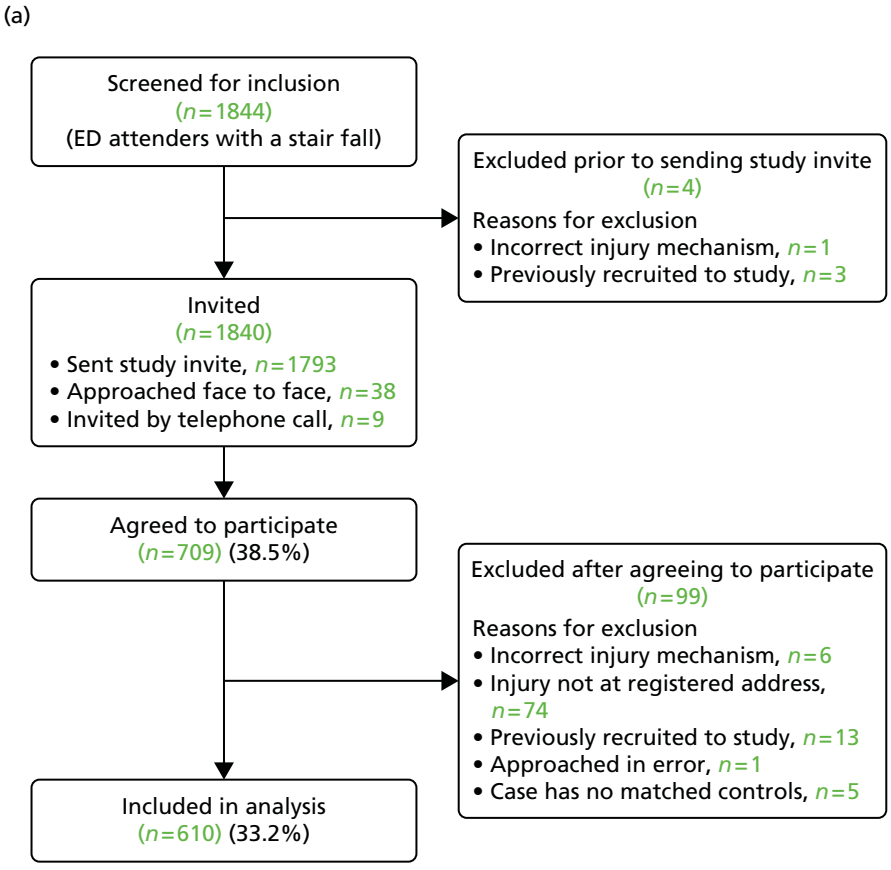


FIGURE 5 Flow of cases and controls through the stair falls study: (a) recruitment of cases; and (b) recruitment of controls. a, Assumed to be 10 times the number of cases as practices were asked to invite 10 controls for each case; b, controls for cases from the fall from stair falls study who had more than four controls and controls for stair falls cases who were not matched to the case (e.g. because the case was excluded); c, controls for cases from the other four ongoing case–control studies. Kendrick D, Zou K, Ablewhite J, Watson M, Coupland C, Bryony K, Hawkins A, Reading R. Risk and protective factors for falls on stairs in young children: multicentre case–control study. *Archives of Disease in Childhood* 2016;**101**:909–16.[82] Copyright © 2016 BMJ Publishing Group Ltd and Royal College of Paediatrics and Child Health. All rights reserved. (*continued*)

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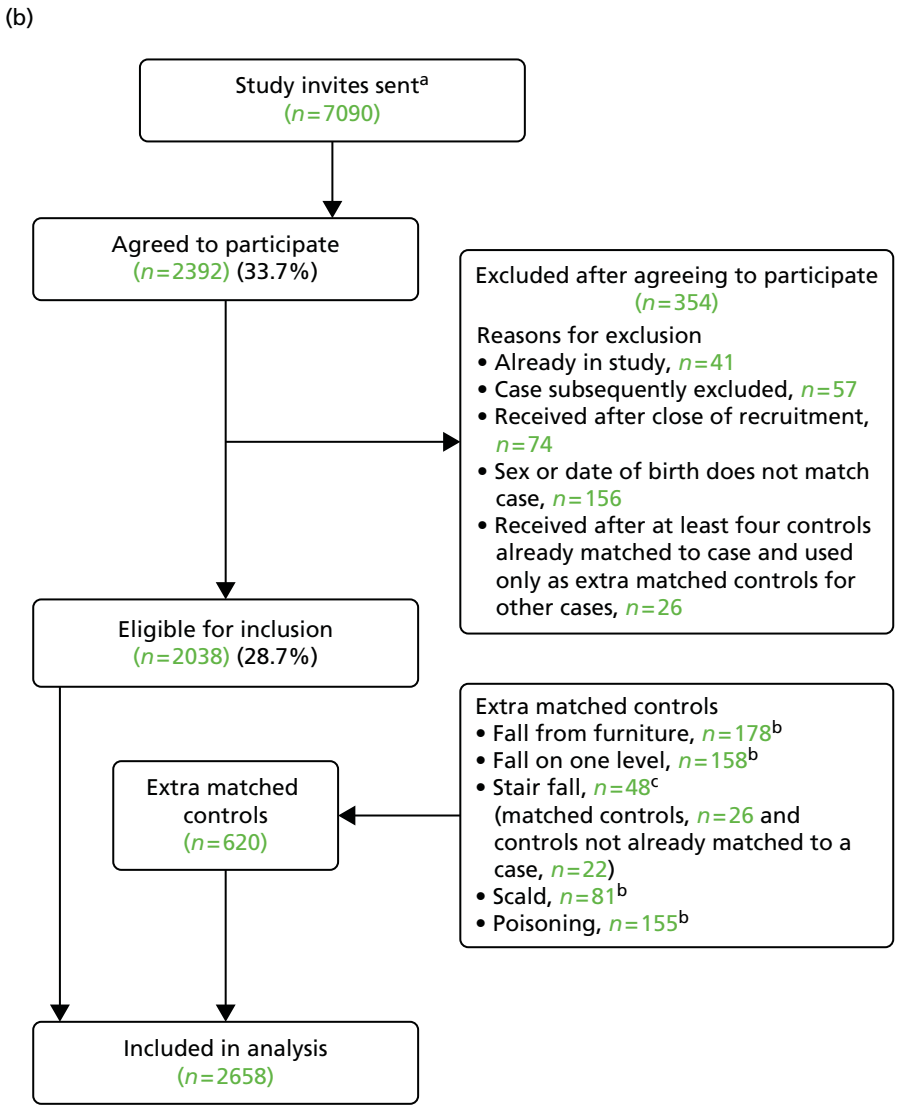


FIGURE 5 Flow of cases and controls through the stair falls study: (a) recruitment of cases; and (b) recruitment of controls. a, Assumed to be 10 times the number of cases as practices were asked to invite 10 controls for each case; b, controls for cases from the fall from stair falls study who had more than four controls and controls for stair falls cases who were not matched to the case (e.g. because the case was excluded); c, controls for cases from the other four ongoing case–control studies. Kendrick D, Zou K, Ablewhite J, Watson M, Coupland C, Bryony K, Hawkins A, Reading R. Risk and protective factors for falls on stairs in young children: multicentre case–control study. *Archives of Disease in Childhood* 2016;**101**:909–16.[82] Copyright © 2016 BMJ Publishing Group Ltd and Royal College of Paediatrics and Child Health. All rights reserved.

TABLE 15 Age and sex of participants and non-participants

Characteristic	Participants ($N = 610$), *n* (%)	Non-participants ($N = 1131$), *n* (%)	Total ($N = 1741$), *n* (%)	Significance
Age group (months)				
0–12	116 (19.0)	139 (12.3)	255 (14.6)	$\chi^2_{(2)} = 15.5$; $p < 0.001$
13–36	364 (59.7)	704 (62.2)	1068 (61.3)	
≥ 37	130 (21.3)	288 (25.5)	418 (24.0)	
Sex				
Male	303 (49.7)	600 (53.1)	903 (51.9)	$\chi^2_{(1)} = 1.81$; $p = 0.18$
Female	307 (50.3)	531 (46.9)	838 (48.1)	

Table 16 shows the sociodemographic characteristics of cases and controls. Compared with controls, cases were less likely to live in a household with more than one adult in paid work (50.0% vs. 59.0%). They also lived in areas with higher levels of deprivation (median IMD score 18.7 vs. 15.2), were more likely to have a mother who had had her first child aged ≤ 19 years (18.5% vs. 9.1%) and were more likely to live in a single adult household (14.6% vs. 10.5%), a household in receipt of state benefits (40.9% vs. 32.4%), in non-owner-occupied housing (40.4% vs. 32.2%) or in a household without a car (14.7% vs. 9.7%).

TABLE 16 Sociodemographic characteristics of cases and controls

Characteristic	Cases ($n = 610$)	Controls ($n = 2658$)
Study centre		
Nottingham	252 (41.3)	1055 (39.7)
Bristol	178 (29.2)	796 (29.9)
Norwich	97 (15.9)	457 (17.2)
Newcastle	83 (13.6)	350 (13.2)
Age (years), median (IQR)[a]	2.0 (1.2–2.9)	2.0 (1.3–3.1)
Age group (months)		
0–12	113 (18.5)	315 (11.9)
13–36	362 (59.3)	1694 (63.7)
37–62	135 (22.1)	649 (24.4)
Male	299 (49.0)	1320 (49.7)
Ethnic origin: white	547 (91.5) [12]	2371 (91.0) [52]
Children aged < 5 years in family	[8]	[44]
0	7 (1.2)	28 (1.1)
1	358 (59.5)	1566 (59.9)
2	212 (35.2)	911 (34.9)
≥ 3	25 (4.2)	109 (4.2)
First child	242 (43.3) [51]	1067 (44.5) [260]
Maternal age ≤ 19 years at birth of first child[b]	100 (18.5) [7]	219 (9.1) [15]
Single adult household	87 (14.6) [15]	272 (10.5) [76]
Weekly out-of-home child care (hours), median (IQR)	13.5 (1.0–22.5) [43]	15 (3.0–24.0) [165]
Adults in paid work	[16]	[56]
≥ 2	297 (50.0)	1534 (59.0)
1	209 (35.2)	784 (30.1)
0	88 (14.8)	284 (10.9)
Household receives state benefits	241 (40.9) [21]	838 (32.4) [68]
Overcrowding (more than one person per room)	52 (9.1) [40]	187 (7.5) [152]
Non-owner occupier	241 (40.4) [14]	836 (32.2) [65]
Household has no car	88 (14.7) [12]	254 (9.7) [50]
IMD score, median (IQR)[c]	18.7 (10.1–32.7)	15.2 (9.0–27.1) [35]
Distance from hospital (km), median (IQR)	3.4 (2.2–5.4)	3.9 (2.4–7.6) [34]

continued

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TABLE 16 Sociodemographic characteristics of cases and controls (*continued*)

Characteristic	Cases ($n = 610$)	Controls ($n = 2658$)
CBQ score, mean (SD)[c]	4.7 (0.9) [43]	4.6 (0.9) [293]
Long-term health condition	63 (10.4) [6]	202 (7.7) [19]
Child health VAS score (range 0–10), median (IQR)[c]	9.9 (9.0–10.0) [9]	9.7 (8.4–10.0) [19]
HRQL (PedsQL), median (IQR)[c,d]	91.7 (83.3–97.6), $n = 303$ [6]	89.3 (82.1–94.0), $n = 1342$ [18]
Parental assessment of child's ability to open safety gate	[19]	[97]
Not likely	423 (73.1)	1808 (76.0)
Very or quite likely	156 (26.9)	571 (24.0)
PDH tasks subscale score, median (IQR)[c,e]	14.0 (10.0–18.0) [61]	14.0 (11.0–18.0) [152]
HADS score, mean (SD)[c,e]	10.4 (6.2) [14]	10.7 (5.9) [36]

a Age when questionnaire completed.
b Applicable only when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% of items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values.
Kendrick D, Zou K, Ablewhite J, Watson M, Coupland C, Bryony K, Hawkins A, Reading R. Risk and protective factors for falls on stairs in young children: multicentre case–control study. *Archives of Disease in Childhood* 2016;**101**:909–16.[82]
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Table 17 shows the frequency of exposures among cases and controls and unadjusted ORs and *Table 18* shows ORs adjusted for a range of confounding variables. Ten of the 24 ORs changed by > 10% on adjustment, with all reducing in magnitude (no carpet on stairs: OR 1.91, AOR 1.52; stairs too steep: OR 1.35, AOR 1.21; stairs too narrow: OR 1.35, AOR 1.28; stairs need repair: OR 1.97, AOR 1.71; stair covering needs repair: OR 1.74, AOR 1.41; stairs not safe: OR 1.71, AOR 1.46; no banisters: OR 1.44, AOR 1.27; not taught child rules about going downstairs: OR 1.60, AOR 1.36; not taught child rules about leaving things on stairs: OR 1.00, AOR 0.85; banister width 2.5–3.75 inches: OR 0.84, AOR 0.75).

Compared with parents of controls, in the adjusted analysis parents of cases were more likely not to use safety gates on their stairs (AOR 2.50, 95% CI 1.90 to 3.29; PAF 21%) or to leave the gates open (AOR 3.09, 95% CI 2.39 to 4.00; PAF 24%), not to have carpeted stairs (AOR 1.52, 95% CI 1.09 to 2.10; PAF 5%) and not to have a landing part-way up their stairs (AOR 1.34, 95% CI 1.08 to 1.65; PAF 18%). They were also more likely to consider their stairs not safe to use (AOR 1.46, 95% CI 1.07 to 1.99; PAF 5%) or their steps in need of repair (AOR 1.71, 95% CI 1.16 to 2.50; PAF 5%). Case households were less likely than control households to have tripping hazards on their stairs (AOR 0.77, 95% CI 0.62 to 0.97) or to not have handrails on all stairs (AOR 0.69, 95% CI 0.56 to 0.86). ORs for most of the remaining 16 exposures were close to 1, with 11 being > 1 (ranging from 1.07 to 1.41) and five being < 1 (ranging from 0.69 to 0.97). All had CIs indicating that associations could have occurred by chance.

Table 19 shows significant interactions in the adjusted analysis. Comparing cases with controls, parents of cases aged 0–12 months and 13–36 months were more likely to have left safety gates on stairs open than closed, with a particularly high OR in parents with infants (AOR 0–12 months 8.64, 95% CI 3.99 to 18.68, PAF 46%; AOR 13–36 months 2.64, 95% CI 1.92 to 3.64, PAF 24%). Parents of cases in all age groups were more likely not to have a safety gate on stairs than to have a closed gate and the OR was again higher in parents with infants (AOR 0–12 months 3.27, 95% CI 1.48 to 7.20, PAF 18%; AOR 13–36 months 2.33,

TABLE 17 Frequency of exposures and unadjusted ORs comparing cases with controls

Exposure	Cases ($n = 610$)	Controls ($n = 2658$)	Unadjusted OR (95% CI)
Did not use any safety gates[a]	142 (23.7) [12]	521 (20.6) [124]	1.22 (0.97 to 1.53)
Exposures measured only for households with stairs	**n = *598***	**n = *2476***	
Gate closed	174 (29.7)	1245 (51.1)	1.00
Gate open	210 (35.9)	555 (22.8)	2.93 (2.32 to 3.72)
No gate[a]	201 (34.4) [13]	636 (26.1)) [40]	2.52 (1.97 to 3.22)
Did not have carpeted stairs[a]	83 (14.1) [8]	200 (8.2) [28]	1.91 (1.44 to 2.53)
Did not have landing part-way up stairs[a]	413 (69.6) [5]	1556 (63.6) [28]	1.35 (1.11 to 1.65)
Had spiral or winding stairs[a]	96 (16.2) [7]	402 (16.4) [30]	1.04 (0.81 to 1.33)
Had tripping hazards on stairs at least some days[b,c]	183 (31.6) [4] ((14))	932 (38.4) [16] ((35))	0.73 (0.60 to 0.89)
Stairs too steep[a]	218 (37.6) [18]	743 (31.0) [80]	1.35 (1.11 to 1.64)
Stairs too narrow[a]	154 (26.8) [23]	484 (20.4) [98]	1.45 (1.17 to 1.80)
Stairs poorly lit[a]	103 (18.0) [26]	329 (13.8) [94]	1.37 (1.07 to 1.76)
Steps in need of repair[a]	67 (11.7) [25]	147 (6.2) [96]	1.97 (1.45 to 2.70)
Banister/handrail on stairs in need of repair[a]	68 (12.0) [32]	203 (8.5) [98]	1.46 (1.09 to 1.97)
Stair covering in need of repair[a]	71 (12.4) [26]	175 (7.4) [96]	1.74 (1.28 to 2.36)
Stairs not safe to use[a]	101 (17.2) [10]	271 (11.1) [25]	1.71 (1.33 to 2.21)
Did not have handrails on all stairs[a]	215 (36.0) [1]	1063 (43.3) [20]	0.72 (0.60 to 0.88)
Did not have banisters or railings on all stairs[a]	152 (26.4) [22]	486 (20.1) [60]	1.44 (1.17 to 1.79)
Not taught child rules about going downstairs	173 (29.9) [20]	624 (25.9) [70]	1.60 (1.19 to 2.17)
Not taught child rules about carrying big/heavy things while going downstairs	291 (50.3) [20]	1134 (47.1) [68]	1.33 (1.01 to 1.74)
Not taught child rules about leaving things on stairs	320 (55.6) [22]	1339 (55.5) [64]	1.00 (0.77 to 1.30)
Exposure measured only for households with banisters	**n = *424***	**n = *1930***	
Banister width (inches) (IQR)[a]	3 (2–4) [190]	3 (2–4) [803]	
Up to 2.5	94 (40.2)	400 (35.5)	1
> 2.5 to ≤ 3.75	67 (28.6)	363 (32.2)	0.88 (0.59 to 1.32)
> 3.75	73 (31.2)	364 (32.3)	0.84 (0.55 to 1.26)
Exposures measured only in children aged 0–36 months	**n = *475***	**n = *2009***	
Used baby walker[a]	135 (29.3) [14]	675 (34.1) [32]	0.80 (0.63 to 1.00)
Did not use playpen or travel cot[a]	384 (83.3) [14]	1645 (83.1) [30]	1.03 (0.78 to 1.36)
Did not use stationary activity centre[a]	348 (75.8) [16]	1486 (75.2) [33]	1.01 (0.79 to 1.29)

a In the last 24 hours.
b In the last week.
c Excludes 'not applicable' responses.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.
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TABLE 18 Adjusted ORs comparing cases with controls

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Did not use any safety gates[b]	1.22 (0.92 to 1.62)	HADS, PDH, first child, stair safety, hours of out-of-home child care
Gate closed	1	Child's ability to open gate, taught child rules about going downstairs, carrying things downstairs and leaving things on stairs, stair safety
Gate open	3.09 (2.39 to 4.00)	
No gate[b]	2.50 (1.90 to 3.29)[c]	
Did not have carpeted stairs[b]	1.52 (1.09 to 2.10)[c]	HADS, PDH, stair safety
Did not have landing part-way up stairs[b]	1.34 (1.08 to 1.65)	Stair safety
Had spiral or winding stairs[b]	0.97 (0.75 to 1.27)	Stair safety
Had tripping hazards on stairs at least some days[d]	0.77 (0.62 to 0.97)	HADS, PDH, stair safety
Stairs too steep[b,e]	1.21 (0.94 to 1.56)	Stair safety
Stairs too narrow[b,e]	1.28 (0.96 to 1.70)	Stair safety
Stairs poorly lit[b,e]	1.32 (0.97 to 1.79)	HADS, PDH, stair safety
Steps in need of repair[b,e]	1.71 (1.16 to 2.50)	HADS, PDH, stair safety
Banister/handrail on stairs in need of repair[b,e]	1.32 (0.92 to 1.88)	HADS, PDH, stair safety
Stair covering in need of repair[b,e]	1.41 (0.99 to 2.02)	HADS, PDH, stair safety
Stairs not safe to use[b,e]	1.46 (1.07 to 1.99)	HADS, PDH, stair safety
Did not have handrails on all stairs[b,e]	0.69 (0.56 to 0.86)	HADS, PDH, stair safety
Did not have banisters or railings on all stairs[b,e]	1.27 (0.99 to 1.63)	HADS, PDH, stair safety
Not taught child rules about going downstairs	1.36 (0.92 to 2.02)	HADS, PDH, first child, child's ability to open safety gate, safety gate, stair safety
Not taught child rules about carrying big/heavy things while going downstairs	1.21 (0.83 to 1.75)[c]	HADS, PDH, first child, child's ability to open safety gate, safety gate, stair safety
Not taught child rules about leaving things on stairs	0.85 (0.60 to 1.22[c]	HADS, PDH, first child, child's ability to open safety gate, safety gate, stair safety
Banister width (inches)[a]		Stair safety
Up to 2.5	1	
> 2.5 to ≤ 3.75	0.83 (0.53 to 1.29)	
> 3.75	0.75 (0.48 to 1.18)	
Used baby walker[b]	0.83 (0.63 to 1.10)	HADS, PDH, first child, hours of out-of-home child care
Did not use playpen or travel cot[b]	1.07 (0.75 to 1.53)	HADS, PDH, uses baby walker, first child, hours of out-of-home child care
Did not use stationary activity centre[b]	1.08 (0.80 to 1.46)	HADS, PDH, uses baby walker, first child, hours of out-of-home child care

a All matched analyses adjusted for deprivation (IMD) and distance from hospital (quintiles in km: ≤ 2.0, 2.1–3.2, 3.3–4.7, 4.8–8.8, > 8.8) plus confounders listed in the table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c Significant interaction with confounders; stratified results shown in *Table 19*.
d In the last 7 days.
e Stair safety is a composite variable combining responses to these questions, which are grouped as all 'safe' responses, some 'safe' responses and no 'safe' responses. When the exposure variable is a measure of stair safety this variable is excluded from the composite stair safety measure used as a confounder in adjusted analyses.

Note
HADS – for matched analysis quintiles: ≤ 5, 5.1–8.0, 8.1–11.0, 11.1–16.0, > 16.0.

TABLE 19 Significant interactions in adjusted analyses comparing cases with controls

Exposure	AOR[a] (95% CI) by age group			Test for interaction
	0–12 months	13–36 months	≥ 37 months	
Stair gate left open[b]	8.64 (3.99 to 18.68)	2.64 (1.92 to 3.64)	1.52 (0.76 to 3.03)	0.008
No stair gate[b]	3.27 (1.48 to 7.20)	2.33 (1.60 to 3.39)	2.08 (1.23 to 3.51)	
	AOR[a] (95% CI) by use of baby walker			
	Used walker	Did not use walker		
Stair gate left open[b]	7.37 (4.36 to 12.45)	2.65 (1.87 to 3.76)		0.002
No stair gate[b]	2.54 (1.33 to 4.87)	2.42 (1.63 to 3.59)		
	AOR[a] (95% CI) by adults in paid work			
	Two or more	One	None	
Not taught child rules about carrying things downstairs	1.45 (0.94 to 2.24)	1.26 (0.76 to 2.09)	0.44 (0.20 to 0.96)	0.009
Not taught child rules about leaving things on stairs	1.01 (0.66 to 1.56)	0.88 (0.54 to 1.42)	0.27 (0.12 to 0.60)	0.004
	AOR[a] (95% CI) by number of adults living with child			
	One adult	More than one adult		
Not taught children rules about leaving things on stairs	0.33 (0.15 to 0.75)	0.95 (0.66 to 1.38)		0.01
Stairs not carpeted[b]	11.07 (3.89 to 31.53)	1.15 (0.79 to 1.66)		< 0.001

a Adjusted for confounders as in *Table 18*.
b In the last 24 hours.

95% CI 1.60 to 3.39, PAF 15%; AOR ≥ 37 months 2.08, 95% CI 1.23 to 3.51, PAF 32%). The association between safety gates and stair falls varied by baby walker use, with a particularly high OR for leaving a safety gate open compared with having a closed gate in walker users (AOR walker users 7.37, 95% CI 4.36 to 12.45, PAF 44%). Parents of cases in households in which no adults were in paid work were less likely not to have taught children rules about carrying things downstairs (AOR 0.44, 95% CI 0.20 to 0.96) or not to have taught children rules about leaving things on stairs (AOR 0.27, 95% CI 0.12 to 0.60). Parents of cases in single adult households were more likely not to have carpeted stairs (AOR 11.07, 95% CI 3.89 to 31.53, PAF 26%) and were less likely not to have taught children rules about leaving things on stairs (AOR 0.33, 95% CI 0.15 to 0.75).

Tables showing the results of the following sensitivity analyses are available from the authors on request. In the analysis using community controls, the AORs for four exposures using the multiply imputed data differed by > 10% from those using the complete-case data for the main analysis. These were not having carpeted stairs (multiply imputed AOR 1.68, 95% CI 1.25 to 2.25; complete case AOR 1.52, 95% CI 1.09 to 2.10), having a stair carpet in need of repair (multiply imputed AOR 1.57, 95% CI 1.13 to 2.18; complete case AOR 1.41, 95% CI 0.99 to 2.03), not using a stationary activity centre (multiply imputed AOR 0.96, 95% CI 0.75 to 1.24; complete case AOR 1.08, 95% CI 0.80 to 1.46) and banister width (2.5–3.75 inches: multiply imputed AOR 0.85, 95% CI 0.61 to 1.20; complete case AOR 0.83, 95% CI 0.53 to 1.29; > 3.75 inches: multiply imputed AOR 0.90, 95% CI 0.65 to 1.25; complete case AOR 0.75, 95% CI 0.48 to 1.18). Four of the interactions from the complete-case analysis remained significant at the 1% level in the multiply imputed analysis and two [interactions between (1) teaching children rules about leaving things on stairs and single parent households and (2) teaching children rules about carrying things on stairs and parental unemployment] had *p*-values of 0.011 in the multiply imputed analysis. Patterns of risk were similar for the

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multiply imputed and complete-case analyses, but AORs differed by > 10% between the complete-case analyses and the multiply imputed analyses for 12 out of 20 AORs. Stratifying analyses by the treatment received (as a proxy for injury severity) resulted in AORs with fairly broad and overlapping 95% CIs for the seen and examined in the ED and the admitted/treated in the ED/discharged with follow-up groups for all exposures. The results from these analyses are available from the authors on request.

Case–control study of risk and protective factors for poisonings (study A)

A total of 567 cases and 2320 controls participated in the poisonings study. The process of recruitment to the study is shown in *Figure 6*. In total, 28% of cases and 28% of controls agreed to participate and were

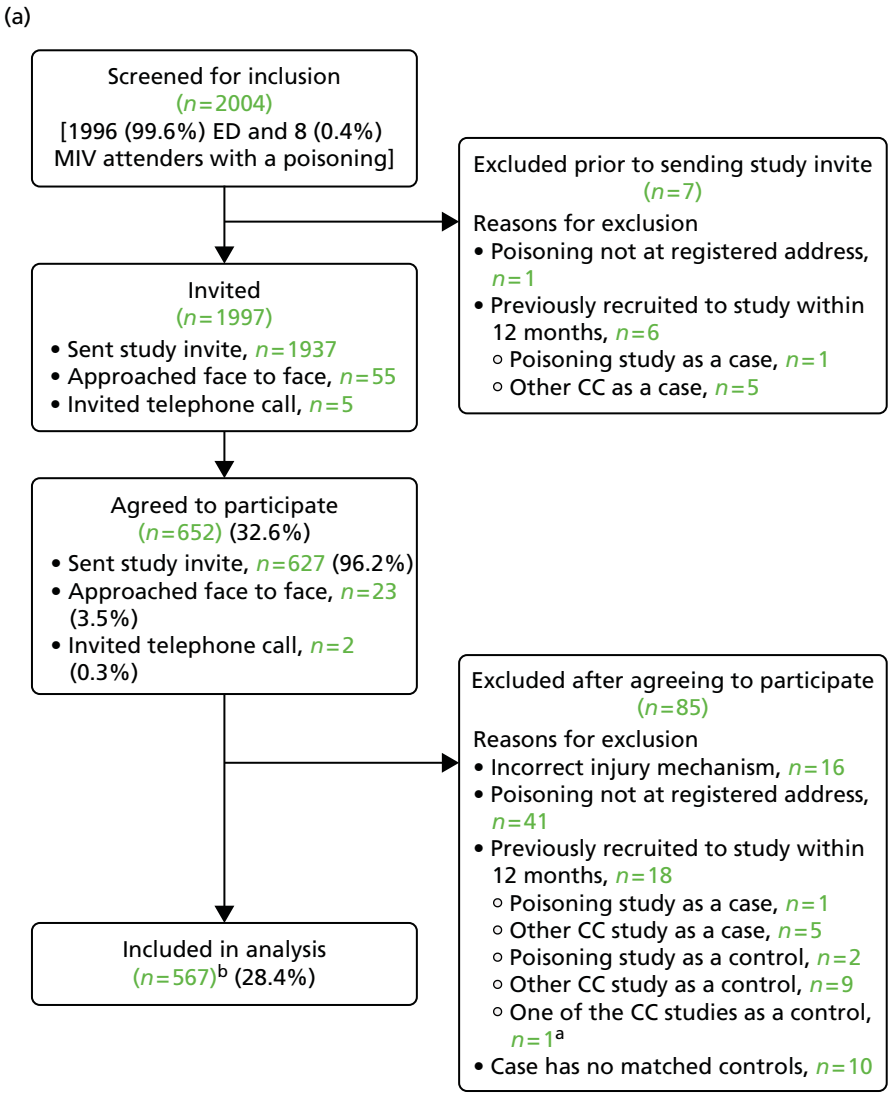


FIGURE 6 Flow of cases and controls through the poisonings study: (a) recruitment of cases; and (b) recruitment of controls. a, The study the participant had previously been recruited to was not recorded; b, includes eight participants previously recruited to one of the other ongoing CC studies as a case and five previously recruited to this study as a control > 12 months previously; c, assumed to be ten times the number of cases as practices were asked to invite 10 controls for each case; d, community controls for cases from the other four ongoing case–control studies; e, controls for cases from poisoning study that had more than four controls; f, includes nine participants previously recruited to one of the other ongoing CC studies as a control and one participant previously recruited to this study as a control > 12 months previously. Reproduced with permission from Kendrick D, Majsak-Newman G, Benford P, Coupland C, Timblin C, Hayes M, *et al.* Poison prevention practices and medically attended poisoning in young children: multicentre case–control study. *Injury Prevention* 2016; in press.[83] © 2017 by the BMJ Publishing group Ltd. All rights reserved. (*continued*)

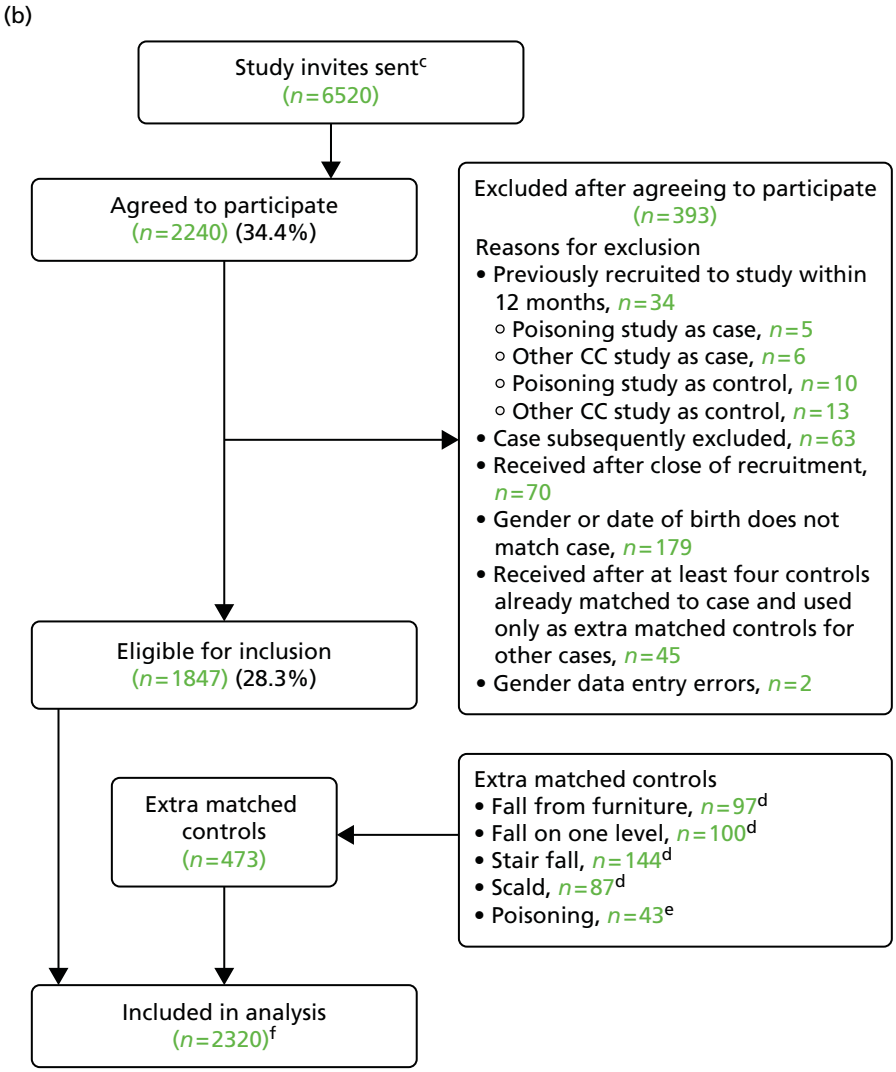


FIGURE 6 Flow of cases and controls through the poisonings study: (a) recruitment of cases; and (b) recruitment of controls. a, The study the participant had previously been recruited to was not recorded; b, includes eight participants previously recruited to one of the other ongoing CC studies as a case and five previously recruited to this study as a control > 12 months previously; c, assumed to be ten times the number of cases as practices were asked to invite 10 controls for each case; d, community controls for cases from the other four ongoing case–control studies; e, controls for cases from poisoning study that had more than four controls; f, includes nine participants previously recruited to one of the other ongoing CC studies as a control and one participant previously recruited to this study as a control > 12 months previously. Reproduced with permission from Kendrick D, Majsak-Newman G, Benford P, Coupland C, Timblin C, Hayes M, *et al.* Poison prevention practices and medically attended poisoning in young children: multicentre case–control study. *Injury Prevention* 2016; in press.[83] © 2017 by the BMJ Publishing group Ltd. All rights reserved.

included in the analysis. The age and sex of participants and non-participants in the poisonings study were similar, as shown in *Table 20*.

The mean number of controls per case was 4.09. The median time from date of injury to date of questionnaire completion for cases was 12 days (IQR 6–22 days).

The majority of cases had sustained single injuries. Parents of seven cases reported injuries in addition to poisonings. Most cases (84%) were seen and examined but did not require treatment, 6% were treated in the ED, 8% were admitted to hospital and 2% were treated and discharged with a follow-up appointment.

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TABLE 20 Age and sex of participants and non-participants

Characteristic	Participants ($N = 567$), *n* (%)	Non-participants ($N = 1345$), *n* (%)	Total ($N = 1912$), *n* (%)	Significance
Age group (months)				
0–12	65 (11.5)	129 (9.6)	194 (10.2)	$\chi^2_{(2)} = 1.67$, $p = 0.43$
13–36	378 (66.7)	926 (68.9)	1304 (68.2)	
≥ 37	124 (21.9)	290 (21.6)	414 (21.7)	
Sex				
Male	280 (49.4)	711 (52.9)	991 (51.8)	$\chi^2_{(1)} = 1.93$, $p = 0.16$
Female	287 (50.6)	634 (47.1)	921 (48.2)	

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Table 21 shows the sociodemographic characteristics of cases and controls.

Table 22 shows the frequency of exposures among cases and controls and unadjusted ORs, and *Table 23* shows ORs adjusted for a range of confounding variables. Four of the eighteen ORs changed by > 10% on adjustment (medicines transferred into different container: OR 1.15, AOR 0.96; household products not stored at adult eye level or above: OR 0.84, AOR 0.95; household products transferred into different containers: OR 1.74, AOR 1.20; no safety gate to stop access to kitchen: OR 0.91, AOR 1.05).

TABLE 21 Sociodemographic characteristics of cases and controls

Characteristic	Cases ($n = 567$)	Controls ($n = 2320$)
Study centre		
Nottingham	193 (34.0)	738 (31.8)
Bristol	179 (31.6)	794 (34.2)
Norwich	106 (18.7)	467 (20.1)
Newcastle	89 (15.7)	321 (13.8)
Age (years), median (IQR)[a]	2.18 (1.49–2.92)	2.24 (1.54–3.02)
Age group (months)		
0–12	65 (11.5)	204 (8.8)
13–36	378 (66.7)	1575 (67.9)
37–62	124 (21.9)	541 (23.3)
Male	280 (49.4)	1210 (52.2)
Ethnic origin: white	514 (92.1) [9]	2115 (92.6) [36]
Children aged 0–4 years in family	[11]	[29]
0	6 (1.1)	16 (0.7)
1	299 (53.8)	1379 (60.2)
2	229 (41.2)	810 (35.4)
≥ 3	22 (4.0)	86 (3.8)

TABLE 21 Sociodemographic characteristics of cases and controls (*continued*)

Characteristic	Cases ($n = 567$)	Controls ($n = 2320$)
First child	210 (41.7) [64]	895 (42.7) [222]
Maternal age ≤ 19 years at birth of first child[b]	84 (16.5) [8]	208 (9.7) [14]
Single adult household	92 (16.6) [13]	262 (11.5) [43]
Weekly out-of-home child care (hours), median (IQR)	12 (0.5–22.0) [31]	15 (2.5–24.0) [112]
Adults in paid work	[11]	[35]
≥ 2	263 (47.3)	1281 (56.1)
1	184 (33.1)	742 (32.5)
0	109 (19.6)	262 (11.5)
Household receives state benefits	228 (41.7) [20]	795 (35.1) [54]
Overcrowding (more than one person per room)	46 (8.8) [42]	163 (7.4) [128]
Non-owner occupier	241 (43.5) [13]	771 (33.8) [41]
Household has no car	81 (14.6) [11]	219 (9.6) [28]
IMD score, median (IQR)[c]	17.6 (10.3–31.7)	15.1 (9.3–26.5) [24]
Distance from hospital (km), median (IQR)	3.5 (2.2–5.9)	4.0 (2.4–7.6) [24]
CBQ score, mean (SD)[c]	4.75 (0.91) [24]	4.61 (0.86) [186]
Long-term health condition	53 (9.4) [5]	187 (8.1) [21]
Child health VAS score (range 0–10), median (IQR)[c]	9.8 (8.8–10) [2]	9.6 (8.4–10) [14]
HRQL (PedsQL), median (IQR)[c,d]	91.7 (85.7 to 97.2), $n = 326$ [3]	89.3 (82.1 to 95.2), $n = 1354$ [24]
Parental assessment of child's ability to access poisons	[21]	[96]
All scenarios 'not likely'	22 (4.0)	112 (5.0)
One or more scenarios 'quite likely' and none 'very likely'	100 (18.3)	513 (23.1)
One or more scenarios scenario 'very likely'	424 (77.7)	1599 (71.9)
PDH tasks subscale score, median (IQR)[c,e]	14.0 (10.3 to 18.0) [50]	14.0 (11.0 to 18.0) [113]
HADS score, mean (SD)[c,e]	10.9 (6.1) [15]	10.8 (6.2) [25]

a Age when questionnaire completed.
b Applicable only when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% of items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values.
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TABLE 22 Frequency of exposures and unadjusted ORs comparing cases with controls

Exposure	Cases ($n = 567$)	Controls ($n = 2320$)	Unadjusted OR (95% CI)
Did not have CRCs or blister packs for all medicines[a]	102 (18.2) [6]	321 (13.9) [8]	1.39 (1.09 to 1.78)
Did not have all medicines in locked medicines box[a]	447 (79.5) [5]	1914 (82.8) [9]	0.84 (0.66 to 1.06)
Not all medicines were locked away[a,b]	454 (83.6) [24] ((0))	1897 (85.4) [92] ((6))	0.87 (0.67 to 1.14)
Not all medicines were stored at adult level or above[a,b]	189 (40.7) [101] ((2))	612 (30.8) [324] ((10))	1.68 (1.35 to 2.09)
Not all medicines stored safely[a]	165 (34.4) [87]	506 (24.9) [287]	1.73 (1.38 to 2.17)
Any medicines transferred into a different container[a]	28 (5.0) [6]	104 (4.5) [10]	1.15 (0.74 to 1.77)
Did not put all or some medicines away immediately after use[b,c]	213 (41.7) [16] ((40))	522 (26.2) [57] ((274))	2.00 (1.62 to 2.45)
Did not have CRCs for all cleaning products[a]	154 (27.5) [8]	686 (29.7) [14]	0.90 (0.73 to 1.11)
Not all household/cleaning products locked away[a,b]	353 (69.4) [54] ((4))	1590 (72.1) [106] ((10))	0.85 (0.68 to 1.05)
Not all household/cleaning products stored at adult level or above[a,b]	409 (83.5) [73] ((4))	1823 (86.0) [191] ((10))	0.84 (0.64 to 1.12)
Not all household/cleaning products stored safely[a]	239 (49.9) [88]	1138 (54.6) [234]	0.82 (0.67 to 1.01)
Any cleaning products transferred into a different container[a]	17 (3.0) [5]	38 (1.6) [10]	1.74 (0.97 to 3.12)
Did not use safety gate to stop child accessing kitchen[a]	411 (73.3) [6]	1735 (75.1) [10]	0.91 (0.73 to 1.13)
Had things child could climb on to reach high surfaces[a]	281 (50.0) [5]	1056 (45.7) [8]	1.18 (0.96 to 1.44)
Did not put all or some household/cleaning products away immediately after use[b,c]	131 (25.0) [30] ((14))	378 (17.1) [74] ((34))	1.62 (1.28 to 2.05)
Had not taught child rules about what to do or not do when sees cleaning products	194 (36.1) [30]	899 (40.0) [72]	0.88 (0.70 to 1.10)
Had not taught child rules about what to do or not do if medicine on worktop	239 (44.0) [24]	1138 (50.7) [74]	0.73 (0.58 to 0.93)
	***Cases* (n = *443*)**	***Controls* (n = *1779*)**	
Exposures measured only in children aged 0–36 months			
Used baby walker[a]	103 (24.3) [19]	539 (30.6) [15]	0.76 (0.59 to 0.98)

a In the last 24 hours.
b Excludes 'not applicable' responses.
c In the last week.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.
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TABLE 23 Adjusted ORs comparing cases with controls

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Did not have CRCs or blister packs for all medicines[b]	1.25 (0.95 to 1.65)	First child, ability to access poisons
Did not have all medicines in locked medicines box[b]	0.82 (0.47 to 1.43)	CRCs, HADS score, PDH score, ability to access poisons, hours of out-of-home care, first child, medicines locked, medicines put away immediately after use, uses kitchen safety gate, medicines stored high, things child could climb on to reach high surfaces
Not all medicines locked away[b]	0.91 (0.64 to 1.31)[c]	CRCs, HADS score, PDH score, uses kitchen safety gate, medicines stored high, things child could climb on to reach high surfaces, hours of out-of-home care
Not all medicines stored at adult level or above[b]	1.59 (1.21 to 2.09)	CRCs, HADS score, PDH score, ability to access poisons, uses kitchen safety gate, first child, things child could climb on to reach high surfaces, hours of out-of-home care
Not all medicines stored safely[b]	1.83 (1.38 to 2.42)	CRCs, HADS score, PDH score, ability to access poisons, first child, uses kitchen safety gate, things child could climb on to reach high surfaces, hours of out-of-home care
Any medicines transferred into a different container[b]	0.96 (0.52 to 1.76)	CRCs, HADS score, PDH score, locked medicines box, medicines locked, medicines stored high
Did not put all or some medicines away immediately after use[d]	2.11 (1.54 to 2.90)	HADS score, PDH score, ability to access poisons, first child, medicines locked, medicines stored high, things child could climb on to reach high surfaces
Did not have CRCs for all cleaning products[b]	0.87 (0.69 to 1.10)	First child, ability to access poisons
Not all household/cleaning products locked away[b]	0.90 (0.69 to 1.17)	CRCs, HADS score, PDH score, uses kitchen safety gate, products stored high, things child could climb on to reach high surfaces, hours of out-of-home care
Not all household/cleaning products stored at adult level or above[b]	0.95 (0.67 to 1.35)[c]	CRCs, HADS score, PDH score, ability to access poisons, uses kitchen safety gate, things child could climb on to reach high surfaces, hours of out-of-home care
Not all household/cleaning products stored safely[b]	0.77 (0.59 to 0.99)	CRCs, HADS score, PDH score, ability to access poisons, first child, uses kitchen safety gate, things child could climb on to reach high surfaces, hours of out-of-home care
Any cleaning products transferred into a different container[b]	1.20 (0.54 to 2.65)	CRCs, HADS score, PDH score, products locked, products stored high
Did not use safety gate to stop child accessing kitchen[b]	1.05 (0. 80 to 1.37)	HADS score, PDH score, first child, hours of out-of-home care
Had things child could climb on to reach high surfaces[b]	1.20 (0.93 to 1.54)	CRCs, HADS score, PDH score, ability to access poisons, first child
Did not put all or some household/ cleaning products away immediately after use[d]	1.79 (1.29 to 2.48)	HADS score, PDH score, ability to access poisons, first child, products locked, products stored high, things child could climb on to reach high surfaces
Had not taught child rules about what to do or not do when see cleaning products	0.81 (0.59 to 1.12)	CRCs, HADS score, PDH score, ability to access poisons, first child, products locked, products put away immediately after use, uses kitchen safety gate, products stored high, products transferred to different container
Had not taught child rules about what to do or not do if medicine on worktop	0.66 (0.45 to 0.96)	CRCs, HADS score, PDH score, ability to access poisons, first child, locked medicines box, medicines locked, medicines put away immediately after use, uses kitchen safety gate, medicines stored high, medicines transferred to different container

continued

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TABLE 23 Adjusted ORs comparing cases with controls (*continued*)

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Used baby walker[b]	0.82 (0.61 to 1.10)	HADS score, PDH score, first child, hours of out-of-home care

a All matched analyses adjusted for deprivation (IMD) and distance from hospital (quintiles in km: ≤ 2.0, 2.1–3.2, 3.3–4.7, 4.8–8.8, > 8.8) plus confounders listed in the table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c Significant interaction with single parenthood or sex; stratified results shown in *Table 24*.
d In the last 7 days.
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Compared with parents of controls, in the adjusted analyses parents of cases were more likely not to store all medicines at adult eye level or above (AOR 1.59, 95% CI 1.21 to 2.09; PAF 15%) and were more likely not to store all medicines safely (locked away or at adult eye level or above) (AOR 1.83, 95% CI 1.38 to 2.42; PAF 16%). Parents of cases were less likely than parents of controls not to store all household products safely (locked away or at adult eye level or above) (AOR 0.77, 95% CI 0.59 to 0.99). They were also more likely not to put medicines away immediately after use (AOR 2.11, 95% CI 1.54 to 2.90; PAF 20%) or to put household products away immediately (AOR 1.79, 95% CI 1.29 to 2.48;, PAF 11%) and less likely not to have taught their children what to do or not do if medicines were left on the worktop (AOR 0.66, 95% CI 0.45 to 0.96). ORs for the remaining 12 exposures were close to 1, with four being > 1 (ranging from 1.05 to 1.25), and eight being < 1 (ranging from 0.81 to 0.96). All had CIs indicating that associations could have occurred by chance.

Table 24 shows significant interactions in the adjusted analysis comparing cases with controls. Parents of cases living in single adult households were more likely not to store all household products at adult eye level or above (AOR 2.43, 95% CI 1.09 to 5.43; PAF 50%). Parents of female cases were less likely not to keep all medicines locked away (AOR 0.59, 95% CI 0.37 to 0.94).

Tables showing the results of the following sensitivity analyses are available from the authors on request. In the analysis using community controls, four of the AORs using the multiply imputed data differed by > 10% from those using the complete-case data for the main analysis. These were medicines not stored safely (multiply imputed AOR 1.62, 95% CI 1.29 to 2.05; complete case AOR 1.83, 95% CI 1.38 to 2.42), household/cleaning products not stored safety (multiply imputed AOR 0.91, 95% CI 0.73 to 1.13; complete case AOR 0.77, 95% CI 0.59 to 0.99), transferring cleaning products to different containers

TABLE 24 Significant interactions in adjusted analyses comparing cases with controls

Exposure	AOR[a] (95% CI) by number of adults living with child		*p*-value from test for interaction
	One adult	More than one adult	
Not all household/cleaning products were stored at adult eye level or above[b]	2.43 (1.09 to 5.43)	0.76 (0.52 to 1.11)	0.007
	AOR[a] (95% CI) by sex of child		
	Male	Female	
Not all medicines were locked away[b]	1.48 (0.85 to 2.58)	0.59 (0.37 to 0.94)	0.009

a Adjusted for confounders as in *Table 23*.
b In the last 24 hours.

(multiply imputed AOR 1.47, 95% CI 0.80 to 2.69; complete case AOR 1.20, 95% CI 0.54 to 2.65) and not putting household/cleaning products away immediately after use (multiply imputed AOR 1.61, 95% CI 1.26 to 2.05; complete case AOR 1.79, 95% CI 1.29 to 2.48). Two of the AORs differed by > 10% between the multiply imputed and the complete-case interaction analyses.

One exposure with a 'not applicable' response option had > 5% of 'not applicable' responses. Analyses were undertaken incorporating a separate category for 'not applicable' responses. The AORs did not differ by > 10% between analyses with and analyses without the 'not applicable' category. The results from these analyses are available from the authors on request. Stratifying analyses by the treatment received (as a proxy for injury severity) resulted in AORs with fairly broad and overlapping 95% CIs for those seen and examined in the ED and those admitted/treated in the ED/discharged with follow-up for all exposures. The results from these analyses are available from the authors on request.

Case–control study of risk and protective factors for scalds (study A)

A total of 338 cases and 1438 controls participated in the scalds study. The process of recruitment to the study is shown in *Figure 7*. In total, 32% of cases and 29% of controls agreed to participate and were included in the analysis. The age and sex of participants and non-participants in the scalds study were similar, as shown in *Table 25*.

The mean number of controls per case was 4.25. The median time from date of injury to date of questionnaire completion for cases was 11 days (IQR 6–21 days).

All cases had sustained a scald and no other injury in addition to the scald. In total, 31% received treatment at the ED, 24% were seen and examined but did not require treatment, 18% were admitted to hospital and 27% were treated and discharged with a follow-up appointment.

Table 26 shows the sociodemographic characteristics of cases and controls. Controls were slightly older than cases (median age 1.56 vs. 1.47 years). Cases were less likely to be of white ethnic origin (81.8% vs. 91.3%) and more likely to have only one child under the age of 5 years (67.5% vs. 62.3%), live in an overcrowded household (15.2% vs. 8.6%) or live in a rented home (49.6% vs. 37.1%). Case households were more likely to receive state benefits than control households (46.0% vs. 35.0%). Cases lived in areas of higher social deprivation (median IMD score 20.6 vs. 15.7) and typically spent less time being cared for outside the home (median number of hours per week 5.5 vs. 12). Parental perception of their child's ability to climb was lower for cases: 78.6% of case parents thought that it was very likely that their child could climb to at least one of the eight places described on the questionnaire compared with 82.8% of control parents.

Table 27 shows the frequency of exposures among cases and controls and unadjusted ORs and *Table 28* shows ORs adjusted for a range of confounding variables. Fifteen of the 28 ORs changed by > 10% after adjustment (no safety gate: OR 1.79, AOR 1.46; things that could be climbed on to reach high surfaces: OR 1.07, AOR 1.24; kettle not at back of worktop/cooker: OR 1.46, AOR 1.20; water temperature too hot: OR 0.67, AOR 0.96; water temperature not known or > 54°C: OR 1.29, AOR 0.99; played/climbed on furniture: OR 0.54, AOR 0.62; held by someone holding hot drink: OR 0.95, AOR 0.83; hot drinks in reach of child: OR 1.99, AOR 2.33; pan handles not turned to back of cooker: OR 1.26, AOR 0.91; child left alone in bathroom: OR 0.53, AOR 0.70; bath run by older child: OR 1.13, AOR 0.74; older child supervised child in bath: OR 0.82, AOR 1.10; not taught rules about bathtubs: OR 2.16, AOR 1.42; not using playpen/travel cot: OR 1.16, AOR 1.33; not using stationary activity centre: OR 1.62, AOR 1.22).

Compared with parents of controls, in the adjusted analysis parents of cases were more likely to have not taught their child rules about things not to climb on in the kitchen (AOR 1.66, 95% CI 1.12 to 2.47; PAF 20%), what to do or not do when parents are cooking using the top of the cooker (AOR 1.95, 95% CI 1.33 to 2.85; PAF 26%) and about hot things in the kitchen (AOR 1.89, 95% CI 1.30 to 2.75; PAF 26%). They were also more likely than control parents to have left hot drinks within reach of their child (AOR 2.33,

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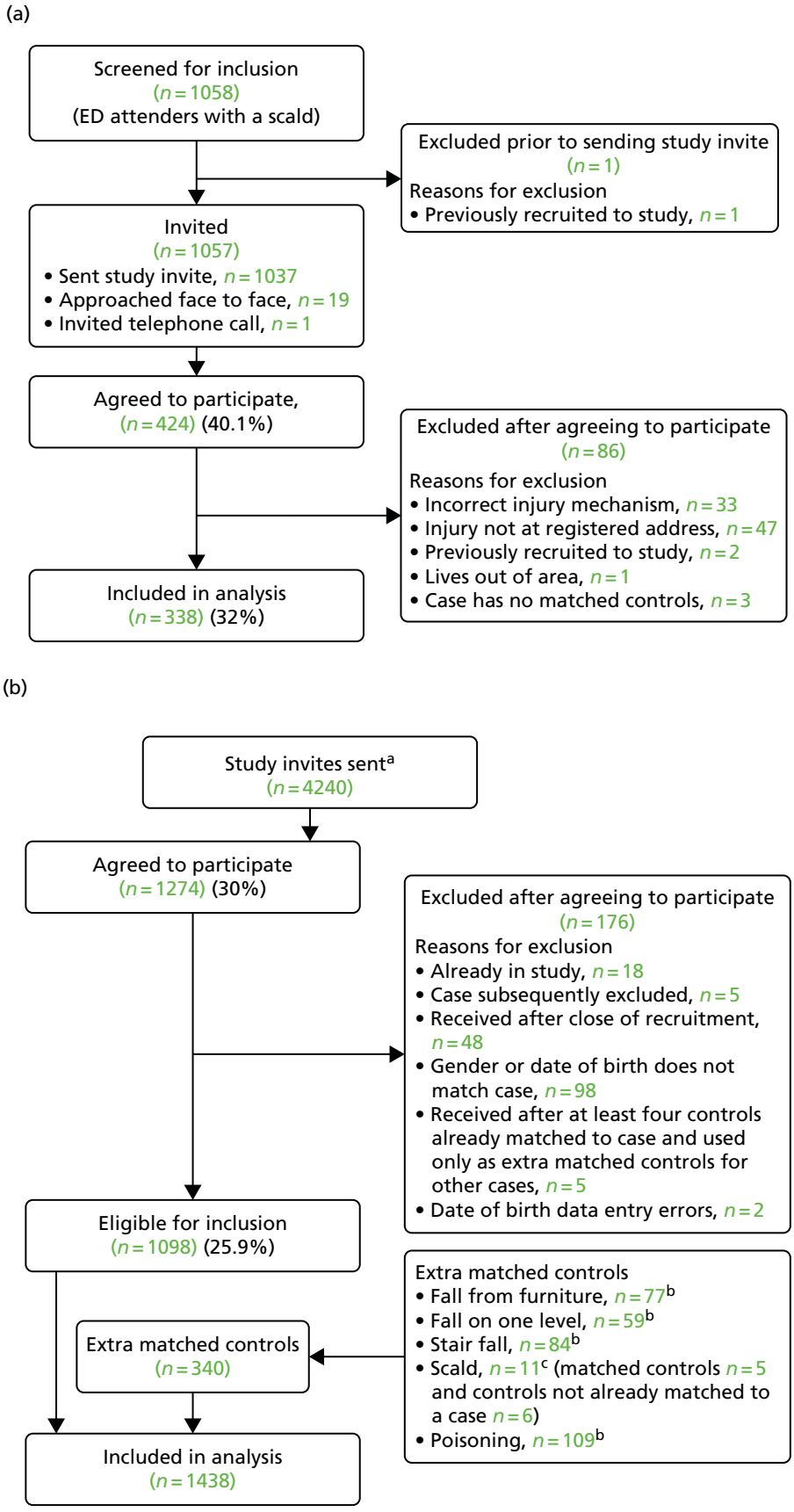


FIGURE 7 Flow of cases and controls through the scalds study: (a) recruitment of cases; and (b) recruitment of controls. a, Assumed to be ten times the number of cases as practices were asked to invite 10 controls for each case; b, controls for cases from the other four ongoing case–control studies; c, controls for cases from scald study that had more than four controls and controls for scald cases that were not matched to the case (e.g. because case was excluded).

TABLE 25 Age and sex of participants and non-participants

Characteristic	Participants ($N = 338$), *n* (%)	Non-participants ($N = 633$), *n* (%)	Total ($N = 971$), *n* (%)	Significance
Age group (months)				
0–12	97 (28.7)	163 (25.8)	260 (26.8)	$\chi^2_{(2)} = 4.60$, $p = 0.10$
13–36	210 (62.1)	383 (60.5)	593 (61.0)	
≥ 37	31 (9.2)	87 (13.7)	118 (12.2)	
Sex				
Male	186 (55.0)	364 (57.5)	550 (56.6)	$\chi^2_{(1)} = 0.55$, $p = 0.46$
Female	152 (45.0)	269 (42.5)	421 (43.4)	

TABLE 26 Sociodemographic characteristics of cases and controls

Characteristic	Cases ($n = 338$)	Controls ($n = 1438$)
Study centre		
Nottingham	123 (36.4)	521 (36.2)
Bristol	112 (33.1)	490 (34.1)
Norwich	54 (16.0)	235 (16.3)
Newcastle	49 (14.5)	192 (13.4)
Age (years), median (IQR)[a]	1.47 (1.03–1.96)	1.56 (1.15–2.07)
Age group (months)		
0–12	91 (26.9)	316 (22.0)
13–36	216 (63.9)	984 (68.4)
37–62	31 (9.2)	138 (9.6)
Male	183 (54.1)	808 (56.2)
Ethnic origin: white	269 (81.8) [9]	1295 (91.3) [19]
Number of children aged 0–4 years in family	[6]	[21]
1	224 (67.5)	883 (62.3)
2	95 (28.6)	476 (33.6)
≥ 3	13 (3.9)	58 (4.1)
First child	140 (44.4) [23]	581 (43.8) [111]
Maternal age ≤ 19 years at birth of first child[b]	43 (14.6) [3]	156 (11.8) [9]
Single adult household	52 (15.9) [10]	171 (12.2) [34]
Weekly out of home child care (hours), median (IQR)	5.5 (0–18) [32]	12 (0–24) [77]
Adults in paid work	[6]	[19]
≥ 2	150 (45.2)	802 (56.5)
1	129 (38.9)	433 (30.5)
0	53 (16.0)	184 (13.0)

continued

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TABLE 26 Sociodemographic characteristics of cases and controls (*continued*)

Characteristic	Cases ($n = 338$)	Controls ($n = 1438$)
Household receives state benefits	151 (46.0) [10]	491 (35.0) [35]
Overcrowding (more than one person per room)	47 (15.2) [28]	116 (8.6) [83]
Non-owner-occupier	164 (49.5) [7]	521 (37.1) [33]
Household has no car	55 (16.5) [5]	174 (12.3) [18]
IMD score, median (IQR)[c]	20.6 (10.1–35.6)	15.7 (9.5–28.8) [18]
Distance from hospital (km), median (IQR)	3.9 (2.1–8.1)	4.6 (2.6–10.3) [16]
CBQ score, mean (IQR)[c]	4.7 (4.0–5.3) [18]	4.6 (4.1–5.2) [155]
Long-term health condition	22 (6.6) [7]	77 (5.4) [13]
Child health VAS score (range 0–10), median (IQR)[c]	9.9 (9.2–10) [4]	9.6 (8.3–10) [4]
HRQL (PedsQL score), median (IQR)[c,d]	94.8 (88.2–98.8), $n = 79$ [3]	89.3 (88.1–94.1), $n = 401$ [3]
Parental assessment of child's ability to climb	[6]	[12]
All scenarios 'not likely'	24 (7.2)	80 (5.6)
One or more scenarios 'quite likely' and none 'very likely'	47 (14.2)	165 (11.6)
One or more scenarios 'very likely'	261 (78.6)	1181 (82.8)
PDH tasks subscale score, median (IQR)[c,e]	13 (10.0–16.0) [34]	14 (11.0–18.0) [99]
HADS score, mean (IQR)[c,e]	9 (6.0–13.0) [11]	10 (6.0–14.0) [20]

a Age when questionnaire completed.
b Only applicable when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% of items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes

Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values.

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TABLE 27 Frequency of exposures and unadjusted ORs comparing cases with controls

Exposure	Cases ($n = 338$)	Controls ($n = 1438$)	Unadjusted OR (95% CI)
Did not use any safety gates[a]	82 (26.3) [26]	242 (17.6) [65]	1.79 (1.29 to 2.48)
Had things child could climb on to reach high surfaces[a]	115 (34.7) [7]	475 (33.2) [6]	1.07 (0.81 to 1.42)
Did not have curly flex or cordless kettle[a]	96 (29.3) [10]	417 (29.5) [25]	1.00 (0.76 to 1.31)
Kettle not at back of worktop/table or back ring of cooker[a]	41 (12.6) [12]	135 (9.5) [17]	1.46 (1.00 to 2.14)
Hot tap water too hot[a]	270 (82.8) [12]	1249 (88.0) [18]	0.67 (0.48 to 0.94)
Temperature of hot tap water not known or known to be ≥ 54 °C[a]	289 (88.7) [12]	1212 (85.5) [21]	1.29 (0.88 to 1.87)
Child climbed or played on furniture at least some days[b,c]	233 (74.4) [7] ((18))	1098 (80.6) [6] ((70))	0.54 (0.37 to 0.77)

TABLE 27 Frequency of exposures and unadjusted ORs comparing cases with controls (*continued*)

Exposure	Cases ($n = 338$)	Controls ($n = 1438$)	Unadjusted OR (95% CI)
Child held by someone holding a hot drink at least some days[b,c]	89 (28.2) [7] ((15))	395 (28.6) [6] ((50))	0.95 (0.72 to 1.26)
Child held by someone using a cooker at least some days[b,c]	77 (24.1) [7] ((11))	357 (25.7) [6] ((44))	0.91 (0.68 to 1.21)
Hot drinks passed over child's head at least some days[b,c]	42 (12.9) [6] ((7))	147 (10.5) [9] ((28))	1.24 (0.85 to 1.80)
Hot drinks left within reach of child at least some days[b,c]	171 (53.9) [12] ((9))	534 (38.0) [12] ((21))	1.99 (1.54 to 2.57)
Hot drinks or hot liquids put on a table with a tablecloth at least some days[b,c]	57 (17.8) [8] ((10))	178 (12.9) [9] ((47))	1.47 (1.05 to 2.05)
Front rings of cooker used at least some days[b,c]	236 (75.2) [13] ((11))	1152 (82.2) [18] ((19))	0.67 (0.49 to 0.90)
Pan handles never turned towards the back of the cooker while cooking[b,c]	104 (32.2) [9] ((6))	380 (27.2) [16] ((23))	1.26 (0.96 to 1.65)
Child left in bathroom without adult even for a moment at least some days[b,c]	55 (17.0) [6] ((8))	384 (27.2) [11] ((17))	0.53 (0.39 to 0.74)
Child left in bath without adult even for a moment at least some days[b,c]	40 (12.5) [9] ((8)	314 (22.2) [12] ((13))	0.47 (0.32 to 0.68)
Bath run for child by an older child at least some days[b,c]	15 (5.6) [11] ((60))	65 (5.6) [19] ((252))	1.13 (0.61 to 2.11)
Older child looked after child in the bath at least some days[b,c]	29 (11.0) [10] ((64))	164 (14.2) [10] ((273))	0.82 (0.53 to 1.27)
Bath never run using cold water first[b,c]	246 (78.8) [8] ((18))	1125 (82.7) [22] ((56))	0.83 (0.61 to 1.13)
Temperature of bathwater never checked using thermometer or other gadget[b,c]	228 (74.5) [10] ((22))	1045 (75.5) [9] ((45))	0.95 (0.71 to 1.29)
Temperature of bathwater never checked using hand or elbow[b,c]	90 (27.6) [7] ((5))	327 (23.4) [10] ((30))	1.23 (0.94 to 1.62)
Child not taught rules about things not to climb on in the kitchen	160 (49.8) [17]	609 (43.3) [32]	1.52 (1.11 to 2.07)
Child not taught rules about what to do or not do when parents are cooking using the top of the cooker	175 (53.2) [9]	636 (45.1) [27]	1.78 (1.29 to 2.44)
Child not taught rules about hot things in the kitchen	181 (55.9) [14]	655 (46.6) [32]	1.79 (1.31 to 2.43)
Child not taught rules about what to do or not do when in the bathtub	141 (44.2) [19]	471 (33.7) [39]	2.16 (1.56 to 2.98)
Safety practices measured only in children aged 0-36 months			
	$n = 307$	$n = 1300$	
Used baby walker[a]	81 (27.0) [7]	446 (34.7) [15]	0.71 (0.53 to 0.94)
Did not use playpen or travel cot[a]	252 (84.3) [8]	1060 (82.5) [16]	1.16 (0.82 to 1.65)
Did not use stationary activity centre[a]	246 (82.0) [7]	951 (74.0) [15]	1.62 (1.17 to 2.25)

a In the last 24 hours.
b In the last week.
c Excludes 'not applicable' responses.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.
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TABLE 28 Adjusted ORs comparing cases with controls

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Did not use any safety gates[b]	1.46 (0.98 to 2.16)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care
Had things child could climb on to reach high surfaces[b]	1.24 (0.89 to 1.72)	HADS score, PDH score, ability to climb, uses safety gate
Did not have curly flex or cordless kettle[b]	0.93 (0.65 to 1.33)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Kettle not at back of worktop/table or back ring of cooker[b]	1.20 (0.67 to 2.15)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Hot tap water too hot[b]	0.96 (0.57 to 1.64)	HADS score, PDH score, ability to climb, first child, bath access
Temperature of hot tap water not known or known to be $\geq 54\ ^{\circ}C$[b]	0.99 (0.57 to 1.70)[c]	HADS score, PDH score, ability to climb, first child, bath access
Child climbed or played on furniture at least some days[d]	0.62 (0.40 to 0.96)	HADS score, PDH score, ability to climb, uses safety gate
Child held by someone holding a hot drink at least some days[d]	0.83 (0.57 to 1.21)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Child held by someone while using a cooker at least some days[d]	0.97 (0.67 to 1.41)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Hot drinks passed over child's head at least some days[d]	1.18 (0.71 to 1.98)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Hot drinks left within reach of child at least some days[d]	2.33 (1.63 to 3.31)	HADS score PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Hot drinks or hot liquids put on a table with a tablecloth at least some days[d]	1.33 (0.85 to 2.08)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
The front rings of the cooker used at least some days[d]	0.70 (0.46 to 1.05)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Pan handles never turned towards the back of the cooker while cooking[d]	0.91 (0.63 to 1.32)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Child left in bathroom without adult even for a moment at least some days[d]	0.70 (0.48 to 1.01)	HADS score, PDH score, ability to climb, first child, number of adults living with child, overcrowding
Child left in bath without adult even for a moment at least some days[d]	0.47 (0.30 to 0.75)	HADS score, PDH score, ability to climb, first child, number of adults living with child, overcrowding
Bath run for child by an older child at least some days[d]	0.74 (0.31 to 1.82)	HADS score, PDH score, ability to climb, first child, number of adults living with child, overcrowding
Older child looked after child in the bath at least some days[d]	1.10 (0.63 to 1.93)	HADS score, PDH score, ability to climb, first child, number of adults living with child, overcrowding
Bath never run using cold water first[d]	0.85 (0.60 to 1.22)	HADS score, PDH score, ability to climb, first child, hot water temperature
Temperature of bathwater never checked using thermometer or other gadget[d]	1.00 (0.70 to 1.43)[c]	HADS score, PDH score, ability to climb, first child, hot water temperature

TABLE 28 Adjusted ORs comparing cases with controls (*continued*)

Exposure	AOR (95% CI)	Confounders adjusted for[a]
Temperature of bathwater never checked using hand or elbow[d]	1.19 (0.86 to 1.64)	HADS score, PDH score, ability to climb, first child, hot water temperature
Child not taught rules about things not to climb on in the kitchen	1.66 (1.12 to 2.47)	HADS score, PDH score, ability to climb, first child, uses safety gate
Child not taught rules about what to do or not do when parents are cooking using the top of the cooker	1.95 (1.33 to 2.85)	HADS score, PDH score, ability to climb, first child, uses safety gate
Child not taught rules about hot things in the kitchen	1.89 (1.30 to 2.75)	HADS score, PDH score, ability to climb, first child, uses safety gate
Child not taught rules about what to do or not do when in the bathtub	1.42 (0.85 to 2.37)[c]	HADS score, PDH score, ability to climb, first child, uses safety gate, bath access, hot water temperature, bath run with cold water first, bath temperature checked
Used baby walker[b]	0.74 (0.52 to 1.03)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care
Did not use playpen or travel cot[b]	1.33 (0.86 to 2.06)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care, uses baby walker
Did not use stationary activity centre[b]	1.22 (0.83 to 1.79)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care, uses baby walker

a All matched analyses adjusted for deprivation (IMD) and distance from hospital plus confounders in the table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c Significant interaction with age; stratified results shown in *Table 29*.
d In the last week.

Notes

PDH – for matched analysis in quintiles: ≤ 10, 10.1–12, 12.1–15, 15.1–19, > 19.

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95% CI 1.63 to 3.31; PAF 31%). Cases were less likely than controls to have played or climbed on furniture (AOR 0.62, 95% CI 0.40 to 0.96) or to have been left alone in the bath (AOR 0.47, 95% CI 0.30 to 0.75). ORs for most of the remaining 22 exposures were close to 1, with 10 being > 1 (ranging from 1.10 to 1.46) and 12 being ≤ 1 (ranging from 0.70 to 1.00). All had CIs indicating that associations could have occurred by chance.

As shown in *Table 29*, there were three exposures for which there was a significant interaction with one of the sociodemographic variables. Comparing cases with controls, parents in households with two or more adults in paid work were more likely not to have taught their child rules about what to do or not do when in the bathtub (AOR 2.81, 95% CI 1.43 to 5.53; PAF 33%). Compared with parents of controls, in single adult households parents of cases were less likely to have a hot water temperature of ≥ 54 °C (or not know the water temperature) (AOR 0.42, 95% CI 0.07 to 2.72), whereas, in households with two or more adults, parents of cases were more likely to have a hot water temperature of ≥ 54 °C (or not know the water temperature) (AOR 1.47, 95% CI 0.85 to 2.56). Compared with control parents, case parents living in rented accommodation were more likely never to check their child's bathwater temperature using a thermometer or other gadget (AOR 1.84, 95% CI 1.03 to 3.28, PAF 36%), whereas parents of cases in owner-occupied housing were less likely to never check the bathwater temperature using a thermometer or other gadget (AOR 0.65, 95% CI 0.42 to 1.03).

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TABLE 29 Significant interactions in adjusted analyses comparing cases with controls

Exposure	AOR[a] (95% CI) by number of adults in paid work			*p*-value from test for interaction
	Two or more	One	None	
Child not taught rules about what to do or not do when in the bathtub	2.81 (1.43 to 5.53)	0.61 (0.28 to 1.32)	1.12 (0.37 to 3.39)	0.006
	AOR[a] (95% CI) by number of adults living with child			
	One adult		More than one adult	
Temperature of hot tap water not known or known to be ≥ 54 °C[b]	0.42 (0.07 to 2.72)		1.47 (0.85 to 2.56)	0.009
	AOR[a] (95% CI) by housing tenure			
	Rented		Owner-occupied	
Temperature of bathwater never checked using thermometer or other gadget[c]	1.84 (1.03 to 3.28)		0.65 (0.42 to 1.03)	0.005

a Adjusted for confounders as in *Table 28*.
b In the last 24 hours.
c In the last week.

Tables showing the complete set of results of the following sensitivity analyses are available from the authors on request. Seventeen of the AORs using the multiply imputed data differed by > 10% from those using the complete-case data for the main analysis and these are shown in *Table 30*. Three of the AORs differed by > 10% between the multiply imputed and the complete-case interaction analyses.

TABLE 30 Comparison of the results from the complete-case and multiple imputation analyses for those exposures for which there was a > 10% difference

Exposure	Complete-case analysis	Multiple imputation analysis		
	AOR[a] (95% CI)	AOR[a] (95% CI)	% Difference	Difference
Did not use any safety gates[b]	1.46 (0.98 to 2.16)	1.69 (1.21 to 2.34)	15.5	0.25
Hot tap water too hot[b]	0.96 (0.57 to 1.64)	0.76 (0.54 to 1.08)	–20.7	–0.20
Temperature of hot tap water not known or known to be ≥ 54 °C[b]	0.99 (0.57 to 1.70)	1.39 (0.95 to 2.05)	40.8	0.40
Child climbed or played on furniture at least some days[c]	0.62 (0.40 to 0.96)	0.73 (0.50 to 1.05)	17.0	0.11
Child held by someone holding a hot drink at least some days[c]	0.83 (0.57 to 1.21)	1.05 (0.78 to 1.42)	27.1	0.22
Hot drinks passed over child's head at least some days[c]	1.18 (0.71 to 1.98)	1.40 (0.95 to 2.07)	18.5	0.22
Hot drinks or hot liquids put on a table with a tablecloth at least some days[c]	1.33 (0.85 to 2.08)	1.48 (1.05 to 2.10)	11.6	0.15
Pan handles never turned towards the back of the cooker while cooking[c]	0.91 (0.63 to 1.32)	1.10 (0.83 to 1.46)	21.0	0.19
Child left in bathroom without adult even for a moment at least some days[c]	0.70 (0.48 to 1.01)	0.61 (0.44 to 0.86)	–12.3	–0.09

TABLE 30 Comparison of the results from the complete-case and multiple imputation analyses for those exposures for which there was a > 10% difference (*continued*)

Exposure	Complete-case analysis AOR[a] (95% CI)	Multiple imputation analysis AOR[a] (95% CI)	% Difference	Difference
Child left in bath without adult even for a moment at least some days[c]	0.47 (0.30 to 0.75)	0.55 (0.38 to 0.80)	17.1	0.08
Bath run for child by an older child at least some days[c]	0.74 (0.31 to 1.82)	0.92 (0.50 to 1.68)	23.9	0.18
Older child looked after child in the bath at least some days[c]	1.10 (0.63 to 1.93)	0.75 (0.48 to 1.18)	–31.5	–0.35
Child not taught rules about things not to climb on in the kitchen	1.66 (1.12 to 2.47)	1.41 (1.02 to 1.93)	–15.3	–0.25
Child not taught rules about what to do or not do when parents are cooking using the top of the cooker	1.95 (1.33 to 2.85)	1.68 (1.21 to 2.32)	–14.0	–0.27
Child not taught rules about hot things in the kitchen	1.89 (1.30 to 2.75)	1.61 (1.18 to 2.19)	–14.9	–0.28
Child not taught rules about what to do or not do when in the bathtub	1.42 (0.85 to 2.37)	1.84 (1.32 to 2.58)	29.9	0.42
Did not use stationary activity centre[b]	1.22 (0.83 to 1.79)	1.45 (1.03 to 2.04)	18.5	0.23

a Adjusted for confounders as in *Table 28*.
b In the last 24 hours.
c In the last week.

For five exposures, the proportion of 'not applicable' responses was > 5%. Analyses were undertaken incorporating a separate category for 'not applicable' responses. The AOR differed by > 10% in the analyses comparing cases with controls with and without a 'not applicable' category for the bath being run by an older child (AOR with 'not applicable' category 0.62, 95% CI 0.28 to 1.34; AOR without 'not applicable' category 0.74, 95% CI 0.31 to 1.82) and for older children looking after a younger child in the bath (AOR with 'not applicable' category 0.95, 95% CI 0.56 to 1.00; AOR without 'not applicable' category 1.10, 95% CI 0.63 to 1.93). The results from these analyses are available from the authors on request.

Stratifying analyses by the treatment received (as a proxy for injury severity) resulted in AORs with fairly broad and overlapping 95% CIs for the seen and examined in the ED and the admitted/treated in the ED/discharged with follow-up groups for almost all exposures. However, the AORs differed between those admitted/treated in the ED/followed up post discharge and those seen and examined in the ED for putting hot drinks or liquids on tables with tablecloths on. Parents of cases who were seen and examined in the ED were less likely than parents of controls to put hot drinks on tables with cloths (AOR 0.11, 95% CI 0.02 to 0.63), but parents of cases admitted to hospital/treated in the ED/followed up post discharge were more likely to put hot drinks on tables with tablecloths than parents of controls (AOR 2.02, 95% CI 1.22 to 3.36). The results from these analyses are available from the authors on request.

Discussion

Main findings

We found that a range of modifiable risk factors were associated with secondary care-attended falls from furniture, falls on stairs or steps, poisonings and scalds in children aged 0–4 years. Only two modifiable risk factors were associated with secondary care-attended falls on one level in children aged 0–4 years.

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Compared with control parents, parents of children who had a fall from furniture were more likely not to use safety gates anywhere in the home (PAF 15%) and, for those with children aged 0–12 months, were more likely to have left them on raised surfaces (PAF 50%), changed nappies on raised surfaces (PAF 34%) and put them in car/bouncing seats on raised surfaces (PAF 12%). Parents of children who had fallen from furniture were less likely to put children aged 13–36 months in car/bouncing seats on raised surfaces (78% reduction in odds). They were more likely not to have taught children rules about things they should not climb on in the kitchen (PAF 16%) and, for those with children aged ≥ 37 months, their children played or climbed on furniture more often (PAF 88%) than control children. Case children who had had a fall from furniture played or climbed on garden furniture less often than control children (26% reduction in odds).

Compared with parents of controls, parents of children who had had a fall on one level were less likely not to use furniture corner covers (28% reduction in odds) and less likely not to have rugs/carpets firmly fixed to the floor (23% reduction in odds). The association with rugs/carpets firmly fixed to the floor varied with the number of adults in the household. Households with one adult in which children had had a fall on one level were more likely not to have rugs/carpets fixed to floors than control households (PAF 18%), whereas households with two adults in which children had had a fall on one level were less likely not to have rugs/carpets fixed to floors than control households (31% reduction in odds).

Compared with parents who kept safety gates closed, parents of children who had fallen down stairs or steps were more likely not to use safety gates on stairs (PAF 21%) or to leave safety gates on stairs open (PAF 24%) than parents of controls. Compared with control households, the odds of not using a safety gate on stairs and of leaving the gate open appeared to be particularly high in families with children aged 0–12 months (PAF 18% and 46%, respectively) and the odds of leaving safety gates open appeared to be high in families who used baby walkers (PAF 44%). Families with children who had fallen down stairs or steps were more likely than controls not to have carpeted stairs (PAF 5%) or not to have a landing part-way up their stairs (PAF 18%). They were also more likely to consider their stairs not safe to use (PAF 5%) or in need of repair (PAF 5%). They were less likely than controls to have tripping hazards on their stairs (23% reduction in odds) or not to have handrails on all stairs (31% reduction in odds). Compared with controls, families with no adults in paid work whose children had fallen down stairs or steps were more likely to have taught children rules about carrying things down stairs and leaving things on stairs (56% and 73% reduction in odds of not teaching rules, respectively). Compared with controls, single adult families whose children had fallen down stairs or steps were more likely to have taught children rules about leaving things on stairs (67% reduction in odds of not teaching rules) and to not have carpeted stairs (PAF 26%).

Compared with parents of controls, parents of children who had had a poisoning were more likely not to store medicines at adult eye level or above (PAF 15%), not to store medicines safely (locked away or at adult eye level or above) (PAF 16%) and not to put medicines (PAF 20%) or household products (PAF 11%) away immediately after use. They were also less likely not to store household products safely (23% reduction in odds) and not to have taught children rules about what to do if medicines are left on the worktop (34% reduction in odds). Parents of children who had had a poisoning in single adult households were more likely than control parents not to store household products at adult eye level or above (PAF 50%). Parents of girls who had had a poisoning were less likely than parents of controls not to lock medicines away (41% reduction in odds).

Compared with parents of controls, parents of children who had had a scald were more likely to have left hot drinks in reach of children (PAF 31%) and more likely not to have taught children rules about climbing in the kitchen (PAF 20%), about what to do or not to do when adults are using the top of the cooker (PAF 26%) or about hot things in the kitchen (PAF 26%). Parents of children who had had a scald were less likely than control parents to have left a child alone in the bath (53% reduction in odds) and their children climbed or played on furniture less often (38% reduction in odds). Compared with controls, families with at least two adults in paid work whose children had had a scald were more likely not to have taught children rules about what to do or not to do when in the bathtub (PAF 33%). Single adult families with children

who had had a scald were less likely than controls to report an unsafe or unknown hot water temperature (58% reduction in odds). Compared with parents of controls, parents of children with a scald living in rented accommodation were more likely not to check the bathwater temperature with a thermometer (PAF 36%).

Most exposures were study specific. Not using safety gates (other than on stairs) was an exposure in all five case–control studies and ORs were > 1 for all studies (ranging from 1.05, 95% CI 0.80 to 1.37 for poisonings to 1.65, 95% CI 1.29 to 2.12 for falls from furniture). All case–control studies included exposures related to teaching children safety rules, but only teaching rules about climbing in the kitchen was measured in more than one study, with both studies finding ORs > 1 (falls from furniture OR 1.58, 95% CI 1.16 to 2.15; scalds OR 1.66, 95% CI 1.12 to 2.47). Across all studies, nine of the 13 ORs related to teaching safety rules were > 1 (ranging from 1.13, 95% CI 0.83 to 1.52 for rules about slippery floors and falls on one level to 1.95, 95% CI 1.33 to 2.85 for rules about what to do or not do when parents are using the top of the cooker and scalds).

Strengths and limitations

We report the largest case–control studies to date examining associations between a range of modifiable risk factors for falls, poisoning and scalds. These studies were conducted in NHS hospitals across England, including urban and rural areas. Adjustment was made for a wide range of potential confounding factors using DAGs. For four of our five studies, the majority of ORs using multiply imputed data for the main analysis did not differ by > 10% from those in the complete-case analysis. However, in most studies, a larger number of ORs in the interaction analyses differed by > 10% between the multiple imputation and the complete-case analyses.

Case–control studies have limitations arising from their observational nature. These include, but are not limited to, measurement error, a range of different types of bias and confounding. Each of these are discussed below. We validated measures for exposures when possible and found high (> 70%) sensitivities and specificities for six out of 12 falls exposures, for two out of 15 poisoning exposures and for two out of three scalds exposures. We used home observations as the 'gold standard', but it is possible that families may have made changes to their homes either as a result of the injury or in anticipation of the home observation. In addition, there may have been some social desirability bias, with parents reporting responses that they judged to be 'more acceptable'. These may potentially explain some of the lack of agreement that we found between parent-reported and observed exposures. It is likely that some misclassification of exposures occurred. Misclassification is likely to be lowest when sensitivity and specificity are both high. Sensitivity and specificity were both > 70% for having safety gates on stairs or across kitchen doorways, having carpeted stairs and landings part-way up stairs, having playpens, furniture corner covers and cordless or curly-flexed kettles and storing household products at adult eye level or above. For other exposures, when misclassification is higher it is more likely that ORs are biased towards the null (although this does not always occur[86]) and this may partly explain our failure to find associations between some exposures and falls, poisonings and scalds. We did explore whether or not the differences between self-reported and observed exposures varied between cases and controls, and we found similar levels of under- and over-reporting for both groups for most exposures. This suggests that differential misclassification is unlikely to have occurred to a large extent. Our analyses did not take misclassification of exposures into account, and for this reason our findings should be interpreted with caution. Future studies should consider adjusting for exposure misclassification.

The participation rates for cases and controls were similar, but were low for all studies, ranging from 24% to 35% for cases and from 24% to 33% for controls across the five studies. If reasons for participation are associated with the exposure or outcome of interest, selection bias may have occurred. Our participation rates do not show large differences by case/control status, age and sex, but we were not able to assess the prevalence of exposures in participants and non-participants, and caution should be exercised in interpreting our findings. In addition to social desirability bias discussed above, recall bias may have occurred. These two types of bias could potentially impact on our ORs in different directions. As most injuries were relatively

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minor, it is possible that a small number of controls may have had similar injuries to cases and on the same date as the case injury but did not seek medical attention for those injuries. This could lead to misclassification of cases and controls. However, this is likely to apply to only a small number of controls; hence, we would expect this to have at most only a minor impact on our results. If seeking medical attention is associated with exposures of interest, this may lead to overestimation of ORs, but the extent to which this may have introduced bias is difficult to assess.

Most ORs for not teaching children various safety rules were > 1 across the five case–control studies and were significantly raised for rules about climbing in the kitchen for falls from furniture and scalds and for rules about what to do or not do when parents were using the cooker top and about not touching hot things for scalds. It is possible that parents who use safety rules supervise their children differently from parents who do not use rules and, as we were not able to adjust for this, residual confounding may partly explain these findings.

In all five case–control studies, cases were more disadvantaged than controls. Socioeconomic disadvantage is likely to be associated with some of the exposures of interest in our studies and, although we adjusted for a range of confounders, it is possible that some residual confounding remained. It is also possible that families belonging to black and minority ethnic (BME) groups were under-represented in our studies and that for some studies (scalds in particular) a higher proportion of cases than controls belonged to a BME group. The proportion of the population reported as white in the 2011 UK census was 86%,[87] whereas the proportion of cases and controls from a BME group ranged from 8% to 18% and from 7% to 9%, respectively, across our five studies. The generalisability of our findings to BME groups may therefore be limited.

Overall, there were few significant interactions found, but our interaction analyses should be interpreted with caution for several reasons. First, a large number of tests for interactions were performed and, although we used a significance level of 1% for these tests, one in every 100 tests will be significant by chance alone. Second, subgroup numbers were small for many comparisons, leading to insufficient power to detect anything other than large differences in associations. Third, differences in estimates of associations between complete-case and multiple imputation analyses suggest that the findings of some of our interaction analyses were not robust to missing data. Consequently, these analyses should be considered as generating rather than testing hypotheses. The significant interactions that were found need confirmation from further research.

Our findings in relation to age are, in general, in keeping with what would be expected based on child development. For example, the increased odds of falls from furniture only in 0- to 12-month-olds who were left on, had nappies changed on or who were put in car/bouncing seats on raised surfaces is to be expected given that these are activities likely to be undertaken by parents whose children are not independently mobile. We found only a small number of exposures with significant interactions with sex, with the exposure more strongly associated with an injury in boys than in girls. The majority of these were in the poisonings case–control study. Boys have higher mortality rates for poisoning than girls[88] and have been found to have higher hospital admission rates for poisonings than girls,[55,89] although some studies including poisonings not requiring hospital admissions have failed to find significant differences by child sex.[90,91] As our cases mainly included minor injuries, this would be consistent with finding only a few exposures more strongly associated with poisonings in boys than in girls.

There were significant interactions for several exposures related to teaching safety rules with either the number of adults in the household or the number in paid work in the stair falls and scalds studies. Previous research suggests that parents start teaching safety rules between the ages of 2 and 4 years and at this point they move from mainly using strategies based on supervision and changing the home environment to teaching- and rule-based strategies to prevent injury.[92,93] Previous research also suggests that teaching safety rules can increase the risk of injury[93,94] and that teaching needs to increase children's understanding of the safety issue to reduce the extent to which they interact with hazards.[94] Our findings suggest that

cases in single adult households and in households without adults in paid work are more likely to have been taught safety rules than controls. It is possible that families in which supervision may be more challenging (e.g. single adult households) or with fewer material resources (e.g. those without adults in paid work) rely more on teaching safety rules than on other injury prevention strategies, but this may not be an effective strategy in these circumstances. Further work is required to explore these hypotheses.

The many exposures in our studies resulted in multiple significance testing; hence, some associations may have been significant by chance alone. Our estimates of associations for some exposures were imprecise because of the low prevalence of some exposures such as use of playpens or stationary activity centres, use of safety gates to prevent access to gardens, transferring household products or medicines to other containers or baths being run by older children. Some exposures were not measured in our studies because they were known to be rare, and our studies were underpowered to detect anything other than implausibly large associations. For example, bunk bed falls account for only 10% of falls from beds and have an annual incidence rate of 0.3 per 1000 children-years.[45,95–98]

Comparisons with existing literature

Comparing our findings with those of previously published studies has been limited by differences in the exposures measured, similar exposures measured in different ways or inadequately detailed descriptions of exposure measures. We have not compared our findings to studies in which cases represent a wide range of injury mechanisms[99] because of the difficulty in interpreting findings that are not specific to single injury mechanisms. We found only one Australian case–control study of infants with head or face trauma[100] matched on age to controls with which to compare the findings from our falls studies. The findings of the Australian study were consistent with our findings for changing nappies on high surfaces (OR 1.77, 95% CI 1.07 to 2.92) and use of high chairs without harnesses (OR 1.47, 95% CI 0.73 to 2.98). We found slightly raised odds of a fall from furniture for children who had not used a baby walker (OR 1.22, 95% CI 0.90 to 1.65) but slightly reduced odds of a fall on one level (0.83, 95% CI 0.58 to 1.10) and for a fall on stairs or steps (AOR 0.83, 95% CI 0.62 to 1.09), which was consistent with the results from the Australian study (OR for ever using a baby walker 0.83, 95% CI 0.50 to 1.38). However, this was inconsistent with the increased odds of a head injury in those using a baby walker most days (OR 2.47, 95% CI 0.97 to 6.48) found by the same study.

There are several case–control studies that we can compare the findings from our poisonings study with. A study from Greece including children predominantly aged 2–4 years attending hospital emergency clinics following a poisoning and non-injured age-, sex- and hospital-matched controls attending other outpatient clinics found no significant association between mother's use of safely packaged products, mainly for detergents, and poisoning attendance (OR not presented).[101] An Australian study of 1- to 3-year-olds attending an ED following a poisoning and three different types of controls (community, ED attenders with another type of injury and ED non-injured attenders) found that a 1% increase in the percentage of medicinal substances stored in accessible locations in bathrooms increased the odds of poisoning by 3% (OR 1.03, 95% CI 1.002 to 1.080).[102]

A case–control study from Thailand of children aged < 5 years attending hospitals following a poisoning matched with controls on age, sex and area of residence found no association between toxic substances in the home, storage practices, frequency of use, packaging or disposal practices and poisoning (ORs not presented).[103] A case–control study from Brazil of children aged < 5 years treated in hospital, matched with children seeking emergency care for other reasons on age, sex, hospital and presence in the home of the same toxic substances found in the case home, found an increased odds of poisoning in families storing toxic substances in boxes/cabinets (OR 3.80, 95% CI 1.15 to 12.49) and an increased odds of poisoning in families storing toxic substances < 150 cm from the floor (OR 16.59, 95% CI 2.86 to 96.20).[104]

Comparing the findings from these studies with our control findings shows some consistency in terms of our higher odds of a poisoning in families not storing medicines at adult eye level or above and in families not storing poisons safely (at adult eye level or above or locked). The previous studies have not measured

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associations between putting medicines or household products away immediately and poisoning, and so we cannot compare our findings in this respect.

There are several case–control studies that we can compare our scalds study with. A Greek study of children predominantly aged 0–4 years attending an ED following a burn injury, of which 61% were scalds, matched on age and sex with non-injured ED attenders, found that a 1-unit increase in a burn avoidance index was associated with a 40% reduction in the odds of a burn (OR 0.6, 95% CI 0.5 to 0.8).[105] The burn avoidance index was a composite measure consisting of direction of handles of cooking utensils on the cooker while cooking, use of front/rear hotplates during cooking, keeping hot objects, foods and liquids in places inaccessible to children and avoidance of tablecloths on kitchen tables.

A study from Iraq of children aged 0–5 years admitted to a burns centre following a burn occurring at home, of which 79% were scalds, matched on age and sex to children admitted to hospital for other reasons, found that a 1-unit increase in a burns hazard score increased the odds of a burn by 32% (OR 1.32, 95% CI 1.02 to 1.71).[106] The burns hazard score included use of kerosene cookers, kerosene heaters, samovars for tea, home generators and non-electric heaters for bathwater, not knowing the boiler temperature, storing petrol at home, having no fire extinguisher and having no smoke alarm. A Dutch study of children aged 0–4 years attending an ED with burn injuries, 62% of which were scalds, matched on age with controls, found that storage of hot drinks in their original containers instead of in vacuum flasks increased the odds of a burn (OR 2.0, 90% CI 1.2 to 3.1).[107] A study in Bangladesh of children aged 0–12 years admitted to a burns unit and controls matched on age, sex and area of residence found that significantly more case households than control households had cooking equipment within reach of children ($p < 0.001$; OR not reported).[108]

All of these case–control studies that we can compare our scalds study findings to studied children with burns and, although most of the burns were caused by scalds in these studies, some of the differences between these studies and our findings may reflect differing case definitions. In addition, there were few common exposures between these studies and our study, which may in part reflect differences between heating and cooking practices between countries. Our findings that families who had hot drinks in reach of children, drank hot drinks while holding children or passed hot drinks over children's heads had an increased odds of a scald are in keeping with the findings from the Greek case–control study.[105] However, as that study used a composite measure of exposure, it is difficult to know the contribution made by keeping hot foods and liquids in inaccessible places to the odds of a scald. Similarly, we did not find significant associations between cooking practices such as use of the front rings of the cooker and turning pan handles towards the back of the cooker and, although these were included in the composite exposure measure in the Greek study, the contribution of these items to the odds of a scald in that study is unknown.[105]

How these findings inform other research within the Keeping Children Safe programme

The findings from study A have been used to inform the decision analyses (study K) undertaken in work stream 5 assessing the cost-effectiveness of interventions to prevent falls and poisoning. They have also been used to inform recommendations on scalds, falls and poison prevention practices in the IPB for the prevention of fire-related injuries, scalds, falls and poisoning (study M).

Chapter 3 What are the NHS, child and family costs of falls, poisonings and scalds? (Work stream 2)

Abstract

Research question

What are the NHS, child and family costs of falls, poisonings and scalds? Is the PedsQL an acceptable and psychometrically sound measure of HRQL in children aged ≥ 2 years in an emergency medicine setting?

Methods

Study C consisted of two substudies. In the HRQL substudy, the toddler version of the PedsQL was used to obtain proxy reports of children's pre-injury HRQL, with questionnaires completed immediately post injury and 2 weeks and 1, 3 and 12 months post injury. Instrument acceptability, internal consistency reliability, construct validity and responsiveness to change were measured. In the costs of injury substudy, resource use and expenditure questions were included in the HRQL questionnaire. Resource use data were combined with unit costs to calculate health-care and non-health-care costs.

Results

Health-related quality-of-life substudy

Internal consistency reliability was adequate (Cronbach's $\alpha > 0.70$). Retrospectively reported pre-injury scale, summary and total scores were (with the exception of the nursery/school subscale) higher than previously reported in healthy UK toddlers and in community controls in the current study. Children with a long-term health condition had poorer pre-injury PedsQL scores than those without, and hypotheses regarding post-injury physical functioning scores for groups defined by injury severity were supported. There were reductions in physical functioning from pre injury to post injury for children with more severe injuries, with most observed effect sizes being large (≥ 0.8).

Costs of injury substudy

In total, 344 parents completed resource use questionnaires, with > 95% of children recovering within 2 weeks of injury and almost 99% recovering within 1 month. Mean NHS costs ranged from £2588 to £2989 across injury mechanisms for children admitted for ≥ 2 days, from £719 to £1011 for those admitted for 0–1 days and from £97 to £178 for those attending an ED but not admitted. Scalds incurred the highest NHS costs for admissions for 0–1 days and for ED attendances. Comparisons between injury mechanisms were not possible for admissions for ≥ 2 days because of small numbers. Mean costs to families ranged from £99 to £399 across injury mechanisms for those admitted for ≥ 2 days, from £38 to £200 for those admitted for 0–1 days and from £18 to £68 for those attending an ED but not admitted. Family costs were highest for scalds for admissions for 0–1 days and for falls from furniture for ED attendances. Family costs mainly consisted of the costs of informal child care and the costs of taking time off work.

Conclusions

Health-related quality-of-life substudy

The PedsQL was a feasible and acceptable measure of HRQL in this population, with adequate internal consistency reliability, discrimination between varying levels of injury severity and sequelae and responsiveness to change. Findings in respect of construct validity were equivocal.

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The costs of injury substudy

The NHS incurs high costs for admissions to hospital lasting ≥ 2 days following injuries, but these injuries are uncommon. More common injuries requiring shorter inpatient stays incur moderate costs, whereas the most common injuries requiring only ED attendance incur small costs. Costs to families can be substantial, especially for injuries requiring hospital admission.

Chapter summary

This chapter presents an overview of the costs and consequences of unintentional injuries to health services and to children and their families, including the economic and HRQL aspects. It describes the methods used to recruit participants to the study and the analyses undertaken. It presents data to validate the PedsQL for a range of injuries in preschool children and to measure the costs of injury to the NHS and families and discusses the key findings of each study. Finally, it outlines its strengths and weaknesses and considers the implications of the results.

Introduction

To date, there has been little information on the cost of unintentional injuries to the NHS, to children and to families, without which the NHS cannot make informed choices about which interventions to fund to prevent home injuries in childhood.

Measuring HRQL is an integral part of measuring the cost of children's injuries, yet tools for doing this have not been validated for a wide range of injury types and severities in preschool children.[64,109–112] We therefore undertook a longitudinal study, nested within the case–control study described in work stream 1 (see *Chapter 2*). The primary objective of the study was to quantify children's HRQL post injury and the costs to the NHS and families of such injuries and to assess the feasibility, acceptability and psychometric properties of the acute version of the PedsQL[109] in a paediatric population with injuries. HRQL and cost data were analysed separately, with no attempt made to assign a monetary value to children's HRQL for incorporation into the cost analysis. An alternative approach to assessing the costs of injuries would have been to estimate the burden of childhood injuries by measuring what society would be prepared to pay to avoid childhood injuries using willingness-to-pay methodology. Although the concept is appealing, practical difficulties have been well documented, relating mainly to the formulation of the questions asked and the interpretation of the responses given.[113] Information on costs and HRQL was used to inform decision analyses (study K) estimating the cost-effectiveness of a range of strategies to prevent childhood falls, poisoning and scalds undertaken in work stream 5 (see *Figure 1* for a diagram of the component parts of the programme grant).

Unintentional injuries from falls, poisonings and scalds do not just result in death and injury. They also place burdens on the NHS and other care agencies and on injured children and their families. At a personal level, these burdens can, for example:

- be financial (e.g. from loss of income if there is a need to take time off work, costs associated with travel to and from hospital or with making adaptations to the home)
- impact on a child's education
- reduce a child's ability to develop physically because of loss of mobility or reduction of fine motor skills
- affect employment prospects
- influence social interactions and life chances, for example as a result of severe scarring
- affect HRQL, at least in the short term.

The costs of injury

In the UK, there is very limited evidence on the costs of unintentional childhood injuries. However, such information is important for prioritising spending on prevention, treatment and rehabilitation services and for economic evaluations of interventions.[114–116] Several studies have attempted to quantify the economic costs associated with unintentional injuries.[30,117–122] These have been undertaken from a variety of perspectives including medical care costs,[117,119,120] medical and social care costs[30] or medical care, social care and societal costs.[118,121,122] However, the estimates are not always specific to children[30,118,121,122] or, when they do focus on children, studies do not always present data on the under-fives.[11] Some costs are estimated based on other types of injuries, for example transposed from data on road traffic crashes.[123]

Although there are some data from other countries, estimates of the economic burden of injury cannot easily be compared between countries and across time because of differences in health-care systems, the absence of standardised methodologies, the different approaches used and a lack of epidemiological and cost data.[124] It should be noted that many previous cost and HRQL studies have used populations that were likely to have sustained more serious injuries.

The costs of injury can be categorised as direct costs resulting from the injury (e.g. costs to the health-care system such as ambulance transport, ED visits, admissions, primary care attendances, rehabilitation and drug costs), indirect costs, which represent the value of lost output because of reduced productivity caused by injury and any resultant disability and losses because of premature death (e.g. costs to the child, family or society such as loss of income from carers taking time off work or lost productivity in later life by the injured or disabled child) and intangible costs (e.g. costs of pain, grief, suffering, etc.). Some studies and sources provide estimates of direct costs and some of direct and indirect costs combined, as described below, but intangible costs, which are difficult to measure in monetary terms, have not been quantified to date.

In England, unintentional injuries occurring in or around the home are a leading cause of preventable death and disability for children aged < 5 years.[1] Falls, poisonings (including suspected poisonings) and thermal injuries are the most common causes of ED attendances[3] and hospital admissions.[2] Although the majority of those injuries are not severe, the disproportionately large numbers of minor injuries are likely to account for the greater costs[125] compared with the costs of relatively rare serious injuries (which individually would incur substantially higher lifetime costs).[1]

Each year in England, > 280,000 children aged < 5 years visit an ED as a result of falls, thermal injuries or poisoning incidents.[3] These visits cost the NHS nearly £32M, based on the average cost of an ED attendance of £114.[31] These figures do not include children treated by GPs or treated at home.[126]

In 2012/13 in England, > 18,300 falls, 5100 poisonings and 1420 scalds among under-fives resulted in emergency admissions.[2] About 90% of admissions were for < 2 days but almost 16% of scalds, 4% of falls and 2% of poisonings were more serious, requiring admission for > 3 days [data available from www.chimat.org.uk/earlyyears/injuries (accessed 4 October 2016)]. In total, the admissions cost the NHS £19.1M (at £586 per short-stay case and £2461 per long-stay case).[30] The most severe childhood injuries, such as severe scalds and traumatic brain injuries (TBIs) from falls, disproportionally contribute to costs to the NHS and other care agencies because of the longer length of hospital stay, cost of treatments in intensive care units, repeated operations and long-term rehabilitation.

Falls constitute almost half of all injury-related admissions to children aged < 5 years, with a rate of between 500 and 600 admissions per 100,000 children annually between 2008/9 and 2012/13 in England.[1] A population-based study of TBIs in north Staffordshire in the 1990s reported that, among under-fives, 62% of TBI cases (of all severities) resulted from falls, rising to > 70% if children who were dropped were included.[127] A study of children admitted with a TBI to intensive care units throughout England and Wales reported that the admission rate among under-fives was 5.3 per 100,000 children annually, with falls constituting 38% of the 136 cases in the sample.[128] These injuries can impose short- or

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long-term problems including post-traumatic stress,[129] disability and cognitive and social impairment, impact negatively on learning ability and reduce chances of future employment and productivity. They also place significant financial[130] and psychological distress[120,131] on children and families, and are a major economic burden to society.[132]

Estimates of short- and long-term costs of injuries, predominantly based on UK data, have been highlighted in the *Chief Medical Officer's Annual Report 2012*[11] (*Table 31*) and a recent report and data analysis published by Public Health England.[1] The CMO's report estimates the costs of severe injuries for the under 15s,[11] as data are more readily available for injuries in this age group, whereas the Public Health England report breaks down the data into age categories, separating the < 5 years age group, and focuses on the most common childhood injuries, including falls, poisonings and scalds.[1] Both reports highlight the high financial costs, with the short-term health-care cost per case, that is, costs related to the hospital and other health service costs immediately after the injury, ranging from £2494 for the average cost of an injury to £14,000 for a serious road traffic injury.[118] The CMO's report notes that the lifetime cost of a childhood TBI can be up to £4.95M per case at 2012 prices.[137,138]

Calculating long-term costs can be complex, as this needs to take account of the long-term consequences of sustaining a severe injury such as educational costs (e.g. special needs for a disabled child), lost productivity costs and social care costs, which are not always well documented.[1] The potential total lifetime health-care, social care and social security costs of TBI in childhood, based on the number of cases in 2003, was estimated to be between £640M and £2.24B.[11]

Using the methodology developed to cost road traffic accidents, the cost of a serious home accident (one requiring admission to hospital and including medical and support costs for the acute event, lost output over the period of recovery and the value of the avoidance of injury) to a child aged < 5 years has been estimated to be £33,200 in June 2009 prices using data for Great Britain.[123] (In this study, 'serious' was defined in the same way as the term is used in the reporting of road casualties; namely, the injury required admission to hospital at least overnight and involved concussion, crushing, laceration of > 5 cm, suspected or actual fracture, multiple injuries or other internal injuries and the outcome of which was inpatient treatment or admission or transfer to a specialist, long-stay or other hospital.)

Several UK studies have estimated the costs of childhood scalds. An average cost of acute inpatient treatment for a minor, uncomplicated paediatric scald [one involving < 10% of the total body surface area (TBSA)] has been estimated to be £1850 in 2002/3 prices,[139] whereas the average cost of acute inpatient treatment of a 'major scald' (30–40% TBSA) in 2007–9 in a paediatric burns unit was as high as £55,000.[119] For a bathwater scald, NHS treatment costs were £25,226 and the wider societal costs were £71,902 at 2010 prices.[140]

Health-related quality of life following childhood injury

The resource and productivity costs do not fully capture the burden of childhood injuries[125] as they do not take account of the quality of life of, or psychological impact on, the child and family. The most commonly used generic measure of HRQL is the European Quality of Life-5 Dimensions (EQ-5D).[141] The EQ-5D measures health using five domains to produce 243 health states to which societal preference weights are assigned to generate a single 'utility index' value, captured on a scale ranging from 0 [for death (or negative values for states worse than death)] to 1 (perfect health) and which depend on the severity of the health problem.[125,142] The utility index is multiplied by the time lived within a health state to calculate quality-adjusted life-years (QALYs). Thus, 1 year lived in perfect health equates to 1 QALY and a year of life lived in less than perfect health equates to < 1 QALY. The EQ-5D has previously been used to measure HRQL following injury,[125,133] but at the time of initiating our study it had not been used in injured children aged < 5 years.[143] The Child Health Utility 9D is a child-specific measure of HRQL but at the time of our study it had been validated only for use in children age 7–11 years (Katherine Stevens, University of Sheffield, April 2010, personal communication).

TABLE 31 Costs of injury

Cost	Value updated to 2012 prices	Base values	Incidence (if applicable)	Population base	Unit	Source
Average cost of ED treatment leading to admission	£146 per patient	£146 per patient	NA	Number of cases: 135,131 (HES 2012[2])	Average cost for the UK (all types, all ages)	Curtis[30]
Average cost for minor injury services leading to admission	£66 per patient	£66 per patient	NA	Number of cases: 135,131 (HES 2012[2])	Average cost for the UK (all types, all ages)	Curtis[30]
Short-term costs, healthcare, RTI	£14,000	£13,500	0–4 years: 82.5 per 100,000; 5–14 years: 55.75 per 100,000[133]	Population estimates: 0–4 years: 3,393,400; 5–14 years: 6,091,500[134] Total seriously injured (at least 3-day hospital stay): 6196	Average cost of a serious RTI (all ages)	Department for Transport[135]
Short-term costs, health care, RTI	£14,000	£13,500	NA	2272 seriously injured or killed on the road[136] minus about 40 killed (HES 2010) = 2232	Average cost of a serious RTI (all ages)	Department for Transport[135]
Short-term costs, health care	£2494	€2769	0–4 years: 82.5 per 100,000; 5–14 years: 55.75 per 100,000[133]	Population estimates: 0–4 years: 3,393,400; 5–14 years: 6,091,500[134] Total seriously injured (at least 3-day hospital stay): 6196	Average cost of an injury (all types, all ages)	Polinder *et al.*[118]
Cost of a serious burn, short-term, health care	£65,788	£63,157	NA	NA	Average cost of inpatient treatment for a major burn, including high-dependency unit care	Pellatt *et al.*[119]
Lifetime cost of a paediatric TBI (medical costs)	£271,805	£268,000	5.6[128]	448[128]	Indication of the lifelong medical cost for a child who suffers a severe TBI at age 3 years	Adapted from Wright (2011)[137] by the Child Accident Prevention Trust[138]

continued

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TABLE 31 Costs of injury (*continued*)

Cost	Value updated to 2012 prices	Base values	Incidence (if applicable)	Population base	Unit	Source
Lifetime cost of a paediatric TBI (all costs)	£4.95M	£4.89M	5.6[128]	448[128]	Indication of the lifelong medical cost, educational cost, productivity loss, benefits and tax loss for a child who suffers a severe TBI at age 3 years	Adapted from Wright *et al.*[137] by the Child Accident Prevention Trust[138]
Short- and long-term costs of TBI health care and non-health care	£1.43M	AUS$ 2.1M	5.6[128]	448 ($n = 47$ for cyclists)[128]	Lifetime average cost of a TBI (all ages) including all health-care costs plus social care costs, productivity losses, carer costs, etc.	Access Economics Pty Limited[122]

HES, Hospital Episode Statistics; NA, not applicable; ONS, Office for National Statistics; RTI, road traffic injury.
Extracted from the supporting information for table 3.2 of the report of the CMO.[11] Contains public sector information licensed under the Open Government Licence v3.0. © Crown Copyright.

There is a dearth of research data in the UK on the estimation of QALYs for childhood injuries. The Long Term Health and Healthcare Outcomes of Accidental Injury (HALO) study followed a cohort of serious accident casualties aged ≥ 16 years (assembled from six previous cohort studies conducted by the same research group). Health state utilities were estimated using the EQ-5D. This study reported that the average QALY loss was between 0.1 and 0.2 QALYs per year, resulting in an average loss of 1.7 QALYs (primarily because of loss of quality rather than length of life) over the following 10 years for those who survived to 6 months after injury compared with a general population, after adjusting for mortality in that general population. The study did not measure QALY loss by injury type or in children aged < 5 years. In the constituent cohorts there were 65 cases of injury victims aged < 16 years at the time of the accident but only those aged ≥ 16 years were included in the HALO follow-up cohort (HALO study final report 2009, J Nicholl, University of Sheffield, April 2010, personal communication).

In the absence of UK data measuring utility decrements associated with injury, data from other countries may be useful in estimating QALY losses. Phillips *et al.*[140] estimate that a bathwater scald in a young child results in a loss of 9.1 QALYs, based on a utility decrement of 0.13 ascertained from a Spanish study of burn injuries in children and adults,[144] in which utilities were ascertained using the EQ-5D, multiplied by 70 additional expected life-years.

Two studies in the USA quantified QALY losses for other types of injuries (poisonings and falls).[125,145] The first of these studies did not use a validated measure of health state utilities.[125] Rather, diagnosis- and age-specific estimates of QALY losses combined physician ratings of the longitudinal impact of injuries on pain and functioning[146,147] with diagnosis-specific data on the likelihood that the injury would permanently impact on the ability to work or earnings potential.[148] The physician rating scales were not specific to children, but raters were asked to rate the likelihood of impairment and duration thereof separately for children and adults. Survey data, weighting the relative importance placed by respondents on different dimensions of impact, were used to translate the estimated impairment impacts into QALYs; most of these weights were specific to children and adolescents. The utility decrements for a fall ranged from 0.1 to 0.13 and for poisoning ranged from 0.03 to 0.046.[125] The second study[145] was of children aged 5–17 years following a TBI resulting from a fall and reported an average utility index, based on the Quality of Well-being Index,[149,150] of 0.687 at 3 months and 0.675 at 6 months. HRQL varied widely in this study, with the utility index ranging from 0.093 to 1.0 at the 3- and 6-month interview points.[145] QALY losses have also been described by injury severity (in those aged < 20 years) in a US study for all types of childhood injuries (including poisoning and medically treated child neglect) and the values per injured case were 28.2 for fatal injury, 1.6 for an admitted case and 0.04 for a non-admitted case.[151] In this study, QALYs were computed on the basis of lives lost to fatal injuries and years of life spent in a disabled state, weighted by physician ratings of the functional loss arising from the severity of the disability; QALY losses in future years were discounted to present values at a 3% annual rate. Physician ratings were based on those routinely used by the US National Highway Traffic Safety Administration;[146] the author acknowledges that these are not fully validated ratings and that they were > 20 years old at the time of writing (2006).

Methodological issues in the measurement of HRQL in children aged < 5 years are attributed to a shortage of appropriately validated instruments that are sensitive to rapid developmental stages,[152] lack of health state utility classification instruments for under 5s and use of proxies in the assessment of a child's health state.[153,154] However, proxy reporting is justified by the lack of cognitive and language comprehension skills necessary for self-completion in children aged < 5 years.[155] Parental perceptions of a child's HRQL are also important as the principal determinant of utilisation of health-care services.[64]

Studies evaluating parent–child agreement for HRQL measures found some disagreements across the domains measured, with parents of sick children tending to underestimate child HRQL and parents of healthy children tending to overestimate child HRQL.[155]

The PedsQL[109] has been found to be a reliable instrument for the measurement of HRQL in children, and is widely applicable in research, clinical practice and community populations.[64,109] The advantages of the

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PedsQL include its brevity, age-appropriate versions and parallel forms for child and parent reporting. The UK-English version has been developed and validated in children with chronic health conditions and in healthy children,[156,157] and has been recommended for the assessment of HRQL in the UK.

The PedsQL has been administered in trauma injuries to under-fives[158] and older children,[111,158,159] including children treated for limb fractures, where it has demonstrated good responsiveness in detecting statistically significant changes in the condition of patients over time.[111,159,160] The instrument has also been used extensively for paediatric TBIs[112,131,158,161,162] and spinal cord injuries.[163,164] The studies have shown a substantial long-term reduction in children's HRQL after moderate to severe injury, particularly with regard to participation in activities, the ability to communicate and the ability to care for themselves. In addition, severe TBIs may add a considerable burden on carers and families, as reported in one study.[131]

More recently, the PedsQL has been evaluated for measuring short-term outcomes for paediatric minor injuries in the ED setting, where it was found to be responsive to changes in health status over 1–2 weeks post injury.[165,166] One of the limitations of the PedsQL, however, is that it does not allow for estimation of health utilities, necessary for the estimation of QALYs. One recent study has demonstrated the feasibility of mapping the PedsQL core scales into EQ-5D utilities; however, to date this has been carried out only for older children (aged 11–15 years).[167]

Methods relating to the health-related quality-of-life and costs substudies

The multicentre longitudinal study (study C) reported here was carried out in four centres (Nottingham, Bristol, Norwich and Newcastle) to:

- validate the PedsQL in a range of medically attended injuries in preschool children (HRQL substudy)
- measure the costs of injury to the NHS and families (costs substudy).

Participants (children aged < 5 years attending an ED or MIU or admitted to hospital in four centres in the UK) were recruited to the case–control study (study A) investigating the relationship between a range of safety behaviours, safety equipment use and exposure to home hazards and the occurrence of falls,[52] poisonings[53] and scalds,[54] as described in work stream 1 (see *Chapter 2*).

Participants in study A were asked to express interest (either during face-to-face recruitment or by post following postal recruitment) in participating in one of three nested studies (study B – validation of the tools used to collect exposure data for study A; study C – measurement of the costs of injury and validation of the PedsQL; and study G – parents' perceptions of barriers to, and facilitators of, injury prevention). Parents recruited face to face had the nested studies explained to them and, if they expressed an interest in study C, they were given the 2-week and the 1-month questionnaires to complete at home. If they were interested in study B or G they were given at least 24 hours to decide whether to participate before being contacted again by the research team. When participants were recruited by post, and if their study A questionnaire had been returned within 2 weeks of the injury date (and with an expression of interest in the nested studies), they were allocated to study C in preference to the other two nested studies (except for a short period of time when recruitment to study B became a priority because of the completion deadline or when participants were recruited to study G if they fulfilled the sampling frame criteria).

As noted above, participants agreeing to take part in study C were initially given or were posted both the 2-week and the 1-month questionnaires at the same time, with clear instructions on how and when to complete them, that is, it was explained that there was no need to complete the 1-month questionnaire (and subsequent follow-up questionnaires) if their child had recovered by the previous time point measured. However, the strategy of posting the two questionnaires together was dropped as it became apparent that the majority of cases were minor injuries who had recovered by 2 weeks and therefore the 1-month and subsequent follow-up questionnaires were posted only to those who did not recover at previous time points.

Recruitment continued until approximately 400 cases had been recruited, stratified into five strata by injury mechanism (i.e. stair falls, falls on one level, falls from furniture, poisonings and scalds). HRQL data were also collected for study A community controls at baseline.

The questionnaires, which collected data on resource use, costs and HRQL, were self-completed by parents, either while in the ED/MIU or hospital ward or (more usually) on their return home, and were returned in person or by post to the research team.

Follow-up questionnaires (see *Appendix 2, Follow-up questionnaires*) were administered by post at up to four time points post injury (2 weeks and 1, 3 and 12 months), with the number of administrations depending on whether or not the child had recovered at the time of completion of the most recent questionnaire (*Figure 8*). We anticipated that most injuries would be relatively minor, with potentially short-lived impacts on children's HRQL. The PedsQL has previously been shown to be responsive to changes in health status over 1–2 weeks post injury in children attending an ED following a minor injury.[165,166] For this reason, the first administration of the PedsQL in study C was at 2 weeks post injury. A maximum of three reminders were sent at each time point to non-respondents. This included an initial postal reminder containing the questionnaire followed by a telephone reminder and, if there was still no response, a mini-questionnaire (see *Appendix 2, Mini questionnaire*) was sent asking whether or not the child had fully recovered from their injury to ensure that no further follow-up questionnaires were sent. All follow-up questionnaires asked for the date of completion so that time since injury could be calculated. Participants were sent a £5 gift voucher for use in local stores for each completed questionnaire returned.

Ethics approval

Ethics approval was obtained from Nottingham Research Ethics Committee 1 (reference number 09/H0407/14).

Validation of the Pediatric Quality of Life Inventory (health-related quality-of-life substudy)

Methods

Describing the Pediatric Quality of Life Inventory

The PedsQL measurement model[64,110] consists of generic core scales and disease-specific modules (not used in this study). The PedsQL 4.0 generic core scales in the parent proxy report version for toddlers (aged 2–4 years) include 21 items tapping four dimensions: physical functioning (eight items), emotional functioning (five items), social functioning (five items) and nursery/school functioning (three items).

Each item has a 5-point response scale (0 = never a problem; 1 = almost never a problem; 2 = sometimes a problem; 3 = often a problem; 4 = almost always a problem). In analysis, items are reverse scored and linearly transformed to a 0–100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, 4 = 0). Scale scores are computed as the sum of the items answered divided by the number of items answered in that scale (to account for missing data), with higher scores denoting better HRQL. If > 50% of items in a given scale are missing, the scale score is not computed and is treated as missing.[64]

Summary scores for physical health (eight items) and psychosocial health (13 items) and a total HRQL score (21 items) can be computed. The physical health summary score is equal to the physical functioning scale score. The psychosocial health summary score is calculated as the sum of the items in the emotional, social and nursery/school functioning scales divided by the number of items answered across these three scales. Similarly, the total HRQL score is computed as the sum of the items across all four scales divided by the total number of items answered.[64]

The standard PedsQL generic core scales have a reference period of the past month and the acute version has a reference period of the past week. Following personal correspondence with the instrument's developer (J Varni, Texas A&M University, 11 October 2007), we adapted the instrument to have a

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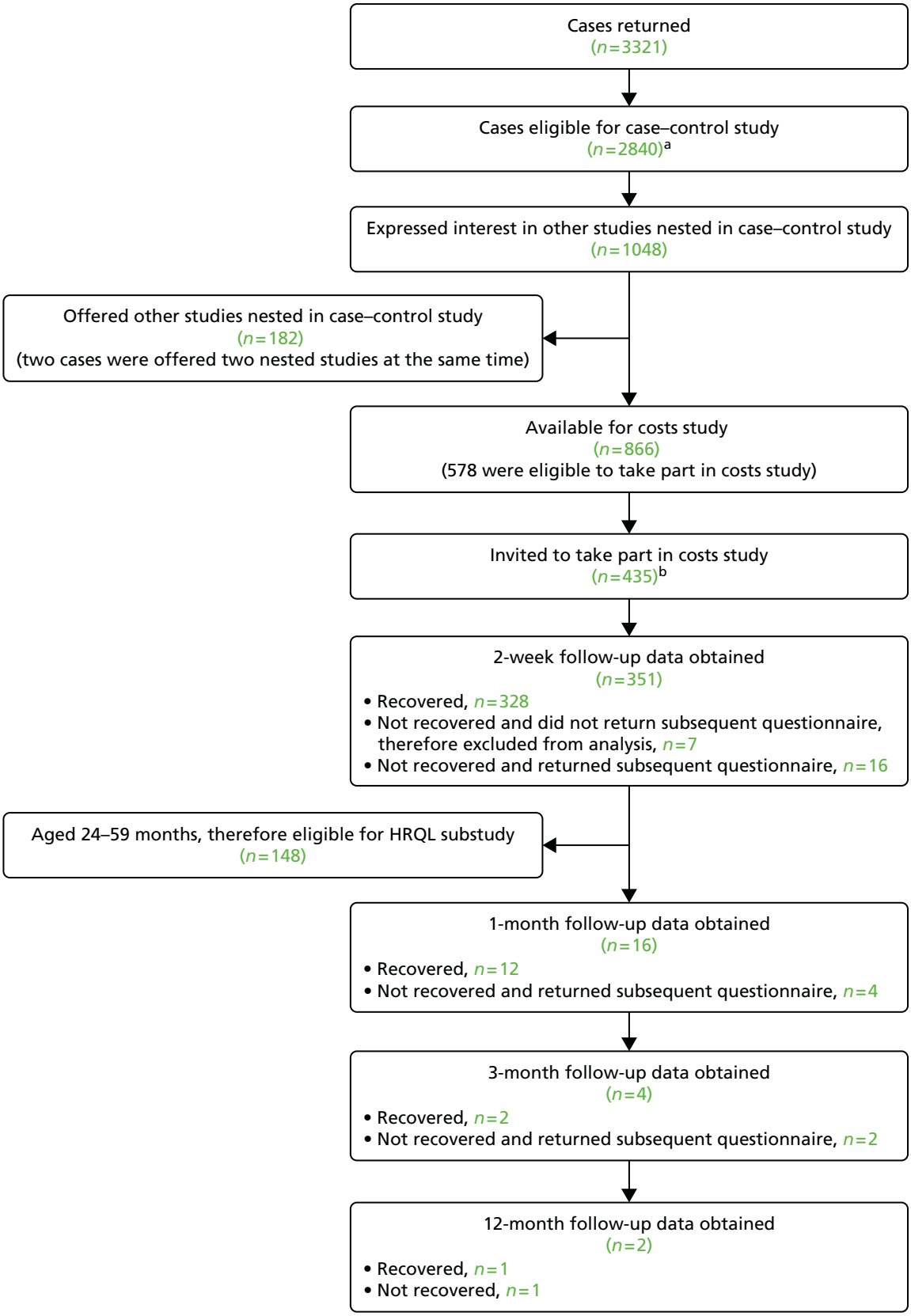


FIGURE 8 Recruitment and questionnaire administration flow chart. a, Includes eight cases subsequently found not to be eligible for the case–control study (costs study, $n = 7$; other nested study, $n = 1$); b, includes nine invitations sent to cases subsequently found to be not eligible for study C and who did not return the 2-week questionnaire.

reference period of the past 2 weeks. This period was chosen because we considered that most children's injuries would be relatively minor and, although many might resolve within 1 week post injury, a 1-week reference period might be too short to capture changes in HRQL, particularly for sprains, fractures and scalds. Although guidelines for measuring HRQL post injury[168] recommend carrying out the first data collection post injury at 1 month, this is based primarily on studies of injured adults. There are few studies reporting HRQL in populations of children with a range of injuries.[8,169] Most children attending an ED or a MIU will have been previously healthy and will have suffered a minor injury, and hence impacts on HRQL may be short-lived. As participants for study C were recruited from among those already participating in study A, we considered the time taken to recruit participants would prevent measurement of HRQL at 1 week post injury. We therefore chose a 2-week reference period.

Administration of PedsQL validation questions

The general data collection methods used are described above. However, it should be noted that, at baseline and the follow-up time points, PedsQL items were asked only of parents of children aged ≥ 24 months; we refer to this subset of participants as the study C HRQL sample. This was necessary because the infant version of the PedsQL instrument[170] was not available when the study was initiated. Although all children were aged ≤ 59 months at the time of the injury, four were aged 60 months by the time of questionnaire completion, but these were retained in the analyses reported in this chapter. The reference period for the PedsQL items at baseline was the 2 weeks prior to the injury that had led to attendance at the ED/MIU or admission to hospital for cases and the 2 weeks prior to questionnaire completion for community controls. In addition to the PedsQL, participants completed the baseline questionnaire for study A, which contained a 10-cm VAS of general health[171] and a question about long-term health conditions.

Analysis

Only the 2-week follow-up data are reported here because of the very small number of children for whom responses at the later time points were requested and received (see *Figure 8*).

Analysis reflected that reported in previous papers on the reliability, validity and responsiveness to change of the PedsQL in general populations[64,157] and in the ED setting.[166,172] Analysis was conducted using M*plus* (version 6; Muthén & Muthén, Los Angeles, CA, USA).

Demographic and injury characteristic variables for participants and non-participants (i.e. study A participants eligible for but not agreeing to participate in the study C HRQL substudy) in the study C HRQL sample were compared using chi-squared tests and independent sample *t*-tests.

Item-level analysis

Item-level analysis was carried out separately on pre-injury data for all study A 'cases' aged ≥ 24 months (i.e. children attending an ED or a MIU or admitted to hospital with an injury; these results are reported in *Tables 33–39* as the largest and therefore most robust sample) and in respect of pre- and post-injury data for the participants in the study C HRQL sample.

Following Varni *et al.*,[64] the rates of missing data per item and the distribution across the five response categories were examined as indicators of the feasibility and acceptability of the measure. Item means, item SDs and item–scale correlations, corrected for overlap, were calculated: item–scale correlations of ≥ 0.40 were considered adequate.[173] Item scaling success was calculated for each item, defined as the number of times that an item correlated higher, by ≥ 2 standard errors (SEs), with its hypothesised scale (with correction for overlap) than it did with each of the other three scales.[174] We then calculated the percentage of item scaling successes (relative to the total number of comparisons) for each scale.

Scale-level analysis

Analyses of missing scale scores, floor and ceiling effects, internal consistency and interscale correlations were carried out separately for pre-injury data for all study A 'cases' aged ≥ 24 months (these results are reported in *Tables 33–39* as the largest and therefore most robust sample) and in respect of pre- and

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post-injury data for the participants in the study C HRQL sample. Confirmatory factor analysis was conducted solely on the study A 'case' pre-injury data as the number of participants in the study C HRQL sample was too small. Analyses addressing known-groups validity were conducted on the study A 'cases' in respect of groups defined by the presence of a long-term health condition and on the study C HRQL sample for groups defined by the nature and severity of the injury; analysis of responsiveness to change was confined to the study C HRQL sample.

Scale distributions

Also following Varni *et al.*,[64] we examined ceiling and floor effects [i.e. the percentage of responses with the maximum possible (100) and minimum possible (0) scores] for each scale and summary score and the percentage of children for whom a scale or summary score could not be computed (because > 50% of the constituent items were missing). Marked floor effects, particularly at baseline, would mean that deterioration in HRQL could not be detected, whereas marked ceiling effects would mean that there was no scope to detect improvement in HRQL.

Scale and summary mean scores were compared, using independent sample *t*-tests, with those from a previous study validating the PedsQL in a sample of healthy toddlers in the UK.[157] Scale and summary mean scores at baseline for study A 'cases' were also compared, using independent sample *t*-tests, with the corresponding mean scores for the age- and sex-matched community controls in study A who had not attended an ED or a MIU or been admitted to hospital on the date of the case injury.

Internal consistency reliability

Scale internal consistency reliability was examined through Cronbach's alpha coefficient;[175] alpha values of ≥ 0.70 are considered adequate for comparisons of patient groups with a higher criterion ($\alpha = 0.90$) for analysis of individual patient scores.[173]

Construct validity

Correlations between scale scores and with parents' rating of their child's overall health on a 10-cm VAS were examined as part of our analysis of construct validity. Following Varni *et al.*,[64] medium to large (≥ 0.40) correlations[176] between the PedsQL scale scores were expected, given that the instrument was developed to measure the integrated multidimensional construct of paediatric HRQL and shared method variance.

Construct validity was examined through confirmatory factor analysis. In exploratory factor analysis, using principal components analysis with oblique rotation, Varni *et al.*[64] have previously identified a five-factor model; school functioning split into two factors but the other three factors that emerged were largely consistent with the a priori hypothesised structure (i.e. the other items loaded onto factors broadly corresponding to their hypothesised scales of physical functioning, emotional functioning and social functioning). Subsequent publications by the PedsQL development team confirmed an equivalent five-factor structure: across age subgroups (5–16 years);[177,178] with respect to socioeconomic status;[179] between healthy children and those with a chronic health condition;[180] across race/ethnicity groups;[181] over a period of 1 year;[182] and across different modes of administration.[183] However, all of these studies were conducted in children aged ≥ 5 years. In personal communication with the research team, the instrument's developer (J Varni, 12 November 2013) recommended testing a four-factor solution (physical functioning, emotional functioning, social functioning and nursery/school functioning) as there are only three items measuring nursery/school functioning in the PedsQL toddler version. We therefore tested a first-order four-factor model (in which each of the factors was correlated with each other) and an alternative second-order model in which three of the first-order factors (emotional functioning, social functioning and nursery/school functioning) were assumed to load onto a second-order factor (psychological health), which was in turn assumed to correlate with the physical function factor (*Table 32*). Model adequacy in our confirmatory factor analysis was initially tested by the chi-square test; criterion values of $p \geq 0.05$ were considered indicative of acceptable fit.[184] However, the chi-square statistic is dependent on the sample size.[185] If the sample size is too small, one is more likely to find that an 'inappropriate model' fits the data; conversely, if the sample size is too large an appropriate model may well

TABLE 32 List of items with labels and first- and second-order factor structures

Item		Label	First order	Second order
1	Walking score	PF1	PF	PH[a]
2	Running score	PF2		
3	Active play/exercise score	PF3		
4	Lifting score	PF4		
5	Bathing score	PF5		
6	Picking up toys score	PF6		
7	Having hurts/aches score	PF7		
8	Energy level score	PF8		
9	Feeling afraid score	EF1	EF	P-SH
10	Feeling sad score	EF2		
11	Feeling angry score	EF3		
12	Sleeping score	EF4		
13	Worrying score	EF5		
14	Playing with other children score	SF1	SF	
15	Other kids wanting to play score	SF2		
16	Being teased score	SF3		
17	Ability to do the same as peers (social) score	SF4		
18	Keeping up with other children at play score	SF5		
19	Ability to do the same as peers (school/nursery) score	SC1	SC	
20	Miss nursery/school – unwell	SC2		
21	Miss nursery/school – doctor's appointment	SC3		

EF, emotional functioning; PF, physical functioning; PH, physical health; P-SH, psychosocial health; SC, school functioning; SF, social functioning.
a As there is only one physical health domain, a second-order structure was fitted only for the 'psychological health' domain.

be rejected on the basis of a highly significant *p*-value.[186] We therefore also examined other goodness-of-fit statistics: the Tucker–Lewis Index (TLI), the comparative fit index (CFI), the standardised root-mean-square residual (SRMR) and the root-mean-square error of approximation (RMSEA). Values of TLI and CFI of > 0.90 and > 0.95, respectively, are considered indicative of good and excellent fit; for SRMR and RMSEA, values of ≤ 0.08 are desirable.[187] In addition, the Akaike and Bayesian information criteria (AIC and BIC) were used to assess the relative quality of alternative models.

Construct validity was further analysed through known-groups validity. For study A 'cases', pre-injury HRQL scores for children with and without a long-term health condition were compared using an independent sample *t*-test; previous studies (e.g. Varni *et al.*[188]) have shown poorer HRQL in children with a chronic health problem than in healthy peers. More detailed known-groups analysis was carried out on data for the study C HRQL sample. We hypothesised that there would be no differences in baseline (i.e. pre-injury) PedsQL scores for any of the comparator groups described below, but that lower PedsQL scores (indicative of poorer HRQL) post injury, particularly in respect of physical functioning, would be observed in:

(a) children whose parents reported that they were not fully recovered from the injury compared with those reported to be fully recovered
(b) children treated for their injury in an ED/a MIU compared with those who were just examined

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(c) children who underwent radiography compared with those who did not undergo radiography
(d) children admitted for observation or to a hospital ward compared with those who were discharged following examination
(e) children who received medication for their injury compared with those who did not receive medication.

We further hypothesised a positive dose–response relationship for:

(f) Children who had two or more procedures carried out compared with those who had one procedure only compared with those who had no procedures. [Procedures (and number of children undergoing each; total $n = 148$) consisted of blood test ($n = 12$), urine test ($n = 2$), radiography ($n = 33$), ultrasound, magnetic resonance imaging or computerised tomography scan ($n = 1$), medicine given by mouth ($n = 54$), medicine given by injection ($n = 3$), medicine applied to skin ($n = 11$), medicine provided to take home ($n = 6$), dressing applied to wound or burn ($n = 11$), stitches ($n = 5$), wound closure strips or wound glue ($n = 28$), bandage, sling or support ($n = 15$), splint ($n = 0$), manipulation of fracture or broken bone ($n = 2$), manipulation of dislocated joint ($n = 1$), operation to fix broken or fractured bone ($n = 1$), cast applied to broken or fractured bone ($n = 8$), physiotherapy ($n = 0$), stomach washout ($n = 0$), general anaesthetic ($n = 4$), local anaesthetic ($n = 1$), tetanus injection ($n = 0$), drip ($n = 2$), blood transfusion ($n = 0$), chest drain ($n = 0$), oxygen ($n = 1$), ventilation tube ($n = 0$), resuscitation ($n = 0$).]
(g) Children who sustained a broken bone compared with those who sustained a cut needing stitches compared with those who sustained a cut or graze not needing stitches.

Previous studies[143,166] have shown poorer quality of life among children with more severe injuries; we did not include a formal assessment of injury severity but comparisons (b)–(g) were designed as proxy measures of injury severity. Known-groups validity was examined through independent sample *t*-tests for comparisons (a)–(e) and through one-way analysis of variance (ANOVA), with post hoc Bonferroni tests for pairwise contrasts, for comparisons (f) and (g).

Responsiveness to change

Responsiveness to change was also examined following Stevens *et al.*[166] We examined change in PedsQL scores from baseline (i.e. pre injury) to follow-up in respect of the groups defined in (a)–(g). Separate paired-sample *t*-tests were carried out for each of the subgroups as defined, and for each comparison we then computed the effect size as the mean change from baseline divided by the SD of the score in that group at baseline. We hypothesised that the differences, particularly in respect of physical functioning, would be positive (i.e. indicating a reduction in HRQL from pre injury to post injury) in those who had not fully recovered, who had been treated for their injury, who had undergone radiography, who were admitted for observation or to a hospital ward, who had received medication or who had one or more procedures, and that effect sizes would be larger in magnitude than for their respective comparators, as described in the previous section.

In previous PedsQL studies, a minimally important difference (MID) of 4.5 points for the PedsQL total score for parent proxy report has been proposed,[188] calculated as the sample's standard error of measurement [SEM; defined as the product of the (baseline) SD and the square root of 1 minus Cronbach's alpha]; MIDs for scale scores ranged from 6.92 for physical health to 9.67 for nursery/school health, with a MID of 5.49 for psychosocial summary. However, it has also been recommended by HRQL researchers[189] that several estimates of the MID should be calculated and used to determine a range for the MID. Following Stevens *et al.*[166] we therefore estimated the MID in two ways: as the SEM and as half the baseline SD.[189–191]

Results

Study participants

Completed study A questionnaires were received from 1334 parents of children aged ≥ 24 months, with completion dates ranging from 18 June 2010 to 28 February 2013. A total of 351 parents also returned a

study C 2-week post-injury questionnaire but only 148 (42%) of these were for children aged 24–59 months and therefore eligible for the study C HRQL substudy. Of these 148, 134 (91%) answered one or more items on the PedsQL at both baseline and follow-up, 10 did not complete any items on the PedsQL at baseline (in five cases because the child was aged < 24 months at the time of completion of the baseline questionnaire) and six did not complete any items on the PedsQL at follow-up (two of whom had also left the PedsQL items blank at baseline). In this sample, dates of completion of the baseline and follow-up questionnaires ranged from 18 August 2010 to 23 January 2013 and from 29 August 2010 to 26 January 2013, respectively.

The time from injury to completion of the baseline questionnaire for the full study A sample ranged from 0 to 243 days, with a median of 11 days (IQR 6–21 days); 89.4% of questionnaires were completed within 28 days of the injury. In the study C HRQL sample, the time from injury to completion of the baseline questionnaire ranged from 0 to 79 days, with a median of 6 days (IQR 5–9 days). The time from injury to completion of the 2 week follow-up questionnaire ranged from 9 to 87 days, with a median of 22 days (IQR 17–30 days); only 7.4% responded within 14 days of the injury. The interval between completion of the baseline questionnaire and completion of the follow-up questionnaire ranged from 2 to 77 days, with a median of 13 days (IQR 9–22 days).

Demographic and injury mechanism variables for the full baseline study A sample and for those who did and did not participate in the study C HRQL substudy are shown in *Tables 33* and *34*.

The only statistically significant differences between participants and non-participants were in respect of study centre, IMD score and injury type. Of the four centres in which the study was taking place, children

TABLE 33 Demographic details of study A 'cases' (aged ≥ 24 months) and of participants and non-participants in the study C HRQL substudy

Characteristic	Study A cases (*N* = 1334), *n* (%)	Study C HRQL substudy participants (*N* = 148), *n* (%)	Study C HRQL substudy non-participants (*N* = 1186), *n* (%)
Male	712 (53.4)	75 (51.4)	636 (53.6)
Ethnic origin: white	1178 (90.1)	136 (93.8)	1042 (89.7)
Child has long-term condition	180 (13.7)	18 (12.6)	162 (13.9)
First child	458 (38.6)	52 (35.5)	406 (38.7)
Single parent household	222 (17.1)	29 (20.0)	193 (16.7)
Household does not own accommodation	539 (41.3)	55 (37.9)	484 (41.8)
Household does not own car	180 (13.8)	24 (13.3)	156 (13.4)
Household receives social welfare benefits	570 (44.2)	70 (48.6)	500 (43.6)
Mother < 20 years old at first birth	179 (15.0)	23 (16.5)	156 (14.8)
Overcrowded accommodation	115 (9.2)	12 (8.6)	103 (9.2)
Study centre			
Nottingham	507 (38.0)	45 (30.4)	462 (39.0)
Bristol	385 (28.9)	42 (28.4)	343 (28.9)
Norwich	279 (20.9)	52 (35.1)	227 (19.1)
Newcastle	163 (12.2)	9 (6.1)	154 (13.0)
Age (months), mean (SD)	36.88 (9.54)	35.74 (9.16)	37.03 (9.58)
IMD score, mean (SD)	22.27 (16.23)	19.27 (14.74)	22.65 (16.37)

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TABLE 34 Injury details of study A 'cases' (aged ≥ 24 months) and of participants and non-participants in the study C HRQL substudy

Injury details	Study A cases (*N* = 1334), *n* (%)	Study C HRQL substudy participants (*N* = 148), *n* (%)	Study C HRQL substudy non-participants (*N* = 1186), *n* (%)
Injury mechanism			
Fall down stairs or steps	307 (23.0)	31 (20.9)	276 (23.3)
Fall on one level	313 (23.5)	39 (26.4)	274 (23.1)
Fall from furniture	303 (22.7)	39 (26.4)	264 (22.3)
Poisoning	331 (24.8)	34 (23.0)	297 (25.0)
Scald	80 (6.0)	5 (3.4)	75 (6.3)
Total number of injuries sustained			
One	1142 (86.6)	122 (83.0)	1020 (87.1)
Two	174 (13.2)	25 (17.0)	149 (12.7)
Three	2 (0.2)	0 (0.0)	2 (0.2)
Nature of injury			
Lost consciousness	20 (1.5)	4 (2.7)	16 (1.3)
Bang on head	437 (32.8)	56 (37.8)	381 (32.1)
Broken bone	147 (11.0)	15 (10.1)	132 (11.1)
Cut needing stitches	121 (9.1)	13 (8.8)	108 (9.1)
Cut or graze not needing stitches	222 (16.6)	21 (14.2)	201 (16.9)
Other injury	193 (14.5)	20 (20.3)	163 (13.7)

from the Norwich centre were over-represented and those from the Nottingham and Newcastle centres were under-represented among participants in the study C HRQL sample. Participants in the study C HRQL substudy had, on average, lower IMD scores than non-participants, denoting residence in less deprived areas. Finally, those who had sustained 'other' injuries were somewhat over-represented among participants in the study C HRQL substudy.

Item-level analyses

Item-level missing data, distribution of responses across the five response categories, means and SDs are shown in *Table 35*.

Across all 1334 respondents, a total of 2116 PedsQL items were missing out of the 28,014 items (1334 × 21) administered, an item missing rate of 7.6%. At the level of individual items, rates of missing data were generally low (ranging from 2.6% to 3.4%) for items in the physical, emotional and social scales; however, higher rates (35.2–35.8%) were observed for the three items in the nursery/school scale, reflecting the fact that many of these children did not attend nursery and hence these questions were not applicable. Adjusting for non-attendance at nursery or school, rates of missing data for the three nursery/school items ranged from 3.8% (item 21) to 4.4% (item 19).

For all but two items (items 10 and 21), the entire response range of 0–100 was used. Item mean scores ranged from 75.33 to 96.26, with SDs ranging from 11.48 to 25.89. For 17 out of the 21 items (81%), item means were within a 10-point range of each other.

TABLE 35 Item scores at baseline: full study A sample ($n = 1334$)

Question		Missing data (%)	0	25	50	75	100	Mean	SD
Physical									
1	Walking	2.7	1.6	0.4	1.5	3.6	90.1	96.26	15.60
2	Running	2.6	2.2	0.7	3.3	5.0	86.1	94.21	18.71
3	Active play	2.8	1.5	0.7	2.0	5.5	87.6	95.49	16.13
4	Lifting	3.4	1.3	2.0	9.8	14.0	69.3	88.32	21.60
5	Bathing	2.8	1.0	0.7	2.2	4.9	88.2	95.91	14.99
6	Picking up toys	2.6	1.9	1.9	5.5	7.6	80.4	91.78	20.71
7	Having hurts/aches	3.1	0.3	1.9	10.8	16.9	66.9	88.25	19.85
8	Energy level	2.9	0.3	1.0	5.6	12.9	77.3	82.72	16.20
Emotional									
9	Feeling afraid	3.1	0.3	1.3	19.7	29.4	46.2	80.90	21.03
10	Feeling sad	2.8	0.0	0.5	12.1	26.8	57.6	86.44	18.21
11	Feeling angry	2.9	0.2	4.0	28.4	26.2	38.3	75.33	23.35
12	Sleeping	2.8	2.2	5.1	16.9	22.9	50.1	79.26	25.89
13	Worrying	3.2	0.2	0.9	6.7	18.3	70.6	90.86	16.87
Social									
14	Playing with other kids	2.6	1.4	1.9	7.2	18.0	68.8	88.72	20.79
15	Other kids wanting to play	2.7	0.2	0.4	5.1	18.3	73.3	92.16	15.23
16	Being teased	3.1	0.1	0.2	2.4	10.3	84.0	95.86	11.48
17	Do same as peers	2.8	1.3	1.3	4.6	10.4	79.5	92.59	18.51
18	Keep up at play	3.0	2.5	1.1	4.0	9.1	80.4	92.19	20.51
Nursery/school									
19	Ability to do the same as peers (school/nursery)	35.8	2.7	1.6	2.5	4.6	52.7	90.16	24.63
20	Miss nursery/school – unwell	35.3	0.1	0.4	7.7	17.5	39.0	86.65	18.44
21	Miss nursery/school – doctor's appointment	35.2	0.0	0.6	4.7	12.0	47.5	91.03	16.43

Item–own scale correlations (corrected for overlap) exceeded the criterion value of 0.4 for all but three items (items 8, 19 and 20). Item scaling success rates [defined as the number of times that an item correlated higher, by ≥ 2 SEs, with its hypothesised scale (with correction for overlap) than it did with each of the other three scales] were 22 out of 24 (92%), 15 out of 15 (100%), 15 out of 15 (100%) and 6 out of 9 (67%) for the physical functioning, emotional functioning, social functioning and nursery functioning scales, respectively, an overall item scaling success rate of 58 out of 63 (92%).

Similar patterns of item response were observed for baseline (pre-injury) and follow-up (post-injury) PedsQL responses in the study C HRQL sample (data not shown but available on request). As expected, in this sample, ceiling effects were less marked and item mean scores were lower post injury, indicative of poorer HRQL at this time.

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Scale-level analyses

Scale distributions

Scale and summary scores could be computed for > 97% of participants for all but the nursery/school subscale, reflecting the patterns of item non-response reported in the previous section. Adjusting for those who did attend nursery, nursery/school scale scores were missing for 3.7% of children.

Floor effects were negligible but ceiling effects for the four scales ranged from 26.8% (emotional functioning) to 57.4% (social functioning). Ceiling effects were less marked for the psychosocial summary and total PedsQL scores (*Table 36*).

For two out of the four scale scores, the psychosocial summary score and the total PedsQL score, the reported mean pre-injury scores were statistically significantly higher (*Table 37*) than for a previously reported sample of healthy UK toddlers,[157] but none of these mean differences exceeded the previously established MIDs for the corresponding scales.[188] For the nursery/school functioning scale, the reported mean pre-injury scores were statistically significantly lower than the previously reported values for healthy UK toddlers, but the observed difference was less than the previously established MID.

For the physical, social and emotional functioning scale scores, the psychosocial summary score and the total PedsQL score, the reported mean pre-injury scores were also statistically significantly higher than the corresponding reported mean scores for the preceding 2 weeks for age- and sex-matched community

TABLE 36 Scale-level summary statistics at baseline: full study A sample ($n = 1344$)

Scale	Missing data (%)	Floor effects (%)	Ceiling effects (%)	Min.	Max.	Mean	SD	Cronbach's α
Physical functioning	2.7	0.0	50.3	9.38	100	92.87	12.78	0.852
Emotional functioning	2.7	0.0	26.8	5	100	82.53	15.83	0.794
Social functioning	2.6	0.1	57.4	0	100	92.24	13.13	0.780
Nursery/school functioning	35.2	0.0	50.3	25	100	89.33	14.65	0.537
Psychosocial summary score	2.7	0.0	18.4	12.5	100	87.77	11.81	0.839
Total PedsQL score	2.6	0.0	16.2	23.61	100	89.8	10.88	0.889

Max., maximum; Min., minimum.

TABLE 37 Comparison of PedsQL scale and summary scores of study A 'cases' pre injury with UK healthy population data[157]

	Study A cases			Buck[157]				
Scale	*n*	Mean	SD	*n*	Mean	SD	Mean difference	95% CI for difference
Physical functioning	1298	92.87	12.78	256	92.60	9.10	0.27	–1.37 to 1.91
Emotional functioning	1298	82.53	15.83	255	76.00	14.60	6.53	4.43 to 8.63
Social functioning	1299	92.24	13.13	256	89.90	12.10	2.34	0.60 to 4.08
Nursery/school functioning	865	89.33	14.65	189	92.30	11.60	–2.97	–5.20 to –0.74
Psychosocial summary score	1298	87.77	11.81	256	84.60	10.50	3.17	1.61 to 4.73
Total PedsQL score	1299	89.80	10.88	256	87.80	8.70	2.00	0.58 to 3.42

controls from study A (data not shown but available on request). A statistically significant difference for the nursery/school scale was also observed, with lower scores for injured children than for controls. Mean differences (controls – cases) were, for the most part, small (ranging from 1.18 for the nursery/school scale to –6.21 for the emotional functioning scale), with only one exceeding the MID of 4.5. Mean scores for community controls, with the exception of physical functioning, were not statistically significantly different from those reported by Buck[157] for a healthy toddler sample in the UK.

The reported pre-injury physical functioning and total PedsQL scores in cases in this study were also statistically significantly higher than the retrospectively reported pre-injury scores reported by Stevens *et al.*[166] in a US sample, but the differences were small in magnitude (2.87 for physical functioning and 1.80 for total PedsQL scores).

Internal consistency reliability

Internal consistency reliability was generally adequate, with Cronbach's alpha coefficients in excess of the criterion of 0.70 for group comparisons for all but the nursery/school functioning scale and Cronbach's alpha coefficients for total PedsQL scores almost reaching the higher criterion of 0.9 for individual-level data comparisons.

Construct validity

Interscale correlations of PedsQL scores ranged from 0.27 (emotional functioning with nursery functioning) to 0.62 (physical functioning with social functioning), with three out of six correlation coefficients exceeding the threshold for 'moderate' of 0.4. Correlations with the 10-cm VAS for parents' rating of their child's health in the 24 hours prior to the injury were low, ranging from 0.12 for social functioning to 0.25 for the psychosocial summary and total PedsQL scores.

Goodness-of-fit statistics from the confirmatory factor analysis for the first- and second-order models are shown in *Table 38*. Neither model suggests a good fit; *p*-values for the chi-square statistic are not ≥ 0.05, TLI and CFI statistics fall short of the criterion values of 0.90 and 0.95, respectively, whereas SRMR and RMSEA values exceed the threshold of 0.08. For the four-factor solution, items 7 and 8 have fairly low loadings onto the first factor (physical functioning). The highest correlations between factors are between physical functioning and social functioning ($r = 0.65$), physical functioning and nursery/school functioning ($r = 0.72$) and social functioning and nursery/school functioning ($r = 0.91$). These observations are consistent with patterns of observed inter-item correlations (data not shown but available on request), which show that items 7 (hurt or ache) and 8 (low energy) do not appear to be strongly correlated with the other physical functioning items and that item 19 [ability to do the same as peers (school/nursery)] does not correlate strongly with the other two nursery/school functioning items but does correlate moderately strongly with a number of social functioning items. Given the high correlation between physical functioning and the other three first-order factors, it is not surprising that the second-order factor structure (two-factor model) is not supported.

TABLE 38 Goodness-of-fit statistics for confirmatory factor analysis

Statistic	First-order model	Second-order model
Chi-square (df), *p*-value	2477 (183), < 0.0001	2508 (185), < 0.0001
TLI	0.775	0.774
CFI	0.804	0.801
SRMR	0.084	0.083
RMSEA	0.098	0.098
AIC	214,540.127	214,567.001
BIC	214,896.706	214,913.244

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In the known-groups validity analyses, as hypothesised in the full study A baseline sample, children with a long-term health condition had poorer pre-injury PedsQL scores than those without such a condition; observed differences for all but emotional functioning exceeded the corresponding established MIDs[188] (*Table 39*).

Among the study C HRQL sample, the majority of our known-groups validity hypotheses were borne out (*Tables 40* and *41*). There were no significant differences in pre-injury scores for any of the comparator groups (a)–(g), as defined previously. Post-injury physical functioning scores were statistically significantly lower (indicative of poorer HRQL) relative to their respective comparators in:

(a) children who were reported as not being fully recovered
(b) children who were treated for their injury
(c) children who had undergone radiography
(d) children who received medication following their injury.

TABLE 39 Known-groups validity with respect to baseline (pre-injury) PedsQL scores

	Child does not have long-term condition			Child has long-term condition				
Scale	*n*	Mean	SD	*n*	Mean	SD	Mean difference (95% CI)	*p*-value
Physical functioning	1107	93.98	11.10	175	86.34	18.72	7.64[a] (5.66 to 9.62)	< 0.001
Emotional functioning	1107	83.26	15.24	175	78.17	18.69	5.09 (2.58 to 7.61)	< 0.001
Social functioning	1108	93.71	10.76	174	83.84	20.38	9.87[a] (7.87 to 11.87)	< 0.001
Nursery/school functioning	717	91.20	12.71	138	79.53	19.21	11.67[a] (9.12 to 14.21)	< 0.001
Psychosocial summary score	1108	88.96	10.48	174	80.68	16.33	8.28[a] (6.44 to 10.10)	< 0.001
Total PedsQL score	1108	90.99	9.29	175	82.79	16.00	8.20[a] (6.53 to 9.87)	< 0.001

a Difference exceeds previously established MIDs[188] for parent proxy report (6.92 for physical functioning, 7.79 for emotional functioning, 8.98 for social functioning; 9.67 for nursery/school functioning, 5.49 for psychosocial summary, 4.50 for total PedsQL score).

TABLE 40 Known-groups validity with respect to follow-up (post-injury) PedsQL scores (independent sample *t*-tests)

	(a) Child fully recovered (*n* = 124, 88%) (*n* = 81 for nursery)		(a) Child not fully recovered (*n* = 17, 12%) (*n* = 11 for nursery)			
Scale	Mean	SD	Mean	SD	Difference (95% CI)	*p*-value
Physical functioning	89.46	15.92	66.54	24.92	22.92[a] (14.12 to 31.71)	< 0.001
Emotional functioning	86.41	15.30	78.53	12.34	7.88[a] (0.21 to 15.56)	0.044
Social functioning	95.11	9.53	92.50	14.02	2.61 (–2.70 to 7.92)	0.333
Nursery/school functioning	92.70	13.65	78.79	25.38	13.91[a] (4.07 to 23.74)	0.006
Psychosocial summary score	90.99	10.37	85.43	12.60	5.56[a] (–0.03 to 11.14)	0.051
Total PedsQL score	90.33	11.44	76.99	15.00	13.34[a] (1.71 to 13.94)	< 0.001

TABLE 40 Known-groups validity with respect to follow-up (post-injury) PedsQL scores (independent sample *t*-tests) (*continued*)

	(b) Examined only ($n = 74$, 52%) ($n = 48$ for nursery)		(b) Treated ($n = 67$, 48%) ($n = 44$ for nursery)			
Physical functioning	90.41	16.36	82.59	20.33	7.82[a] (1.71 to 13.94)	0.013
Emotional functioning	85.27	16.57	85.67	13.57	–0.40 (–5.48 to 4.67)	0.876
Social functioning	93.84	11.98	95.87	7.54	–2.04 (–5.42 to 1.34)	0.234
Nursery/school functioning	93.06	15.97	88.83	15.87	4.23 (–2.37 to 10.83)	0.206
Psychosocial summary score	90.25	12.402	90.47	8.69	–0.23 (–3.83 to 3.38)	0.901
Total PedsQL score	90.16	13.09	87.13	12.01	3.02 (–1.18 to 7.22)	0.157
	(c) Child underwent radiography ($n = 96$, 74%) ($n = 62$ for nursery)		**(c) Child did not undergo radiography ($n = 33$, 26%) ($n = 22$ for nursery)**			
Physical functioning	92.19	12.81	68.94	23.86	23.26[a] (16.87 to 29.64)	< 0.001
Emotional functioning	86.41	15.57	81.52	13.89	4.90 (–1.11 to 10.90)	0.110
Social functioning	96.36	8.21	86.70	13.92	9.66[a] (2.75 to 10.58)	0.001
Nursery/school functioning	93.48	13.01	82.95	21.59	10.53[a] (3.00 to 18.05)	0.007
Psychosocial summary score	91.74	10.07	85.45	11.86	6.29[a] (2.12 to 10.46)	0.003
Total PedsQL score	91.75	10.30	78.60	14.82	13.15[a] (7.55 to 18.74)	< 0.001
	(d) Child not admitted for observation or to ward ($n = 67$, 56%) ($n = 47$ for nursery)		**(d) Child admitted for observation or to ward ($n = 53$, 44%) ($n = 32$ for nursery)**			
Physical functioning	87.84	16.70	87.91	18.50	–0.07 (–6.31 to 6.17)	0.982
Emotional functioning	85.34	14.82	84.63	15.00	0.71 (–4.60 to 6.04)	0.789
Social functioning	95.47	9.24	94.72	9.17	0.75 (–2.55 to 4.05)	0.653
Nursery/school functioning	89.10	17.74	93.23	13.63	–4.13 (–11.42 to 3.16)	0.263
Psychosocial summary score	90.34	10.16	90.28	9.93	0.06 (–3.55 to 3.66)	0.974
Total PedsQL score	89.13	11.40	89.24	11.98	–0.11 (–4.28 to 4.04)	0.956
	(e) Child did not receive medication ($n = 53$, 38%) ($n = 33$ for nursery)		**(e) Child received medication ($n = 88$, 62%) ($n = 59$ for nursery)**			
Physical functioning	94.26	10.47	82.14	21.01	12.12[a] (6.00 to 18.25)	< 0.001
Emotional functioning	86.23	16.61	85.00	14.31	1.23 (–4.00 to 6.45)	0.643
Social functioning	96.73	7.06	93.67	11.43	3.05 (–0.42 to 6.52)	0.085
Nursery/school functioning	95.20	9.55	88.70	18.29	6.50 (–0.30 to 13.30)	0.061
Psychosocial summary score	92.27	9.42	89.25	11.37	2.98 (–0.72 to 6.68)	0.113
Total PedsQL score	92.73	8.78	86.30	13.97	6.42[a] (2.20 to 10.65)	0.003

a Difference exceeds previously established MIDs[188] for parent proxy report (6.92 for physical functioning, 7.79 for emotional functioning, 8.98 for social functioning; 9.67 for nursery/school functioning, 5.49 for psychosocial summary, 4.50 for total PedsQL score).

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TABLE 41 Known-groups validity with respect to follow-up (post-injury) PedsQL scores (one-way ANOVA)

	(f) 0 procedures (*n* = 41, 29%) (*n* = 24 for nursery)		(f) 1 procedure (*n* = 47, 33%) (*n* = 31 for nursery)		(f) 2+ procedures (*n* = 53, 38%) (*n* = 37 for nursery)			Bonferroni post hoc tests, mean difference (95% CI)		
Scale	Mean	SD	Mean	SD	Mean	SD	*p*-value	Difference 0 vs. 1	Difference 0 vs. 2+	Difference 1 vs. 2+
Physical functioning	94.82	10.79	85.95	18.75	81.07	21.37	0.001	8.86[a] (–0.44 to 18.17)	13.74[a,b] (4.69 to 22.81)	4.88 (–3.85 to 13.61)
Emotional functioning	84.02	18.38	89.36	13.05	83.11	13.70	0.092	–5.34 (–13.11 to 2.44)	0.91 (–6.66 to 8.48)	6.25 (–13.54 to 1.04)
Social functioning	96.00	9.14	94.23	11.66	94.44	9.44	0.679	1.77 (–3.53 to 7.07)	1.57 (–3.59 to 6.72)	–0.21 (–5.14 to 4.73)
Nursery/school functioning	95.14	10.40	90.32	16.40	88.96	18.33	0.325	4.82 (–14.48 to 2.13)	6.17 (–4.03 to 16.38)	1.36 (–8.12 to 10.84)
Psychosocial summary score	90.97	11.86	91.50	10.40	88.88	10.19	0.439	–0.53 (–6.14 to 5.08)	2.09 (–3.38 to 7.55)	2.62 (–2.61 to 7.84)
Total PedsQL score	92.15	10.99	89.18	13.32	85.66	12.69	0.044	2.97 (–3.48 to 9.41)	6.49[a,b] (0.22 to 12.76)	3.52 (–2.52 to 9.57)
	(g) Cut without stitches (1) (*n* = 19, 42%) (*n* = 12 for nursery)		(g) Cut with stitches (2) (*n* = 11, 24%) (*n* = 11 for nursery)		(g) Fracture (3) (*n* = 15, 33%) (*n* = 8 for nursery)		*p*-value	Difference (1) vs. (2)	Difference (1) vs. (3)	Difference (2) vs. (3)
Physical functioning	85.19	19.23	88.84	11.35	58.33	23.29	< 0.001	–3.64 (–21.81 to 14.52)	26.86[a,b] (10.30 to 43.43)	30.51[a,b] (11.47 to 49.54)
Emotional functioning	91.05	12.54	86.82	14.19	78.33	11.75	0.021	4.23 (–7.77 to 16.23)	12.72[a,b] (1.78 to 23.66)	8.48[a] (–4.09 to 21.06)
Social functioning	96.25	7.25	95.45	8.20	88.67	14.94	0.106	0.80 (–9.24 to 10.84)	7.58 (–1.57 to 16.74)	6.79 (–3.73 to 17.31)
Nursery/school functioning	97.22	7.40	87.88	17.23	70.83	26.73	0.010	9.34 (–9.25 to 27.94)	26.39[a,b] (6.06 to 46.72)	17.05[a] (–3.65 to 37.74)
Psychosocial summary score	94.00	8.74	90.38	8.29	82.56	12.01	0.006	3.61 (–5.70 to 12.93)	11.43[a,b] (2.94 to 19.93)	7.82[a] (–1.94 to 17.58)
Total PedsQL score	90.27	12.91	89.82	6.66	72.39	13.69	< 0.001	0.46 (–10.90 to 11.82)	17.88[a,b] (7.53 to 28.23)	17.42[a,b] (5.52 to 29.32)

a Difference exceeds previously established MIDs[188] for parent proxy report (6.92 for physical functioning, 7.79 for emotional functioning, 8.98 for social functioning; 9.67 for nursery/school functioning, 5.49 for psychosocial summary, 4.50 for total PedsQL score).
b Denotes mean difference significant at 5% level.

Analysis of variance showed a statistically significant positive relationship between the number of procedures carried out and physical functioning [comparison (f); see *Table 41*], but post hoc tests indicated that the only significant contrast was between children who had undergone two or more procedures and children who had undergone none. Similarly, ANOVA showed an overall significant effect for comparison (g), but post hoc tests showed that the only significant contrast was between those who sustained a broken bone and those who sustained a cut or graze not requiring stitches. For comparator groups (a), (b), (c) and (e), the observed differences in physical functioning scores exceeded the previously established MID of 6.92,[188] as did differences between those who had undergone two procedures and those who had undergone none for comparison (f), and between those who had sustained a fracture and those who had sustained any type of cut or graze for comparison (g).

Statistically significant differences in the direction expected were also observed for:

- emotional functioning between children who were reported as not being fully recovered and those who had recovered
- social functioning between those who had undergone radiography and those who had not
- nursery/school functioning between:
    - those who had not fully recovered and those who had recovered
    - those who had undergone radiography and those who had not
    - those who had sustained a fracture and those who had sustained a cut not requiring stitches
- the psychosocial summary score between those who had sustained a fracture and those who had sustained a cut not needing stitches, with the difference between those who had and those who had not fully recovered bordering on statistical significance
- total PedsQL score between:
    - those who had not fully recovered and those who had recovered
    - those who had undergone radiography and those who had not
    - those who received medication and those who did not
    - those who underwent two or more procedures and those who underwent no procedures
    - those who had sustained a fracture and those who had sustained a cut requiring stitches or a cut not requiring stitches.

All statistically significant differences reached the previously reported MID for the corresponding scale.[188]

Only for comparison (d) (those admitted for observation or to a ward vs. those not admitted) were there no statistically significant differences between the groups.

Responsiveness to change

As hypothesised, there were statistically significant reductions in physical functioning from pre-injury to post-injury for those who were not fully recovered, those who had been treated for their injury, those who had undergone radiography, those who had been admitted for observation or to a ward, those who had received medication and those who had undergone one or more procedures (*Tables 42* and *43*). These effect sizes ranged from 0.32 (for those who had one procedure carried out) to 1.54 (for those who had not fully recovered), with most being 'large' (≥ 0.8) by reference to Cohen's criteria.[176] The observed mean differences ranged from 4.76 for children who had one procedure carried out to 27.08 for those who were not fully recovered, with most exceeding the previously established MID of 6.92 for this scale.

Reductions in PedsQL scores from pre-injury to post-injury were also observed: for emotional, social and nursery functioning; for the psychosocial summary score; and for the total PedsQL score in those who had not fully recovered and those who had undergone radiography; and for total PedsQL score in those who were treated in the ED/MIU or on a ward, those who had received medication and those who had

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TABLE 42 Responsiveness to change: measures of injury severity

	(a) Child fully recovered ($n = 118$, 89%) ($n = 73$ for nursery)							(a) Child not fully recovered ($n = 15$, 11%) ($n = 11$ for nursery)						
	Pre-injury		Post-injury					Pre-injury		Post-injury				
Scale	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value
Physical functioning	92.87	12.29	89.58	15.51	3.29	0.27	0.039	91.04	17.55	63.96	25.41	27.08[b]	1.54	0.001
Emotional functioning	79.72	15.08	85.97	15.36	–6.25	–0.41	< 0.001	80.00	13.36	79.67	12.17	0.33	0.02	0.892
Social functioning	93.90	10.40	94.99	9.67	–1.09	–0.10	0.344	93.00	16.99	92.00	14.37	1.00	0.06	0.670
Nursery/school functioning	87.39	14.99	92.69	13.60	–5.30	–0.35	0.005	91.67	17.48	78.79	25.38	12.88[b]	0.74	0.171
Psychosocial summary score	86.97	9.81	90.80	10.43	–3.83	–0.39	< 0.001	87.94	12.96	85.13	12.98	2.81	0.22	0.362
Total PedsQL score	89.37	9.39	90.29	11.28	–0.92	–0.10	0.410	89.19	14.33	76.36	15.59	12.83[b]	0.90	0.005
	(b) Examined only ($n = 71$, 53%) ($n = 45$ for nursery)							(b) Treated ($n = 62$, 47%) ($n = 39$ for nursery)						
	Pre-injury		Post-injury					Pre-injury		Post-injury				
	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value
Physical functioning	92.65	13.97	90.41	16.63	2.24	0.16	0.303	92.68	11.72	82.45	20.02	10.23[b]	0.87	< 0.001
Emotional functioning	79.47	15.88	85.49	16.54	–6.02	–0.38	0.005	80.08	13.71	85.00	13.46	–4.92	–0.36	0.011
Social functioning	92.67	13.06	93.66	12.10	–0.99	–0.08	0.564	95.08	8.66	95.79	7.64	–0.71	–0.08	0.540
Nursery/school functioning	87.50	15.08	92.59	16.40	–5.09	–0.34	0.070	88.46	15.72	88.89	15.81	–0.43	–0.03	0.888
Psychosocial summary score	86.46	11.36	90.11	12.52	–3.65	–0.32	0.018	87.79	8.62	90.22	8.62	–2.43	–0.28	0.051
Total PedsQL score	88.96	11.33	90.26	13.16	–1.30	–0.11	0.426	89.79	8.30	86.95	11.72	2.84	0.34	0.071
	(c) Child did not undergo radiography ($n = 96$, 75%) ($n = 62$ for nursery)							(c) Child underwent radiography ($n = 32$, 25%) ($n = 21$ for nursery)						
	Pre-injury		Post-injury					Pre-injury		Post-injury				
	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value
Physical functioning	93.12	12.04	92.08	13.14	1.04	0.09	0.486	91.61	15.22	69.92	23.56	21.69[b]	1.43	< 0.001
Emotional functioning	77.89	14.79	86.04	15.58	–8.15[b]	–0.55	< 0.001	84.06	14.50	81.87	13.96	2.19	0.15	0.356
Social functioning	93.96	9.97	96.13	8.42	–2.17	–0.22	0.056	92.50	15.08	89.84	14.11	2.66	0.18	0.327
Nursery/school functioning	88.84	14.07	93.68	12.78	–4.84	–0.34	0.012	87.10	17.07	82.14	21.78	4.96	0.29	0.360

	(c) Child did not undergo radiography ($n = 96$, 75%) ($n = 62$ for nursery)							(c) Child underwent radiography ($n = 32$, 25%) ($n = 21$ for nursery)						
	Pre-injury		Post-injury					Pre-injury		Post-injury				
	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value
Psychosocial summary score	86.38	9.48	91.43	10.24	–5.05	–0.53	< 0.001	88.53	12.41	85.70	11.96	2.83	0.23	0.193
Total PedsQL score	89.11	9.26	91.66	10.40	–2.55	–0.28	0.023	89.75	12.37	79.19	14.66	10.56[b]	0.85	< 0.001
	(d) Child not admitted ($n = 67$, 56%) ($n = 47$ for nursery)							(d) Child admitted ($n = 52$, 44%) ($n = 30$ for nursery)						
	Pre-injury		Post-injury					Pre-injury		Post-injury				
	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value
Physical functioning	93.04	10.36	87.41	17.26	5.63	0.54	0.007	93.45	13.41	88.88	17.27	4.57	0.34	0.126
Emotional functioning	77.95	15.80	84.92	14.71	–6.97	–0.44	< 0.001	80.67	13.79	84.90	15.00	–4.23	–0.31	0.069
Social functioning	94.78	8.32	95.13	9.50	–0.35	–0.04	0.795	92.31	12.58	94.90	9.16	–2.59	–0.21	0.154
Nursery/school functioning	88.92	14.28	88.83	17.82	0.09	0.01	0.976	87.78	14.31	93.33	13.91	–5.55	–0.39	0.046
Psychosocial summary score	87.02	9.75	89.91	10.32	–2.89	–0.30	0.032	86.70	9.92	90.53	9.87	–3.83	–0.39	0.013
Total PedsQL score	89.43	8.65	88.89	11.58	0.54	0.06	0.703	89.45	10.07	89.81	11.35	–0.36	–0.04	0.843
	(e) No medication given ($n = 49$, 37%) ($n = 29$ for nursery)							(e) Medication given ($n = 84$, 63%) ($n = 55$ for nursery)						
	Pre-injury		Post-injury					Pre-injury		Post-injury				
	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value
Physical functioning	92.78	11.42	94.37	10.66	–1.59	–0.14	0.124	92.60	13.79	82.22	20.80	10.38[b]	0.75	< 0.001
Emotional functioning	78.21	15.94	85.92	16.51	–7.71	–0.48	0.002	80.65	14.21	84.88	14.35	–4.23	–0.30	0.016
Social functioning	95.20	8.90	96.53	7.23	–1.33	–0.15	0.304	92.98	12.40	93.56	11.60	–0.58	–0.05	0.698
Nursery/school functioning	89.37	13.16	94.54	10.03	–5.17	–0.39	0.050	87.20	16.37	88.94	18.36	–1.74	–0.11	0.537
Psychosocial summary score	87.23	9.31	91.75	9.50	–4.52	–0.49	0.001	87.00	10.68	89.24	11.50	–2.24	–0.21	0.110
Total PedsQL score	89.50	8.98	92.77	8.55	–3.27	–0.36	0.002	89.26	10.60	86.35	13.92	2.91	0.27	0.083

ES, effect size.

a All differences shown are pre-injury score minus post-injury score, with positive differences denoting a reduction in HRQL and negative differences representing an improvement in HRQL.

b Difference exceeds previously established MIDs[188] for parent proxy report (6.92 for physical functioning, 7.79 for emotional functioning, 8.98 for social functioning; 9.67 for nursery/school functioning, 5.49 for psychosocial summary, 4.50 for total PedsQL score).

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TABLE 43 Responsiveness to change: dose–response

	(f) 0 procedures ($n = 39$, 29%) ($n = 22$ for nursery)							(f) 1 procedure ($n = 42$, 32%) ($n = 28$ for nursery)							(f) 2 procedures ($n = 52$, 39%) ($n = 34$ for nursery)						
	Pre-injury		Post-injury					Pre-injury		Post-injury					Pre-injury		Post-injury				
Scale	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value	Mean	SD	Mean	SD	Difference[a]	ES	*p*-value
Physical functioning	94.63	7.55	95.03	10.82	–0.4	–0.05	0.841	90.9	14.78	86.14	18.04	4.76	0.32	0.015	92.61	14.43	80.89	21.53	11.72[b]	0.81	0.002
Emotional functioning	77.37	15.1	84.23	18.26	–6.86	–0.45	0.025	81.19	15.73	89.29	13.09	–8.10[b]	–0.51	0.002	80.38	14	82.79	13.36	–2.41	–0.17	0.221
Social functioning	95.26	7.94	95.9	9.24	–0.64	–0.08	0.69	92.26	14.19	93.9	12.13	–1.64	–0.12	0.44	93.94	10.73	94.33	9.5	–0.39	–0.04	0.825
Nursery/school functioning	87.88	13.79	94.7	10.77	–6.82	–0.49	0.03	87.5	16.59	90.77	15.93	–3.27	–0.2	0.586	88.36	15.55	88.48	18.92	–0.12	–0.01	0.975
Psychosocial summary score	86.91	8.2	90.73	11.93	–3.82	–0.47	0.037	86.85	12.39	91.49	10.62	–4.64	–0.37	0.008	87.41	9.67	88.66	10.17	–1.25	–0.13	0.45
Total PedsQL score	90.01	7.15	92.43	10.77	–2.42	–0.34	0.173	88.51	12.04	89.29	13.15	–0.78	–0.06	0.599	89.53	10.16	85.46	12.74	4.07	0.4	0.074

a All differences shown are pre-injury score minus post-injury score, with positive differences denoting a reduction in HRQL and negative differences representing an improvement in HRQL.
b Difference exceeds previously established MIDs[188] for parent proxy report (6.92 for physical functioning, 7.79 for emotional functioning, 8.98 for social functioning; 9.67 for nursery/school functioning, 5.49 for psychosocial summary, 4.50 for total PedsQL score).

undergone two or more procedures. For the most part, these observed effect sizes were small to moderate (according to Cohen's criteria of 0.2 for small and 0.5 for moderate) and few differences reached statistical significance or exceeded the corresponding previously established MIDs.[188]

Contrary to expectations, improvements from pre-injury to post-injury with, in some instances, substantial effect sizes were observed for the emotional, social and nursery functioning scales, the psychosocial summary score and the total PedsQL score for children who had:

- fully recovered
- only been examined in the ED/MIU
- not undergone radiography
- not received medication
- undergone no procedures.

The majority of these differences reached statistical significance.

Improvements from pre-injury to post-injury were also observed in respect of emotional, social and nursery functioning and the psychosocial summary score in those:

- treated in the ED/MIU
- admitted for observation or to a ward
- receiving medication
- who had undergone one or more procedures.

However, few of these differences reached statistical significance.

Using the full baseline study A sample, computed MIDs for the four domains of the PedsQL ranged from 4.92 for physical functioning to 9.97 for nursery functioning using the SEM method and from 6.39 for physical functioning to 7.92 for emotional functioning using the half of the baseline SD method. Computed MIDs using these two methods were 4.74 and 5.91, respectively, for the psychosocial summary score and 3.62 and 5.44, respectively, for the total PedsQL score.

Discussion

Main findings

In general, the PedsQL proved to be a feasible and acceptable measure of HRQL in this population, with adequate internal consistency reliability, the ability to discriminate between varying levels of injury severity and sequelae and evidence of responsiveness to change. Findings in respect of construct validity were, however, equivocal.

Strengths and limitations

A comprehensive classic psychometric analysis was conducted, mirroring previous analyses by the developers of the PedsQL and by others using the instrument in post-injury and ED populations, thereby facilitating comparisons with previous findings. The sample size using the baseline study A questionnaires was 1334, an adequate number for all of the analyses conducted.

However, the recall period of 2 weeks used in this study corresponded neither to the 4-week reference period of the standard PedsQL nor to the 1-week reference period of the acute version, which was used in the previously reported study of minor injuries by Stevens *et al.*[165,166] This therefore limits comparison of the findings with these studies.

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The sample size for the study C HRQL substudy was relatively small ($n = 148$), and so it was not possible to conduct confirmatory factor analysis on post-injury HRQL scores; this has implications for the precision of other test statistics.

Pre-injury HRQL scores were of necessity retrospectively reported. Of some note is the finding from this research that retrospectively reported pre-injury scale, summary and total scores in the full study A sample were (with the exception of nursery/school functioning) statistically significantly higher than those reported by Buck[157] in an earlier study of healthy UK toddlers and than those for community controls in the current study. A similar pattern of better HRQL pre-injury by comparison to US population norms[188] is evident in the ED study by Stevens *et al.*,[166] although that group do not explicitly analyse or comment on this. Previous studies of HRQL in injured adults[192,193] have also found pre-injury HRQL as recalled post-injury to be higher than population norms. Two potential explanations for this phenomenon have been put forward. The first is that those who sustain injuries are healthier, fitter, more active and more energetic than the general population of a similar age, with this better health status leading them into situations in which they are more likely to sustain an injury. The second explanation is that 'response shift'[191,194] may be present, in other words, that patients, or in this case parents acting as proxies, may be recalibrating the internal standards by which they evaluate HRQL in light of the experience of a traumatic event. Further research is needed to elucidate which of these explanations is the more plausible. Nonetheless, Watson *et al.*[192] and Wilson *et al.*[193] both conclude that retrospective recall of pre-injury HRQL provides a better baseline than do population norms for measuring post-injury impact.

Comparison with other studies

The overall rate of missing data of 7.6% was higher than the rates of 1.95% reported by Varni *et al.*[64] for proxy report for children aged 2–18 years and of 2.4% reported by Varni *et al.*[188] for children aged 2–16 years, but the average age of children in those samples was 9.3 years and 7.9 years, respectively. Higher rates of missing data are to be expected in samples of younger children as the nursery/school items do not apply to many toddlers. Varni *et al.*[188] reported an overall percentage of missing values on the nursery/school functioning scale for toddlers (aged 2–4 years) of 52%, a higher rate than that observed in the current study, with an inverse relationship between the age of the child and the level of missing data.

Findings in respect of item response distributions generally reflect those of Varni *et al.*,[64] with the full range of scores being used for all items in Varni *et al.*'s sample and for all but two items in the study A pre-injury sample. Item distributions tended to be skewed towards higher HRQL in our sample and in Varni *et al.*'s sample.[64] In their sample of 2- to 18-year-olds, Varni *et al.*[64] reported item means for proxy report ranging from 65.9 to 88.4, with means for 16 out of the 23 items falling within a 10-point range and item SDs ranging from 23.3 to 35.2; for the 15 items in the psychosocial summary score, proxy report item means ranged from 85.9 to 86.8, with SDs ranging from 24.1 to 34.2. They indicate that computing scale scores by simple linear averaging is possible when the means and SDs of items within a given scale or summary are roughly equivalent.[174] In the current study, for pre-injury data, a range similar to that reported by Varni *et al.*[64] was observed in respect of item means (75.33–96.26 for all items, 75.33–95.86 for the 13 items in the psychosocial summary score) and SDs (11.48–25.89 for all items and for those in the psychosocial summary score), suggesting that the calculation of scale scores according to the PedsQL algorithm was appropriate. Item–own scale correlations exceeded the criterion of ≥ 0.4 for 18 out of the 21 items in our sample, compared with all items for proxy report as reported by Varni *et al.*[64]

In scale-level analyses, Varni *et al.*[64,195] reported a lack of floor effects for both healthy and ill children, with no more than 2.3% of children scoring the minimum possible value for any of the scale or summary scores, a finding reflected here. For proxy report, they reported ceiling effects among healthy children ranging from 10.3% for the total PedsQL score to 58.1% for social functioning. Ceiling effects for pre-injury scores in our sample were comparable to those reported by Varni *et al.*[195] in respect of 2- to 4-year-olds for emotional functioning and psychosocial summary scores, but were more pronounced in our sample for physical, social and nursery/school functioning and total PedsQL scores. Ceiling effects for pre-injury scores in our sample were also more marked than those reported by Buck[157] in healthy UK toddlers for all but nursery/school

functioning. In a comparable study to ours of retrospectively reported pre-injury PedsQL scores, Stevens *et al.*[166] also report high levels of ceiling effects (56.2% for physical functioning, 21.9% for psychosocial summary score and 18.6% for total PedsQL score).

Our findings in respect of item internal consistency reliability and interscale correlations in the current study largely reflect previous reports by Varni *et al.*[64] and by Buck,[157] the latter in a population of healthy toddlers in the UK.

Findings from the confirmatory factor analysis in the current study did not support either the first- or the second-order solutions. Previous reports by the developers of the PedsQL suggest a stable factor structure across a range of disease and demographic subgroups and modes of administration;[177–183,196] between healthy children and those with a chronic health condition;[180] across race/ethnicity groups;[181] over a period of 1 year;[182] and across different modes of administration.[183] Amiri *et al.*[197] reported acceptable fit to a five-factor model in Iranian adolescents whereas Viira and Koka[198] reported that goodness-of-fit statistics approached criteria for acceptable fit when the error covariance was set to be free between certain items in the physical, social and emotional functioning scales. However, poor factorial validity has been reported in adaptations of the PedsQL for Catalan[199] and Serbian[200] populations, despite adequate internal consistency, reliability and convergent validity against psychological constructs in the latter study. Hao *et al.*[201] also report poor fit against some of the goodness-of-fit indices for a five-factor model in confirmatory factor analysis of the Chinese version of the PedsQL, whereas Petersen *et al.*[202] report problems with fit to a four-factor model for parent proxy report in the Swedish adaptation. None of the previous reported studies used the toddler version of the PedsQL (although under-fives were included in some of the studies by the PedsQL development team, the reported findings on factor structure relate only to children aged ≥ 5 years).

However, findings from known-groups validity analyses do provide evidence of construct validity, with the majority of our hypotheses being borne out. Varni *et al.*[64] included a comparison between healthy, acutely ill and chronically ill children as part of their consideration of construct validity, and found significant overall differences and between all pairs of subgroups, for all PedsQL scale and summary scores; in a subsequent study,[188] they again showed that healthy children had significantly higher scores on the PedsQL than those with a chronic condition. Upton *et al.*,[156] in the initial adaptation of the PedsQL for use in the UK, also reported significant differences in scores between healthy children and those with chronic health problems. These observations reflect our own findings in respect of pre-injury scores for children without and with a long-term health condition. Stevens *et al.*[166] found that the PedsQL, in particular the physical functioning scale, discriminated between injury types and good compared with poor clinical outcomes. Although our analyses are not directly comparable, as injury types and outcomes were recorded in different ways in the two studies, our results also show that PedsQL physical functioning scores were lower in children who were reported as not being fully recovered and those with more serious injuries. The main exception to our hypothesised associations was that there were no significant differences in PedsQL scores at follow-up between those admitted for observation or to a ward and those not admitted. We conjecture that this question may have been variably interpreted by parents, with some whose child stayed in the ED or MIU for a period of time for examination responding to the effect that their child had been 'admitted for observation' and others answering 'not admitted' in identical circumstances. Availability of a hospital bed rather than medical need may also have influenced admission patterns.

Reflecting the findings of Stevens *et al.*,[166] we also found the PedsQL to be responsive to change from pre-injury to post-injury, particularly in respect of physical functioning. Varni *et al.*[188] reported MIDs calculated according to the SEM method, defined as the product of the (baseline) SD and the square root of 1 minus Cronbach's alpha; they report a MID for proxy report of 4.50 for the total PedsQL score, with scale score MIDs ranging from 6.92 for physical functioning to 9.67 for nursery/school functioning. In the current study, the MIDs for emotional and nursery/school functioning were similar to those previously reported, but those for physical and social functioning, psychosocial summary and total PedsQL scores were smaller. Stevens *et al.*[166] reported SEMs ranging from 4.0 to 6.5 and the half-SD index ranging from 6 to 9.

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Resource use study (costs substudy)

Methods

The purpose of this multicentre longitudinal costs of injury study was to itemise, value and sum the costs of unintentional childhood injuries.[113] The study focused on the costs resulting from the injury borne by (1) the NHS and (2) the child and his or her family. The study did not attempt to quantify, in monetary terms, the impact on quality of life.

Administration of resource use questions

General data collection methods are described in *Methods relating to the health-related quality-of-life and costs substudies*. To obtain an estimate of NHS costs and child and family costs related to each child's injury, resource use and expenditure questions were developed and included in the study C questionnaires. Parents were also asked to give informed consent for access to their child's medical records to collect data to validate parent-reported resource use. Parents who did not provide consent were still eligible to participate in study C, but data were not extracted from their child's records. The resource use questions collected parent self-reported information on the following:

- NHS costs:
  - ED or MIU attendance – investigations and treatment received
  - inpatient stays – number of inpatient stays, length of stay, specialty, reason (e.g. operation type)
  - outpatient visits – health professional(s) visited, number of visits, average length of appointment
  - GP visits – number of visits, average length of appointment
  - nurse visits – number of visits, average length of appointment
  - other health professional visits (e.g. physiotherapist, health visitor)
  - prescribed medication
  - aids and appliances (e.g. crutches)
- child and family costs:
  - visits to health professionals – mode of transport and associated costs, average travel time, average waiting time, average length of appointment
  - hospital outpatient visits – mode of transport and associated costs, average waiting time, average length of appointment
  - time off from usual activities [work (parent), nursery/preschool/playgroup (child)]
  - carers – informal (family members, e.g. time off work), formal (paid help) – for injured child and/or other dependents.
  - over-the-counter medication.

To validate the NHS resource use and expenditure data collected from parent-completed questionnaires, responses were compared with routine data from secondary care records for a subsample of 10% of the study participants. The aim was to extract data from two randomly sampled cases from each study centre for each of the five relevant injury mechanisms who had given consent to access their medical records, plus data from all cases at all centres who had been admitted to hospital and gave consent to access their medical records. However, not all centres had two cases with each type of injury. Consequently, the final sample included 42 cases, 14 from Norwich, 13 from Bristol, nine from Nottingham and six from Newcastle. Of the 42 cases, 10 had incurred a fall on one level, nine a fall on the stairs, 10 a fall from furniture, 10 a poisoning and three a scald. Six cases were admitted to hospital for their injury. Data were extracted from the medical records by researchers on whether or not the child was admitted, length of stay, investigations carried out, treatment received and outpatient visits.

Details of resource use were sought for the time since injury in the 2-week questionnaire and the time intervals between questionnaires for subsequent questionnaires (e.g. 2 weeks for the 1-month questionnaire, 2 months for the 3-month questionnaire).

Analysis

To obtain the average cost per case, the resource use data collected longitudinally using the self-completion questionnaires at 1, 3 and 12 months or until the child had completely recovered, whichever was sooner, were combined with unit cost data obtained from various sources, including NHS reference costs[31] and the Personal Social Services Research Unit (PSSRU)[30] (see *Appendix 2*, *Table 146*), and summed together. All costs were inflated to 2012 UK pounds. Data from individuals were included in all cost categories for which they reported resource use information. As not all individuals reported information for all categories (i.e. incomplete responses), average costs for each category were derived using variable numbers of responders. Additionally, total average costs (with associated uncertainty) were obtained using data from only individuals who responded to all cost categories.

Average costs were estimated for each type of injury (i.e. stair falls, falls on one level and falls from furniture, poisonings and scalds). An analysis was undertaken to investigate the sensitivity of the average cost estimates to variations in the unit costs assigned, that is, the impact of varying the unit costs of ED treatments and investigations as well as inpatient stays (known to vary widely across hospitals) within the IQR reported in the NHS reference costs on the results was investigated.

To validate the accuracy of parents' responses to questions about their children's use of health service resources, responses from a sample of parents were compared with the information contained in the medical records of their children. Kappa statistics were calculated to provide a quantitative measure of the magnitude of agreement between parents' reporting and the medical records.

The main analysis was a complete-case analysis. Sensitivity analyses were undertaken for the primary cost outcomes – NHS costs, non-NHS costs and total costs – to check the robustness of the findings to missing data. Multiple imputation was undertaken assuming that data were missing at random. The imputation model included all cost component variables that sum together to produce the total overall cost. Because of non-normality of the cost component variables, predictive mean matching was used for the imputation. The imputation model also included the socioeconomic and injury characteristics listed later in *Table 59*. Fifty data sets were imputed, and were combined using Rubin's rules.[77]

Results

This section presents data on the costs to the NHS, such as costs relating to ED attendance, investigations and treatments, and costs relating to hospital admission. It also includes data on other health-care resource use, for example GP visits and attendance at outpatient departments, and data on non-health-care costs incurred by the family, for example costs of over-the-counter medication, travel and child care. Results describing the characteristics of study participants who were not fully recovered at 2 weeks and who were subsequently lost to follow-up are presented elsewhere.[203]

The NHS and other costs are sensitive to the proportions of injured children who are admitted to hospital and lengths of stay in hospital for different types of injuries. In this study, because the recruitment regime invited the parents of all children who were admitted to hospital to participate, the proportion admitted is substantially higher than for home accidents as a whole. Over one-third of injured children in this sample were admitted to hospital (see *Table 45*), although most of these were admitted for observation, not for an overnight stay. Only 4.3% of our sample were admitted overnight, which is comparable with the percentage of children in this age group attending an ED who are admitted overnight following an injury (5%).[3]

Table 44 shows the numbers of questionnaires administered by injury mechanism and administration date and the numbers actually returned (see also *Figure 8*). It includes only those participants with complete

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TABLE 44 Numbers of resource use questionnaires administered and returned

Follow-up point (post injury)	Falls on one level		Stair falls		Falls from Furniture		Poisonings		Scalds		Total		
	A	R	A	R	A	R	A	R	A	R	A	R	Cumulative % recovered
2 weeks	76	76	86	82	96	88	63	63	23	19	344	328	95.3
1 month	0	0	4	2	8	7	0	0	4	3	16	12	98.8
3 months	0	0	2	1	1	1	0	0	0	0	4	2	99.4
12 months	0	0	1	0	0	0	0	0	1	1	2	1	99.7

A, number of questionnaires returned; R, number of children recovered.

data over the 12-month follow-up period (i.e. all questionnaires returned until complete recovery). Of the 383 2-week questionnaires returned, 32 were mini-questionnaires (see *Appendix 2, Mini questionnaire*) that did not contain data on resource use and these are excluded from *Table 44*. In addition, seven cases were lost to follow-up (1 month, $n = 5$; 3 months, $n = 2$) and their recovery status was unknown; these have also been excluded from *Table 44*.

To validate the accuracy of parents' responses to questions about their children's use of health service resources, responses from 42 parents were compared with the information contained in the medical records of their children. The results, including the kappa values illustrating interobserver agreement, are shown in *Table 45*. Landis and Koch[79] provide a commonly used framework for interpreting kappa values:

- 0.81–1.00 – almost perfect agreement
- 0.61–0.80 – substantial agreement
- 0.41–0.60 – moderate agreement
- 0.21–0.40 – fair agreement
- 0.00–0.20 – slight agreement
- < 0.00 – poor agreement.

Care is needed in interpreting the results. Kappa values are strongly influenced by the prevalence of the outcome and there are extremes of prevalences in many of the variables, as noted in *Table 45*. For example, a urine test in the ED had a low prevalence of three out of 39 (8%), and all three had been misreported in the parent questionnaire, giving a kappa of 0.00, although the probability of observed agreement is 0.92. As noted, for example by Feinstein and Cicchetti,[204] kappa is difficult to interpret in these circumstances [i.e. a low kappa value despite high agreement (for the prevalent category)]. There is poor agreement for observation in the ED, and advice in the ED resulting in probabilities of observed agreement of 0.63 and 0.74, respectively, resulting in kappa values of 0.26 and 0.03, respectively. This may be because the 'medical' interpretation of these categories differed from the parents' interpretation.

The following procedures and visits have been omitted from *Table 45* because, in the validation sample, no parents reported and/or no children had a particular procedure/visit recorded in their medical records. The omitted variables are:

- scan in the ED
- splint in the ED
- manipulation of dislocated joint in the ED
- operation to fix fracture in the ED
- physiotherapy in the ED
- stomach wash in the ED

TABLE 45 Comparison of parent responses and information from medical records

Variable	*n*	V = yes, Q = yes	%	V = no, Q = no	%	V = yes, Q = no	%	V = no, Q = yes	%	P (observed agreement)	P (expected agreement)	Kappa coefficient	95% CI
Admitted to hospital	42	2	5	34	81	4	10	2	5	0.86	0.79	0.32	–0.09 to 0.74
Overnight stay in hospital	32	1	3	29	91	1	3	1	3	0.94	0.88	0.47	–0.16 to 1.00
Blood test in ED	40	5	13	32	80	2	5	1	3	0.93	0.73	0.72	0.43 to 1.00
Urine test in ED[a]	39	0	0	36	92	3	8	0	0	0.92	0.92	0.00	Undefined to 1.00
Radiography in ED	39	5	13	33	85	1	3	0	0	0.97	0.76	0.89	0.69 to 1.00
Observation in ED	35	11	31	11	31	7	20	6	17	0.63	0.50	0.26	–0.06 to 0.58
Advice in ED	39	28	72	1	3	7	18	3	8	0.74	0.73	0.03	–0.27 to 0.34
Medicine by mouth in ED	40	6	15	26	65	2	5	6	15	0.80	0.62	0.47	0.17 to 0.78
Medicine by injection in ED[a]	38	0	0	36	95	2	5	0	0	0.95	0.95	0.00	Undefined to 1.00
Cream on skin in ED	38	4	11	31	82	1	3	2	5	0.92	0.75	0.68	0.35 to 1.00
Medicine to take home from ED	38	1	3	32	84	3	8	2	5	0.87	0.83	0.21	–0.25 to 0.68
Dressing for wounds in ED	40	2	5	36	90	0	0	2	5	0.95	0.86	0.64	0.19 to 1.00
Stitches in ED	38	1	3	36	95	1	3	0	0	0.97	0.92	0.65	0.03 to 1.00
Bandage/sling/support in ED	38	1	3	35	92	0	0	2	5	0.95	0.90	0.48	–0.12 to 1.00
Manipulation of broken/fractured bone in ED	39	1	3	38	97	0	0	0	0	1.00	0.95	1.00	1.00 to 1.00
Cast to hold fracture/broken bone in ED[a]	39	0	0	38	97	0	0	1	3	0.97	0.97	0.00	Undefined to 1.00
General anaesthetic in ED	40	4	10	35	88	1	3	0	0	0.98	0.80	0.88	0.64 to 1.00
Local anaesthetic in ED[a]	39	0	0	36	92	2	5	1	3	0.92	0.93	–0.04	–0.11 to 0.04
Drip in ED[a]	38	0	0	37	97	1	3	0	0	0.97	0.97	0.00	Undefined to 1.00
Oxygen therapy in ED[a]	39	0	0	36	92	2	5	1	3	0.92	0.93	–0.04	–0.11 to 0.04
Intubation in ED[a]	39	0	0	38	97	1	3	0	0	0.97	0.97	0.00	Undefined to 1.00
Day-case visit(s)[a]	43	0	0	39	91	4	9	0	0	0.91	0.91	0.00	Undefined to 1.00
Consultant visit(s)[a]	42	0	0	38	90	4	10	0	0	0.90	0.90	0.00	Undefined to 1.00

V, results from examination of medical records; Q, responses from parent questionnaires; P, probability.
a Variables for which there was a low kappa value despite high agreement (for the prevalent category).

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- tetanus injection in the ED
- blood transfusion in the ED
- chest drain in the ED
- resuscitation in the ED
- hospital nurse visit(s)
- physiotherapist visits(s).

Note that because of the very small number of inpatient stays (i.e. four reported by parents and six reported in medical records, with agreement of only two) it was not possible to assess the agreement for length of stay in hospital.

Table 45 illustrates that > 95% of children were reported to have recovered from their injuries within 2 weeks of their accident and almost 99% within 1 month. However, there was variation in the proportions recovered within 2 weeks by injury mechanism, ranging from 100% for falls on one level and poisonings to 95.3% for stair falls, 91.7% for falls from furniture and 82.7% for scalds.

Parents of 435 children who reported seeking medical attention at an ED, a MIU or a walk-in centre were invited to participate, of whom 351 (81%) agreed and from whom NHS resource use information was collected via the return of the 2-week follow-up questionnaire (*Table 46*). Of these, 129 children (39% of those for whom admission status was known) were reported by parents to have been admitted for observation or treatment.

Based on parental questionnaires, and therefore with limited reliability, *Table 47* shows that two-thirds of cases required only the lowest levels of investigation and treatment, with a further 16% of cases requiring category 2 investigations (e.g. radiography) and either category 1 or category 2 treatment. Definitions of investigations and treatment categories are provided in *Table 47*.

As described earlier, 344 out of 351 (98%) parents who agreed to participate provided data on recovery from injury and were included in the analysis. Seven participants who completed the 2-week questionnaire and were known not to have fully recovered at 2 weeks were subsequently lost to follow-up. These participants were similar in terms of age, sex, injury mechanism, admission status and NHS costs to those not lost to follow-up (*Table 48*).

Complete data were available for 288 (84%), 314 (91%) and 268 (78%) participants for NHS costs, non-NHS costs and combined NHS and non-NHS costs, respectively. In total, 95% of children were

TABLE 46 Numbers of children by nature of initial contact and admission status, as reported by parents

Variable	*n* (%)
Type of NHS unit for initial contact	
ED	341 (97)
MIU	0 (0)
Walk-in centre	10 (3)
Admitted	
Admitted for observation	114 (32)
Admitted for overnight stay	15 (4)
Not admitted	202 (58)
Not known whether or not admitted	23 (7)

TABLE 47 NHS resource use reported by parents stratified by injury mechanism

Resource	Injury mechanism				
	Falls on one level, *n* (%)	Falls on stairs, *n* (%)	Falls from furniture, *n* (%)	Poisonings, *n* (%)	Scalds, *n* (%)
Number of responders	64	77	75	57	15
ED treatment and investigation[a]					
VB03Z emergency medicine, category 3 investigation with category 1–3 treatment	0 (0)	1 (1)	2 (3)	0 (0)	0 (0)
VB04Z emergency medicine, category 2 investigation with category 4 treatment	1 (2)	2 (3)	1 (1)	0 (0)	0 (0)
VB05Z emergency medicine, category 2 investigation with category 3 treatment	1 (2)	0 (0)	0 (0)	1 (2)	0 (0)
VB06Z emergency medicine, category 1 investigation with category 3–4 treatment	5 (8)	1 (1)	1 (1)	0 (0)	0 (0)
VB07Z emergency medicine, category 2 investigation with category 2 treatment	3 (5)	5 (6)	10 (13)	1 (2)	0 (0)
VB08Z emergency medicine, category 2 investigation with category 1 treatment	9 (14)	2 (3)	4 (5)	9 (16)	0 (0)
VB09Z emergency medicine, category 1 investigation with category 1–2 treatment	45 (70)	63 (82)	53 (71)	43 (75)	15 (100)
VB11Z emergency medicine, no investigation with no significant treatment	0 (0)	3 (4)	4 (5)	3 (5)	0 (0)
Hospital admission at initial ED visit					
≥ 2 days	1 (2)	2 (3)	3 (4)	3 (5)	1 (7)
≤ 1 day	17 (27)	26 (34)	19 (25)	34 (60)	6 (40)
GP surgery					
1 visit	5 (8)	5 (6)	3 (4)	2 (4)	2 (13)
≥ 2 visits	0 (0)	2 (3)	1 (1)	0 (0)	0 (0)
Outpatient department					
1 visit	3 (5)	2 (3)	7 (9)	0 (0)	2 (13)
≥ 2 visits	0 (0)	4 (5)	0 (0)	0 (0)	4 (27)
Health visitor					
1 visit	3 (5)	2 (3)	1 (1)	4 (7)	3 (20)
≥ 2 visits	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Subsequent inpatient days[b]					
1 day	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)
≥ 2 days	0 (0)	0 (0)	0 (0)	0 (0)	1 (7)

continued

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TABLE 47 NHS resource use reported by parents stratified by injury mechanism (*continued*)

Resource	Injury mechanism				
	Falls on one level, *n* (%)	Falls on stairs, *n* (%)	Falls from furniture, *n* (%)	Poisonings, *n* (%)	Scalds, *n* (%)
Prescribed medication					
Number prescribed medication	6 (9)	6 (8)	3 (4)	1 (2)	5 (33)

a Examples of Investigations: category 1 = urine test; category 2 = blood test, radiography; category 3 = scan. Examples of treatments: category 1 = observation, advice, cream to put on their skin, medicine to take home, bandage, sling or support; category 2 = medicine given by mouth, dressing for wound or burn, paper stitches or wound glue, splint, cast to hold broken or fractured bone in place, physiotherapy, stomach washout, local anaesthetic, tetanus injection, drip; category 3 = medicine given by injection, stitches, oxygen through mask or tube to help breathing; category 4 = manipulation of broken or fractured bone or dislocated joint, general anaesthetic, blood transfusion, chest drain, tube in throat for child who cannot breathe for themselves; category 5 = resuscitation.
b These inpatient stays are in addition to those resulting from the initial ED visit, which may also have incurred an inpatient stay.

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TABLE 48 Characteristics of participants not fully recovered at 2 weeks who were subsequently lost to follow up

Age (months)	Sex	Injury mechanism	IMD score	Admittance status	HRG code for ED treatment	NHS cost in the first 2 weeks post injury (£)
28	Male	Fall from furniture	27.2	Admitted for 0–1 days	VB09Z	700.01
32	Male	Fall on one level	42.5	Not admitted	VB07Z	142.92
38	Female	Fall on stairs	8.8	Missing	Missing	Missing
43	Female	Fall from furniture	10.8	Admitted for 0–1 days	VB09Z	741.11
10	Male	Scald	41.5	Admitted for 0–1 days	VB08Z	700.01
49	Female	Fall on one level	11.8	Not admitted	VB08Z	130.76
25	Female	Fall from furniture	35.5	Not admitted	VB09Z	91.47

HRG, Healthcare Resource Group.

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reported by parents to be fully recovered within 2 weeks of injury and 99% ($n = 340$) were reported to be fully recovered within 1 month of injury. *Table 49* reports the characteristics of the study participants. Falls injuries were reported most frequently (75%), with 18% of injuries being poisonings and 7% being scalds. The mean age of participants was 23 months and 49% were male. Participants were relatively disadvantaged, with 43% of households receiving state benefits, 37% living in non-owner-occupied accommodation and 15% of households not having any adults in paid work. Few children (8%) had a long-term health condition prior to the injury.

Health-care resource use and costs are presented in *Tables 50–54* by injury mechanism, and non-health-care resource use and costs are presented in *Tables 55–57* by injury mechanism. The total health-care and non-health-care costs per child are presented in *Table 58*. (The sources of the costs used are shown in *Appendix 2*, *Tables 145* and *146*.)

TABLE 49 Characteristics of study participants

Characteristic	Participants ($n = 344$), n (%)
Study centre	
Nottingham	103 (29.9)
Bristol	126 (36.6)
Norwich	96 (27.9)
Newcastle	19 (5.5)
Injury mechanism	
Fall on one level	76 (22.1)
Fall from furniture	96 (27.9)
Fall on stairs or steps	86 (25.0)
Poisoning	63 (18.3)
Scald	23 (6.7)
Age (months), mean (SD)	22.9 (13.0)
Male	169 (49.1)
Ethnic origin: white	312 (94.0) [12]
Number of children aged < 5 years in family	[12]
1	200 (60.2)
2	115 (34.6)
≥ 3	17 (5.1)
First child	143 (45.1) [27]
Maternal age ≤ 19 years at birth of first child	48 (14.8) [19]
Single adult household	46 (13.9) [14]
Weekly out-of-home child care (hours), median (IQR)	6 (0.0–20.0) [23]
Adults in paid work	[12]
≥ 2	168 (50.6)
1	114 (34.3)
0	50 (15.1)
Household receives state benefits	143 (43.2) [13]
Overcrowding (more than one person per room)	26 (8.1) [23]
Non-owner occupier	124 (37.3) [12]
Household has no car	45 (13.5) [10]
IMD score, mean (SD)	19.6 (14.4)
Distance from hospital (km), median (IQR)	3.7 (2.2–6.5)
Long-term health condition	25 (7.6) [13]
Child health VAS score (range 0–10), median (IQR)	9.9 (9.0–10.0) [11]

Notes
Values in square brackets represent missing values.
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TABLE 50 Emergency department and hospital admission costs by injury mechanism and nature of treatment

	Not admitted at initial ED visit					Admitted overnight at initial ED visit					Admitted for observation at initial ED visit				
	Falls					Falls					Falls				
	On one level	On stairs	From furniture	Poisonings	Scalds	On one level	On stairs	From furniture	Poisonings	Scalds	On one level	On stairs	From furniture	Poisonings	Scalds
Number of children in each emergency medicine treatment and investigation category (see definitions in* Table 47*)															
n	46	49	53	20	8	1	2	3	3	1	17	26	19	34	6
VB01Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VB02Z	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VB03Z	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0
VB04Z	0	1	0	0	0	1	1	1	0	0	0	0	0	0	0
VB05Z	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
VB06Z	4	0	0	0	0	0	0	0	0	0	1	1	1	0	0
VB07Z	1	2	8	0	0	0	0	0	0	0	2	3	2	1	0
VB08Z	6	1	2	1	0	0	0	0	0	0	3	1	2	8	0
VB09Z	35	42	39	16	8	0	0	0	2	1	10	21	14	25	6
VB11Z	0	3	4	3	0	0	0	0	0	0	0	0	0	0	0
Mean	98.97	94.48	96.66	87.03	82.98	210.42	227.58	233.30	137.06	114.01	132.35	122.03	124.62	124.43	114.01
SE	2.46	2.81	2.97	3.50	5.56	–	17.16	11.44	23.04	–	5.84	3.39	4.33	3.36	0.00
Median	91.47	91.47	91.47	91.47	91.47	210.42	227.58	244.74	114.01	114.01	114.01	114.01	114.01	114.01	114.01
Min.	57.52	57.52	57.52	57.52	57.52	210.42	210.42	210.42	114.01	114.01	114.01	114.01	114.01	91.47	114.01
Max.	142.92	190.71	142.92	130.76	91.47	210.42	244.74	244.74	183.14	114.01	183.14	162.06	162.06	162.06	114.01

	Not admitted at initial ED visit					Admitted overnight at initial ED visit					Admitted for observation at initial ED visit				
	Falls					Falls					Falls				
	On one level	On stairs	From furniture	Poisonings	Scalds	On one level	On stairs	From furniture	Poisonings	Scalds	On one level	On stairs	From furniture	Poisonings	Scalds
ED treatment and investigation costs (£): sensitivity analysis using lower interquartile limit for ED treatments and investigations															
Mean	84.55	80.47	83.32	73.67	69.39	180.67	182.78	183.48	119.87	101.09	114.67	107.04	108.77	108.29	101.09
SE	2.17	2.27	2.73	3.42	5.93	–	2.11	1.40	18.78	–	4.50	2.58	3.22	2.46	0.00
Median	78.45	78.45	78.45	78.45	78.45	180.67	182.78	183.48	119.87	101.09	114.67	107.04	108.77	108.29	101.09
Min.	42.21	42.21	42.21	42.21	42.21	180.67	180.67	180.67	101.09	101.09	101.09	101.09	101.09	78.45	101.09
Max.	123.29	147.28	123.29	112.61	78.45	180.67	184.88	184.88	157.43	114.19	157.43	138.73	138.73	138.73	101.09
ED treatment and investigation costs (£): sensitivity analysis using upper interquartile limit for ED treatments and investigations															
Mean	111.15	105.76	108.29	97.76	92.78	227.19	251.67	259.83	148.10	119.00	142.84	129.20	132.77	133.50	119.00
SW	2.76	2.94	3.17	3.92	6.49	–	24.48	16.32	29.10	–	7.54	4.30	5.61	4.22	0.00
Median	102.69	102.69	102.69	102.69	102.69	227.19	251.67	276.15	119.00	119.00	119.00	119.00	119.00	119.00	119.00
Min.	63.03	63.03	63.03	63.03	63.03	227.19	227.19	119.00	119.00	119.00	119.00	119.00	119.00	102.69	119.00
Max.	156.99	203.33	156.99	145.94	102.69	227.19	276.15	278.68	206.29	148.91	206.29	178.68	178.68	178.68	119.00

Max., maximum; Min., minimum.

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TABLE 51 Numbers of hospital admissions and costs by injury mechanism

Variable	Falls			Poisonings	Scalds
	On one level	On stairs	From furniture		
Admissions					
Number of cases	1	3	3	3	3
Admission for 1–2 days	0	3	3	3	2
Admission for > 2 days	1	0	0	0	1
Costs (£)					
Mean	2461	586	586	586	1211
SE	–	–	–	–	625
Median	2461	586	586	586	586
Min.	2461	586	586	586	586
Max.	2461	586	586	586	2461

Max., maximum; Min., minimum.

TABLE 52 Other health-care costs by injury mechanism

Variable	Cost per child by injury mechanism (£)				
	Falls			Poisonings	Scalds
	On one level	On stairs	From furniture		
Number of responders	64	77	75	57	15
Admission for 0–1 day					
Mean	586	586	586	586	586
SE	0	0	0	0	0
Median	586	586	586	586	586
Min.	586	586	586	586	586
Max.	586	586	586	586	586
Admission for ≥ 2 days					
Mean	2461	2461	2461	2461	2461
SE	–	–	–	–	–
Median	2461	2461	2461	2461	2461
Min.	2461	2461	2461	2461	2461
Max.	2461	2461	2461	2461	2461
GP visits					
Mean	2.75	2.06	0	0.2	2.33
SE	2.75	1.27	0	0.2	1.68
Median	0	0	0	0	0
Min.	0	0	0	0	0
Max.	176	88	0	11.63	23.25

TABLE 52 Other health-care costs by injury mechanism (*continued*)

Variable	Cost per child by injury mechanism (£)				
	Falls				
	On one level	On stairs	From furniture	Poisonings	Scalds
Outpatient visits					
Mean	6.52	16.82	16.68	0	70.93
SE	3.70	6.93	5.88	0	32.52
Median	0	0	0	0	0
Min.	0	0	0	0	0
Max.	139	278	278	0	417
Health visitor					
Mean	0.74	0.13	0.28	1.19	1.40
SE	0.47	0.09	0.28	0.63	1.40
Median	0	0	0	0	0
Min.	0	0	0	0	0
Max.	21	5.09	21	21	21
Subsequent inpatient days[a]					
Mean	0	0	7.81	0	78.13
SE	0	0	7.81	0	78.13
Median	0	0	0	0	0
Min.	0	0	0	0	0
Max.	0	0	586	0	1172
Prescribed medication					
Mean	0.16	0.1	0.05	0.03	2.39
SE	0.08	0.05	0.03	0.03	1.18
Median	0	0	0	0	0
Min.	0	0	0	0	0
Max.	3.64	2.23	2.23	1.75	13.12

Max., maximum; Min., minimum.

a These inpatient stays are in addition to those resulting from the initial ED visit, which may also have incurred an inpatient stay.

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The results in *Tables 50–57* show that the burden of injury, especially on families (i.e. non-health-care costs), can be considerable, even for injuries that were treated in the ED and did not require admission. *Table 57* shows that for non-admitted children, non-health-care costs can be as high as £600, although the median values across injury mechanisms were all < £10.

For children admitted for treatment (as opposed to observation), costs to families (i.e. non-health-care costs) are much higher, with scalds being the most 'expensive' injuries – the median cost is almost £400 and the maximum is £680 (see *Table 57*). It should be noted that these costs are based on responses from only three parents.

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TABLE 53 Total health-care costs according to whether admitted overnight at initial ED visit, admitted for observation at initial ED visit or not admitted to ED at initial visit by mechanism of injury

	Cost per child by injury mechanism (£)				
	Falls				
Variable: total health-care costs	On one level	On stairs	From furniture	Poisonings	Scalds
Admitted overnight					
Number of responders	1	2	3	3	1
Mean	2810.42	2688.96	2988.67	2598.05	2588.13
SE	–	16.80	227.60	23.04	–
Median	2810.42	2688.94	2861.61	2575.01	2588.13
Min.	2810.42	2672.14	2673.65	2575.01	2588.13
Max.	2810.42	2705.74	3430.74	2644.14	2588.13
Admitted for observation					
Number of responders	17	26	19	34	6
Mean	719.59	746.55	735.48	725.47	1010.92
SE	5.73	17.33	13.73	7.99	231.22
Median	700.01	700.73	700.01	677.47	781.14
Min.	700.01	700.01	700.01	677.47	702.24
Max.	769.14	1026.06	850.11	855.88	2150.01
Not admitted					
Number of responders	46	49	53	20	8
Mean	119.91	114.99	126.80	96.71	178.10
SE	9.93	10.37	11.12	7.81	52.00
Median	91.47	91.47	91.47	91.47	114.35
Min.	57.52	57.52	57.52	57.52	57.52
Max.	437.79	474.69	437.79	227.27	508.47

Max., maximum; Min., minimum.

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By far the largest components of the non-health-care costs were informal child care and time off work, ranging up to £670 for child care and £570 for time off work (see *Table 56*). However, the median costs of these components were zero in both cases, except for informal care for scalds (£22.84).

The total non-health-care costs were highest for scalds (mean £177), with a maximum of almost £700 (see *Table 56*). Falls from furniture were the most expensive falls (mean £71, maximum £605).

Falls can also be high-cost injuries (see *Table 53*) for the health sector, with total health-care costs per child ranging up to £2989 for falls from furniture. Note that in *Table 52* one child incurred an inpatient stay of 15 days costing £2461 following a fall from furniture; however, because of missing responses on the self-completion questionnaire, it was not possible to obtain a total health-care cost for this child (i.e. they do not contribute a cost to *Table 53*). Similarly, a child who incurred a high inpatient cost of £2720 following a scald (see *Table 51*) was subsequently excluded from the total health-care cost calculations (see *Table 53*).

TABLE 54 Sensitivity analysis of health-care costs: lower and upper interquartile limits for ED treatment and investigation costs and hospital inpatient and outpatient costs

	Cost per child by injury mechanism (£)				
	Falls				
Sensitivity analysis	On one level	On stairs	From furniture	Poisonings	Scalds
Sensitivity analysis using lower limit *Admitted overnight*					
Number of responders	1	2	3	3	1
Mean	2090.67	1954.14	2169.19	1890.87	1885.21
SE	–	1.74	159.58	18.78	–
Median	2090.67	1954.14	2072.78	1872.09	1885.21
Min.	2090.67	1952.39	1958.9	1872.09	1885.21
Max.	2090.67	1955.88	2480.88	1928.43	1885.21
Admitted for observation					
Number of responders	17	26	19	34	6
Mean	501.91	526.57	515.53	505.89	724.84
SE	4.44	16.40	11.40	6.04	166.02
Median	487.09	487.09	487.09	487.09	568.22
Min.	487.09	487.09	487.09	464.45	489.32
Max.	543.43	802.73	654.82	603.99	1537.09
Not admitted					
Number of responders	46	49	53	20	8
Mean	102.83	99.65	109.52	81.40	159.63
SE	8.73	9.65	10.06	6.18	51.37
Median	78.45	78.45	78.45	78.45	101.33
Min.	42.21	42.21	42.21	42.21	42.21
Max.	379.19	435.42	379.19	176.23	495.45
Sensitivity analysis using upper limit *Admitted overnight*					
Number of responders	1	2	3	3	1
Mean	3231.19	3117.03	3461.05	3013.1	2997.12
SE	–	24.12	261.82	29.10	–
Median	3231.19	3117.03	3320.58	2984	2997.12
Min.	3231.19	3092.91	3094.42	2984	2997.12
Max.	3231.29	3141.15	3968.15	3071.29	2997.12

continued

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TABLE 54 Sensitivity analysis of health-care costs: lower and upper interquartile limits for ED treatment and investigation costs and hospital inpatient and outpatient costs (*continued*)

	Cost per child by injury mechanism (£)				
	Falls				
Sensitivity analysis	On one level	On stairs	From furniture	Poisonings	Scalds
Admitted for observation					
Number of responders	17	26	19	34	6
Mean	832.07	857.53	848.12	838.62	1155.84
SE	7.39	18.12	15.49	9.32	264.52
Median	807.00	807.72	807.00	807.00	888.13
Min.	807.00	807.00	807.00	790.69	809.23
Max.	894.29	1144.68	1002.21	986.43	2461.00
Not admitted					
Number of responders	43	49	53	20	8
Mean	133.56	126.86	140.21	108.62	190.83
SE	10.70	10.64	11.77	9.02	52.85
Median	102.69	102.69	102.69	102.69	102.69
Min.	63.03	63.03	63.03	63.03	63.03
Max.	475.42	491.35	475.42	261.28	519.69

Max., maximum; Min., minimum.
Source: see *Table 146* in *Appendix 2*.

TABLE 55 Non-health-care resource use reported by parents

	Resource use by injury mechanism, *n* (%)				
	Falls				
Non-health-care resource use categories	On one level	On stairs	From furniture	Poisonings	Scalds
Number of responders	70	77	87	59	21
Taking over-the-counter medication	31 (44)	31 (40)	29 (33)	3 (5)	11 (52)
Purchased aids or equipment[a]	9 (13)	19 (25)	12 (14)	12 (20)	4 (19)
Incurred travel costs	6 (9)	7 (9)	7 (8)	5 (8)	3 (14)
Incurred time off work	7 (10)	15 (19)	13 (15)	9 (15)	6 (29)
Injured child					
In formal child care	0 (0)	1 (0)	1 (1)	0 (0)	0 (0)
In informal child care	12 (17)	17 (22)	13 (15)	7 (12)	6 (29)
Other children					
In formal child care	19 (27)	22 (29)	29 (33)	25 (42)	10 (47)
In informal child care	0 (0)	2 (3)	1 (1)	0 (0)	1 (5)

a Aids and equipment were typically for falls (safety gates, furniture corner protectors or bed guards) and for poisonings (cupboard locks).

TABLE 56 Non-health-care costs by injury mechanism

	Cost per child by injury mechanism (£)				
	Falls				
Non-health-care cost categories	On one level	On stairs	From furniture	Poisonings	Scalds
Number of responders	70	77	87	59	21
Over-the-counter medication					
Mean	2.29	2.2	2.32	0.17	5.49
SE	0.32	0.33	0.38	0.12	2.25
Median	0.00	0.00	0.00	0.00	3.99
Min.	0.00	0.00	0.00	0.00	0.00
Max.	8.88	9.78	17.76	4.89	47.01
Aids					
Mean	0.07	3.47	0.62	1.83	1.14
SE	0.07	1.48	0.33	1.31	0.96
Median	0.00	0.00	0.00	0.00	0.00
Min.	0.00	0.00	0.00	0.00	0.00
Max.	4.80	100.00	20.00	75.88	20.00
Formal child care					
Mean	0.00	5.47	4.10	0.00	0.77
SE	0.00	4.26	3.96	0.00	0.77
Median	0.00	0.00	0.00	0.00	0.00
Min.	0.00	0.00	0.00	0.00	0.00
Max.	0.00	320.08	344.39	0.00	16.21
Informal child care					
Mean	17.40	20.88	44.15	27.80	91.01
SE	5.95	5.63	11.71	9.01	36.42
Median	0.00	0.00	0.00	0.00	22.84
Min.	0.00	0.00	0.00	0.00	0.00
Max.	363.32	228.40	589.73	498.44	671.40
Time off work					
Mean	8.90	22.79	19.73	22.2	78.36
SE	3.40	6.96	5.63	7.67	33.21
Median	0.00	0.00	0.00	0.00	0.00
Min.	0.00	0.00	0.00	0.00	0.00
Max.	111.44	334.32	229.04	222.88	572.60
Travel					
Mean	0.52	0.70	0.61	0.92	0.95
SE	0.29	0.27	0.26	0.68	0.55
Median	0.00	0.00	0.00	0.00	0.00

continued

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TABLE 56 Non-health-care costs by injury mechanism (*continued*)

Non-health-care cost categories	Cost per child by injury mechanism (£)				
	Falls				
	On one level	On stairs	From furniture	Poisonings	Scalds
Min.	0.00	0.00	0.00	0.00	0.00
Max.	17.40	12.58	14.47	39.40	8.40
Total					
Mean	29.18	57.52	71.42	52.92	177.73
SE	6.69	10.62	13.48	11.78	50.03
Median	4.89	12.58	14.47	17.13	33.44
Min.	0.00	0.00	0.00	0.00	0.00
Max.	367.31	412.14	605.30	498.44	699.55

Max., maximum; Min., minimum.

TABLE 57 Total non-health-care costs according to whether admitted overnight at initial ED visit, admitted for observation at initial ED visit or not admitted to ED at initial visit by mechanism of injury

Non-health-care cost categories	Cost per child by injury mechanism (£)				
	Falls				
	On one level	On stairs	From furniture	Poisonings	Scalds
Admitted overnight					
Number of responders	2	3	4	3	3
Mean	213.17	177.68	99.16	284.77	399.17
SE	154.14	112.44	31.27	122.01	161.77
Median	213.17	68.52	108.69	279.98	397.32
Min.	59.03	61.99	14.47	75.88	119.91
Max.	367.31	402.54	164.8	498.44	680.29
Admitted for observation					
Number of responders	16	24	21	37	7
Mean	38.14	73.73	65.41	52.76	199.51
SE	12.74	17.15	20.71	11.63	74.45
Median	4.89	30.81	8.88	22.84	4.89
Min.	0.00	0.00	0.00	0.00	0.00
Max.	145.70	228.40	266.84	277.84	474.43
Not admitted					
Number of responders	46	46	57	17	9
Mean	17.58	37.45	68.26	17.91	48.21
SE	4.67	11.15	18.10	8.34	28.36
Median	4.89	6.89	8.88	0.00	4.89
Min.	0.00	0.00	0.00	0.00	0.00
Max.	116.33	412.14	605.30	123.05	239.38

TABLE 58 Total health-care and non-health-care costs according to whether admitted overnight at initial ED visit, admitted for observation at initial ED visit or not admitted to ED at initial visit by mechanism of injury

Total health-care and non-health-care cost categories	Cost per child by injury mechanism (£)				
	Falls				
	On one level	On stairs	From furniture	Poisonings	Scalds
Admitted overnight					
Number of responders	1	2	3	3	1
Mean	3177.73	2921.21	3065.95	2882.82	2708.04
SE	–	153.48	252.61	142.62	–
Median	3177.73	2921.21	2964.39	2854.99	2708.04
Min.	3177.73	2767.73	2688.12	2,650.89	2708.04
Max.	3177.73	3074.68	3545.33	3142.58	2708.04
Admitted for observation					
Number of responders	14	24	19	34	6
Mean	754.14	817.57	800.97	780.70	1191.90
SE	17.77	27.64	28.15	16.90	249.19
Median	732.23	731.58	725.90	731.42	971.52
Min.	704.00	700.01	700.01	700.01	734.68
Max.	914.84	1126.32	1097.58	1133.72	2314.81
Not admitted					
Number of responders	44	44	49	17	7
Mean	135.95	154.62	197.07	115.55	224.59
SE	12.08	17.87	26.49	12.20	70.34
Median	102.77	98.36	107.78	96.36	212.72
Min.	57.52	71.40	71.40	57.52	57.52
Max.	498.33	555.06	1043.08	227.27	513.36

Max., maximum; Min., minimum.

Repeated outpatient visits and the costs associated with readmissions contribute to high health-sector costs for scalds (see *Table 52*).

Among children not admitted after their initial visit to the ED, health-care costs are typically between £100 and £200 (see *Table 53*), with scalds being slightly more expensive than other injuries.

NHS and non-NHS costs were not found to be correlated with deprivation (*Figure 9*), although there was some evidence that participants on benefits on average had lower non-NHS costs than those not on benefits (*Figure 10*). NHS and non-NHS costs by injury mechanism were similar across study centres, except for Newcastle, which was difficult to compare because of the low number of participants recruited ($n = 19$) (*Figure 11*).

The multiple imputation model used the cost component-level data together with socioeconomic and injury data to estimate the total NHS and non-NHS costs for all participants. *Table 59* shows the number of households with complete and missing cost data as well as socioeconomic and injury characteristics. The imputed results (*Table 60*) are comparable to the complete-case analysis with the exception of the mean

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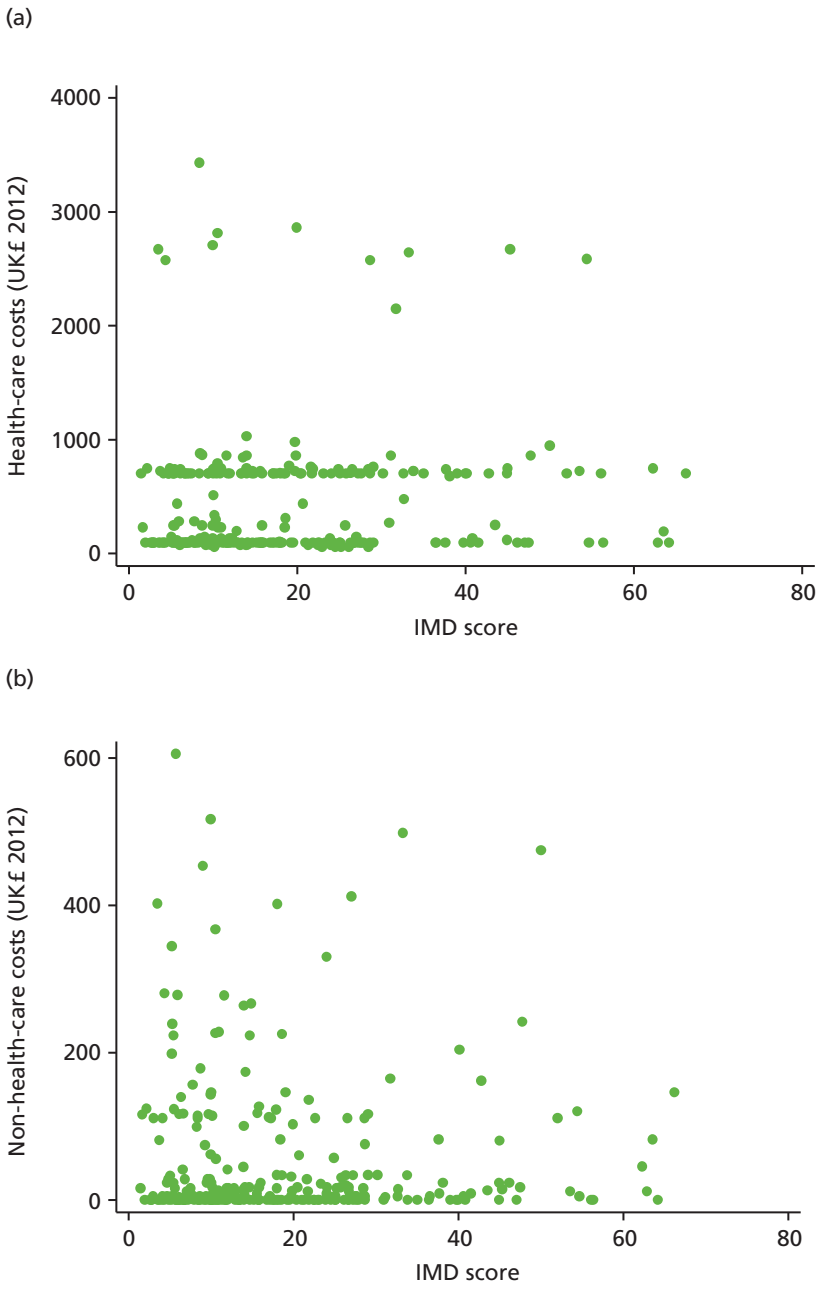


FIGURE 9 Scatterplots of costs against IMD score: (a) health-care costs; and (b) non-health-care costs. Reproduced with permission from Cooper NJ, Kendrick D, Timblin C, Hayes M, Majsak-Newman G, Meteyard K, Hawkins A, Kay B. The short-term cost of falls, poisonings and scalds occurring at home in children under 5 years old in England: multicentre longitudinal study. *Injury Prevention* 2016; [published online first 29 January 2016] http://dx.doi.org/10.1136/injuryprev-2015-041808.[203] Copyright © 2015 by the BMJ Publishing Group Ltd. All rights reserved.

cost of falls on one level (£2022, SE £1177) and falls from furniture (£2448, SE £651) for those children admitted overnight. This is likely because of the small number of children in all admitted overnight injury categories, resulting in substantial uncertainty in the mean cost estimates, portrayed by the large SEs.

Discussion

Main findings

This study sought to expand on current knowledge about the burden on the health service and families of unintentional injuries to children aged < 5 years in the home.

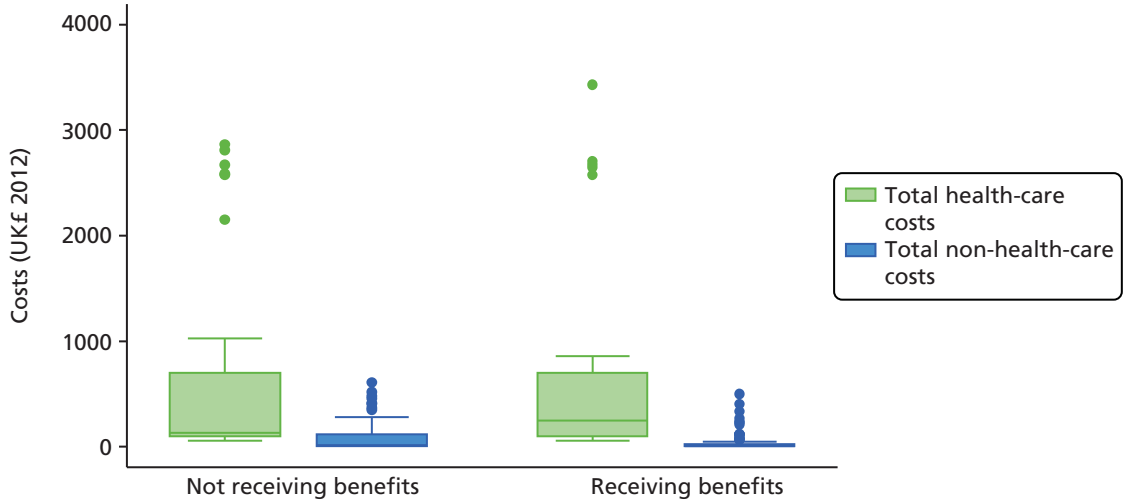


FIGURE 10 Box plots of health-care and non-health-care costs by benefit status. Reproduced with permission from Cooper NJ, Kendrick D, Timblin C, Hayes M, Majsak-Newman G, Meteyard K, Hawkins A, Kay B. The short-term cost of falls, poisonings and scalds occurring at home in children under 5 years old in England: multicentre longitudinal study. *Injury Prevention* 2016; [published online first 29 January 2016] http://dx.doi.org/10.1136/injuryprev-2015-041808.[203] Copyright © 2015 by the BMJ Publishing Group Ltd. All rights reserved.

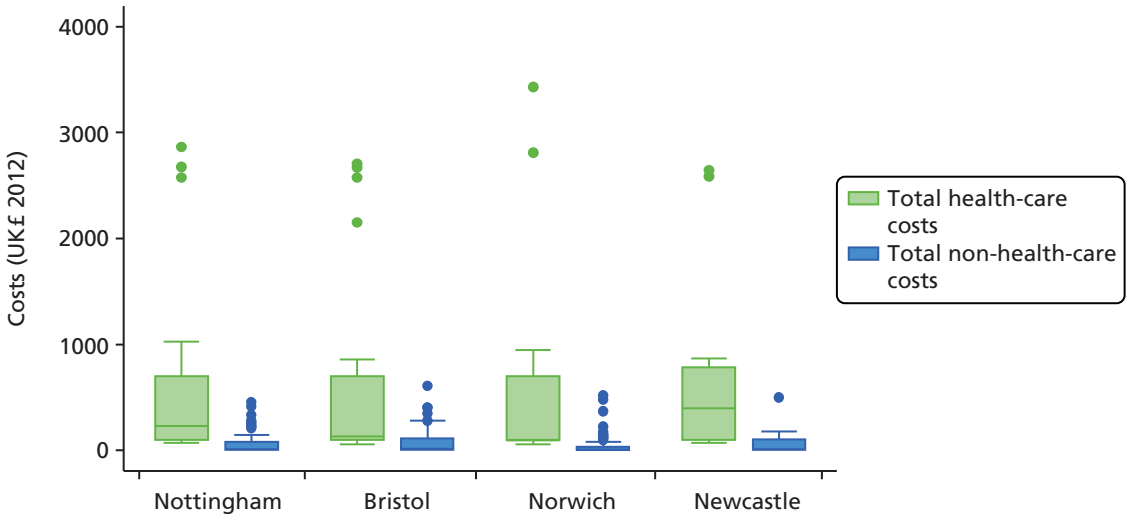


FIGURE 11 Box plots of health-care and non-health-care costs by study centre. Reproduced with permission from Cooper NJ, Kendrick D, Timblin C, Hayes M, Majsak-Newman G, Meteyard K, Hawkins A, Kay B. The short-term cost of falls, poisonings and scalds occurring at home in children under 5 years old in England: multicentre longitudinal study. *Injury Prevention* 2016; [published online first 29 January 2016] http://dx.doi.org/10.1136/injuryprev-2015-041808.[203] Copyright © 2015 by the BMJ Publishing Group Ltd. All rights reserved.

Of those who responded to the initial resource use questionnaire, > 95% of their children were reported to have recovered from their injuries within 2 weeks and almost 99% within 1 month. As expected, children admitted overnight incurred the highest health-care costs as well as the highest family (non-health-care) costs including child care, travel and time off work, although these accounted for < 5% of the children in the sample. Hence, the distribution of health-care and non-health-care costs was highly skewed, with the majority of participants incurring only small to moderate costs but a few children incurring more substantial costs.

Specifically, the study provides data showing that, even for the families of children treated in the ED and not admitted to hospital for observation or treatment, there are significant costs, notably for child care and time off work. The study also showed that these costs vary by injury mechanism.

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TABLE 59 Number of households with complete and missing data for each variable included in the imputation model

Variable	Number of households	
	Complete data	Missing
Cost component		
A&E treatments and investigations	312	32
Inpatient stay (admitted to A&E)	339	5
Other A&E costs	344	0
Outpatient stay	319	25
Inpatient stay	344	0
Health visitor visits	326	18
GP visits	331	13
Prescribed medication	341	3
Dental care	344	0
Over-the-counter medication	338	6
Aids	338	6
Professional care	344	0
Care provided by relatives	340	4
Time off usual activities	329	15
Time off work	339	5
Travel to A&E	344	0
Travel to hospital	319	25
Travel to general practice	331	13
Travel to other appointments	325	19
Socioeconomic and injury characteristics		
Age	344	0
Sex	344	0
IMD score	344	0
Injury mechanism	344	0
Distance from hospital	344	0
VAS score	333	11
Hours cared for out of home	321	23
Mean behaviour score	321	23
Total HADS score	331	13
Single parent household	330	14
Mother aged $\leq$ 19 years at first birth	325	19
Ethnicity	332	12
Study centre	344	0

A&E, accident and emergency.

TABLE 60 Results from the multiple imputation analysis

Total health-care and non-health-care cost categories	Cost per child by injury mechanism (£), mean (SE)				
	Falls				
	On one level	On stairs	From furniture	Poisonings	Scalds
Admitted overnight					
Number of responders	2	3	4	3	3
NHS costs	1808.79 (1021.58)	2681.52 (22.65)	2349.11 (667.69)	2598.06 (23.04)	2612.66 (47.96)
Non-NHS costs	213.17 (154.14)	177.68 (112.44)	99.16 (31.27)	284.77 (122.01)	400.54 (162.84)
Total costs	2021.96 (1173.10)	2859.21 (109.81)	2448.27 (651.39)	2882.82 (142.62)	3013.20 (181.21)
Admitted for observation					
Number of responders	19	26	21	37	8
NHS costs	737.49 (16.37)	746.55 (17.32)	755.43 (21.26)	724.94 (7.63)	945.74 (176.03)
Non-NHS costs	42.92 (14.88)	72.32 (16.07)	65.42 (20.71)	52.78 (11.63)	190.11 (71.74)
Total costs	780.41 (24.82)	818.87 (26.07)	820.85 (32.38)	777.71 (15.83)	1135.85 (190.93)
Not admitted					
Number of responders	50	52	66	21	10
NHS costs	131.29 (15.71)	124.65 (9.82)	124.65 (9.59)	97.49 (8.62)	164.32 (42.21)
Non-NHS costs	21.25 (5.67)	35.59 (10.08)	64.51 (15.97)	16.96 (8.03)	44.48 (25.70)
Total costs	152.55 (18.12)	150.25 (15.49)	189.02 (20.85)	114.44 (11.67)	208.80 (51.69)

Strengths and limitations

As we expected children admitted to hospital to have higher health-care costs than those not admitted, we oversampled admissions to increase the precision of cost estimates in this group. Although 40% of our sample was admitted, most children were admitted only for observation, with only 4.3% admitted overnight. This is very similar to the proportion of under-fives attending an ED following an injury at home who were admitted to hospital in 2002 when the last national data were collected from the Home Accident Surveillance System (HASS) in UK EDs.[3] The proportion of children admitted for < 1 day in 2002 according to the HASS was only 0.6%,[3] a figure much smaller than in our study. This difference may partly reflect the development of short-stay paediatric assessment units (SSPAUs), which provide assessment, investigation, observation and treatment for children with acute illnesses or injuries.[205] These are becoming increasingly common but are not yet provided by all hospitals.[206] The most common injuries admitted to SSPAUs are head injuries and ingestions.[207] The changing pattern of emergency paediatric service provision over recent years and the lack of national data on the proportion of ED attenders aged < 5 years who are admitted to inpatient wards or SSPAUs after an injury at home makes it difficult to assess the representativeness of our sample. However, it is likely that children admitted as inpatients or to SSPAUs are over-represented in our study. To our knowledge, there are no recent data available for the UK on the proportions of children admitted to hospital, admitted for observation or attending an ED but not admitted by injury type that we could use to weight our cost data to estimate total costs for each injury type. We have therefore analysed costs for admitted and non-admitted children separately. In addition, as we studied only five injury mechanisms, our findings are not generalisable beyond those injury mechanisms.

Our study population included children participating in the case–control studies in work stream 1 (see *Chapter 2*). They are likely to be children whose parents are more interested in child safety than the general population of parents of injured children. Furthermore, as this substudy focused on the costs of injuries, it is possible that parents who considered that they had incurred greater costs may have been

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more motivated to participate than those who considered that they incurred fewer costs. This may have resulted in an overestimation of the costs of injury in our study.

The numbers of participants in our study, especially when disaggregated by injury mechanism and admission status, could be very small. As a result of this, some cost estimates are imprecise.

Comparisons of treatments reported by parents with those recorded in medical records showed only fair or poor agreement for most questions asking parents about what treatments their children had received in the ED (assuming that medical record data are the 'gold standard'). This may possibly be because of the ways in which information is understood by parents or because of the nature of the questions asked in this study. Even apparently straightforward questions relating to whether the parent received advice in the ED had low kappa values, as did the question about whether the child was observed in the ED. With the advent of SSPAUs, it is understandable that parents may find it hard to distinguish between admission to an inpatient ward and admission to a SSPAU. Further refinement of questions to measure resource use in this area is needed. For the 42 individuals with complete data in the validation sample, the mean ED treatment and investigation costs were estimated to be £137 based on medical record data and £111 based on parents' responses to the self-completion questionnaire. This suggests that using parent-reported health-care costs may lead to a relatively small underestimation of actual costs to the NHS, assuming that medical record data are the 'gold standard'.

Comparison with other studies

It is difficult to compare the findings of this study with the results of other studies for a number of reasons: differences in study populations or health-care services or the tendency to look solely at health-care costs, specific types of (usually) more severe injuries or those with long-term consequences or other age ranges.[11,119,122,124,125,138,140] However, one study, that by Griffiths *et al.*,[139] noted that an uncomplicated hot drink scald can result in health-care costs of £1850, a figure not dissimilar to our finding for the maximum cost of an admission for observation for a scald. We have been unable to find any studies reporting the costs to families of home injuries in the under-fives with which to compare our findings. Our study, and the lack of other published studies, highlights the importance of measuring the cost of both major and minor childhood injuries, caused by a variety of mechanisms, to inform evidence-based policy making for injury prevention.

Chapter 4 What injury prevention interventions are being undertaken by children's centres to prevent thermal injuries, falls and poisonings? Children's centres' use of injury prevention interventions: two cross-sectional national surveys (work stream 3)

Abstract

Research question

What interventions are being undertaken by children's centres to prevent thermal injuries, falls and poisonings?

Methods

Two national postal surveys of children's centre managers selected from all children's centres in 30 PCTs across England were undertaken (study D). The surveys covered injury prevention activity, knowledge and attitudes towards injuries and their prevention, barriers to, and facilitators of, injury prevention and partnership working. The 2010 survey focused on fire-related injuries. The 2012 survey focused on falls, poisonings and scalds.

Results

The response rate was 56% (384/688) in the 2010 survey and 61% (517/843) in the 2012 survey. In both surveys, around 60% of children's centres identified unintentional injuries as one of their three main priorities, although fewer than half had a written injury prevention strategy. Managers held positive attitudes towards injury prevention, but reported gaps in their knowledge. Two-thirds of centres had access to local home safety equipment schemes in 2010, but only 42% had access in 2012. Common barriers to injury prevention were lack of staff capacity, lack of funding and working with 'hard-to-reach' groups. Common facilitators were good relationships with families, working with other agencies, low-cost/free safety equipment schemes and trained and knowledgeable staff.

Conclusions

Most children's centres do not have an evidence-based strategic approach to child injury prevention. To ensure effective injury prevention, children's centres need support to plan, deliver and evaluate their activities.

Chapter summary

This work stream consisted of two national cross-sectional surveys of children's centres. They were used to inform the development of an injury prevention intervention (an IPB) for delivery by children's centres, which was evaluated using a RCT (study M in work stream 6) (see *Chapter 7*). So that information on the prevention of fire-related injuries was obtained in time to inform the design of the intervention, two surveys were undertaken. The first was conducted early in the KCS programme and covered fire-related injury. The second was conducted later in the KCS programme to inform the design of the second IPB for preventing thermal injuries, falls, poisonings and scalds. The relationship between the component studies in the KCS programme is shown in *Figure 1*.

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Introduction

In 2007 the Audit Commission/Health Care Commission report *Better Safe Than Sorry*[19] highlighted that unintentional injuries are a major public health threat for preschool children in England, but that many of those charged with developing and implementing local strategies to prevent unintentional injury found it difficult to do so, and that there was little evidence of a systematic approach to develop, implement and monitor programmes to prevent unintentional injuries in children.

To improve the health of children in England, centres providing children and families with a range of co-ordinated services from a variety of professionals were set up under the Sure Start scheme between 2004 and 2010.[208,209] These centres have the potential to improve home safety for children through the evidence-based Healthy Child Programme and the provision of advice on accident and injury prevention that forms part of their statutory guidance.[210] However, despite recent evaluations of the Sure Start programme, we currently know little about the extent to which children's centres are fulfilling this role.[211–216] Study D describes and quantifies the injury prevention activities being undertaken by children's centres across England.

Methods

The objective of the surveys undertaken in this study was to explore the activities being undertaken by children's centres to prevent thermal injuries, falls and poisonings in children aged < 5 years. Two cross-sectional national surveys of children's centres in England were undertaken. A survey of fire-related injury prevention took place in 2010,[217] whereas the focus of the 2012 survey was the prevention of falls, poisonings and scalds. The 2010 study population consisted of managers of children's centres in 30 PCTs [three in each of 10 strategic health authority (SHA) areas] across England. Two of the 30 PCTs had merged by 2012, so the 2012 study population consisted of managers of all children's centres in 29 PCTs. When managers managed more than one centre, they were asked to complete a questionnaire for each centre.

The questionnaires included questions about the management and organisation of children's centres, child health priority areas and injury prevention activities. We used questions from previous surveys when possible.[218–220] We assessed face validity by asking members of the Faculty of Medicine and Health Sciences at the University of Nottingham who were not injury prevention researchers to review the questionnaires. We checked content validity by asking injury prevention experts and the lay research adviser within the study group to review the questionnaire.[221] We used a variety of methods to enhance the reliability of questions, including adhering to the 'principles of questionnaire design',[222] expert advice and piloting.[222,223] We piloted the questionnaires using managers from four children's centres from PCTs across the country who were not part of the final sample. Minor changes were made to the questionnaires following piloting. Copies of the questionnaires are provided in *Appendix 3*.

Methods that have previously been shown in systematic reviews to increase response rates were used. These included using reminders, providing further questionnaires, keeping the questionnaires as short as possible, providing Freepost reply envelopes, providing an assurance of confidentiality, using the NHS logo on the envelope and questionnaire to try and influence saliency and using university logos on study documentation.[69,70] Questionnaires were sent out in March 2010 (fire-related injury prevention) and January 2012 (fall, poisoning and scald prevention). Three reminders were used to improve the response rate.[69,70] For the first survey, a random one in 10 sample of questionnaires was double entered and discrepancies identified and corrected. The data entry error rate was 0.19%. For the second survey, all data were double entered by an external data entry company and discrepancies identified and corrected. Data were analysed using Stata/SE 11.0 (StataCorp LP, College Station, TX, USA).

Sample size estimations, based on the prevalance of responses to questions on injury activity in primary care groups (PCGs),[219] indicated that for an unclustered design, 196 responses would allow the prevalance of the following to be estimated with a maximum 95% CI of ±7%: unintentional injuries ranked as least important of a range of health topics (66%), taking action to prevent injuries (34%), having a written injury prevention strategy (29%) or believing that the organisation can be effective in preventing injuries (58%).

In 2010 there were 2918 children's centres in England and 147 PCTs, giving an average of 20 children's centres per PCT. Assuming a 65% response rate from children's centres, based on health professionals' response rates in previous similar surveys[218–220] gave an average cluster size of 13 responses per PCT. The design effect to account for cluster sampling assuming an intraclass correlation coefficient (ICC) of 0.05 and an average cluster size of 13 is 1.6. Therefore, 314 responses were required from a total of 25 PCTs ($n = 314/13$). To ensure a national spread of children's centres, PCTs were stratified by SHA ($n = 10$) and three PCTs were sampled at random within each SHA to give 30 PCTs in total. Questionnaires were sent to all children's centres in those 30 PCTs. By the time of the 2012 survey, more children's centres had been established and two PCTs had merged, so questionnaires were sent to all children's centres in the 29 PCTs.

The majority of attitudinal questions required responses on a five-point Likert scale. For the purposes of analysis we combined the 'strongly agree' and 'agree' responses into an 'agree' category and the 'disagree' and 'strongly disagree' responses into a 'disagree' category. Responses to open questions were categorised by generating a coding list and assigning responses to categories. This was undertaken by two researchers working independently and any disagreements were handled by consensus-forming discussions. Categorical variables are described using frequencies and percentages. No adjustment for clustering has been made as these are purely descriptive statistics. Approval for the study was granted by North Nottinghamshire Research Ethics Committee (reference number 09/H0407/44).

Results

In the 2010 survey, 694 questionnaires were posted, five were returned undelivered and one recipient was no longer a children's centre. The response rate was 56% (384/688). In the 2012 survey, 851 questionnaires were posted, eight were returned undelivered and, of the 526 returned, nine were blank, giving a response rate of 61% (517/843). The denominators vary for responses to individual questions presented in the following sections as not all respondents answered all questions.

Characteristics of children's centres

Table 61 shows the characteristics of the children's centres that participated in the 2010 and 2012 surveys. The percentage of respondents from phase 3 children's centres increased between the 2010 and 2012 surveys, with a concomitant reduction in the percentages of respondents from phase 1 and phase 2 centres. Most centres were led (i.e. managed) by local authorities or education departments at both time points, with very few having a NHS lead. Responses were fairly evenly distributed across SHA areas in both the 2010 survey and the 2012 survey. In both surveys, a larger proportion of responses came from the South East Coast SHA (20% in 2010 and 19% in 2012).

Children's centre priority areas and injury prevention strategies

Table 62 shows the priority afforded to injury prevention by children's centres in 2010 and 2012. A similar percentage of respondents considered injury prevention to be among their three main child health priorities in 2010 (58%) and 2012 (60%). In 2010, 16% (59/374, 10 missing) placed injury prevention first whereas in 2012, 16% (80/485, 32 missing) placed injury prevention first. Fewer than half the respondents in 2010 (47%) and 2012 (42%) stated that their children's centre had an injury prevention strategy, and most did not know if their PCT/local authority had an injury prevention strategy at each time point (61% for PCTs/local authorities in 2010, 65% for local authorities in 2012 and 74% for PCTs in 2012), as shown in *Table 63*.

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TABLE 61 Characteristics of children's centres participating in the 2010 and 2012 surveys

Characteristic	2010 survey, *n* (%)	2012 survey, *n* (%)
Phase	[6]	[31]
1 (2004–6)	148 (39)	144 (30)
2 (2006–8)	203 (54)	197 (41)
3 (2008–10)	24 (6)	141 (29)
Lead agency	[28]	[54]
Local authority/education	268 (75)	334 (72)
Charity	24 (7)	59 (13)
NHS	10 (3)	10 (2)
SHA		
East Midlands	28 (7)	58 (11)
East of England	41 (11)	69 (13)
London	29 (8)	43 (8)
North East	32 (8)	37 (7)
North West	35 (9)	36 (7)
South Central	35 (9)	43 (8)
South East Coast	75 (20)	98 (19)
South West	39 (10)	54 (10)
West Midlands	25 (7)	34 (7)
Yorkshire and the Humber	45 (12)	45 (9)

Note
Numbers in square brackets represent missing values.

TABLE 62 Priority areas

Priority areas	2010, *n* (%)	2012, *n* (%)
Unintentional injury prevention	221 (58)	308 (60)
Healthy diet/healthy lifestyle	309 (81)	410 (79)
Breastfeeding	93 (24)	189 (37)
Mental health/emotional well-being	57 (15)	91 (18)
Child protection	42 (11)	93 (18)
Dental health	41 (11)	36 (7)
Ante-/postnatal support	39 (10)	40 (8)
Smoking cessation support	31 (8)	25 (5)
Speech/language/literacy/communication support	–	61 (12)
Immunisation	–	30 (6)

TABLE 63 Injury prevention strategies

	Your children's centre, *n* (%)		Your PCT/local authority, *n* (%)	Your PCT, *n* (%)	Local authority, *n* (%)
Response	2010 [32]	2012 [49]	2010 [30]	2012 [62]	2012 [42]
Yes	164 (47)	198 (42)	129 (36)	100 (22)	156 (33)
No	153 (43)	222 (47)	11 (3)	18 (4)	11 (2)
Don't know	35 (10)	48 (10)	214 (60)	337 (74)	308 (65)

Note
Numbers in square brackets represent missing values.

Knowledge and attitudes

In the 2010 survey, the potential for improving knowledge was demonstrated as few (11%, 38/348) knew that the most common cause of death was choking and suffocation or that falls are the most common non-fatal injury (33%, 115/350). Respondents' attitudes towards injury prevention from the 2010 survey are shown in *Figure 12*. Attitudes towards injury prevention were positive, with the majority believing that most child accidents were preventable (94%, 358/379) and that children's centres could effectively prevent accidents (99%, 377/381) and most disagreeing that other agencies had greater responsibilities for preventing child accidents than children's centres (64%, 244/379).

Respondent attitudes towards injury prevention from the 2012 survey are also shown in *Figure 12* and are very similar to the findings from 2010. In the 2012 survey, knowledge of the main cause of child injury deaths in the under-fives in the home remained poor, with only 12% (51/435) knowing that most child injury deaths resulted from choking and suffocation and 47% (211/445) knowing that falls were the most common non-fatal injuries.

In the 2010 survey, respondents were more likely to think that providing home safety equipment (89%, 330/372), providing one-to-one (88%, 329/372) or group home safety advice (86%, 316/368) or media campaigns on home safety (69%, 256/371) would be more effective than providing leaflets without additional advice (40%, 150/376). The questions on the effectiveness of prevention activities were not asked in the 2012 survey.

Injury prevention activities

Injury prevention activities in 2010 and 2012 are shown in *Figure 13*. In the 2010 survey, 97% (364/376) of centres were involved in some form of injury prevention including displaying posters on child safety (97%, 371/382), participating in Child Safety Week (93%, 348/376), inviting outside speakers to talk to parents (78%, 293/378), collecting data on child accidents (56%, 205/365), lobbying or campaigning on child safety issues (34%, 122/364), working with local media (17%, 63/372) or issuing first aid kits (15%, 55/375). The involvement in injury prevention in 2012 was very similar to that in 2010.

Centres provided advice on a range of fire-related injury prevention topics (*Figure 14*). Advice was most commonly provided on general fire safety, smoking cessation and bonfire and firework safety and least commonly on barbecue safety, candle safety, handling hot irons and making fire escape plans. Providing leaflets was the approach most commonly used to address most of these topics.

Centres provided advice on a range of falls, poisonings and scalds prevention topics (*Figures 15–17*). For falls prevention, advice was most commonly provided on stair safety, not leaving children on high surfaces, what to do if a child has a head injury and general falls prevention and was least commonly provided on non-slip bath mats, baby walker safety and high chair and pushchair safety. For poisoning prevention, advice was

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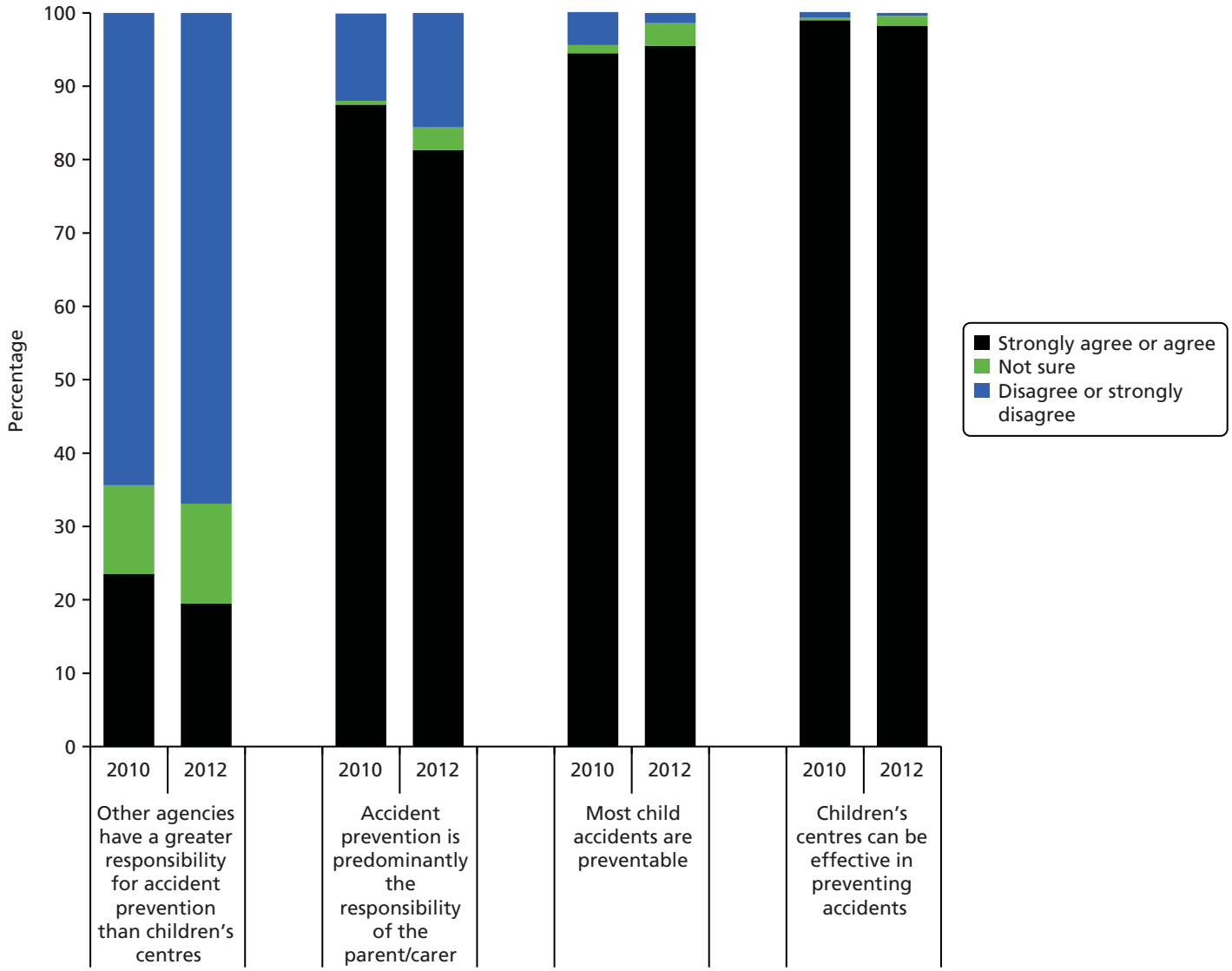


FIGURE 12 Attitudes towards injury prevention among respondents. From Watson *et al.*[217] under the Creative Commons Attribution Non-Commercial 3.0 Unported License (see https://creativecommons.org/licenses/by-nc/3.0/).

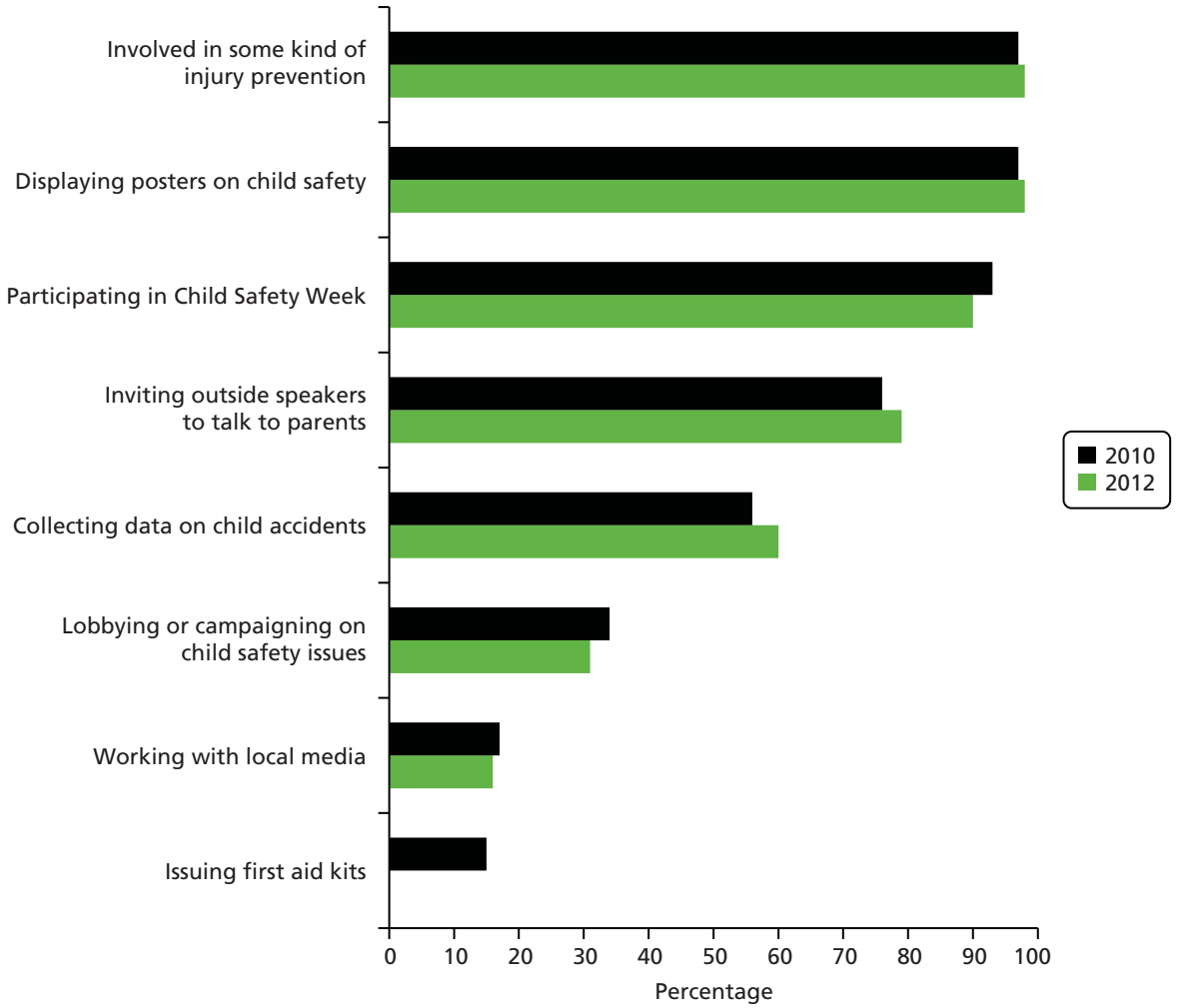


FIGURE 13 Injury prevention activities undertaken by children's centres.

most commonly provided on safe storage of hazardous substances such as medicines and household chemicals and general poisoning prevention and least commonly provided on poisonous plants and disposal of unwanted medicines. For scalds prevention, advice was most commonly provided on handling hot drinks, general scald prevention and cooking safety and least commonly provided on thermostatic mixer valves (TMVs). It appears that advice in groups and one-to-one advice was being used more commonly for falls, poisonings and scalds prevention in 2012 than for fire-related injury prevention in 2010.

In the 2010 survey, two-thirds (64%, 245/384) of centres were aware of a home safety equipment scheme in their locality, whereas one in five (21%, 79/384) did not know if their area had a scheme. One-quarter of those with schemes (26%, 60/233) had schemes provided through the Royal Society for the Prevention of Accidents (RoSPA) national Safe At Home scheme and just over half the schemes (58%, 135/234) were based within children's centres. Many schemes were fairly new, with 50% (122/245) being established within the preceding 18 months. Schemes provided, and in most cases fitted (78%, 186/238), a varying range of items of safety equipment, most commonly free (68%, 165/241) or at low cost (18%, 43/241). Equipment provided included stair gates, fireguards, cupboard locks, window catches and furniture corner covers. Stair gates were the most commonly provided (91%, 220/242) and furniture corner covers the least commonly provided (42%, 102/242).

In the 2012 survey, fewer centres (42%, 217/517) reported a home safety equipment scheme in their area and one-fifth (22%, 112/517) did not know if there was such a scheme. Of those that had a scheme, 7% (17/248) were part of the Safe At Home national scheme organised by RoSPA. Similar to the 2010

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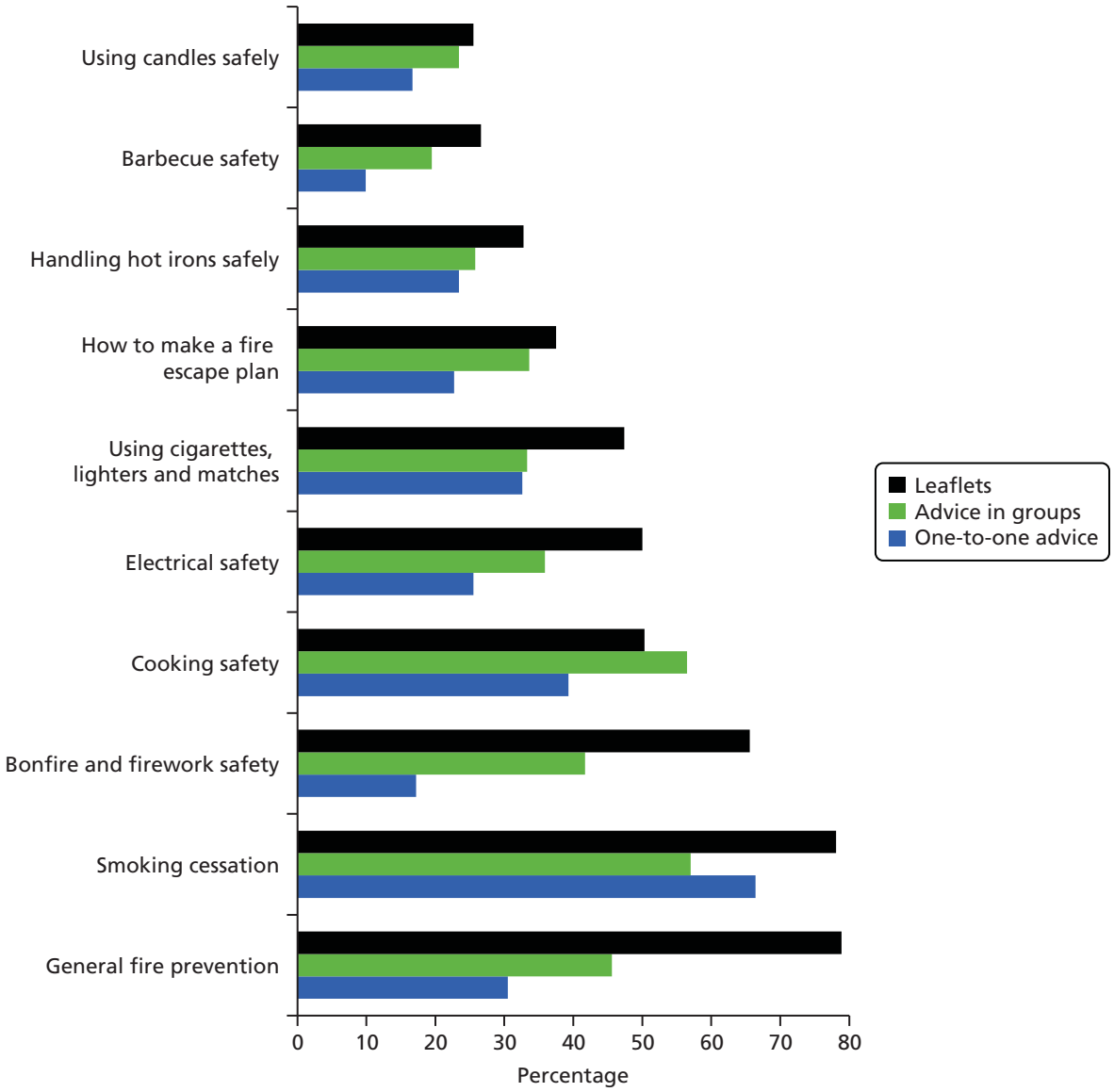


FIGURE 14 Advice provided by children's centres on fire prevention (2010 survey). From Watson *et al.*[217] under the Creative Commons Attribution Non-Commercial 3.0 Unported License (see https://creativecommons.org/licenses/by-nc/3.0/).

findings, almost half (47%, 101/217) the schemes had been in operation for < 18 months and 9% (19/217) had been in operation for > 4.5 years. Over half the schemes (53%, 111/211) operated from children's centres. Schemes provided corner covers (68%, 104/154), devices to measure bathwater temperature (51%, 76/149), first aid kits (29%, 42/143), fridge locks (52%, 78/149), lockable medicine cupboards (10%, 15/143), safety catches for cupboards and drawers (74%, 111/150), safety gates (63%, 95/150), TMVs (4%, 5/140) and window locks (47%, 69/148). Most provided free (60%, 128/214) or low-cost equipment (34%, 73/214) and a smaller number loaned the equipment (5%, 10/214). Most (69%, 140/202) delivered equipment to homes and fitted it (55% 114/206).

Joint working

In the 2010 survey, few respondents (15%, 56/375) were aware of a local child accident prevention group. There was evidence of joint injury prevention work being undertaken with a range of organisations, most commonly community nursing services (86%, 331/384), fire and rescue services (69%, 266/384) and road safety organisations (61%, 233/384). There was also evidence of referral to other services such as NHS

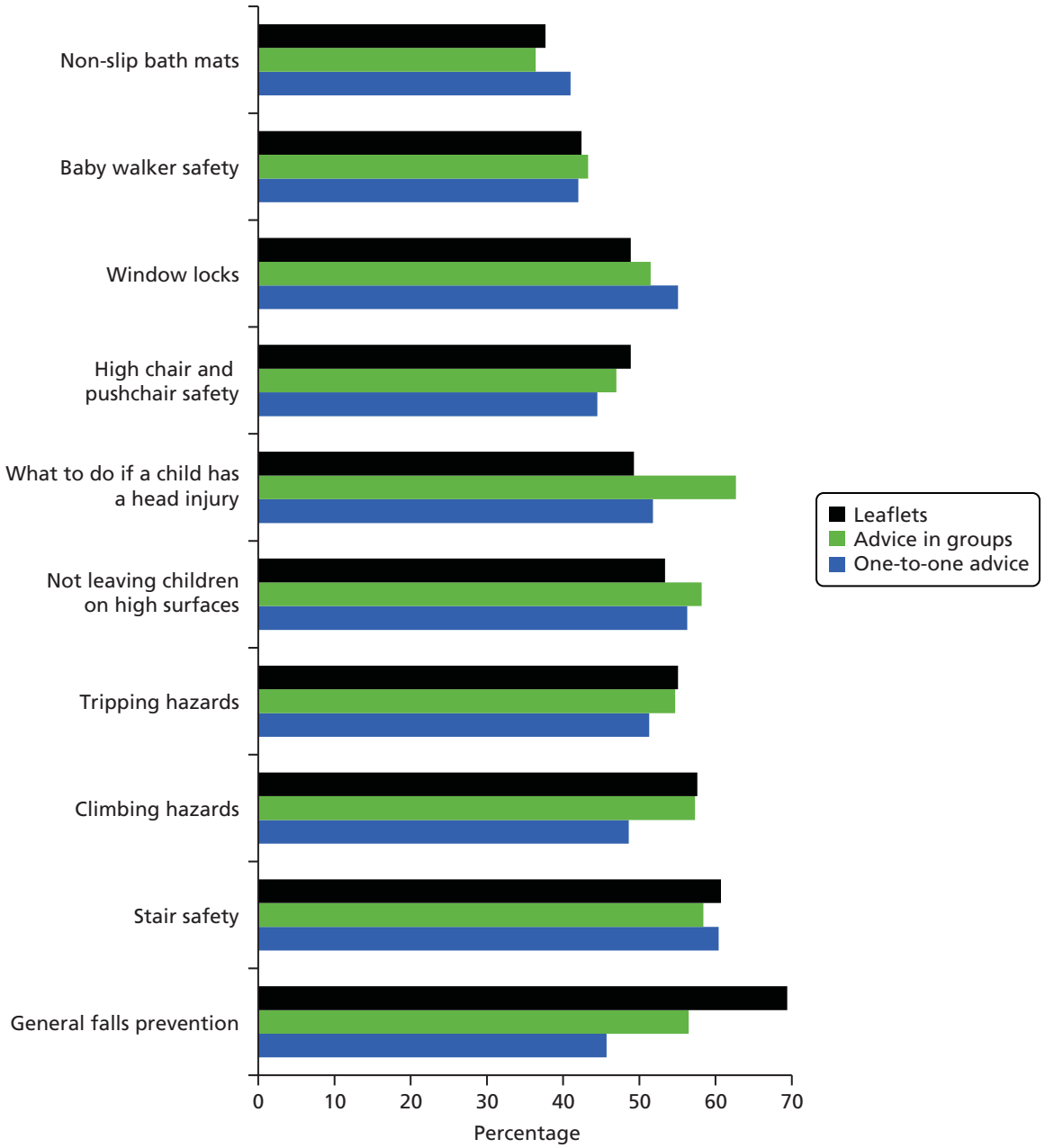


FIGURE 15 Advice provided by children's centres on falls prevention (2012 survey). From Watson MC, Mulvaney C, Timblin C, Stewart J, Coupland CA, Deave T, Hayes M, Kendrick D. Missed opportunities to keep children safe? National Survey of injury prevention activities of children's centres. *Health Education Journal* 2016;**75**:833–42.[224] http://dx.doi.org/10.1177/0017896916629816. Published with kind permission from SAGE Publishing.

smoking cessation services (95%, 360/377) and fire and rescue services for smoke alarms (86%, 321/375) and fire safety risk assessments (85%, 309/362).

In the 2012 survey, 14% (68/503) of respondents knew of a child accident prevention group in their area and 59% (296/503) stated that they did not know whether or not there was such a group. In 2012, centres were not asked if they worked with other organisations on injury prevention. Some centres referred families to safety equipment schemes (47%, 221/466), to pharmacists for the safe disposal of unwanted medicines (49%, 230/472) and to organisations for home safety checks (53%, 251/473), most of which referred to fire and rescue services (62%, 122/198). Very few referred families to an organisation for TMVs (3%, 13/461).

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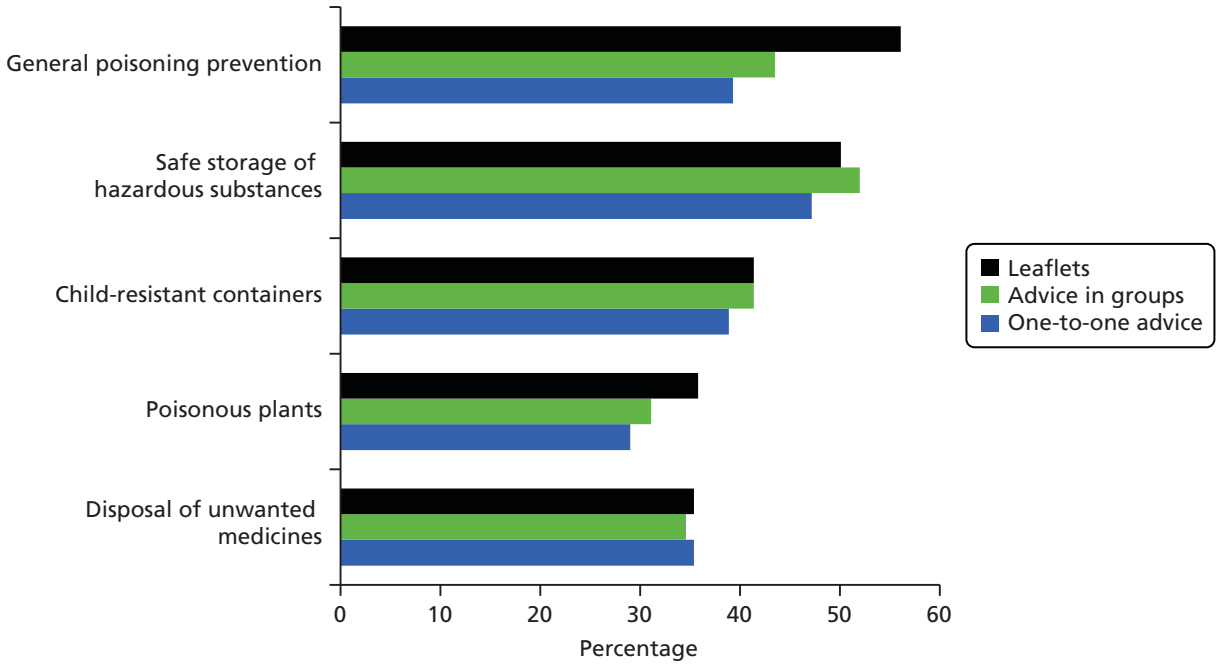


FIGURE 16 Advice provided by children's centres on poisoning prevention (2012 survey). From Watson MC, Mulvaney C, Timblin C, Stewart J, Coupland CA, Deave T, Hayes M, Kendrick D. Missed opportunities to keep children safe? National Survey of injury prevention activities of children's centres. *Health Education Journal* 2016;**75**:833–42.[224] http://dx.doi.org/10.1177/0017896916629816. Published with kind permission from SAGE Publishing.

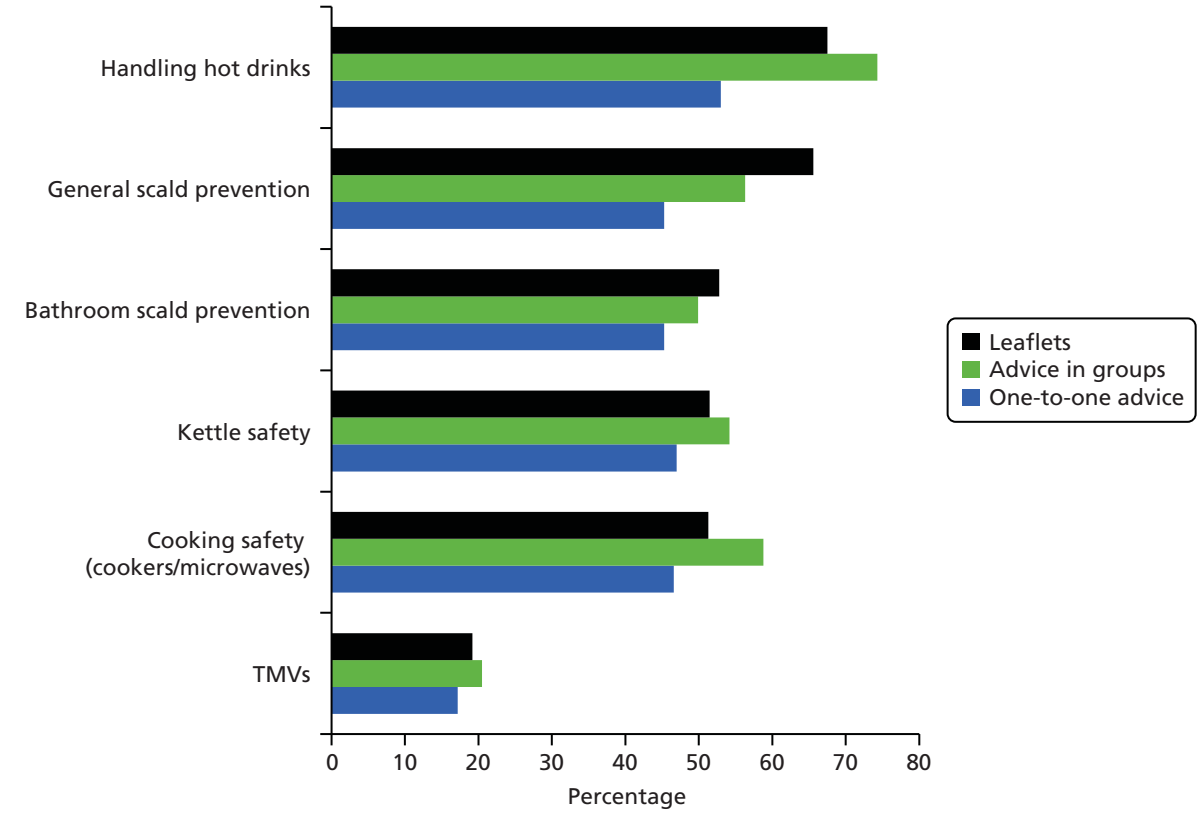


FIGURE 17 Advice provided by children's centres on scald prevention (2012 survey). From Watson MC, Mulvaney C, Timblin C, Stewart J, Coupland CA, Deave T, Hayes M, Kendrick D. Missed opportunities to keep children safe? National Survey of injury prevention activities of children's centres. *Health Education Journal* 2016;**75**:833–42.[224] http://dx.doi.org/10.1177/0017896916629816. Published with kind permission from SAGE Publishing.

Barriers to, and enabling factors for, injury prevention work

The main barriers to, and enabling factors for, injury prevention activities in the 2010 and 2012 surveys are shown in *Figures 18* and *19*, respectively. Lack of capacity in terms of staff time (39%, 131/339 in 2010; 39%, 162/417 in 2012) and lack of funding (33%, 111/339 in 2010; 52%, 216/417 in 2012) were the most frequently mentioned barriers. The most frequently mentioned enabling factors were access to families (45%, 113/249 in 2010; 39%, 121/312 in 2012) and working with other agencies (44%, 110/249 in 2010; 35%, 109/312 in 2012).

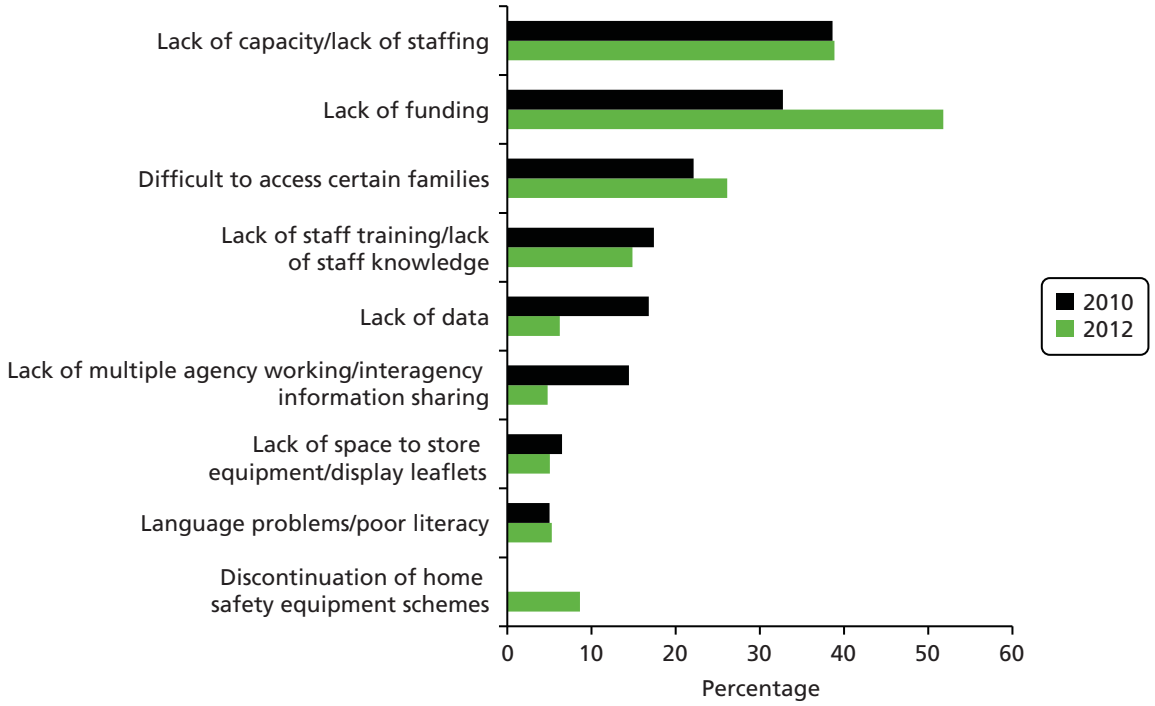


FIGURE 18 Barriers to injury prevention work.[217,224]

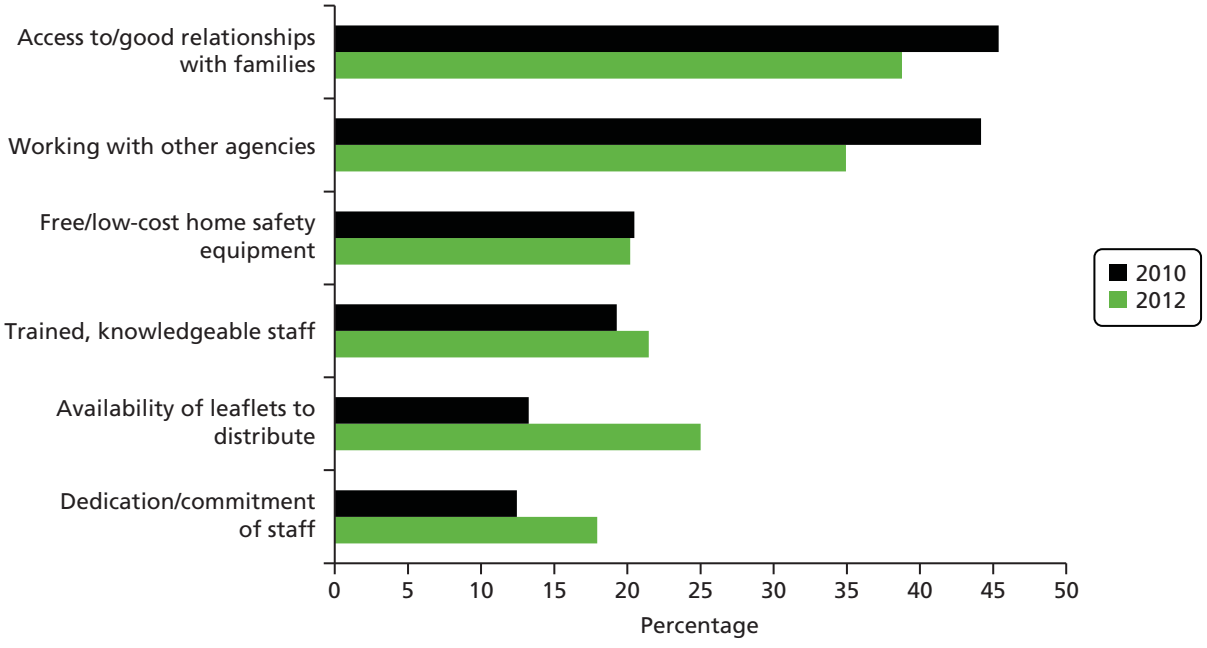


FIGURE 19 Facilitators for injury prevention work.[217,224]

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Support for injury prevention activities

In the 2010 survey, most respondents stated that training (97%, 362/373), provision of educational materials (95%, 351/369), examples of good practice (94%, 341/363), help with planning injury prevention (94%, 343/366), support for working with partners (89%, 320/358) and communities (88%, 311/354) and help with evaluating activities (85%, 303/356) would be useful for their centre.

Discussion

Main findings

In both surveys we found that around 60% of children's centres identified unintentional injuries as one of their three main priorities but fewer than half had a written injury prevention strategy. Providing leaflets to parents was the most common approach for delivering injury prevention information in 2010 and it remained a common method in 2012, despite this being perceived as less effective than other methods. Although managers held positive attitudes towards injury prevention, they had gaps in their knowledge about injury prevention and about important local initiatives. Two-thirds of centres had access to a local home safety equipment scheme in 2010 but this had fallen to 42% in 2012, with fewer schemes in 2012 providing and fitting free equipment. Our findings suggest that most centres do not have an evidence-based strategic approach, that child injury prevention appears to be a neglected area within children's centres given the scale of the problem and that most centres would welcome help and support in planning, delivering and evaluating child injury prevention. The findings suggest the considerable scope for improving the provision of child injury prevention activities in children's centres, which is the focus of the RCT (study M) undertaken in work stream 6 of this programme (see *Chapter 7*).

Strengths and limitations of the study

Our response rates are similar to those of surveys of other professional groups[225] but, as in many surveys, non-response bias may have occurred whereby respondents may have been more interested and active in injury prevention than non-respondents. If this is the case the findings may overestimate injury prevention activity within children's centres. Similarly, as we collected self-reported activity data, social desirability bias may have led to overestimation of 'true' activity levels. If either type of bias has occurred, given the scope for increasing injury prevention that we have demonstrated, this would strengthen our conclusions.

Our surveys provided a broad overview of the injury prevention activity taking places in children's centres. The survey was not able to explore injury prevention activity in detail or the motivations for choosing particular ways of working or undertaking particular activities. Such information is important for designing interventions for delivery in children's centres and for understanding and developing the role that children's centres play in child injury prevention.

Data from the national database of children's centres (Leila Allsopp, Department for Children, Schools and Families, 1 July 2009, personal communication), which we used as our sampling frame in 2010, indicated that 37% of centres were established in phase 1 (2004–6), 59% in phase 2 (2006–8) and 4% in phase 3 (2008–10). The database that we used as our sampling frame in 2012 (Shirley Best, Department for Education, 29 November 2011, personal communication) indicated that 31% of centres were set up in phase 1 (2004–6), 49% in phase 2 (2006–8) and 21% in phase 3 (2008–10). The phase of the centres responding to our 2010 and 2012 surveys was similar to that in the national sample, suggesting that our findings should be broadly generalisable to children's centres across England. One-fifth of responses came from children's centres located within the South East Coast SHA in the 2010 and 2012 surveys. This reflected the existence of a larger number of children's centres in this area compared with other SHAs in the national database of children's centres.

Comparisons with existing research

We were not able to find any other published studies exploring children's centre injury prevention activities for comparison with our study. Previous surveys of injury prevention activities by health authorities[218]

and PCGs[219] report findings similar to ours in terms of lack of capacity, lack of useful data and lack of prioritisation of injury prevention work.[218,219]

Despite national publications highlighting the importance of child injury prevention and the priority it should be afforded,[1,19,22,25] child injury prevention was not among the top three child health priorities for two-fifths of children's centres that responded to our survey. We also found lack of a strategic approach to injury prevention, with many centres not having a written injury prevention strategy and reliance on less effective methods of behaviour change such as providing leaflets,[226] suggesting that better use could be made of the current evidence base, consistent with the conclusions in the *Better Safe Than Sorry* report.[19] As most managers held positive attitudes to injury prevention, believed that children's centres could be effective in preventing injuries and were keen to receive support, there is scope for further developing the injury prevention activities being delivered by children's centres.

Although we found evidence of joint working with individual organisations, most respondents did not know of the existence of local injury prevention groups or strategies, suggesting suboptimal partnership working[227–230] despite recent recommendations.[1,19,22,25] Working effectively in partnership across agencies and organisations can be a complex process[231–233] and it is likely that children's centres will need support to do this. There have been numerous recommendations for the creation of local injury prevention co-ordinator posts[19,22,234,235] and, if such posts are established, these could support children's centres in their injury prevention work.

How these findings inform other research within the Keeping Children Safe programme

Our surveys confirm the scope for improving the provision of child injury prevention activities in children's centres. The findings from study D have been used to inform the development of guides for interviews with children's centre managers and staff to explore barriers to, and facilitators of, injury prevention (study G in work stream 4; see *Figure 1* and *Chapter 4*). The findings have also been used to develop an injury prevention intervention (an IPB) for delivery by children's centres, which was evaluated using a RCT (study M in work stream 6; see *Chapter 7*). Finally, the findings were used to develop a second IPB incorporating the findings from all of the studies in the KCS programme.

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Chapter 5 What are the barriers to, and facilitators of, implementing thermal injury, falls and poisoning prevention interventions among children's centres, professionals and community members? (Work stream 4)

Abstract

Research question

What are the barriers to, and facilitators of, implementing thermal injury, falls and poisoning prevention interventions among children's centres, professionals and community members?

Methods

This work stream included three studies exploring barriers to, and facilitators of, injury prevention: a systematic review (study E), a qualitative study of children's centre managers and staff (study F) and a qualitative study of parents of injured and uninjured children (study G).

Study E

Quantitative papers were identified from a systematic review undertaken in work stream 5 (study I), which was supplemented with a systematic review of qualitative evidence. Bibliographic databases and other sources were searched up to May 2009 for quantitative papers and up to March 2010 for qualitative papers. Data were explored using framework analysis and synthesised narratively.

Study F

Semistructured interviews were conducted with managers and staff from children's centres across four study sites. Interview topics included health and safety promotion programmes, barriers to, and facilitators of, delivering health promotion, engaging parents and development of staff capacity and child injury prevention. Data were analysed using framework analysis.

Study G

Semistructured interviews were conducted with parents of injured and uninjured children (cases and controls from study A). Maximum variation sampling was used to ensure a range of child ages, injury types and deprivation levels. Interview topics included beliefs about injury prevention, injury prevention strategies, control over injury prevention actions and barriers to, and facilitators of, injury prevention actions. Data were analysed using thematic analysis.

Results

In total, 64 papers (quantitative, $n = 57$; qualitative, $n = 7$) were included in the systematic review. Thirty-three interviews were conducted with staff from 16 children's centres and 64 parents were interviewed, 16 whose children had had a fall, 16 whose children had had a poisoning, 16 whose children had had a scald and 16 whose children had not had an injury. The review found that many studies did not explicitly explore barriers and facilitators and, when they were explored, this was most often from the perspective of those delivering the intervention. A range of barriers and facilitators was found consistently across studies E–G. These included the need for interventions to be delivered by staff with trusted relationships with families, tailoring interventions to the needs of families and stage of development of the child, focusing on specific injury

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prevention topics and providing simple and reinforced messages. Parents identified that 'real-life' stories of how injuries had happened may help to raise awareness.

Conclusions

Facilitators for children's centres and parents to undertake injury prevention were identified as were modifiable barriers. The effect of addressing these barriers and facilitators within interventions aimed at children's centres and families requires evaluation.

Chapter summary

This work stream consisted of a systematic review of facilitators of and barriers to home injury prevention interventions for preschool children (study E), a qualitative study exploring the views of children's centre managers and staff regarding facilitators of and barriers to injury prevention (study F) and a qualitative study exploring parents' views of facilitators of and barriers to implementing injury prevention within the home (study G). Findings from this work stream were used to inform the design of an injury prevention intervention for delivery in children's centres. The design and evaluation of this intervention is reported in work stream 6 (see *Chapter 7*).

Introduction

Over the last 20 years, numerous studies of injury prevention activity among front-line health professionals, public health professionals and health-care organisations in the UK have consistently demonstrated that child injury prevention is given a low priority and is inadequately resourced, that professionals have unmet training needs to deliver injury prevention and that systematic implementation of evidence-based practice is lacking.[19,218–220,236–244] More recently, in 2010, NICE produced two guidelines on preventing unintentional injuries in children and young people (PH29[25] and PH30[27]), which clearly defined the evidence-based interventions that should be provided and the responsibilities for professionals and organisations in implementing those interventions. The impact of the NICE guidelines on child injury prevention practice awaits assessment.

Among parents, professionals and organisations, a range of barriers to, and facilitators of, injury prevention has been found. A systematic review of qualitative literature undertaken in 2011 reported on barriers to, and facilitators of, interventions that supply or install home safety equipment or provide home safety risk assessments.[245] Barriers and facilitators covering 15 areas were found. Legal and policy barriers included the short-term nature of many programmes, lack of co-ordination and weak legislation or regulation. Information provision was a barrier, with parents reporting a lack of information and service providers reporting difficulties in providing information to families in accommodation with a rapid turnover of tenants. Living in homes that people were not free to modify, homes in which people lacked autonomy to make household decisions or rented homes with high tenant turnover were major barriers to installing safety equipment and childproofing a home, as were equipment costs, poor-quality or malfunctioning equipment and a lack of skills to fit equipment. Difficulty in understanding child development and anticipating injury risk, having fatalistic attitudes towards injuries, being suspicious of strangers entering the home to assess or install equipment, being suspicious of 'free' equipment and parental perceptions of officials blaming or accusing them of neglect or abuse all acted as barriers. A lack of experience of specific risks in a new environment and lack of understanding by health workers of child safety norms and expectations in immigrants' cultures were also cited as barriers.[245]

Facilitators included legislation that required action when children were resident in the home (e.g. fire and Rescue Services Act 2004[246]), providing timely information (e.g. safety information provided in the community after birth was more likely to be retained than that provided in hospital at the time of birth), using 'real-life' incidents, partnerships and collaborations between service providers, having landlords with

the ability and motivation to repair properties, training for landlords, councils and parents in installing, replacing and using equipment and providing ongoing support and maintenance for safety equipment. Parental supervision was acknowledged as a major facilitator but, as this was resource intensive, the need to supplement it with other forms of injury prevention was emphasised.[245]

At the level of professionals, a systematic review of the global literature identified six barriers to professionals undertaking injury prevention activities.[247] These were inadequate knowledge and training, lack of time, lack of resources, lack of confidence in counselling parents about injury prevention or in their ability to influence parents' behaviour, the setting in which professionals worked and personal injury prevention behaviour.[247] Surveys of English health organisations, including health authorities and PCTs, identified the low priority given to unintentional injuries,[218,219] lack of strategic planning,[218,219] lack of capacity and resources, in particular injury prevention co-ordinator posts,[218] lack of useful local data,[218] inadequately developed multiagency working[219] and a lack of knowledge about the burden of injuries and the effectiveness of interventions.[219]

At an organisational level, it is vital to understand the context within which interventions are set. Despite this, details on context, methods and implementation of interventions are rarely reported in the literature. Several systematic reviews conclude that the characteristics of innovations, communities, individuals and the delivery of the intervention are all important in determining the effectiveness of implementation.[248–251] In terms of providers, recognition of the need for a specific intervention, belief in its beneficial effects, confidence in ability and having the necessary skills to deliver the intervention have consistently been found to be associated with successful implementation.[248] At an organisational level, important aspects for achieving implementation are a culture conducive to change, effective leadership and programme champions and providing training that includes active learning delivered in a supportive atmosphere with ongoing technical assistance, resources and support.[248]

As described in work stream 3 (see *Chapter 4*), children's centres have a key role in promoting child and family safety. It is therefore important to understand how home safety interventions can be most effectively implemented within the context of children's centres. The findings from study D described in work stream 3 demonstrate considerable interest in and motivation for undertaking child injury prevention work within children's centres. However, this is coupled with a lack of prioritisation of the topic, gaps in knowledge about child injuries, lack of a strategic evidence-based approach to injury prevention and a range of barriers to undertaking injury prevention, most commonly lack of funding and lack of staff capacity. This work stream aimed to gain a greater understanding of the barriers to, and facilitators of, injury prevention for children's centres and parents. The findings from work stream 4 were used to inform the design of a child injury prevention intervention (an IPB plus a training and facilitation package to support its implementation), which was evaluated as part of work stream 6 (see *Chapter 7*). The methods and results for studies E–G are reported in this chapter along with an overarching discussion covering all three studies.

Systematic review using quantitative and qualitative studies of barriers to, and facilitators of, implementing home safety interventions among families with young children (study E)

Methods

The objective was to systematically review quantitative [RCTs, non-RCTs (including quasi-randomised studies) and controlled before-and-after studies (CBAs)] and qualitative (all designs) studies on barriers to, and facilitators of, implementing home safety interventions to prevent unintentional injuries in children aged 0–4 years. The systematic review was conducted in parallel with an update of a Cochrane systematic review of the effectiveness of home safety interventions,[49] undertaken as part of the KCS programme of research and reported in *Chapter 6* (work stream 5). We used the quantitative papers identified from the

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Cochrane systematic review and supplemented these with a systematic review of qualitative evidence. Full details of the methods used are reported elsewhere.[49,252]

Studies were eligible if they included children aged ≤ 5 years and their families, provided home safety education with or without the provision of safety equipment for the prevention of falls, poisonings or thermal injuries and reported barriers to, or facilitators of, success of the intervention. Community injury prevention programmes (e.g. World Health Organization Safe Community-type interventions) were included only if it was clear that they provided home safety education for the prevention of falls, poisonings or thermal injuries to individual parents or groups of parents. Studies reporting fire setting were excluded because of the difficulty of attributing intent. The sources searched and search strategies for the Cochrane review are described in work stream 5 (see *Chapter 6*). Searches were conducted from the date of inception of the bibliographic databases up to 31 May 2009. We searched MEDLINE, EMBASE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Applied Social Sciences Index and Abstracts (ASSIA), PsycINFO and Web of Science for qualitative evidence from the date of database inception to March 2010 as well as a range of other electronic sources. The search strategy for qualitative papers is provided in *Appendix 4, Search strategy for identification of qualitative studies for the systematic review of barriers to, and facilitators of, injury prevention (study E)*.

All papers included in the Cochrane review were assessed for inclusion by two reviewers searching the full-text articles for mention of reported barriers and facilitators. Assessment of risk of bias was undertaken as described in work stream 5. Titles and abstracts of qualitative papers were assessed for inclusion independently by two reviewers. We did not appraise qualitative papers for quality because there is considerable debate about (1) whether qualitative studies should be appraised for quality, (2) which methods should be used and (3) the degree of agreement between different appraisers and different methods.[253–255] Data were extracted from eligible articles by two reviewers independently using a standard data extraction form. Disagreements between reviewers in study selection or data extraction were handled by consensus-forming discussions. Data were synthesised using an iterative process to develop themes, which were explored using framework analysis.[256]

Results

The process of the selection of studies is shown in *Figure 20*. Sixty-four studies were included in the review, 57 sourced from the Cochrane review[72,257–312] and seven from the searches for qualitative studies.[92,313–318] Tables of excluded studies are available from the authors on request. The risk of bias in the included quantitative studies is shown later in *Table 72*, which demonstrates that many studies were at risk of bias, most commonly from inadequate allocation concealment or lack of blinding of outcome assessment.

Seven key facilitators and six key barriers were identified from the included studies. *Table 64* shows the key facilitators and *Table 65* shows the key barriers. These key facilitators and barriers are summarised in the following sections.

Facilitators

Features of successful interventions were prearranged home safety visits, at which free safety equipment was provided and fitted with easy-to-use instructions, particularly for low-income families; tailoring methods for different groups or individuals and combining with environmental measures (active and passive interventions); community involvement and awareness raising to understand community perceptions and values and address these and to reduce stigma, normalise safety practices and reach high-risk groups; and partnership working with a range of organisations. For some types of injury (e.g. scald prevention through reducing hot tap water temperature), focusing on a single type of injury was helpful, as was providing short and simple home safety messages. Simple methods for reinforcing advice, such as continued contact with health professionals, group sessions in clinics, poster displays, mailed reminders and stickers to display in the home, were described as helpful. Interventions requiring minimal, simple, non-repetitive action to implement (such as lowering the hot water temperature) were more likely to be successful than those requiring more complex or repeated actions. Interventions providing and fitting safety equipment had

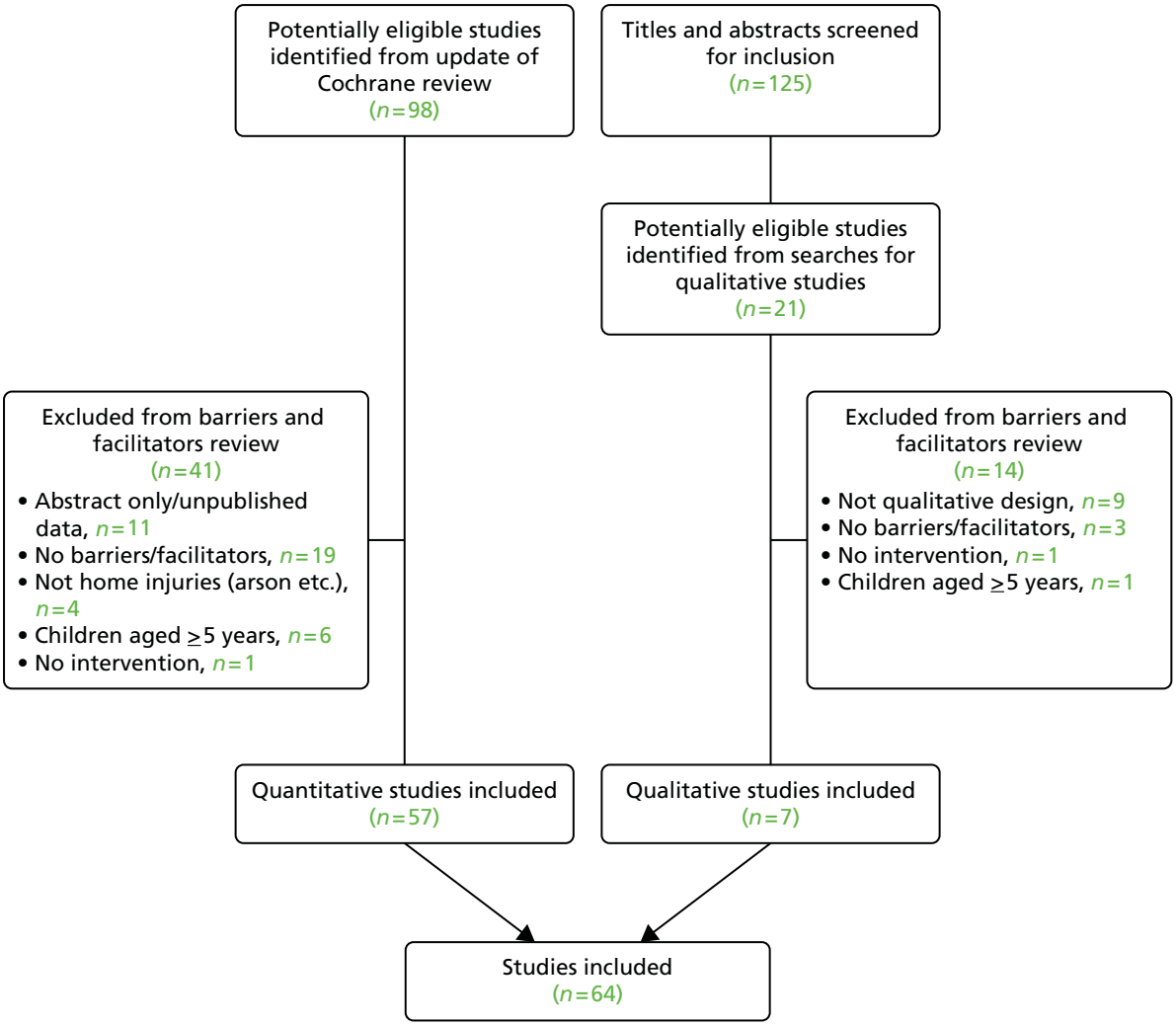


FIGURE 20 Process of the selection of quantitative and qualitative studies for the review. Reproduced from Ingram JC, Deave T, Towner E, Errington G, Kay B, Kendrick D. Identifying facilitators and barriers for home injury prevention interventions for pre-school children: a systematic review of the quantitative literature. *Health Education Research* 2012;**27**(2):258–68,[252] by permission of Oxford University Press.

greater effects than those providing discount vouchers for equipment purchase or those providing advice about equipment and local suppliers or facilitating access to equipment in other ways. Studies using behaviour change models for influencing parental safety behaviour and techniques to increase self-efficacy found these to be beneficial. The use of techniques to achieve organisational change in terms of delivering home safety interventions was also considered important. A range of incentives was used successfully to encourage participation in studies and uptake of interventions such as providing free interventions (safety equipment or first aid training), small monetary incentives for completing outcome measurement tools or crèche facilities for group sessions.

Using professionals who had established a relationship with families to deliver safety messages had many benefits, as they were trusted familiar figures and were accepted in the home. Trained lay community volunteers were more acceptable to some communities, and it was appreciated when they were able to deliver messages in the primary language of participants or were of the same ethnic origin. The credibility of home safety messages was enhanced in some studies by being delivered in clinical settings, such as child health clinics or EDs. Those delivering the interventions gained both home safety knowledge and skills in delivering home safety interventions, and this helped to sustain interventions.

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TABLE 64 Facilitators for implementing home safety interventions identified from included studies

Study	Facilitators						
	Intervention approach	Focused message	Minimal changes	Role of the deliverer	Safety equipment accessibility	Behaviour change models	Incentives
Quantitative studies							
Babul 2007[257]	✓		✓	✓	✓	✓	
Carman 2006[258]	✓			✓	✓	✓	
Coggan 2000[259]	✓	✓		✓			
Colver 1982[260]	✓	✓	✓		✓		
DiGuiseppi 2002[261]		✓		✓	✓	✓	
Emond 2002[262]				✓		✓	
Fergusson 1982[263]	✓	✓	✓				
Georgieff 2004[264]	✓	✓		✓	✓	✓	
Gielen 2002[265]				✓		✓	
Gielen 2007[266]	✓	✓		✓		✓	
Guyer 1989[267]	✓					✓	
Harvey 2004[268]	✓	✓	✓	✓	✓	✓	
Hendrickson 2005[269]				✓	✓		
Jenkins 1996[270]	✓	✓		✓		✓	
Johnston 2000[271]	✓			✓	✓	✓	
Katcher 1989[272]			✓	✓	✓	✓	
Kelly 1987[273]		✓				✓	
Kelly 2003[274]	✓	✓	✓	✓			✓
Kendrick 1999[275]	✓	✓		✓	✓		✓
Kendrick 2011[276]		✓		✓	✓	✓	
King 2001[277]	✓	✓	✓	✓	✓		
Krug 1994[278]	✓				✓		
LeBailly 1990[279]					✓	✓	
Llewellyn 2003[280]	✓			✓			
Mallonee 2000[281]	✓	✓	✓	✓	✓	✓	✓
McDonald 2005[282]	✓	✓		✓	✓	✓	✓
McLoughlin 1982[283]	✓						
Miller 1982[284]	✓	✓	✓	✓	✓		
Mock 2003[285]	✓	✓	✓	✓	✓		
Mueller 2008[286]	✓		✓	✓	✓		
Nansel 2002[287]	✓	✓	✓	✓		✓	
Nansel 2008[288]	✓	✓		✓		✓	
Odendaal 2009[289]	✓			✓	✓	✓	✓
Olds 1994[290]	✓			✓		✓	

TABLE 64 Facilitators for implementing home safety interventions identified from included studies (*continued*)

Study	Facilitators						
	Intervention approach	Focused message	Minimal changes	Role of the deliverer	Safety equipment accessibility	Behaviour change models	Incentives
Ozanne-Smith 2002[291]	✓			✓		✓	
Paul 1994[292]		✓		✓	✓		
Petridou 1997[293]	✓		✓	✓			
Pless 2007[294]	✓			✓			
Posner 2004[295]	✓	✓	✓	✓	✓		
Rey 1993[296]	✓						
Sangvai 2007[297]	✓	✓	✓	✓			
Schelp 1987[298]	✓	✓		✓	✓	✓	
Schlesinger 1996[299]	✓						
Schwarz 1993[300]			✓	✓		✓	
Schwebel 2009[301]	✓	✓		✓			
Svanström 1995[302]	✓						
Swart 2008[303]		✓	✓	✓	✓		
Sznajder 2003[304]	✓			✓	✓	✓	✓
Thomas 1984[305]	✓		✓	✓		✓	✓
Vineis 1994[306]	✓	✓		✓			
Waller 1993[307]	✓	✓		✓			
Watson 2005[72]	✓	✓		✓		✓	
Woolf 1987[308]	✓	✓		✓	✓		
Woolf 1992[309]	✓	✓	✓	✓	✓	✓	
Yang 2008[310]			✓		✓	✓	
Ytterstad 1995[311]	✓	✓			✓	✓	
Zhao 2006[312]	✓	✓		✓		✓	
Qualitative studies							
Carr 2005[313]	✓			✓		✓	
Gibbs 2005[314]						✓	
Morrongiello 2004[92]	✓				✓	✓	
Morrongiello 2004[315]	✓	✓				✓	✓
Morrongiello 2009[316]	✓		✓	✓		✓	✓
Pollack-Nelson 2002[317]						✓	
Van Niekerk 2010[318]	✓				✓	✓	✓

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TABLE 65 Barriers to implementing home safety interventions identified from included studies

Author	Barriers					
	Cultural	Socioeconomic	Complex interventions	Deliverer constraints	Physical barriers	Behavioural barriers
Quantitative studies						
Babul 2007[257]			✓			✓
Carman 2006[258]	✓	✓	✓			
Coggan 2000[259]	✓					
Colver 1982[260]	✓					✓
DiGuiseppi 2002[261]	✓	✓	✓		✓	✓
Emond 2002[262]			✓			
Fergusson 1982[263]				✓		
Georgieff 2004[264]	✓	✓	✓	✓	✓	✓
Gielen 2002[265]	✓		✓		✓	✓
Gielen 2007[266]						
Guyer 1989[267]			✓			✓
Harvey 2004[268]				✓	✓	
Hendrickson 2005[269]	✓	✓				
Jenkins 1996[270]	✓				✓	
Johnston 2000[271]			✓			
Katcher 1989[272]	✓				✓	
Kelly 1987[273]			✓	✓		
Kelly 2003[274]		✓				
Kendrick 1999[275]			✓			
Kendrick 2011[276]		✓		✓	✓	✓
King 2001[277]			✓			✓
Krug 1994[278]		✓		✓	✓	
LeBailly 1990[279]		✓	✓		✓	✓
Llewellyn 2003[280]			✓	✓		
Mallonee 2000[281]						✓
McDonald 2005[282]		✓		✓		
McLoughlin 1982[283]			✓	✓		✓
Miller 1982[284]	✓		✓		✓	
Mock 2003[285]		✓		✓		
Mueller 2008[286]	✓				✓	
Nansel 2002[287]		✓		✓		
Nansel 2008[288]		✓		✓		✓
Odendaal 2009[289]			✓	✓	✓	
Olds 1994[290]	✓					✓
Ozanne-Smith 2002[291]			✓	✓		

TABLE 65 Barriers to implementing home safety interventions identified from included studies (*continued*)

Author	Barriers					
	Cultural	Socioeconomic	Complex interventions	Deliverer constraints	Physical barriers	Behavioural barriers
Paul 1994[292]		✓		✓	✓	
Petridou 1997[293]	✓				✓	
Pless 2007[294]				✓		✓
Posner 2004[295]					✓	
Rey 1993[296]			✓			✓
Sangvai 2007[297]	✓					✓
Schelp 1987[298]			✓	✓		
Schlesinger 1996[299]				✓		
Schwarz 1993[300]			✓		✓	
Schwebel 2009[301]		✓				✓
Svanström 1995[302]						
Swart 2008[303]	✓					✓
Sznajder 2003[304]	✓			✓	✓	
Thomas 1984[305]					✓	✓
Vineis 1994[306]						✓
Waller 1993[307]				✓	✓	✓
Watson 2005[72]	✓				✓	✓
Woolf 1987[308]						✓
Woolf 1992[309]	✓				✓	✓
Yang 2008[310]	✓					✓
Ytterstad 1995[311]			✓			
Zhao 2006[312]	✓	✓				
Qualitative studies						
Carr 2005[313]	✓		✓			✓
Gibbs 2005[314]					✓	✓
Morrongiello 2004[92]					✓	✓
Morrongiello 2004[315]	✓		✓			✓
Morrongiello 2009[316]	✓		✓			✓
Pollack-Nelson 2002[317]	✓		✓		✓	✓
Van Niekerk 2010[318]					✓	✓

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Barriers

Parents in some studies, particularly in disadvantaged areas, were suspicious of unannounced home visits because of mistrust of the health system, child protection fears, immigration issues and/or fear of strangers in the home. Transient populations, with frequent house moves, were difficult to deliver interventions to and those moving house sometimes removed safety equipment. Living in rented accommodation prevented equipment being fitted because families worried that landlords might object or equipment might inconvenience other tenants (e.g. smoke alarms going off) or families could not afford to make changes to a property they did not own. Language barriers and low literacy hampered the delivery of interventions in some studies and using interpreting services and translators proved difficult. Families living with economic constraints would often choose food and daily living items over the purchase of safety equipment. In addition, installing equipment required time, tools and skills. When safety equipment broke, was faulty or was perceived as inconvenient or annoying by families (e.g. smoke alarms), this contributed to poor compliance.

Families' beliefs, traditions and supervisory behaviours influenced whether or not they were likely to take part in studies and the extent to which they were willing to change their home safety and supervisory practices. Short intervention periods and brief educational interventions including single home visits or well-child contacts or awareness raising campaigns were viewed as insufficient to change beliefs and behaviours.

Complex interventions were not always successful if they addressed too many home safety topics in one intervention or used multiple methods that required several concurrent behaviour changes. Often they also required more highly skilled practitioners, which made them less sustainable. Interventions that needed large numbers of staff or volunteer training or large amounts of time to deliver were sometimes unsuccessful because of time constraints, and were often unsustainable.

Identifying barriers to, and facilitators of, injury prevention among children's centre managers and staff (study F)

Methods

The objective of this study was to explore perceptions of barriers to, and facilitators of, implementing health promotion and injury prevention interventions among children's centre staff.

Semistructured interviews were conducted with staff members from children's centres, which were sampled purposively to include a range of characteristics: phase of establishment of children's centre, PCT area, lead agency and catchment population size. For each study site we identified phase 1 and phase 2 centres in the most deprived 30% of super output areas, as assessed by 2007 Indices of Multiple Deprivation for each region,[319,320] and located in the two PCT areas closest to each study site. Children's centre managers were approached by researchers by letter, followed by a telephone call to discuss the study and answer any questions managers might have.

Researchers from the four study sites, Nottingham, Norwich, Newcastle and Bristol, undertook interviews lasting for 30–45 minutes at the children's centre, university or local NHS premises, at a time convenient to participants. Participation was voluntary and participants were free to withdraw at any time. Participants completed a consent form prior to interview. Interview topics included details about health and safety promotion programmes, focusing on aspects of the barriers to, and facilitators of, holding health promotion sessions, the best ways to engage with parents and the development of staff capacity and child safety work. An interview topic guide was developed using the findings from study D described in work stream 3 (see *Chapter 4*) and is shown in *Appendix 4, Interview guide for interviews with children's centre managers and staff (study G)*. Interviews were digitally recorded and transcribed verbatim. Quotations are presented using a code giving the study centre name, a number for the children's centre and a letter for the interviewee.

Analysis was undertaken using framework analysis[321,322] and completed with software package NVivo 9.2 (QSR International, Warrington, UK). The initial framework was developed by researchers in Nottingham coding six randomly selected transcripts and reviewed by researchers in Bristol who developed the final thematic

framework after analysing data from the 33 interviews. Emerging themes were reviewed by researchers from the four study sites and the qualitative consultant to the KCS research programme at each stage of the analysis. Coding consistency was checked by independent coding of two interviews by two researchers during development of the initial framework and of four interviews once coding was complete for all 33 interviews. Disagreements were handled by consensus-forming discussions. The coding frame was reviewed by researchers in all study sites, the qualitative consultant and the lay research adviser. Ethics approval was granted by North Nottinghamshire Research Ethics Committee (reference number 09/H0408/113).

Results

Semistructured interviews were conducted with 33 staff members (17 managers and 16 staff nominated by managers with face-to-face contact with parents and responsibility for organising health promotion activities) from 16 children's centres across the four study areas. The characteristics of participating children's centres are shown in *Table 66*. This indicates that a wide range of children's centres across the four study sites took part in the study in terms of lead agency, rural/urban setting, phase and length of operation.

Seven key facilitators and six key barriers were identified. These are shown in *Boxes 1* and *2*, illustrated by participants' quotations.

TABLE 66 Characteristics of participating children's centres

Characteristic	Number of centres
Study centre	
Nottingham	4
Newcastle	4
Bristol	4
Norwich	4
Organisational setting	
NHS	4
LA	11
Charity	1
Rural/urban setting	
Urban	10
Urban/inner city	1
Urban and outer urban	1
Urban and phase 3 added rural population	1
City suburb	3
Phase	
1	7
2	9
Length of time children's centre in operation (years)	
≤ 2	1
3–4	6
5–6	2
≥ 7	5

continued

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TABLE 66 Characteristics of participating children's centres (*continued*)

Characteristic				Number of centres
No information				2
Study centre	**Organisational setting**	**Rural/urban**		
	NHS = 4	Urban = 10	1 = 7	≤ 2 years = 1
	LA = 11	Urban/inner city = 1	2 = 9	3–4 years = 6
	Charity = 1	Urban and outer urban = 1		5–6 years = 2
		Urban and phase 3 added rural population = 1		≥ 7 years = 5
		City suburb = 3		No information = 2

LA, local authority.

BOX 1 Key facilitators for delivering health promotion and injury prevention interventions in children's centres

Awareness of national policies and local strategies

Our policies are formed from the Children's Act um and Working Together to Safeguard Children and the staying safe element and the being healthy element of Every Child Matters that overrides everything . . . all policies with the children's centres alongside the priorities highlighted in the Children and Young people's plan which then provides us with um information for our self-evaluation and our service improvement plans which highlights specific national indicators.

Nottingham3a

Access to local data on injuries

This year we're focussing on erm the, the accident and emergency . . . the numbers of visits to accident and emergency departments . . . in hospitals and we've identified particularly this area that I work, it has one of the highest levels erm of, of accidents, tragic accidents. So we're working on how, how to prevent . . . [and] how to equip parents with the skills.

Nottingham1a

We got all of the data, the health data from accident and emergency for example which was really, really powerful and that provides us with an education programme not just for the centre but actually for children as well . . . I think [it] is possibly the most powerful data you'll ever have really and broken down into specific ages as well.

Newcastle2b

Aligning with local needs

Because we've got a parent's forum, and I'm sure D has spoken about this, is that we consult with them about what sort of things that they want, erm, thinking about health promotion, thinking about things that which, you know top of our agenda really. So they've been very successful.

Nottingham1b

BOX 1 Key facilitators for delivering health promotion and injury prevention interventions in children's centres (*continued*)

Whether it's specific parents meeting when we invite them in for their opinions and things they'd like but then also . . . because some people won't come to that kind of forum . . . so we encourage staff to chat with parents in a session where it's very relaxed and ask them about their feedback things that they'd like to see things that they don't like things that they'd like help on and that and we try and then respond to that as best we can. So it's not the fact that we're just asking their opinions and doing nothing about it we then can signpost on all . . . we can say 'well actually people are really interested in that area we'll try and get somebody in to come and discuss that with them'.

Nottingham2b

Working in partnership with other organisations

It brings to us an overview of what's happening city wide because we want to link with all the other children's centres, it brings an overview of statistics that they get about hospital attendances and concerns and sort of what type of accidents are happening in the home. So it gives us the information for us to then work with. It also because it's a partnership gives opportunities to do joint funded things and things such as promoting the booklets that we've had from the Child Safety Forum.

Newcastle1b

Yeah, well obviously we've got the five outcomes, so we've got 'Be healthy, staying safe', which is one of our, our five outcome groups and, erm, we, in this, this area here we have one local 'Be healthy, staying safe' group, which has health visitors, midwives, specialist family support team, nutritionists, those key people, that come to those meetings and, we do an improvement plan for the children's centre, which looks at those elements of health promotion and everything and how other agencies can support that.

Nottingham1b

Funding to provide interventions/programmes

Norwich1b: Erm, we worked in conjunction with preschools in the area and made safety calendars. We worked alongside the fire service who installed smoke alarms . . .

Interviewer: And what's the reason mainly for that sort of stopping?

Norwich1b: A lot of the stuff was the funding, so the First Aid, all the courses . . . the First Aid, the safety packs, the food hygiene, all of those were funding issues.

And Safety Crackers again it was a voluntary, a small voluntary organisation, they had a paid worker who'd overseen the programme and obviously looked at bids and funding and what have you but they also had an employed fitter who could go out to parents' homes and fit things like smoke alarms, fit safety gates and it was a one-stop shop but they lost their funding.

Newcastle3a

Engagement with parents and families

Understanding community needs and strong trust-based relationships with parents and families

Relationships . . . and relationship building. You've got to get the trust of people who, they will be here for the accident bit, they'll be here for the healthy eating, they'll be here for absolutely every aspect of it so you've got to build those relationships up.

Newcastle2b

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BOX 1 Key facilitators for delivering health promotion and injury prevention interventions in children's centres (*continued*)

If you want to really get the most disadvantaged families when it comes to erm these things, I think you have got to be really creative and a lot of it does come down to the staff and how it is promoted and word of mouth in this area is really, really vital. So if it is run by somebody who is already known in the community or is trusted then it is 'oh is it so and so doing it? Fine okay I will come'. So I think that is quite important.

Bristol1a

Facilities appropriate to the varied needs of parents and providing support to access children's centres

It's a massive step sometimes just to come through the door of the children's centre. And . . . some people might be feeling quite isolated. They may not want to come in on their own, erm, they might not think it's for them, they might not think it's for everybody.

Newcastle4a

If we want parents to come along then we need to look at things like crèche and making sure that whatever the parents are learning the crèche workers are doing with the children. So if they're doing something around healthy eating maybe in the crèche, you know the crèche workers are cutting up an apple and talking to the children about it so the parents and the children are learning together.

Newcastle3a

For vulnerable families, they need to be able to see someone that they recognise, know what they're going for, so as much information that you can show, talk to them and say 'look this is what we're going to be doing, if you come along, I'm going to be there and so and so is going to be there and we're all going to do it together'. I think that's what you need for some of them . . . and the time that they actually do it and yeah just giving them as much information . . . with our groups we're so, although they're very structured, if a child doesn't want to sing, it doesn't matter I know that things have got to be structured but I think it needs to have a little bit of leeway. And then after, you'll probably find if you're running a programme for 5 weeks in the third week it was no problem at all it's just getting them through the door.

Bristol1b

Effective communication

So I think there needs to be that level of passion because it's got to be a continuous thing you're not going to sell it to every single parent so you've got to be prepared to 25 parents in order to get the five that actually would like to do it so you've got to have that strong momentum I think to carry on going for it and believing in it.

Nottingham2b

I think it is . . . it's the practical they enjoy the practical side and actually . . . and having . . . small groups but being engaged with their children the . . . on reflection when I was looking at this before, if you target a health initiative at a parent themselves initially that's where we get the resistance. Because we are engaging with their children parents tend to want the best for their children and parents will engage in things for their children.

Nottingham3a

BOX 1 Key facilitators for delivering health promotion and injury prevention interventions in children's centres (*continued*)

Practical support to promote safety messages

If it was something about safety in the home environment, and we managed to get them plug sockets and things like that, just saying to them have you got your plug sockets in . . . Have you got your stair gate up, have you . . . so make, have you used that new mattress that we've been able to get for you so that we've got that follow on. So it is not that they just come to a programme and away you go, it is about that follow-up really.

Newcastle3a

But what we offer advice, we will offer to go into the home and give advice to people at any time, we will use what we get from the Child Prevention Forum, also we do have a checklist that we do ourselves in the home. Particularly when we engage with people we do the 8-week visits and we try to cover that with people, you know we'll take in the bags that we give, we do give plug covers and things like cupboard locks and drawer locks so we give them and they are easy to put in place, so we do go through that. We also offer a home visit at any time, we'd include all the information about what the fire service does and actually if there was anything else that we could do we would do that.

Newcastle1b

Using parent feedback to improve interventions

We do ongoing evaluations so if we find that something is not going well, you know at the end of each term we would ask parents to give us evaluation about you know the best things of the group and how we can improve it and then we will change things according to the feedback that we have had.

Bristol1a

Evaluating interventions/programmes

We did have a big evaluation last year um with the mental health team to look at how we can make it work better, which is why we agreed to try a different take on it this time but again it's not working. What is working well is the individual referrals, so parents who want to go and speak to somebody individually um and individual counselling whereas I think opening up about your own stress, your own mental health within the group setting a lot of parents find very difficult.

Nottingham3a

High-quality training that can be cascaded to team members

I suppose, some training is – not is only as good, but is only as successful as the person you send on it, and how competent they are at coming back. So, some of our team are competent enough to go on training . . . and come back, and then talk to the whole staff as a team at a staff meeting, and suggest running a workshop on it . . . when training is delivered . . . and put together, . . . you need to think about how you can train someone on something, and empower them to take it back.

Norwich4a

What we try and do is send staff that have got that 'oh yes I'd really like to go and see that' and encourage them to go and then to come back and share and then to put it in practice . . . lead it and champion . . . we find that works quite well rather than everybody learning a little bit we've got some people that know an awful lot that can then share the information.

Nottingham2b

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BOX 2 Key barriers to delivering health promotion and injury prevention interventions in children's centres

Lack of data on injuries at national and local level

We used to get data from A&E that said, this is the amount of accidents you've had with under-fives from your area. We saw a significant dip. I don't think it was the safety packs, I think it was the increased contact that workers were having with families, and the safety packs were the sort of sweetener to get through the door, because they loved them. But we don't get that data now, so we don't know what we do, whether what we are doing is working.

Norwich1a

Bristol1a: Well back when we were Sure Start local programme, I think that we were provided with some data around accidents within the home and number of admissions.

Interviewer: So do you have those figures?

Bristol1a: I don't know, I haven't got those figures any more. We used to get a lot more reporting from health when we were Sure Start Local Programme but as a children's centre have dried up.

Lack of prioritisation of injuries as a key issue

I mean, accident prevention in the first Sure Start targets were about reducing hospital admissions, so that's where the Home Safety Scheme came. That isn't a target for us any more.

Norwich3a

Erm so it is like trying to join up what is already working in the area, where are the gaps that sort of thing. So we identified four areas that we felt were the biggest health issues for [this local area] of which home safety isn't one of them.

Bristol1a

Unsustainability of interventions because of limited time or resources

My worry is that the health promotion practitioner has now left and hasn't been replaced and it really did need that one person because we used to have meetings every month or so to arrange that. If you lose that one person that is going to co-ordinate that we would probably still do our own thing around safety week but would it be the big event that it is?

Nottingham4b

You know, because the point was made, once it's gone, it's gone. And are we sure we're getting to the most vulnerable? But you do have to have, you know, benefits and various other criteria, and that's the majority of our families. Erm, so it's like do you have a hierarchy of need, or is it just you fit that criteria and then it works? You know, you get the equipment, but when 600 units have gone out, that's it. Because I've got over 2000 children in my catchment area.

Norwich3a

Lack of funding or facilities to provide health promotion

[Parents response was] 'Wow – really waiting to see that' and . . . sort of . . . giving out healthy food and stuff but when it came to signing up for course we found there weren't enough places for all of them so it kind of put them off and they thought what was the point of that that was kind of their reaction the parents . . . so I thought I'm not sure if they should have done that unless there were lots of places for all of them

Bristol2b

BOX 2 Key barriers to delivering health promotion and injury prevention interventions in children's centres (*continued*)

We worked with a local organisation called Health First, who had reduced price, er, safety equipment as well, so we would point people in their direction if they wanted some additional things. And we had a much bigger budget to be able to do that . . . so we stopped doing that when we ran out of money to do it.

Norwich1a

There used to be, erm, something quite good, which was locally, called Safety Crackers. But they haven't got the . . . funding for that, so sadly, that was quite a good service as well.

Newcastle4a

Difficulty engaging 'hard-to-reach' groups

. . . a very multicultural community um I think there's over 50 different ethnicities within our particular area, it's also very transient which means that we have constantly got a lot of moving so within a space of a year you could have upwards of 15 families living in one particular accommodation where they come in, they are there for a short period of time and then they move on and another family comes in . . . isolation is a big issue within the local area, the cultural mix is generally quite good . . . but where you have an asylum seeker that is placed in accommodation in a road which is not within their cultural mix they do become very isolated and it takes a lot of support to get them out of the house [and] some of the accommodation um isn't particularly suitable for young families.

Nottingham3a

The government would love it yes the government would love it if we could put our hands on and actively encourage to get through the door teenage parents . . . you know what I mean . . . under age mums . . . that kind of thing and actually they're probably out there but they're very, very hard to reach and they don't always engage and that so . . . we never stop trying and we're always looking at different ways of trying to encourage people in.

Nottingham2b

Poor communication between other community professionals and children's centres

I felt irritated in the past where staff at children's centres have been expected to pick up what I felt were very much health issues so they you know we have been told oh who is your link member of staff for smoking cessation and I am thinking well yeah I could have someone on paper but actually that doesn't mean very much and they don't have that knowledge and expertise. Um at times it's been quite hard to get from health practitioners the support that you want.

Bristol3b

The fire service we do send referrals in for them to do a home safety assessment for smoke alarms as need be. One thing we don't get back from that is any feedback . . . we don't know if it's happened and we don't know the numbers.

Nottingham4b

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Identifying barriers to, and facilitators of, injury prevention among parents and caregivers (study G)

Methods

The objective of this study was to identify key facilitators and barriers for parents in terms of keeping their children safe from unintentional injury within the home. Participants recruited to the case–control studies undertaken in work stream 1 (see *Chapter 2*) were eligible to participate in this or two other studies nested within the case–control studies (studies B and C). Participants were eligible to participate in only one nested study, so those participating in study B or C were excluded from taking part in this study.

A sampling frame was devised to aid maximum variation sampling. This grouped parents by injury type (falls, poisonings, scalds or no injury) and deprivation, based on the IMD[65] (less than the median IMD rank and greater than or equal to the median IMD rank). Before inviting parents to participate, researchers checked the sampling frame to ensure that participants would add to the variation within the sample.[323] Sixty-five parents across four centres (Nottingham, Bristol, Norwich and Newcastle) consented to participate and were recruited: 49 parents whose child had attended an ED or a MIU or had been admitted to hospital with an unintentional injury and 16 parents whose child had not experienced an unintentional injury requiring secondary care attendance when recruited to the study (as defined for recruiting controls for the case–control studies in work stream 1).

Data were collected using semistructured interviews. The interview topic guide was developed using findings from the systematic review of barriers to, and facilitators of, injury prevention[252] described earlier in this chapter (study E). Four pilot interviews were undertaken across two study centres. Following piloting, the interview guide was adapted with minor word changes and additional prompts. Data from pilot interviews were not included in the analysis. Two versions of the interview guide were developed: one for use when interviewing parents whose child had experienced an injury and one for use with parents with an uninjured child. The guide covered five main topics: parental beliefs about injury prevention, strategies that can help to prevent injuries, parent or carer control over injury prevention actions, barriers to injury prevention actions and facilitators of injury prevention actions (see *Appendix 4* for the interview guides).

Interviews lasted between 30 and 60 minutes and were conducted in the parents' home. They were digitally recorded, anonymised prior to transcription and transcribed verbatim. Initially, data were explored for emerging themes by one researcher reading and rereading transcripts. Four transcripts were also read by a group of researchers consisting of an independent research consultant, a lay research advisor who was also a parent and two researchers from different study sites and an agreed coding structure was produced. This was applied to subsequent interview transcripts. Other emerging themes were discussed and agreed until a final set of themes was applied to all remaining interview transcripts. The coding process included identifying both confirming and disconfirming cases.[324] Data analysis was facilitated using NVivo 9.

Ethics approval was granted by Nottingham Research Ethics Committee 1 (reference number 09/H0407/14).

Results

The process of selection of participants is shown in *Figure 21*. The characteristics of the 65 children whose parents participated in the study are shown in *Table 67*. There illustrates wide variation in terms of child age and deprivation and good representation of both male and female children, with roughly equal numbers of children recruited across the four study sites. One interview was inaudible and was excluded from the analyses.

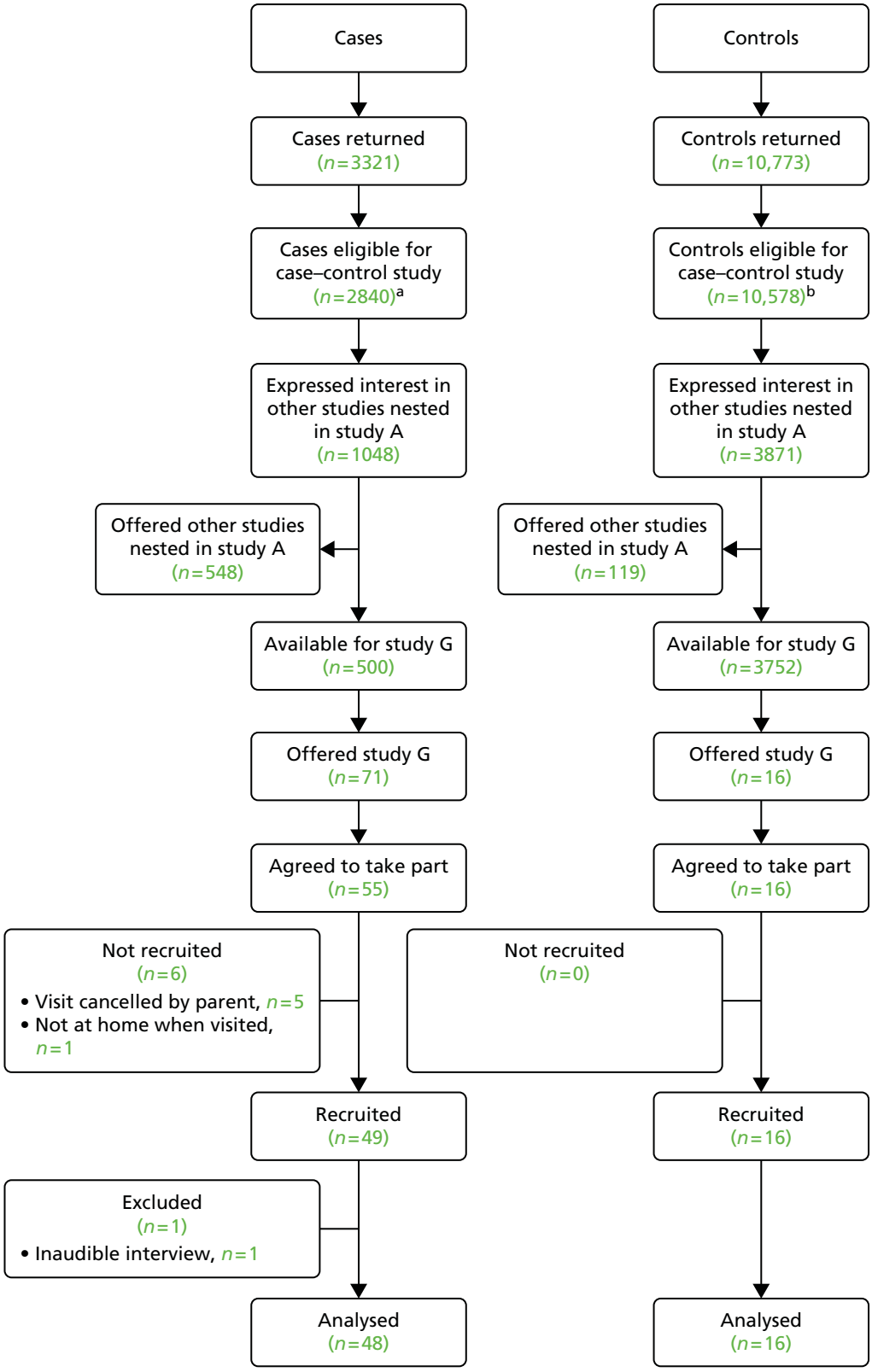


FIGURE 21 Recruitment to the study identifying barriers to, and facilitators of, injury prevention among parents and caregivers (study G). a, Includes eight cases subsequently found not to be eligible for study A (study C, n = 7; study G, n = 1). These eight were not used to compare characteristics of participants in study B. b, Includes 37 controls subsequently found not to be eligible for study A.

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TABLE 67 Characteristics of the children whose parents participated in the study by injury mechanism

Centre	Injury mechanism			
	Fall	Poisoning	Scald	No injury
Nottingham	Female; age 3 years; IMD rank 13,476	Female; age 2 years; IMD rank 1399	Female; age < 1 year; IMD rank 13,692	Male; age 3 years; IMD rank 10,967
	Male; age 2 years; IMD rank 11,759	Male; age 3 years; IMD rank 6244	Female; age 1 year; IMD rank 31,559	Male; age 2 years; IMD rank 5291
	Male; age 2 years; IMD rank 30,973	Male; age 2 years; IMD rank 21,774	Male; age 1 year; IMD rank 26,413	Male; age 2 years; IMD rank 27,268
	Female; age 3 years; IMD rank 17,970	Female; age 2 years; IMD rank 15,537	Male; age 2 years; IMD rank 28,812	Female; age 1 year; IMD rank 25,571
Bristol	Female; age 1 year; IMD rank 30,256	Male; age 2 years; IMD rank 25,659	Female; age 1 year; IMD rank 25,613	Male; age 3 years; IMD rank 28,758
	Male; age 2 years; IMD rank 12,414	Male; age 1 year; IMD rank 8833	Female; age < 1 year; IMD rank 28,416	Female; age 2 years; IMD rank 27,694
	Male; age < 1 year; IMD rank 31,697	Male; age 1 year; IMD rank 22,767	Female; age 2 years; IMD rank 18,495	Male; age 2 years; IMD rank 3028
	Male; age 2 years; IMD rank 2895	Male; age 1 year; IMD rank 7849	Male; age 1 year; IMD rank 12,787	Male; age 1 year; IMD rank 7462
	Female; age > 1 year; IMD rank 19,014			
	Male; age 2 years; IMD rank 2829			
Norwich	Female; age 3 years; IMD rank 21,939	Male; age 3 years; IMD rank 18,121	Female; age < 1 year; IMD rank 21,219	Male; age 1 year; IMD rank 10,072
	Male; age 1 year; IMD rank 3721	Male; age 2 years; IMD rank 7803	Female; age 2 years; IMD rank 17,202	Male; age 3 years; IMD rank 21,939
	Female; age 4 years; IMD rank 6014	Female; age 3 years; IMD rank 17,202	Female; age 4 years; IMD rank 8628	
	Male; age 1 year; IMD rank 18,121	Male; age 3 years; IMD rank 21,313	Female; age 2 years; IMD rank 7914	
Newcastle	Female; age 1 year; IMD rank 4126	Female; age 3 years; IMD rank 15,067	Male; age 1 year; IMD rank 7131	Female; age 4 years; IMD rank 13,335
	Male; age 1 year; IMD rank 10,213	Male; age 4 years; IMD rank 18,700	Male; age 1 year; IMD rank 6562	Male; age 1 year; IMD rank 29,509
	Female; age 1 year; IMD rank 6815	Female; age 2 years; IMD rank 25,678	Male; age 3 years; IMD rank 8391	Female; age 2 years; IMD rank 14,770
	Male; age < 1 year; IMD rank 3979	Female; age 2 years; IMD rank 11,964	Female; age 2 years; IMD rank 4454	Male; age 2 years; IMD rank 29,273
	Male; age 1 year; IMD rank 7967			

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Barriers for parents undertaking injury prevention within the home

Five main themes, each with subthemes, emerged relating to barriers to injury prevention. All parents described multiple barriers. The five main themes and related subthemes were:

1. lack of anticipation by parents of injury-producing events and/or their consequences:
    i. lack of anticipation that injury-producing event would occur because of child's age and/or stage of development
    ii. anticipation of injury-producing event but lack of anticipation of the severity of injury that may occur during the event
    iii. anticipation of injury-producing events but no translation into preventative action
2. fatalism:
    i. inevitable events that were impossible to prevent
    ii. falls were more likely to be viewed as inevitable than poisonings or scalds
3. interrupted supervision:
    i. distractions and multitasking
    ii. maternal fatigue
    iii. number of children in the household and the presence of older siblings
    iv. difficulties of parenting alone
4. environmental constraints:
    i. safety equipment cannot be relied on to prevent injury
    ii. safety equipment was not relevant for the family
    iii. cost of safety equipment
    iv. difficulties in having or using safety equipment when the property is not owned by parents
5. timing/targeting of safety information in relation to ages and stages of child development:
    i. information arriving too late in relation to the ages and stages of child development
    ii. lack of safety information
    iii. feeling bombarded by safety information.

Quotations illustrating these themes and subthemes are provided in *Box 3*.

Facilitators for parents undertaking injury prevention within the home

Five main themes, most of which had subthemes, emerged relating to facilitators of injury prevention. All parents described a combination of these strategies and the way that they combined these strategies altered with child age and development. The five main themes were:

1. anticipating and responding to injury risk:
    i. anticipating injury risk and reducing risk through supervision
    ii. anticipating injury risk and reducing risk through separation of child and hazard
2. parental supervision:
    i. never leaving the child alone
    ii. knowing where the child is and listening for silence as a cue for parental intervention
    iii. parents changed from never leaving the child alone to listening as children got older

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BOX 3 Barriers to parents' injury prevention practices

Lack of parental anticipation of injury risk

I was surprised because for one I'd never known him go on the worktop, like go to reach for anything on the worktop, I didn't think he'd be able to reach, erm, because of having two children before we know not to leave things on the edge of the worktop you know so it wasn't and [B] said it wasn't right on the edge it was kind of halfway back. But you know he was obviously determined and he was stretching as far as he possibly could. So yeah, it was a case of not realising how much he'd grown and – and erm, yeah – so I was surprised.

Scald, Nottingham, male, age 2 years, ≥ median IMD

Fatalism

I don't think anyone can stop anyone from doing anything to be fair. If someone thought that they could stop a child from having an accident then they are quite delusional cos then you're going down the route of you can stop rape from happening you can stop violence and all that stuff you can't. Some things are just going to happen.

Fall, Newcastle, female, age 1 year, < median IMD

Interrupted supervision

It's difficult to try and get on with just daily tasks . . . You know like cooking and cleaning it's hard to do those kinds of things and watch [M] at the same time.

Poisoning, Newcastle, male, age 4 years,< median IMD

Erm time I think busy I mean I work full-time I work evenings I am all over the place so I've always got so much to do erm so maybe like when you haven't had enough sleep she is not a good sleeper at night so I mean the night before last we got about 2 and a half hours of sleep. So it's easy to overlook something or forget something you have got a lot on your mind . . . and it's just trying and I keep on top of everything so I think that is like my biggest worry or potentially when things can go wrong I mean that's how the accident happened.

Fall, Newcastle, female, age 1 year, < median IMD

And yeah its just a juggling act three kids you have always got to have eyes in the back of your head . . . He is little yeah and you you forget that as well like when you have got a 5-year-old and you got a baby . . . 2 is still only a baby he is only young himself so you have got to be careful not to expect too much of them so erm cos he looks so much bigger as well than a baby you know.

Poisoning, Bristol, male, age 2 years, ≥ median IMD

Environmental constraints

We don't own the property we rent privately rent and err our landlord just has done hardly anything to the house . . . so that's frustrating as its out of our hands . . . and I think you do you do tend to put off buying the safety gear because you have already spent a ton of money.

Fall, Newcastle, female, age 1 year, < median IMD

Especially with it not being my because its a rented house. I can't put shelving across here. So I am just sort of following him around pretty much. I mean ideally I would put shelves up so I can move everything up a height and erm yeah put door catches on things you can't drill, erm the taps [bath taps] are quite

BOX 3 Barriers to parents' injury prevention practices. (*continued*)

hard yeah cos they are not mixers and it's really like I am sure no matter how tight I tie them he can undo them.

Fall, Nottingham, male, age 2 years,< median IMD

Timing of safety information

I think there should be some leaflets given out or something cos you get lots of leaflets when you are pregnant or when you first have a child and I think it is may be something that needs to be sort of pushed onto parents just to make you more aware because I wasn't aware, I didn't think about it I'll admit it, you just don't you know.

Poisoning, Nottingham, female, age 2 years, < median IMD

The trouble is I do think when you have got kids you get bombarded with so many leaflets from so many different places it could be about this that and everything that you tend to maybe either put them in a pile and not look at them anyway.

Fall, Bristol, male, age 2 years,< median IMD

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3. teaching children about hazards and safety rules:
    i. use of controlled risk as a teaching tool
    ii. explaining risk and consequences of injury
    iii. creating and adhering to safety rules
4. adapting the home:
    i. minimising access to rooms perceived as particularly hazardous
    ii. placing items perceived as hazardous out of the child's reach
    iii. installing and using safety equipment
5. learning from other parents' 'real-life' stories:
    i. real-life stories raise awareness and help parents anticipate injury risk.

Quotations illustrating these themes and subthemes are provided in *Box 4*.

Discussion

Main findings

The systematic review and interviews with children's centre managers, staff and parents have enabled identification of key barriers to, and facilitators of, implementing injury prevention by children's centres and parents. Many of these were of direct relevance to, the design of, the intervention evaluated in work

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BOX 4 Facilitators of parents' injury prevention practices

Anticipating and responding to injury risk

So we are kind of pre-empting it a bit . . . . Yeah and just seeing what he's trying to do and thinking right how can we protect him from that? . . . I think it's just common sense more so than anything isn't it?

Poisoning, Bristol, male, age 1 year, < median IMD

One is to keep her away from all sort of dangers especially in the kitchen from knife, bottles, medicine, all sharps, steps and any other things that we perceived to be dangerous to her really but what we try to do is to keep a constant eye on her. I mean that's the main thing that we always do. We try to keep an eye on her, anything that looks dangerous we try to remove it.

Scald, Bristol, female, age 2 years, ≥ median IMD

Parental supervision

Its just being on your guard at all times it don't matter if you think like you're cleaning stuff and that is in a safe place out of his reach cos he they will still get to it. It's knowing where they are. Listen out for the silence when it goes silent you know they are up to something.

Fall, Bristol, male, age 2 years, < median IMD

The stair gates are helpful of course they are helpful they are a tool that we do use and they can keep so you can you can go away or you can leave them unsupervised for a time but I think the most important thing is the supervision.

Control, Newcastle, male, age 2 years, < median IMD

Teaching children about hazards and safety rules

Because they learn from what's right from wrong from an early age. They learn that no you can't touch the kettle that that it's going to be hot and if you touch it it is going to burn you. Same with the cooker you can't reach and get grab something off the cooker and things like that they need to still know what is right from wrong that if they touch something it is going to hurt them and if something is hot.

Control, Nottingham, male, age 3 years, ≥ median IMD

Like with the radiator that is hot, we let him touch it, just the once, just to see so he knows that it's hot so he doesn't go back we did that with the taps as well so it's just sort of letting them experiment with things to see that they can hurt and that they are a danger and stuff.

Fall, Norwich, male, age 1 year, < median IMD

Adapting the home

When they are younger obviously the safety equipment because you can't teach them rules but you try as well but you need the equipment as well.

Control, Nottingham, male, age 2 years, < median IMD

We got two baby gates on the ground floor we got one upstairs just to prevent falling on the stairs we got these corner I don't know how you call them covering the corners not to bump in to them er what else do we do . . . we got locks in the kitchen on every single cupboard we are planning to put them on the drawers as well because now she is interested in the drawers . . . we keep all doors or the gates closed all the time because she is wandering off and doing things that you wouldn't want her to do . . . what else

BOX 4 Facilitators of parents' injury prevention practices. (*continued*)

We did . . . we lowered the cot as she grew level by level so its on the ground level at the moment preventing her falling out.

Poisoning, Nottingham, female, age 2 years, < median IMD

Erm no chemicals are kept in there medicines are kept high up in an enclosed shelf it's not locked but you need two hands and to be an adult to get it out so it is not easy for the children the children couldn't reach it even with their steps they couldn't reach it.

Control, Norwich, male, age 3 years, ≥ median IMD

Learning from other parents 'real-life' stories

. . . actual case studies of what's happened to people's children so that they know that yes this can happen and it's true life and to be aware.

Poisoning, Nottingham, female, age 2 years, < median IMD

The iron I am really aware of because again that was an experience with someone that I knew had an iron dropped on himself when he was a baby and you know had brain damage from it so, so I am always really careful to think about that very much.

Fall, Nottingham, female, age 3 years, < median IMD

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stream 6 (see *Chapter 7*). Some were contradictory, for example the provision of high-quality training was seen as an important facilitator by children's centre managers and staff but the systematic review found that the requirement for a large amount of training for an intervention could also be a barrier. The systematic review also found that interventions needed to have a sufficiently long intervention period and multiple contacts to be successful in changing behaviour, but these interventions were also less likely to be implemented successfully or be sustainable because of resource requirements. It was therefore clear that there were trade-offs between some facilitators and barriers, which required compromises in the design of the intervention in work stream 6.

The key findings from studies E–G relevant for the design of the intervention in work stream 6 and the sources of the findings are shown in *Table 68*. This illustrates the similarities and differences between the findings arising from the different sources and the value of using findings from multiple sources.

Strengths and limitations of these studies

The use of three different studies to explore barriers to, and facilitators of, implementing home safety interventions from the perspectives of parents and professionals has allowed us to identify themes that are important to the deliverers of injury prevention interventions and to those receiving interventions. The use of different methodologies to explore the same phenomenon provided diversity of views and allowed triangulation of data and verification across studies, enhancing the credibility of the findings. Each study also had its strengths. To our knowledge, our systematic review is the first to combine data from quantitative and qualitative studies of barriers to, and facilitators of, child home safety interventions. Likewise, to our knowledge, the study of the views of children's centre managers and staff is the first qualitative study in its field. The wide range of roles and experiences of participants provided breadth and depth to the interview

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TABLE 68 Findings relevant to the design of the injury prevention intervention and the sources of the recommendations

Intervention should	Source of recommendation		
	Systematic review	Interviews with children's centre managers and staff	Interviews with parents
Be based on a behaviour change model	■		
Be delivered by professionals with an established trusted relationship with parents	■	■	
Be delivered by enthusiastic and motivated staff		■	
Be tailored to family needs and take account of the complexity of real-life situations	■	■	■
Be tailored to the child's stage of development, addressing anticipation of injury risk and appropriate use of reasoning and safety rules	■		■
Challenge parents' preconceived ideas when necessary	■		■
Address a small number of injury prevention topics, using short and simple messages with reinforcement, and not require multiple, concurrent behaviour changes	■		■
Provide required facilities (e.g. crèche/interpreter)	■		
Provide incentives for behavioural change and/or for completion of outcome measurement tools	■	■	
Be of sufficient duration and intensity to achieve behavioural change, but not so resource intensive that it is unfeasible to deliver	■		
Address local/national priorities		■	
Use local/national injury data		■	
Be based on effective partnership working		■	
Be adequately resourced	■	■	
Provide high-quality training but not require unsustainable amounts of training	■	■	
Provide opportunities to learn from parents' real-life injury experiences			■

responses. The children's centres were situated in rural, suburban and urban settings across wide geographical areas, and barriers and facilitators were broadly similar across all study centres and are likely to be generalisable to other children's centres in England. The qualitative study of parents' views about barriers to, and facilitators of, the prevention of children's injuries at home is the largest to date, adding considerably to the small amount of existing qualitative evidence in this area. It includes parents of children of varying ages and socioeconomic circumstances, including both parents whose children had been injured and parents whose children had not been injured, providing a range of parental perspectives within the data. The size of this study and the inclusion of parents whose children have experienced a variety of injury mechanisms has allowed, for the first time, comparison of barriers and facilitators across injury mechanisms.

Qualitative research is increasingly being used in multicentre research programmes to help answer complex research questions.[327] However, little has been written about the potential applications and limitations of the approach. Both interview studies undertaken as part of work stream 4 were conducted by a team of researchers from the four study sites. One of the main advantages of multicentre qualitative research is the

additional capacity and expertise to execute the research, allowing a wide range of different perspectives to be captured.[328] This can also be advantageous when recruitment is challenging, and we were able to recruit additional participants at two study centres when recruitment was lower than expected at another centre. Sharing of expertise also extended to the data analysis, whereby multiple researchers were involved in the analytical process, helping to improve the rigour of the findings.[329] There are also potential limitations to undertaking qualitative research across multiple study sites. As the researcher plays a central role in eliciting information by creating 'unique conversational spaces',[330] it is important to ensure that consistent methods are used across the research sites.[328] This was achieved in the KCS programme by the use of multicentre training, the development of standard operating procedures, sharing and reading the first four transcripts between researchers coding the data and regular teleconferences, face-to-face meetings and e-mail contact.

Our review was limited, as all reviews are, by the quality of the included studies and the quality of their reporting. Our review focused on barriers and facilitators identified by authors of included studies. As these were not the primary outcome measures for most included studies, it is possible that some outcome reporting bias occurred in authors' reports of these. Details about how authors became aware of barriers to and facilitators of the delivery of the interventions within their studies were sparse, and explicit attempts by authors to study barriers and facilitators were rare. Most studies reported on barriers and facilitators from the perspective of those delivering interventions, not from the perspective of those receiving interventions.

Our interviews with children's centre managers and staff took place during a time of reorganisation for many children's centres, making it difficult at times to find staff who were willing and able to participate, and a small number of interviews were curtailed because of other work pressures. Managers nominated staff members to participate in interviews, hence a selection bias may have occurred whereby particular views are under- or over-represented. The wide range of responses provided by participants would suggest that this may not have occurred to an important extent. Nominated staff tended to be more hesitant and unsure about their children's centre's role in injury prevention than managers, but they were able to provide information about the practical experience of delivering interventions, which was very valuable.

It is possible that the parents and children's centre staff who agreed to take part in the interviews had a particular interest in or were motivated by the aims of the study or child safety in general and that their views may reflect this. As for other qualitative research, given its context-specific nature, it is not appropriate to generalise our findings to the wider population of parents or children's centres. However, the maximum variation sampling, the large number of interviews conducted and the multicentre nature of both of our interview studies will have helped to obtain a wide representation of views and experiences, which should be broadly transferable to parents of young children and children's centre staff in other disadvantaged areas of the country.

Comparisons with the published literature

Our review extends the findings of the systematic review of qualitative studies by Smithson *et al.*,[245] who explored barriers to, and facilitators of, interventions supplying and/or installing home safety equipment and home safety risk assessments. The key facilitators, in common with those we found, were partnership working, training, policy drivers, providing culturally sensitive information and advice, providing interventions appropriate to the family's needs and living conditions, having trusting relationships with professionals, providing education relevant to a child's developmental stage and acknowledging mothers' ongoing safety efforts.[245] In contrast to the Smithson *et al.* review,[245] we found that the use of behaviour change models to guide the design of interventions and focusing on fewer types of injury also acted as facilitators. Both our review and that of Smithson *et al.*[245] identified many similar barriers including socioeconomic, cultural and language barriers, lack of control over housing and poor housing conditions and mistrust of professionals and their motives. Our review also highlighted the difficulty of providing interventions to transient populations and of achieving behavioural change with one-off educational interventions, short-lived interventions or complex interventions that require multiple concurrent behavioural changes in the face of long-held beliefs and practices and the unsustainability of interventions requiring large investments of resources or staff time. In contrast, Smithson *et al.*[245] highlighted social isolation and poor relationships

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between mothers and their partners or with the household decision makers as barriers to injury prevention. Making physical changes to the home or allowing an outside agency into the home (e.g. to fit safety equipment or undertake a home safety assessment) is likely to need agreement from all adults living in the household. This may have emerged as a barrier in the Smithson *et al.* review,[245] as it included only studies supplying or installing safety equipment or providing home safety assessments, whereas our review included studies with a much broader range of interventions.

The facilitators identified in the interviews with children's centre managers and staff are consistent with those from our systematic review[252] and Smithson *et al.*'s review[245] regarding partnership working and engagement of families. In terms of barriers, our findings are consistent with the review findings[245,252] regarding absence of local injury data, low prioritisation of injuries, short-term interventions, low literacy levels, low income levels, problems with communication between professionals and inadequate funding, resources or time. In addition, our findings are consistent with the barriers to, and facilitators of, injury prevention identified by children's centre mangers in our national survey of children's centres in England undertaken as part of work stream 3[217] (see *Chapter 4*).

The findings from interviews with parents regarding barriers to injury prevention are also consistent with those from our systematic review[252] and Smithson *et al.*'s review[245] in terms of constraints from economics or living conditions, difficulties in understanding child development and anticipating injury risk, fatalistic attitudes towards injuries and mistrust of professionals, and a lack of information on child safety for parents. In terms of facilitators, our findings are consistent with those of the Smithson *et al.* review[245] in terms of the use of 'real-life' injury experiences as learning opportunities for parents, the importance of supervision and the importance of timely safety information.

The findings from our review and qualitative studies are also consistent with recommendations from NICE on interventions to support changing health-related behaviours.[226] Recommendations include providing interventions based on partnership working that are evidence based, tailored to individuals' needs and developed with the target population, that enhance self-efficacy and that are based on theories or models of behaviour change.

How these findings inform other research within the Keeping Children Safe programme

The findings from studies E–G were used to inform the development of an injury prevention intervention (an IPB) for delivery by children's centres, which was evaluated using a RCT (study M in work stream 6; see *Chapter 7*). Finally, the findings were used to develop a second IPB incorporating the findings from all studies in the KCS programme (see *Figure 1*).

Chapter 6 How effective and cost-effective are a range of strategies for preventing falls, poisoning and scalds based on decision-analysis models incorporating data generated from research questions 1–3 and systematic reviews of the published literature? (Work stream 5)

Abstract

Research question

How cost-effective are strategies for preventing thermal injuries, falls and poisonings?

Methods

This work stream consisted of four studies:

1. *Study H*. Systematic overviews were carried out, with bibliographic databases and other sources searched (fires, March 2009; falls, October 2010; poisonings, January 2012; scalds, October 2012). Data were synthesised narratively.
2. *Study I*. A systematic review was carried out, with bibliographic databases and other sources searched to May 2009. Random-effects PMAs were used to estimate pooled ORs and incidence rate ratios (IRRs).
3. *Study J*. Random-effects NMAs were used to estimate pooled effect sizes for all combinations of interventions.
4. *Study K*. Decision analyses were used to estimate incremental cost-effectiveness ratios (ICERs) and probabilities of interventions being cost-effective.

Results

There was little evidence on the impact of home safety interventions on risk of injury or death from fires, scalds, falls or poisonings.

Fire prevention

Most evidence related to smoke alarms. Several case–control studies found that smoke alarm ownership was associated with a lower risk of house fire death and injury. PMA showed that interventions increased functional alarm ownership (OR 1.81, 95% CI 1.30 to 2.52). NMA found that education plus home safety inspection plus providing and fitting low-cost/free equipment was most effective in increasing functional alarm ownership [OR 7.15, 95% credible interval (CrI) 2.40 to 22.73; p best = 0.66]. Education plus providing and fitting low-cost/free equipment was the most cost-effective intervention (£34,200 per QALY, reducing to £4500 per QALY assuming that there were 1.8 children aged < 5 years per household).

Scald prevention

Most evidence related to 'safe' bathwater temperatures. Narrative reviews and PMA found that interventions promoted 'safe' temperatures (OR 1.41, 95% CI 1.07 to 1.86). NMA found that education plus providing and fitting low-cost/free equipment (TMVs) was the most effective intervention (OR 38.82, 95% CrI 3.58 to 599.10; p best = 0.97). However, this was the most cost-effective intervention only if TMVs were fitted during major refurbishment or in new builds for families in social housing, in which case money was saved.

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Falls prevention

Most evidence related to safety gates and baby walker use. Narrative reviews and PMA found that interventions increased safety gate use (OR 1.61, 95% CI 1.19 to 2.17). NMA found that education plus home safety inspection plus providing and fitting low-cost/free equipment was the most effective intervention (OR 7.80, 95% CrI 3.18 to 21.3; *p* best = 0.97). Usual care (*p* best = 0.999) had the highest probability of being cost-effective (at £30,000 per QALY) and education had the lowest ICER (£284,068 per QALY). Narrative reviews and PMA found that interventions reduced baby walker use (OR 1.57, 95% CI 1.18 to 2.09). NMA found that education was most effective (OR for walker use 0.48, 95% CrI 0.31 to 0.84).

Poisoning prevention

Most evidence related to safe storage of medicines and household products. Narrative reviews and PMA found that interventions increased the safe storage of medicines (OR 1.53, 95% CI 1.27 to 1.84) and household products (OR 1.55, 95% CI 1.22 to 1.96). NMA found that education plus providing and fitting low-cost/free equipment was the most effective intervention for medicines (OR 2.51, 95% CrI 1.01 to 6.00; *p* best = 0.39) and education plus home safety inspection plus providing and fitting low-cost/free equipment was the most effective intervention for household products (OR 2.59, 95% CrI 0.59 to 15.16; *p* best = 0.37). Usual care (*p* best = 0.83) had the highest probability of being cost-effective (at £30,000 per QALY) for the safe storage of medicines. Education had the lowest ICER compared with usual care at £41,330 per QALY, reducing to £19,315 per QALY if education was targeted at families in the most disadvantaged areas where injury rates were higher. For safe storage of cleaning products, all interventions were more costly and less effective than usual care.

Conclusions

In general, more intensive interventions (e.g. education plus providing and fitting low-cost/free equipment and in some cases home safety inspection) were more effective than less intensive interventions, but the most effective interventions were not necessarily the most cost-effective.

Chapter summary

All studies in this work stream relate to evidence on the prevention of fire-related injuries, scalds, falls and poisonings. The work stream consists of study H (overviews of reviews and systematic reviews of primary studies), study I (update of a Cochrane systematic review of home safety interventions and PMAs of interventions), study J (NMAs of interventions) and study K (decision analyses of interventions). This chapter commences with an overall introduction and then describes the methods for studies H–K in turn. The results are then presented for fire prevention, scalds prevention, falls prevention and, finally, poisonings prevention interventions. As many studies are included in more than one of our overviews of reviews, systematic reviews or meta-analyses, to avoid repetition we present one table describing the characteristics of the reviews included in all overviews and a second describing the characteristics of the primary studies included in all overviews, systematic reviews and meta-analyses. Within each injury mechanism, the results from studies H–K are described in turn. The chapter ends with an overarching discussion.

Introduction

Over the last 25 years, and prior to the KCS programme, a series of systematic reviews have been undertaken evaluating the effect of a wide range of home safety interventions in childhood for the prevention of thermal injuries, falls and poisoning,[33–42,331–337] including four by members of the KCS study group.[33–36] Only three of these reviews included meta-analyses,[33,37,40] with the remainder being narrative reviews. Both the narrative reviews and meta-analyses provided evidence that home safety interventions were effective in promoting some safety behaviours (e.g. storage of medicines and household products out of reach, having a 'safe' hot tap water temperature) and possession and use of some items of safety

equipment (e.g. possession of a functional smoke alarm and of a fitted and used stair gate). The reviews also demonstrated a lack of evidence about whether or not home safety interventions reduced injury rates. However, there was considerable variation in the findings of the reviews because of differences in the populations, settings, interventions and outcomes of studies included in the reviews. The reviews also varied widely in scope and quality. Since commencing the KCS programme, a small number of further relevant reviews have been published.[338–340] Multiple systematic reviews, especially when their findings are not consistent, generate uncertainty for policy makers and practitioners, making evidence-based decision making difficult.[341] There is therefore a need to consolidate evidence across existing reviews and, as many reviews were undertaken > 10 years ago, a need to update the evidence with more recently published studies.

Overviews are useful when there are multiple interventions for the same condition or problem reported in separate systematic reviews.[342] Study H therefore reports the findings from four systematic overviews and systematic reviews of more recently published studies covering the prevention of fire-related injuries, scalds, falls and poisonings in childhood. Study I presents the findings from an update of a Cochrane systematic review and meta-analysis of home safety interventions for the prevention of fire-related injuries, scalds, falls and poisonings in childhood.[33]

The interventions evaluated in these systematic reviews and meta-analysis were heterogeneous and included various combinations of education, home safety inspection, provision of free or low-cost safety equipment and fitting of equipment. Some aimed only to prevent single types of injury (e.g. fire-related injuries), whereas others aimed to prevent a range of injuries. The treatment of control arms also varied across studies; they most often received 'usual care', but some control arms received generic safety advice or elements of the intervention, for example home safety inspection but not home safety equipment. Decision-makers have to make decisions about the 'best' intervention to commission or provide to prevent child injuries and analyses 'lumping' varying intervention treatments together or varying control treatments together are of limited use for these decisions. NMA methods[343–345] extend standard (pairwise) meta-analysis to allow all interventions to be compared with one another, including comparisons not evaluated within any of the primary studies. Health technology assessment is making increasing use of NMA to inform decisions about optimal intervention strategies for medical conditions.[346] In injury prevention, in which interventions are frequently complex and multifaceted but the number of studies evaluating each intervention is only small, NMA is particularly relevant. At the time of commencing the programme grant there were no published NMAs in the field of child home injury prevention. Study J presents the findings from the first NMAs to evaluate child home safety interventions for fire-related injuries, scalds, falls and poisonings.

Knowing which interventions are most effective for preventing injuries is important, but cost-effectiveness is an essential part of any decision-making process. At the time of commencing the KCS programme there were few economic evaluations of interventions to prevent fire-related injuries, scalds, falls or poisonings in the UK.[347,348] One economic evaluation of a RCT of a smoke alarm giveaway programme in disadvantaged wards in London found higher costs and higher injury and fatality rates in intervention wards than in control wards; the study concluded that the programme, as delivered in the trial, was unlikely to be a cost-effective use of resources.[347] Since commencing the KCS programme, a systematic review and quality assessment of economic evaluations of 48 injury prevention studies was published in 2012,[349] with searches run up to the end of 2009, which included only the economic evaluation of a smoke alarm giveaway programme cited above. A systematic review of published economic evaluations of legislation, regulations and standards and/or their enforcement and promotion by mass media to prevent unintentional injuries in children undertaken to support NICE guidance PH29[25] found no UK studies.[116] An economic modelling exercise undertaken to support NICE guidance PH29,[25] PH30[27] and PH31[350] explored the cost-effectiveness of regulations for and the enforcement, promotion and monitoring of the installation of TMVs in social housing where there are children aged < 5 years.[351] This concluded that the cost per QALY gained ranged from £67,000 to £144,600 depending on uptake in eligible households over a 15-year period (assumed to be 70% and 30%, respectively). An economic evaluation of a RCT designed to fit TMVs in social housing households with children aged < 5 years concluded that, if fitted as part of a major refurbishment or rebuild of social housing,

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the public purse saved £1.41 for every £1 spent and it was likely that installing TMVs represented value for money.[140] The KCS programme aimed to increase the evidence base in this area by undertaking a series of decision analyses (study K) of interventions to prevent fire-related injuries, scalds, falls and poisonings found to be effective in the NMA undertaken earlier in the programme (study J). The findings from studies H–K informed the development of the intervention (the IPB for preventing fire-related injuries), which was tested using a RCT in work stream 6 (see *Chapter 7*). The findings from work stream 5 were subsequently used, in conjunction with the findings from all other work streams in the programme, to develop an IPB for the prevention of fire-related injuries, scalds, falls and poisonings (see *Chapter 7*).

Methods

The methods for the overviews of reviews and systematic reviews (study H), the PMAs (study I), the NMAs (study J) and the decision analyses (study K) are described in turn in the following sections.

Overviews of reviews and systematic review of primary studies published subsequent to the reviews (study H)

Objectives

The objectives of the overviews and systematic reviews were to:

1. summarise the evidence from systematic (narrative) reviews or meta-analyses of non-legislative home safety interventions for preventing thermal injuries (fire-related injuries and scalds), falls and poisonings within the home in children aged 0–19 years that report injuries, safety equipment possession or use or injury prevention practices
2. update the evidence from systematic reviews by systematically reviewing more recently published primary studies (RCTs, non-RCTs, CBAs, cohort studies and case–control studies), appraising study quality and extracting data or, when necessary, obtaining data from authors
3. identify primary studies and data for inclusion in NMAs (study J) and identify plausible effect sizes for interventions to inform decision analyses.

Methods

Eligibility criteria

Overviews of reviews, systematic reviews and meta-analyses of experimental (RCTs, non-RCTs and CBAs) and controlled observational (cohort and case–control) studies were eligible for inclusion. Systematic reviews were defined using the Cochrane reviewer's handbook definition.[342] Reviews were eligible if they reported:

1. Non-legislative interventions aimed at the prevention of fire-related injuries, scalds, falls or poisonings among children aged 0–19 years.
2. The use of home safety equipment or other injury prevention practices for the primary, secondary or tertiary prevention of fire-related injuries, scalds, falls or poisonings. Primary prevention referred to preventing the injury-producing events (e.g. fires), secondary prevention referred to preventing an injury occurring during the event (e.g. a smoke alarm does not prevent the fire but can prevent an injury by alerting people and enabling escape from the fire) and tertiary prevention referred to minimising the impact of the injury through the provision of first aid.
3. Interventions within the scope of activities undertaken by children's centres in England. The remit of children's centres included the provision of 'advice on accident and injury prevention' (p. 12)[210] (contains public sector information licensed under the Open Government Licence v3.0); interventions beyond this remit, such as legislative interventions, World Health Organization Safe Community programmes or complex home visiting programmes, were excluded.

Primary studies, of the designs described above and published following the date of the most recent comprehensive systematic review, were eligible for inclusion. We searched from the date of the most recent review that included all study designs, interventions and outcomes eligible for our reviews. For fire prevention, these were the reviews published by Towner *et al.* in 1996[352] and Warda *et al.* in 1999.[353,354] For the prevention of scalds, falls and poisoning we chose the most recent review, which was the 2001 review by Towner *et al.*[36] For first aid interventions only one systematic review was found, which included only four studies;[355] hence, searches for primary studies for first aid interventions were run from the date of inception of the databases.

Information sources

We searched MEDLINE, EMBASE, CINAHL, ASSIA, PsycINFO and Web of Science. The dates for which searches were run for each overview are shown in *Table 69*.

Searches

Search terms for MEDLINE are provided in *Appendix 5, Search terms for the overviews of reviews and primary studies for study H* for each overview and systematic review, with strategies adapted as necessary for the other databases. Other sources searched are listed in *Appendix 5, Other sources searched for overviews of reviews and primary studies for study H*. Searches were not restricted by language or publication status. Articles were translated when necessary.

Study selection

Titles and abstracts of articles were scanned independently by two reviewers to identify articles to retrieve in full. When articles appeared eligible but no abstract was available, full articles were retrieved. Disagreements between reviewers were dealt with by consensus-forming discussions and referral to a third reviewer.

Data collection process

Data were extracted on study design, participants, interventions, comparator groups and outcomes independently by two reviewers using a standardised data extraction form. Disagreements between reviewers were dealt with by consensus-forming discussions and referral to a third reviewer.

Assessment of risk of bias

Assessments of risk of bias were carried out independently by two reviewers. Disagreements between reviewers were dealt with by consensus-forming discussions and referral to a third reviewer.

The risk of bias for reviews was assessed using the Overview Quality Assessment Questionnaire (OQAQ).[356] The risk of bias for primary studies was assessed using adequacy of allocation concealment, blinding of outcome assessment and follow-up of at least 80% of participants for RCTs and blinding of outcome assessment, follow-up of at least 80% of participants and balance of confounders between treatment groups for non-RCTs and CBAs. For overviews conducted later in the programme of research (scalds, poisonings and first aid interventions) we assessed risk of bias for primary studies using the criteria specified in the Cochrane reviewers handbook.[342] The risk of bias for cohort and case–control studies was assessed using the Newcastle–Ottawa Scale.[357]

TABLE 69 Dates for running searches for reviews and primary studies for each overview

Interventions	Searches for reviews	Searches for primary studies
Fire prevention	Date of inception to March 2009	January 1996 to March 2009
Scald prevention	Date of inception to October 2012	January 2001 to October 2012
Falls prevention	Date of inception to October 2010	January 2001 to October 2010
Poisoning prevention	Date of inception to January 2012	January 2001 to January 2012
First aid interventions	Date of inception to October 2010	Date of inception to October 2010

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Data synthesis

Data were synthesised narratively. We tabulated the characteristics of included reviews and included primary studies. For each primary study included in a review, we tabulated which reviews it was included in and the outcomes that it reported.

Pairwise meta-analyses of the effectiveness of home safety interventions (study I)

Objective

The objective of the systematic review and meta-analyses was to synthesise evidence from RCTs, non-RCTS and CBAs on the effectiveness of home safety education provided to children (or families with children) aged 0–19 years, with or without the provision of low-cost, discounted or free equipment (hereafter referred to as home safety interventions), in reducing injury rates or increasing home safety equipment possession or use or injury prevention practices.

Methods

We updated a Cochrane systematic review and PMAs previously published by members of the KCS programme team.[33] This included PMAs for outcomes for which NMA was not possible (study J).

Eligibility criteria

Randomised controlled trials, non-RCTs and CBAs whose participants were children and young people (aged ≤ 19 years) and their families and which evaluated home safety interventions provided by health or social care professionals, school teachers, lay workers or voluntary or other organisations aimed at reducing home injuries or increasing home safety practices were included. To be included, studies had to report injuries, possession and use of home safety equipment or injury prevention practices among their outcome measures. The outcomes of interest for the KCS programme were:

1. fire prevention – possession of a smoke alarm, possession of a functional smoke alarm, checking or changing smoke alarm batteries, possession of fireguards, storage of matches out of reach, possession of a fire extinguisher, possession of a fire escape plan
2. scald prevention – having a safe hot tap water temperature, keeping hot drinks/foods out of reach
3. falls prevention – possession of a fitted safety gate, possession or use of a baby walker, possession of a non-slip bath mat or decals, possession of window safety devices (locks, screens or opening width restrictors, hereafter referred to as window locks), never leaving a child alone on a high surface
4. poisoning prevention – storing medicines out of reach, storing other household products out of reach, storing poisons out of reach, storing plants out of reach, possession of the PCC number.

Information sources

We searched the Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, PsycINFO, Web of Science, CINAHL, Database of Abstracts and Reviews of Effects, NHS Economic Evaluation Database and Health Technology Assessment database from date of inception to end of May 2009. In addition, a range of websites was searched (to June 2009) and hand searching was carried out of abstracts from the 1st to the 9th World Conferences on Injury Prevention and Control, the journal *Injury Prevention* (to March 2009) and reference lists of articles included in the review and published systematic reviews. The sources searched are shown in *Appendix 5, Other sources searched for study I*. Authors of published and unpublished studies were contacted as described in the published review.[49]

Search

The MEDLINE search strategy is provided in *Appendix 5, Search strategy for study I*. This was adapted as necessary for other databases. Searches were not restricted by language or publication status. Articles were translated when necessary.

Study selection
Titles and abstracts of articles were scanned independently by two reviewers to identify articles to retrieve in full. When articles appeared eligible but no abstract was available, full articles were retrieved. Disagreements between reviewers were dealt with by consensus-forming discussions and referral to a third reviewer.

Data collection processes
Data were extracted independently by two reviewers using a standardised data extraction form. Disagreements between reviewers were dealt with by consensus-forming discussions and referral to a third reviewer. Authors of studies were contacted to supply unpublished data, including individual participant data when this allowed studies to be included in our meta-analyses (e.g. when papers reported composite outcomes such as safety scores but individual items of the composite measure were outcomes in our meta-analyses). When individual participant data were obtained, we formatted these in a standard format.

Assessment of risk of bias
Assessments of risk of bias were made independently by two reviewers. Disagreements between reviewers were dealt with by consensus-forming discussions and referral to a third reviewer.

Data synthesis
Meta-analyses were undertaken when three or more studies reported the same outcome. For injury rates, pooled IRRs were estimated using random-effects models. For CBAs, we estimated follow-up injury rates adjusted for baseline rates. For binary outcome measures (safety equipment possession or use, injury prevention practices), pooled ORs were estimated using random-effect models. Studies were adjusted for clustering as necessary and management of studies with more than one intervention or control arm is described in the published review.[49] Cases with missing values were excluded from all analyses.

Heterogeneity between effect sizes was described using forest plots, chi-square tests and the I^2 statistic. Potential explanations for heterogeneity were explored by a priori subgroup analyses, which included whether or not safety equipment was provided, study setting and study quality. Publication and related biases for binary outcomes were investigated using the approach recommended in recent guidelines.[358] For meta-analyses of injury rates, when there were $\geq$ 10 studies we assessed publication bias using Egger's test. The individual contribution of each study to the pooled result was assessed graphically, and sensitivity analyses were undertaken to assess the effect of removing each study from each analysis. The robustness of the findings with respect to study quality was assessed using subgroup analyses by comparing treatment effects between randomised and non-randomised studies and between RCTs with and without adequate allocation concealment, blinded outcome assessment and follow-up of at least 80% of participants in each study arm.

Network meta-analyses (study J)

Objective
The objective of the NMAs was to evaluate the effectiveness of home safety interventions for the prevention of fires, scalds, falls and poisonings using an extension of PMA that enables comparison of all evaluated interventions simultaneously within a single coherent analysis.

Methods

Study identification
Data were extracted from primary studies identified from the overviews of reviews and systematic reviews of more recently published primary studies undertaken in study H. When individual participant data were used in the PMA for study I, the same data were used in study J.

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Statistical methods

Network meta-analyses were undertaken for the following binary outcomes:

1. fire prevention – possession of a smoke alarm, possession of a functional smoke alarm, possession of different types of battery-powered alarms, possession of fireguards, storage of matches out of reach, possession of a fire extinguisher, possession of a fire escape plan
2. scald prevention – having a safe hot tap water temperature, keeping hot drinks/foods out of reach
3. falls prevention – possession of a fitted safety gate, possession or use of a baby walker, possession of a non-slip bath mat or decals, possession of window locks, never leaving a child alone on a high surface
4. poisoning prevention – storing medicines out of reach, storing other household products out of reach, storing poisons out of reach, storing plants out of reach, possession of the PCC number.

Pairwise meta-analyses are usually restricted to calculating a pooled estimate of effectiveness comparing two groups, often an intervention group with a control group. Home safety interventions are often complex and multifaceted interventions, consisting of various combinations of safety education, the provision of free or low-cost safety equipment, fitting of safety equipment and home safety assessments. The control arms used in studies of home safety interventions may include usual care (which can vary between studies), generic safety advice (as opposed to specific or tailored advice) or some, but not all, of the elements of the intervention. Consequently, PMA often involves some 'lumping' together of interventions (and control conditions). For example, in PMAs of interventions to promote functional smoke alarms,[33,37,40] interventions that provided education were grouped together with interventions that provided smoke alarms. This included interventions fitting low-cost/free smoke alarms, providing but not fitting low-cost/free smoke alarms, providing home safety inspections and referring to child safety centres. In addition, the educational component of these interventions included very brief face-to-face advice, providing leaflets and videos, providing generic or tailored safety advice or classes or lectures on parenting/child safety. The control conditions included unspecified usual care, well child visits, standard/generic safety advice, leaflets, videos, information about or referral to child safety centres and home safety inspections.

However, commissioners, service providers and parents, among others, need to decide on the 'best' intervention for preventing a particular injury. NMA enables comparison of all evaluated interventions simultaneously within a single coherent analysis.[343–345] Suppose we have studies providing effect estimates for a control compared with intervention A and for intervention A compared with intervention B. NMA allows estimation not only of the pooled effects when pairwise evidence exists (direct comparison between control and intervention A and between intervention A and intervention B) but also of effects when interventions are not directly compared but are linked through a connected network of studies (indirect comparison between control and intervention B). Interventions can also be ranked in order of effectiveness. This approach is increasingly being used in health technology assessment when deciding on the optimal intervention strategy for a particular condition.[346,359]

Network meta-analysis was used to compare all interventions with one another, using all available data in a connected network of studies and a standard NMA random-effects model with a binary outcome.[344,345] Pooled estimates of intervention effects for all combinations of pairwise comparisons were obtained. Intervention effectiveness was ranked based on absolute intervention effects (derived using an underlying rate based on the usual-care arms) and the probability that each intervention was best for a particular outcome was calculated.[344]

The between-study SD parameter was used to assess the variability in effect sizes within pairwise comparisons above that expected by chance.[360–362] We assessed and tested the consistency between evidence from studies that directly compared the two treatments under consideration ('direct' evidence) and evidence from the remaining studies in the network ('indirect' evidence). We also assessed goodness of fit of the model. Analyses were conducted using a Markov chain Monte Carlo (MCMC) method[344] and fitted using WinBUGS software [version 1.4.3; Medical Research Council (MRC) Biostatistics Unit, Cambridge, UK].[363] Further technical details of the analysis together with the WinBUGS code are available from the authors on request.

In addition, we have already taken steps to start to address some of the research recommendations arising from the KCS programme to allow for more detailed analysis of the evidence by extending methods for NMAs. These include methods for adjusting for baseline risk, simultaneously incorporating aggregate and individual participant data, exploring effect modifiers and extrapolating evidence across different networks for multiple outcomes. These are not described in this report and the reader is referred to the publications.[364–367]

Decision analyses (study K)

Objective

The objective of the decision analyses was to determine the cost-effectiveness of interventions shown to be effective (defined as those for which the 95% CI or the 95% CrI did not include the value of 1) in the NMA undertaken in study J. This included interventions to:

1. increase the prevalence of functioning smoke alarms
2. increase the prevalence of TMVs
3. increase the prevalence of safety gate use
4. increase the prevalence of the safe storage of medicines and household products.

Methods

We evaluated the impact on overall lifetime costs and quality of life of living in a household with or without the item of safety equipment or safety practice of interest (functioning smoke alarm, a TMV, a safety gate and safe storage of poisons and household products) in hypothetical populations of newborn infants, from birth to 4 years of age. We used three-stage mathematical models to estimate lifetime QALYs and intervention costs from a public sector perspective [UK NHS costs, Personal Social Services (PSS) costs and other public sector costs], discounted at the standard annual rate of 3.5%.[114] ICERs and the principle of dominance[368] were applied based on calculating the ICER of each intervention compared with the next most effective intervention. That is, an intervention was *dominated* by an alternative intervention if the alternative was both less costly and more effective and *extendedly dominated* if an alternative intervention was both more costly and more effective but had a lower ICER (i.e. provided better value for money). Cost-effectiveness acceptability curves presenting the probabilities of interventions being cost-effective at different decision-makers' cost per additional QALY thresholds[114] were estimated from the models.

Decision models

Our decision modelling was guided by published principles for good modelling practice and design[369] and NICE public health methods guidance.[370,371] We used the software package R (version 2.15.1; R Foundation for Statistical Computing, Vienna, Austria) to construct models and these were assessed using Monte Carlo simulation in R or MCMC simulation in WinBUGS 1.4.3.[372] *Figure 22* illustrates the three-stage decision model using the example of interventions to promote the prevalence of functional smoke alarms and *Figure 23* illustrates the decision model structure within each yearly cycle of the stage 2 (preschool) model.

The first stage of the model, referred to as the *intervention model*, consisted of a decision tree analysing the effectiveness of interventions to increase the prevalence of functional smoke alarms (informed by NMA undertaken in study J[374]) and the costs of these interventions. The second stage of the model, referred to as the *pre-school model*, used outputs of the *intervention model* as its primary inputs and modelled fire-related injuries (i.e. minor, moderate and severe) and fatalities of children during the preschool period (aged 0–4 years) using a Markov state-transition structure incorporating a decay/repair factor to allow smoke alarms to cease functioning and to be repaired. The third stage of the model, referred to as the *long-term model*, modelled over an individual's lifetime, includes costs and health effects of fire-related injuries occurring from birth to 4 years of age, using a Markov state-transition structure. For the Markov models in the second and third stages of the analysis, a yearly cycle duration was used and models were run for 100 years (5 years in stage 2 and 95 years in stage 3). Total costs and QALYs were established for each intervention by attributing costs (inflated to 2012 prices) and quality-of-life weights to each state.

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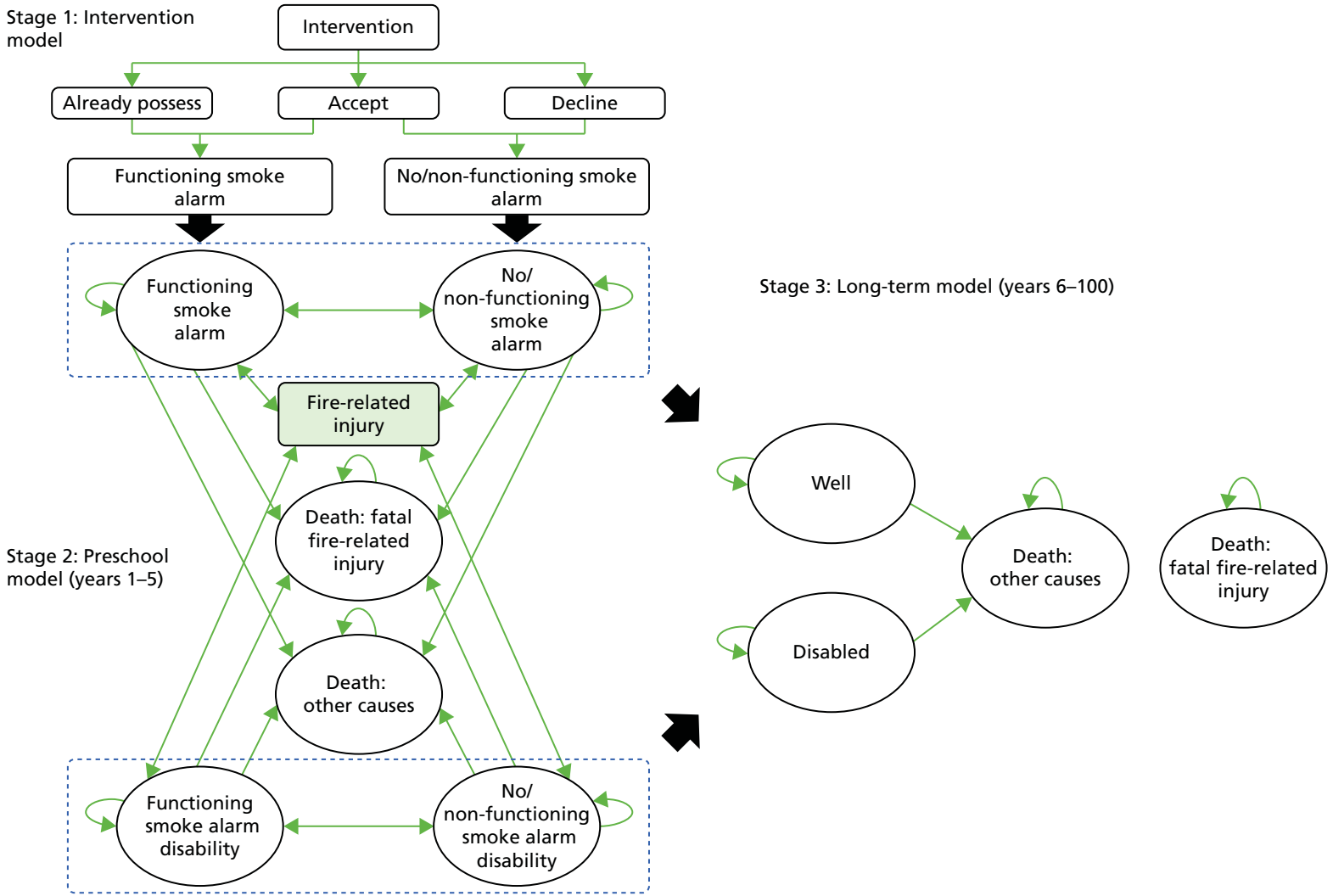


FIGURE 22 Schematic diagram illustrating the three-stage process for decision modelling using the example of interventions to promote the prevalence of functional smoke alarms. Note: shaded box is an intermediate state that may occur within any one yearly cycle. Adapted from Saramago *et al.*[373] under the Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

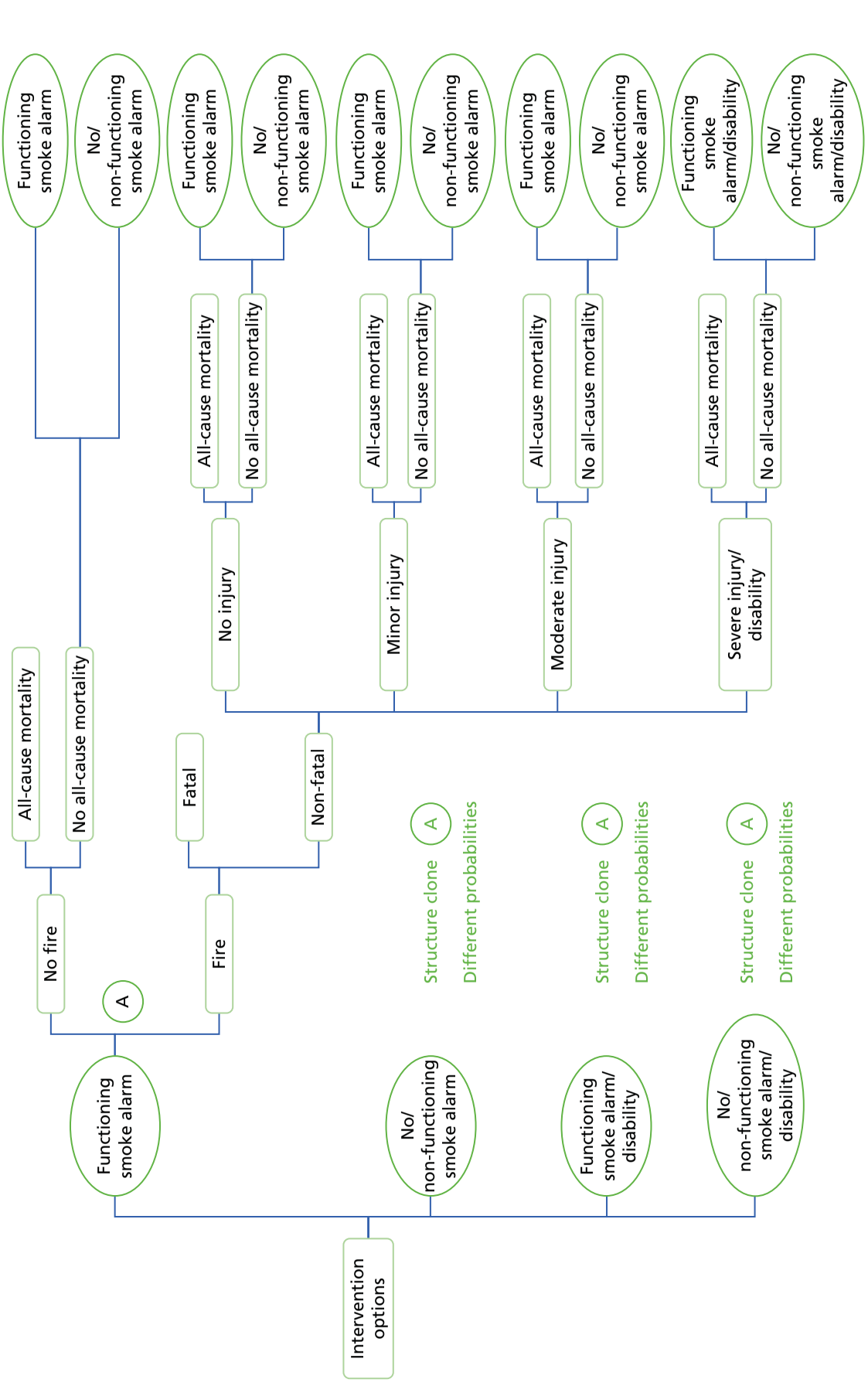


FIGURE 23 Decision model structure within each yearly cycle of the stage 2 (preschool model) model. Note: the oval nodes match to the oval nodes in the schematic diagram in *Figure* 22.

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Evidence used to inform the base-case model, together with distribution information when applicable, is presented in *Appendix 5, Base-case model inputs for the decision analysis for smoke alarms for study K* for smoke alarm interventions, *Appendix 5, Base-case model inputs for the decision analysis for safe hot tap water temperatures for study K* for safe hot tap water temperature interventions, *Appendix 5, Base-case model inputs for the decision analysis for safety gates to prevent stairway falls for study K* for safety gate interventions, *Appendix 5, Base-case model inputs for the decision analysis for safe storage of medicines for study K* for safe storage of medicines and *Appendix 5, Base-case model inputs for the decision analysis for safe storage of household products for study K* for safe storage of household products. When possible, input parameters were informed by UK-based data. When possible we tried to ensure that input parameters that were common across decision models were consistent but as the models were developed at different times across the project this was not always possible (see *Appendix 5*). A summary of the base-case methodological assumptions is outlined in *Table 70*.

Main modelling assumptions

We made a series of assumptions during the modelling:

1. The possession of 'functioning' smoke alarms was a surrogate/intermediate outcome for household risk of fire-related injury/death. We used previously published evidence to support this assumption.[37,376,377] The evidence used for the decision-analysis models for other interventions is given in the base-case evidence tables in *Appendix 5*.
2. The probability of a household accepting an intervention was assumed to be the same across all interventions because of a lack of information on the acceptance of different smoke alarm promotion interventions. When this information was available for decision-analysis models for other interventions it was used and is described in the base-case evidence tables in *Appendix 5*.
3. The benefit of a household having a functioning smoke alarm accrues to a single child aged 0–4 years of age. This ignored the potential benefits for other household members and is therefore a conservative assumption. This assumption also applies to models for interventions for TMVs, safety gates and the safe storage of medicines and household products.

TABLE 70 Summary of assumptions for the base-case model for the decision analysis for interventions to promote functional smoke alarms

Element of assessment	Base case
Type of economic evaluation	Cost–utility analysis
Perspective on costs	Public sector
Perspective on outcomes	All health effects on individuals
Evidence on outcomes	Simultaneous synthesis of evidence on multiple interventions
Measure of health effects	QALYs
Main source of data for measurement of HRQL	Reported directly by patients (J Nicholl, personal communication)[a]
Source of preference data for valuation of changes in HRQL	Representative sample of the public (UK population norms)[375]
Discount rate	An annual rate of 3.5% for costs and health effects
Equity weighting	An additional QALY has the same weight, regardless of the characteristics of the individuals who gain the health benefit
Size of the cohort simulated	100,000
Time horizon	100 years – until population all dead to account for all outcomes

a Sources for decision analyses for other interventions are described in *Appendix 5*.

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4. As with most Markov models, we assumed that the probability of future fire-related injuries was independent of previous fires or fire-related injuries and remained constant throughout the model time frame (i.e. 5 years for part 2 of the model). This assumption also applies to models for interventions for TMVs, safety gates and the safe storage of medicines and household products.
5. The model allows for only one fire or fire-related injury in a single cycle (i.e. 1 year). This assumption also applies to models for interventions for TMVs, safety gates and the safe storage of medicines and household products.

Uncertainty

Modelling took account of uncertainty around input parameter point estimates through the use of posterior probability distributions from 5000 MCMC simulations for estimates of the effectiveness of interventions from the NMAs and the use of probability distributions based on point estimates and SEs (see *Appendix 5*) for other model parameters obtained from the literature. The decision model was evaluated by performing 5000 MCMC simulations. Mean costs and mean QALYs were averaged across all 5000 MCMC simulations.

We assessed the robustness of our findings to the assumptions that we made during modelling and to the data that we used to populate models through a series of one-way sensitivity analyses. For interventions to promote functional smoke alarms these included reducing the prevalence of smoke alarms in households prior to interventions from 80% to 50%;[347] reducing the probability of accepting the intervention from 90% to 50%;[347] reducing the probability of the decay of safety equipment from 0.1 to 0; and increasing the number of children per household from 1 to 1.8 (i.e. the national average).[378]

For the decision analyses for interventions to promote a safe hot tap water temperature, sensitivity analyses included increasing the probability of accepting non-TMV interventions from 0.74 to 0.9 (as used in the functional smoke alarm model); reducing the probability to 0 of a child incurring a scald when safe hot water is practised, as for the TMV interventions; removing the fixed costs associated with setting up a scheme to promote safe hot water as promotion of safe hot water is likely to be part of a wider home safety scheme; increasing the number of scalds per year to 653 from 582,700 households[140] to reflect the probability of a scald in children in social housing/deprived areas; and including the costs of TMVs and fitting separately (i.e. not part of a refurbishment or rebuild scheme).[140]

For the decision analyses for interventions to increase the possession of a fitted safety gate, analyses included reducing the number of safety gates fitted to 1; reducing the cost of education by using the cost of providing a leaflet only; providing low-cost (£5) rather than free safety gates; reducing the fixed costs of the intervention to £40,000; increasing the number of children per household from 1 to 1.8; reducing the probability of possessing a fitted safety gate from 0.56 to 0.45 to reflect the baseline possession of a fitted and used stair gate in families in deprived areas of Nottingham;[72] and changing the utility deficits by assuming no uncertainty from 0.05, 0.1 and 0.2 for mild, moderate and severe injuries, respectively, to 0.07, 0.19 and 0.34, respectively.[143]

For the decision analysis for interventions to promote the safe storage of medicines, the sensitivity analyses included changing the baseline probability of safe storage from 75% (ascertained from the results of study A) to 93%[56] or to 50% (assumption); changing the probability that the intervention is accepted from 90% to 50% (assumption); changing the proportion admitted from 63%[379] to 83.3% (Philip Miller, ED nurse, Nottingham University Hospitals NHS Trust, 7 April 2014, personal communication); changing the incidence of unintentional poisoning from 18.07 per 10,000 person-years to 44.9 and 48.5 per 10,000 person-years, reflecting the injury rates among those aged < 5 years living in the two most disadvantaged quintiles based on the Townsend deprivation index;[91] changing the number of cupboard locks from one Pop-It™ lock (costing £2.65) (Kid Rapt, Usk, UK) and one magnetic lock (costing £4.80) to two Pop-It locks (costing £5.30) and two magnetic locks (costing £9.60); increasing the number of children in a household from 1 to 1.8;[378] and increasing the uncertainty associated with the utility decrements for poisoning injuries from 10% of the utility decrement value to, first, 20% and, second, 50%.

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Finally, for the decision analyses for interventions to promote the safe storage of household products, sensitivity analyses included changing the baseline probability of safe storage from 45% (ascertained from the results of study A) to 93%;[56] changing the probability that the intervention is accepted from 90% to 50% (assumption); changing the proportion admitted from 33.2%[2] to 83.3% (Philip Miller, personal communication); increasing the incidence of unintentional poisoning from 12.04 per 10,000 person-years to 44.9 and 48.5 per 10,000 person-years, reflecting the injury rates among those aged < 5 years living in the two most disadvantaged quintiles based on the Townsend deprivation index;[91] and increasing the number of children in a household from 1 to 1.8.[378]

Results

During the period in which the KCS programme was being undertaken, the National Institute for Health Research (NIHR) Health Technology Assessment (HTA) programme commissioned a feasibility study of the effectiveness of a children's centre-based parenting intervention that included first aid.[380] It was therefore decided that the intervention being developed within the KCS programme would not include first aid. The overview of reviews of first aid interventions was completed but did not therefore inform the development of the intervention. The published paper describes the methods and results of that overview[381] but they are not described further in this report.

Fire prevention

Figure 24 shows the process of identification and selection of reviews and primary studies to be included in the overview and in the NMAs for fire prevention interventions (studies H and J). Ten narrative systematic reviews, four meta-analyses (which also included narrative systematic reviews of outcomes not included in meta-analyses) and 63 primary studies were included in the overview. Thirty of the 63 primary studies were included in at least one NMA for fire prevention outcomes. For the overview of fire prevention interventions, search results from bibliographic databases were combined for reviews and primary studies, and so the flow chart for the process of study selection for fire prevention interventions is less detailed than that for the other overviews.

Figure 25 shows the process and selection of primary studies included in the systematic review and PMAs of home safety education and safety equipment for fire, scalds, falls and poisoning prevention outcomes (study I). Thirty-three studies were included in at least one meta-analysis for the fire prevention outcomes.

Characteristics of reviews and primary studies

The characteristics and quality assessment of the reviews included in the fire prevention overview (study H) are shown in *Table 71*. Four reviews focused specifically on fire prevention interventions,[37,353,354,391] with the remainder including interventions addressing a range of injury mechanisms. The risk of bias in included reviews was variable, with OQAQ scores ranging from 2 to 7 (median 5) out of a maximum possible score of 7.

The characteristics of the primary studies included in the fire prevention overview (study H), the systematic review and PMA (study I) and the NMAs (study J) are shown in *Table 72*. Most ($n = 42$, 67%) primary studies were RCTs, seven (11%) were non-RCTs, 10 (16%) were CBAs and three (5%) were case–control studies. The design of one (2%) study was insufficiently described to distinguish whether it was a non-RCT or a CBA. Tables of excluded reviews and primary studies are available on request from the authors.
The risk of bias in the included primary studies was also variable; 43% of RCTs had adequate allocation concealment, 53% followed up at least 80% of participants in each arm and 31% had blinded outcome assessment. Of the non-RCTs and CBAs, 12% had blinded outcome assessment, 47% followed up at least 80% of participants in each arm and 29% had a balanced distribution of confounders between treatment arms. The case–control studies scored 7, 7 and 8 (out of a maximum of 9) on the Newcastle–Ottawa Scale, indicating that they were of high quality.

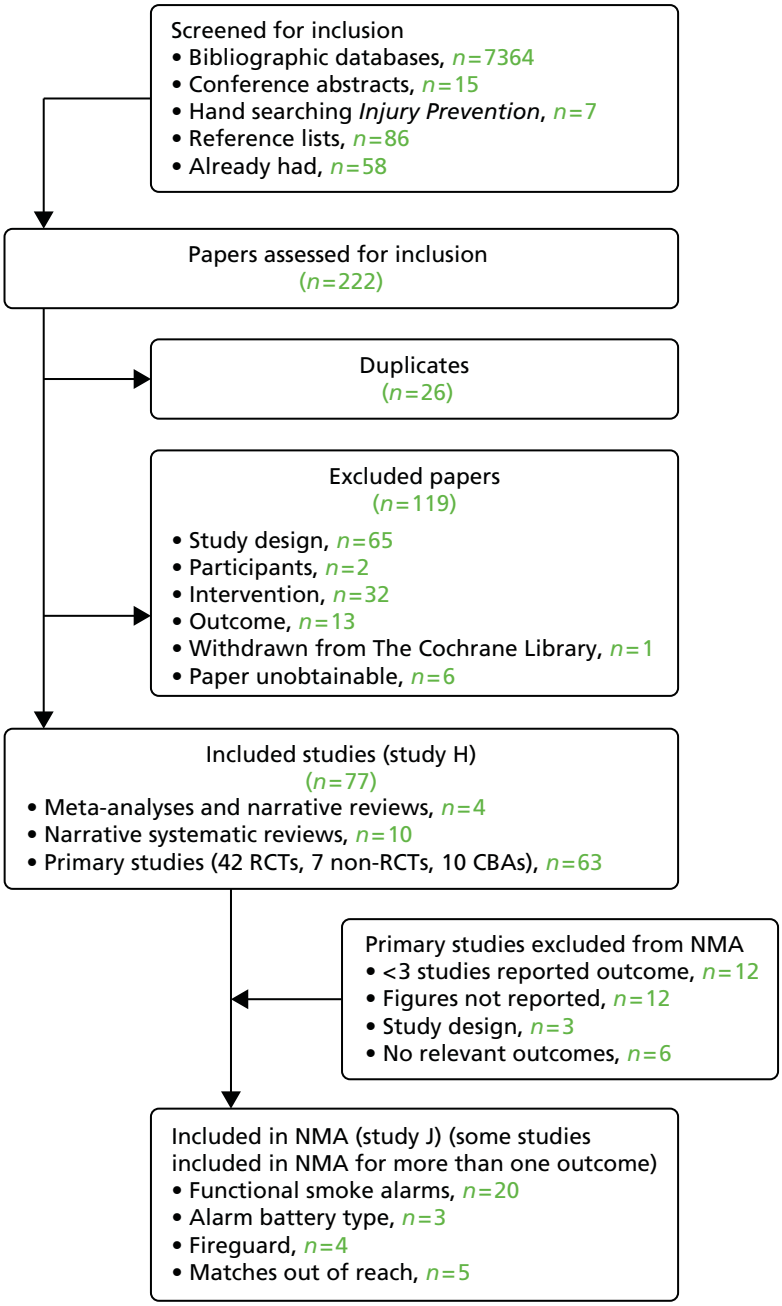


FIGURE 24 Process of study identification and selection for the overview of reviews and NMAs for fire prevention outcomes (studies H and J). Created using data from Cooper *et al.*[374]

Reducing fire-related injuries

Study H

The overview included nine systematic reviews reporting interventions to prevent fire-related injuries,[33,36,37,41,353,354,384,387,391] which, between them, drew on data from only four primary studies. No meta-analyses that reported the effect of interventions on fire-related injuries were found. The reviews found two case–control studies reporting the risk of injury or death in homes with and without smoke alarms. Both found a two- to threefold increase in the odds of a fatal house fire compared with a non-fatal house fire in households with smoke alarms.[50,425] The reviews found inconsistent or insufficient evidence about whether or not interventions promoting smoke alarms were associated with a reduction in fire-related injuries, from one RCT[261] and one CBA.[423] The CBA reported an increased prevalence of smoke alarm use, which was also associated with a reduction in fire-related injuries.[423] This finding was not

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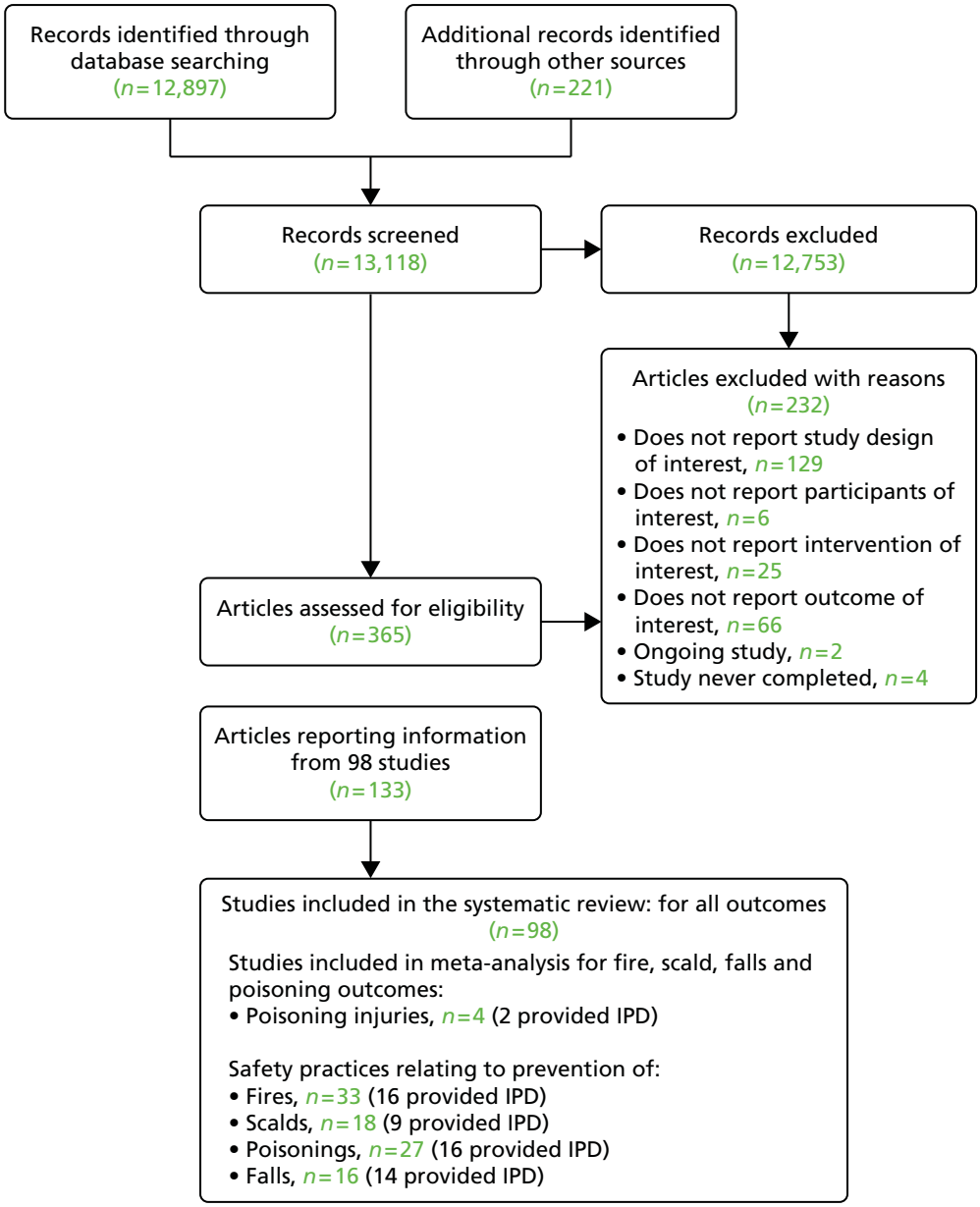


FIGURE 25 Identification and selection of studies for inclusion in the PMAs for fire, scalds, falls and poisoning prevention (study I). IPD, individual participant data. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

confirmed by the RCT, but this may be explained by the ineffectiveness of the intervention in the trial, as there was no significant increase in the prevalence of smoke alarm use.[261]

Two case–control studies explored the odds of fatal house fires related to smoking and alcohol use.[50,394] The first found significant increases in the risk of a fatal house fire when smoking was the source of ignition of the fire and when household members were impaired by drugs or alcohol.[50] The second found a significantly greater risk of a fatal household fire among households with smokers than among those with non-smokers, a dose–response relationship with the number of smokers in the household and an increased risk with smoking 10–19 cigarettes per day or $\geq$ 20 cigarettes per day compared with non-smokers. The same study found no significant association between the number of alcoholic drinks consumed per household member and risk of fatal house fire.[394]

TABLE 71 Characteristics of reviews included in the overviews for fire, scald, falls and poison prevention (study H)

Study	Design	Interventions	OQAQ score	Included in overview			
				Fi	S	Fa	P
Bass 1993[382]	Narrative review of RCTs and non-RCTs	Injury prevention counselling in primary care settings	4	■	■		
DiGuiseppi 2000[40]	Narrative review and meta-analysis of RCTs	Individual-level interventions delivered in clinical settings, including primary care and acute care	6	■	■		■
DiGuiseppi 2001[37]	Narrative review and meta-analysis of RCTs and non-RCTs	Mass media, counselling, home safety checks, provision of equipment and legislation delivered in clinical settings, homes and schools	6	■			
Elkan 2000[383]	Narrative review and meta-analysis of RCTs, non-RCTs and CBAs	Home visiting by British health visitors or personnel with responsibilities within the remit of British health visitors	5	■	■	■	■
Guyer 2009[338]	Narrative review of experimental and quasi-experimental designs	Counselling, safety equipment and home visits delivered by GPs, community health workers and paediatricians	4		■	■	■
Kendrick 1994[384]	Narrative review of studies of all designs	Education, counselling, provision of safety equipment, home visits and legislation	2	■			
Kendrick 2007[385]	Narrative review and meta-analysis of RCTs, non-RCTs and CBAs	Individual and group-based parenting interventions	7		■		■
Kendrick 2007[33]/ 2012[49]	Narrative review and meta-analysis of RCTs, non-RCTs and CBAs	Home safety education and provision of safety equipment delivered by health or social care professionals, school teachers, lay workers or voluntary or other organisations in health-care settings, schools and homes	7	■	■	■	■
Lyons 2003[332]	Narrative review of RCTs, non-RCTs, CBAs and ITS	Reduction of physical hazards in the home by community health workers, trained researchers/volunteers, GPs and paediatricians	7		■	■	■
Lyons 2006[42]/Turner 2011[340]	Narrative review of RCTs	Education, safety equipment and reduction of hazards delivered by community nurses, trained researchers, project assistants, occupational therapists and health visitors in home, health-care and clinical settings	5	■	■	■	■
McClure 2005[333]	Narrative review of CBAs and BAs	Injury counselling and household injury hazard identification delivered by paediatricians and health staff in community settings	4			■	
Nilsen 2004[334]	Narrative review of CBAs	Education, home safety inspection and environmental improvements delivered by paediatricians, local health staff and school staff in community settings	3			■	■
Nixon 2004[336]	Narrative review of CBAs and RCTs	Targeted education, household hazard identification and control, promotion of poison control telephone information service delivered by paediatricians and local health staff in community settings	3				■
Parbhoo 2010[386]	Narrative review of studies of all designs	Any strategy to reduce paediatric burns	3		■		

continued

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TABLE 71 Characteristics of reviews included in the overviews for fire, scald, falls and poison prevention (study H) (*continued*)

Study	Design	Interventions	OQAQ score	Included in overview			
				Fi	S	Fa	P
Pearson 2009[387]	Narrative review of RCTs, non-RCTs, CBAs and BAs	Supply and/or installation of home safety equipment and/or home risk assessments delivered by GPs, doctors, nurses, research assistants, paediatricians, community health workers and health visitors in various settings	5	■	■	■	■
Speller 1995[41]	Narrative review of studies of all designs	Education by paediatricians, GPs and trained interviewers in any setting	4	■		■	
Spinks 2004[335]	Narrative review of CBAs and RCTs	Counselling and hazard identification by paediatricians and health staff in community settings	4			■	■
Ta 2006[391]	Narrative review of studies of all designs	Counselling, education, safety equipment provision, home safety checks, safety centre referrals and arson prevention campaigns delivered by fire service professionals, physicians, teachers, community health workers and volunteers in all settings	4	■			
Towner 1996[352]	Narrative review of RCTs, non-RCTs, CBAs and ITS	Education, safety equipment and home visits delivered by paediatricians, local health staff and school staff in any setting	4			■	■
Towner 2001[36]	Narrative review of RCTs, non-RCTs, CBAs and BAs	Home safety inspection, modification and education delivered by paediatricians, local health staff, school staff and community outreach workers in any setting	2	■	■	■	■
Turner 2004[337]	Narrative review of non-RCTs and CBAs	Community-based interventions to reduce burns and scalds in children	7		■		
US Preventive Services Task Force 1996[388]	Narrative review of RCTs, non-RCTs and CBAs	Counselling in clinical settings to prevent household and recreational injuries	2		■		■
Warda 1999[353]	Narrative review of studies of all designs	Modifiable risk factors for fires – smoke alarms, smoking, alcohol use and drug use (did not directly evaluate interventions)	5	■	■		
Warda 1999[354]	Narrative review of studies of all designs	Education, counselling, safety equipment provision, home safety checks and legislation delivered in all settings	5	■	■		
Waters 2001[331]	Narrative review of studies of all designs	Education and environment modification targeted to individuals and communities and applicable to the Australian situation	3	■	■	■	■

BA, before-and-after study; Fa, falls; Fi, fires; ITS, interrupted time series; P, poisoning; S, scalds.
Using data from Young *et al.*,[48] Zou *et al.*[389] and Wynn *et al.*[390]

TABLE 72 Characteristics of the primary studies included in all overviews (study H), PMAs (study I) and NMAs (study J) for fire, scalds, falls and poisoning prevention

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Adler 1994[392]	RCT A = Y; B = N; F = N	Children aged 5–16 years with a history of fire setting or fire play (n = 138)	I_1 = educational material, two home visits by firefighters to provide education, behaviour modification, parental instruction in use of negative consequences in the event of fire setting, plotting events leading up to an incident and discussing alternative ways of responding to incidents in future I_2 = as I_1 plus offer of psychiatric referral C_1 = fire safety educational material C_2 = fire safety educational material plus offer of psychiatric referral												
Azeredo 2003[393]	CBA B = N; F = U; BC = U	Children attending kindergarten classes (grades 1–5) in 12 schools (n = approx. 6300)	I = multifaceted injury prevention curriculum in schools, including fire safety education and smoke alarm giveaway and installation C = opportunity to have a smoke alarm installed												
Babul 2007[257]	RCT A = Y; B = N; F = N	Parents of newborn infants at a general hospital serving mainly urban or suburban communities (n = 600)	I_1 = home visit from community health nurse to identify hazards and teach parents how to remove or modify the hazards; free safety kit (smoke alarm, safety gate 50% discount coupon, table corner cushions, cabinet locks, blind cord wind-ups, water temperature card, doorstoppers, electrical outlet covers, poison control sticker); instructional brochure targeting falls, burns, poisoning and choking; risk assessment checklist I_2 = free safety kit (see I_1) C = usual care												

continued

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TABLE 72 Characteristics of the primary studies included in all overviews (study H), PMAs (study I) and NMAs (study J) for fire, scalds, falls and poisoning prevention (*continued*)

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Ballard 1992[394]	Case–control study NOS score: 7	Households with fatal or non-fatal residential fire injury ($n = 372$)	Exposures = smoking and alcohol drinking behaviour												
Barone 1988[395]	RCT A = N; B = N; F = N	Five parenting classes ($n = 108$ parents of toddlers)	I = slides, handouts on burn prevention, bathwater thermometer, hot water gauge, usual safety education C = usual safety education												
Baudier 1998[396]	RCT A = U; B = U; F = N	Infant schoolchildren from 42 schools and their parents ($n = 494$ parents)	Exploratory phase in two schools: I = use of safety teaching kit by teachers in schools, cartoon book and sticker given to children to take home, weekly posters displayed on classroom doors to inform parents, exhibition in school hall, leaflets distributed, meeting held with parents about the risk of accidents discussed in school C = none of the above. Operational phase in 40 schools: I = provision to schools of safety teaching kit with user guide, leaflets, stickers, posters, suggestion of a mini exhibition, meeting with parents (six took place in 20 schools with parent participation at meetings ranging from 0% to 20%) C = none of the above												
Blake 1993[397]	NRCT/CBA B = U; F = N; BC = U	Parents in two inner-city health clinics ($n = 171$)	I = educational video to increase awareness of accident prevention C = no video												

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Bulzacchelli 2009[398]	NRCT B = N; F = N; BC = N	Parents of children aged 1 month to 7 years attending a well-child clinic in low-income urban communities ($n = 294$)	I_1 = prescribed visit to mobile safety centre for safety advice, interactive safety exhibits and provision of safety devices at reduced cost (safety gates, cabinet locks, referral to fire department for free smoke alarm installation) I_2 = encouraged to visit mobile safety centre C = told about purpose of mobile safety centre and given more information on request but not referred to centre	■			■	■			■	■			■
Campbell 2001[399]	RCT A = U; B = Y; F = N	Hispanic migrant youths aged 11–16 years, low income ($n = 660$)	I = eight sessions of multimedia first aid and home safety training presented by bilingual and bicultural college students C = eight sessions of multimedia tobacco and alcohol prevention education presented by bilingual and bicultural college students	■			■	■			■	■			■
Carlsson 2011[400]	NRCT B = U; F = N; BC = N	Mothers with low educational level with 4- to 7-month-old babies attending two child health-care centres ($n = 99$)	I = 30- to 60-minute workshop discussing burn and scald prevention and a 1-hour home visit with researcher covering child injury prevention C = usual care		■	■									
Chan 2004[401]	RCT A = U; B = U; F = U	Families in two districts of Hong Kong with children aged < 3 years admitted to hospital with an unintentional injury ($n = 76$)	I = four quarterly home visits and monthly telephone follow-ups from lay home visitors focusing on practical solutions to injury prevention and standard educational material on injury prevention C = standard educational material on injury prevention	■	■	■									

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TABLE 72 Characteristics of the primary studies included in all overviews (study H), PMAs (study I) and NMAs (study J) for fire, scalds, falls and poisoning prevention (*continued*)

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Christakis 2006[402]	RCT A = Y; B = Y; F = Y	Parents of children aged < 11 years attending clinics in the previous 3 years (n = 887)	I_1 = web-based safety information for parents plus notification to health-care provider of safety topics that parents had expressed an interest in online and information on those topics I_2 = notification to health-care provider of safety topics that parents had expressed an interest in online and information on those topics I_3 = web-based safety information for parents C = usual care		■								■		
Clamp 1998[71]	RCT A = Y; B = N; F = Y	Families with children aged < 5 years registered at one GP surgery (n = 165)	I = GP safety advice, leaflets and low-cost safety equipment (smoke alarms, window locks, cupboard and drawer catches, socket covers, door slam devices, fireguards, stair gates). Discounted items offered to families in receipt of means-tested state benefits (36.1%) C = usual care	■		■	■	■		■	■	■		■	■
Colver 1982[260]	RCT A = U; B = U; F = N	Families with children aged < 5 years attending child health clinics, day nurseries, nursery classes and a toddler group in a deprived area (n = 80)	I = encouraged to watch television safety campaign, home visit, advice on benefits to obtain safety equipment and local availability of safety equipment C = encouraged to watch television safety campaign		■	■	■	■							
Davis 1987[403]	RCT A = U; B = N; F = N	41 grade 4–6 classes (n = 857)	I = six 1-hour fire safety lessons with workbook, demonstrations, teacher training, materials and take-home materials for parents C = usual lessons	■											

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Dershewitz 1977[404]/ 1979[405]	RCT A = U; B = Y; F = N	Mothers of children attending a medical clinic enrolled in prepaid medical plan ($n = 308$)	I = safety advice, safety booklet and free safety equipment provided by researcher C = free safety equipment provided by researcher	■			■	■			■	■			■
DiGuiseppi 2002[261]	RCT A = Y; B = Y; F = N	Households in council rented accommodation ($n = 2145$)	I = free smoke alarm with offer of free fitting and reminder to change batteries C = no smoke alarm	■				■				■			
Fergusson 1982[263]	NRCT B = U; F = Y; BC = Y	Families of children aged 2–3 years participating in the Christchurch Child Development Study ($n = 1126$)	I = 'Mr Yuk' stickers for poisonous substances, list of substances to which stickers should be attached and educational leaflet provided by researcher C = none of the above				■				■				
Franklin 2002[406]	CBA B = U; F = U; BC = N	Children and young people aged 4–17 years referred from the county court system, fire departments, schools and parents after fire-setting behaviour ($n = 252$)	I = 1-day multidisciplinary programme with interactive content focusing on impact of fire-setting behaviour including peer counselling approach C = no programme	■											
Gaffney 1996[407]	CBA B = U; F = U; BC = U	Populations of unspecified control and intervention areas (n not reported)	I = multifaceted community campaign to reduce risk factors and the rate of hot water scalds in children aged 0–4 years C = no campaign		■										
Garcia 1996[408]	CBA (C) B = U; F = U; BC = U	Fourth-grade elementary schoolchildren and their parents ($n = 3904$)	I = safety fair at schools, which included interactive safety stations on poisons, fires and home injuries C = no safety fairs				■								

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Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Georgieff 2004[264]	CBA B = U; F = N; BC = N	Children aged < 3 years from five deprived wards ($n = 92$)	I_1 = awareness-raising campaign including leaflets, logo, radio advert campaign, bus advertising campaign, burns and scalds road shows (advice) – free bathwater thermometers and hot tap water temperature testing by researchers $I_2 = I_1$ + free TMV for baths C = none of the above		■				■				■		
Gielen 2001[409]	RCT A = Y; B = Y; F = N	Paediatric residents in a hospital-based clinic serving a low-income community ($n = 31$)	I = 1-hour injury prevention seminar plus 5 hours of injury prevention training C = 1-hour injury prevention seminar	■								■			
Gielen 2002[265]	RCT A = U; B = U; F = U	First- and second-year paediatric residents and their patient–parent dyads, low-income population of parents of children aged 0–6 months ($n = 187$)	I = safety counselling by professional health educator, discounted home safety equipment during visit to Children's Safety Centre, home visit involving hazard assessment (targeting falls, burns and poisonings) and safety recommendations C = safety counselling by professional health educator, discounted home safety equipment during visit to Children's Safety Centre	■	■	■	■	■	■	■	■	■	■	■	■
Gielen 2007[266]	RCT A = Y; B = ; F = Y	Parents of children aged 4–66 months attending an urban paediatric ED ($n = 901$)	I = personalised report containing tailored, stage-based messages based on the precaution adoption process model C = report on other child health topics	■		■	■	■		■	■	■		■	■

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Gomez-Tromp 2011[410]	CBA B = U; F = U; BC = U	Children aged 9–13 years in 35 schools (n = 1260)	I = scalds prevention programme consisting of seven lessons, a DVD, a workbook for each pupil and a downloadable teacher's manual C = waiting list for the above		■	■									
Guyer 1989[267]	CBA B = U; F = Y; BC = N	Population of 14 cities and towns in Massachusetts (n = 286,676)	I = community injury prevention programme including injury counselling by paediatricians to parents of young children and home safety inspections C = no community injury prevention programme	■		■	■								
Harvey 2004[268]	RCT A = U; B = N; F = N	Households without smoke alarms in areas with a high prevalence of residential fire deaths and a low prevalence of functional smoke alarms; primarily low-income residents and/or high proportion of rented housing (n = 4455)	I = smoke alarm installation C = voucher for free smoke alarm	■								■			
Hendrickson 2005[269]	RCT A = N; B = N; F = Y	Mothers with children aged 1–4 years, predominantly Mexican/Mexican American (n = 82)	I = safety counselling from researchers, identification of home hazards, provision of safety equipment (doorknob covers, smoke detectors or new batteries if smoke alarm already in situ, fire extinguisher, cabinet latches and outlet covers) C = none of the above	■	■	■	■	■	■	■	■	■	■	■	■

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Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Hillman 1986[411]	RCT A = U; B = U; F = Y	Second-, third- and fourth-grade school students ($n = 60$)	I_1 = fire response training provided by undergraduate and postgraduate students including rationale for responses and behavioural practice I_2 = fire response training provided by undergraduate and postgraduate students including rationale for responses and verbal practice I_3 = fire response training provided by undergraduate and postgraduate students without rationale for responses and behavioural practice I_4 = fire response training provided by undergraduate and postgraduate students without rationale for responses and verbal practice												
Hwang 2006[412]	CBA B = N; F = U; BC = Y	Third- and fourth-grade students in two elementary schools in an urban, poor community ($n = 150$)	I = home visit from fire service personnel and installation of free smoke alarm with 10-year battery plus provision of fire escape plan C = usual care												
Jenkins 1996[270]	RCT A = Y; B = Y; F = Y	Families with children aged 0–17 years admitted to a paediatric burns unit ($n = 141$)	I = education pre discharge from nurses, physiotherapists or occupational therapists about burn care and prevention using specially designed booklet C = routine discharge teaching without booklet												
Johnston 2000[271]	RCT A = N; B = N; F = Y	Families of children aged 4–5 years enrolled in Head Start programme provided to socioeconomically disadvantaged children ($n = 418$)	I = home safety inspections by educational paraprofessionals followed by provision of educational materials and syrup of ipecac[a] and smoke alarms and batteries as appropriate C = home safety inspection and written information only												

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Johnston 2006[413]	NRCT (I_1 + I_2 vs. C) with nested RCT (I_1 vs. I_2) B = U; F = N; BC = N	Pregnant women at < 22 weeks' gestation (n = 343)	I_1 = three home visits during pregnancy including home safety information; well-child visits enhanced by the addition of a 'Healthy Steps' professional I_2 = well-child visits enhanced by the addition of a 'Healthy Steps' professional C = usual care			■	■								■
Jones 1983[414]	RCT A = U; B = U; F = Y	Third-grade students (n = 47)	I_1 = external instruction (children trained in fire responses) I_2 = self-instruction (children trained in fire responses plus trained to verbalise, monitor, evaluate and reinforce their behaviour)	■	■										
Jones 1989[415]	RCT A = U; B = U; F = Y	Third-grade students (n = 46)	I_1 = training in fire response skills including provision of rationale for why responses are appropriate I_2 = training in fire response skills	■	■										
Jordan 1993[416]	Cohort NOS score: 9	Pregnant/parenting mothers aged < 18 years at birth of child who gave birth in Baltimore in 1983 (n = 529)	Exposure = receipt of home safety information from any source			■	■								
Katcher 1989[272]	RCT A = U; B = U; F = N	Consecutive paediatric clinic clients randomised to two groups (n = 697)	I = counselling by paediatrician plus tap water thermometer and tap water safety literature C = counselling by paediatrician and tap water safety literature		■				■				■		
Kelly 1987[273]	RCT A = U; B = Y; F = N	Parents of 6-month-old children attending primary care centre for well child care (n = 129)	I = three-part individualised safety course at well-child care visits C = routine safety education	■	■	■	■	■	■	■		■	■	■	■

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				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Kelly 2003[274]	RCT (C) A = U; B = Y; F = Y	Parents of children aged 15 months to 6 years attending women, infants and children clinics ($n = 289$)	I = videotape and PCC pamphlet and PCC stickers C = usual care												
Kendrick 1999[275]	NRCT B = N; F = N; BC = Y	Children aged 3–12 months registered at 36 general practices ($n = 2119$)	I = health visitor safety advice at child health surveillance consultations, provision of low-cost equipment (stair gates, fireguards, cupboard and drawer locks, smoke alarms), home safety checks and first aid training C = usual care												
Kendrick 2005[417]	RCT A = Y; B = N; F = Y	Women at ≥ 28 weeks' gestation registered at 64 general practices ($n = 1174$)	I = discussion and advice from midwife and health visitor on walker use, checklist, anonymised parental accounts of walker injuries, postcard, fridge magnet, birthday card, signing of a plan of action C = usual care												
Kendrick 2007[418]	RCT A = Y; B = Y; F = Y	Children aged 7–10 years in state-funded primary schools ($n = 459$)	I = injury prevention curriculum targeting falls, poisonings, fires and burns delivered by school teachers trained by fire service personnel C = usual care												
Kendrick 2011[276]	RCT A = Y; B = Y; F = Y	Households with children aged < 5 years in social housing in disadvantaged communities ($n = 124$)	I = TMV fitted by qualified plumber and educational leaflets prior to and at the time of fitting C = usual care												
King 2001[277]	RCT A = Y; B = Y; F = Y	Children aged < 8 years attending an ED for injury or medical complaint ($n = 1172$)	I = home safety inspection, information on correcting any deficiencies, discount vouchers for safety equipment, demonstrations of use of safety devices and information on preventing specific injuries provided by researcher C = home safety inspection and safety pamphlet												

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Kolko 2001[419]	NRCT B = N; F = Y; BC = N	Boys referred for services by the City of Pittsburgh Bureau of Fire (n = 54)	I_1 = cognitive–behavioural therapy designed to encourage behaviours other than fire setting I_2 = fire safety education including instruction in fire safety skills, prevention practices, fire protection and evacuation C = home visit by firefighter providing information about the danger of fires and the function of firefighters and asking children to promise not to get involved in unsanctioned fire play	■											
Lacouture 1978[420]	CBA (C) B = N; F = U; BC = Y	Schoolchildren aged 6–14 years in Wilmington (intervention) and Scituate (control), Massachusetts (n = 400)	I = community poison prevention education programme directed at schoolchildren C = no community poison prevention education programme				■								
Lamb 2006[421]	CBA B = Y; F = U; BC = U	Children from primary schools in four education authorities aged 10–11 years (n = 145, with follow-up study to assess changes over time in 671 children)	I = one 2-hour visit to 'Lifeskills' experiential learning centre C = no visit to centre	■											
LeBailly 1990[279]	NRCT B = U; F = N; BC = U	Families attending two paediatric group practices, one in urban area, other in suburban area (n = 407)	I_1 = well child visit and safety equipment I_2 = well child visit, safety equipment and safety counselling by physician I_3 = well child visit and safety counselling by physician C = well child visit	■			■								

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				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
LeBlanc 2006[99]	Case–control NOS score: 7	Children aged ≤ 7 years presenting to an ED with injuries from falls, burns or scalds, ingestions or choking matched to children who presented during the same period with acute non-injury-related conditions ($n = 692$)	Exposures = tap water temperature > 54°C, kettle or appliances with dangling cords, no stove guard		■		■								
Macarthur 2003[422]	Cohort NOS score: 6	Parents or guardians of children aged < 9 years ($n = 504$)	Exposed group = campaign (media, retail and community partners) emphasising lowering hot water tap temperature, child safety in the kitchen, keeping hot drinks away from child and checking smoke alarms regularly Unexposed group = none of the above		■										
Mallonee 1996[423]/ 2000[281]	CBA B = N; F = Y; BC = N	Population of a 24-square mile area of Oklahoma City (intervention area) and population of the rest of Oklahoma (control area) ($n = 213,607$ dwellings)	I = distribution of smoke alarms door to door by volunteers and community agencies to homes without a smoke alarm C = no smoke alarm distribution	■											
Margolis 2001[424]	Cohort NOS score: 7	Low-income pregnant mothers and their infants aged < 2 years in Durham, North Carolina ($n = 317$)	Exposed group = two to four home safety checks per month through the infant's first year of life providing parental education on child health and development and injury prevention Unexposed group = usual care (women who had sought prenatal care during the 9 months before the programme's initiation)		■										
Marshall 1998[425]	Case–control NOS score: 7	All fatal residential fires in North Carolina over a 1-year period ($n = 155$)	Exposures = presence of one or more potential rescuers, presence of a functioning smoke detector	■											

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Matthews 1988[426]	NRCT B = U; F = Y; BC = U	Mothers of toddlers recruited from clinics, day care centres ($n = 26$)	I = home safety inspection, video, handouts, modelling regarding safety and managing dangerous child behaviour, hot water thermometers, choke tube C = home visit with video, handouts, modelling on language simulation	■				■				■			
McDonald 2005[282]	RCT A = Y; B = ; F = N	Parents of children aged 6 weeks to 24 months attending well child clinic ($n = 144$)	I = tailored safety advice in kiosk in well child clinic, feedback report to paediatrician to encourage safety counselling, information on safety equipment savings at child safety centre C = usual care	■		■	■	■		■	■				■
Miller 1982[284]	NRCT B = U; F = Y; BC = Y	Children attending for routine paediatrician health care ($n = 240$)	I = pamphlet and a 1-minute educational message from paediatrician plus low-cost smoke detector C = usual care	■				■				■			
Minkovitz 2003[427]	RCT A = N; B = Y; F = N	Children aged ≤ 3 years ($n = 2235$)	I = Healthy Steps programme for the first 3 years of life including extended well-child office visits to address questions and concerns about child development and behaviour and to promote positive parent–child interactions, home visits to promote intellectual and emotional development, child development telephone line, parent support groups and written health promotion information including safety advice. Programme delivered by paediatricians and Healthy Steps specialists (nurses, nurse practitioners, social workers and early childhood educators) C = usual care		■		■		■		■		■		■

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				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Minkovitz 2003[427]	NRCT B = N; F = Y; BC = N	Children aged ≤ 3 years (n = 3330)	As previous entry		■		■								■
Mock 2003[285]	CBA B = N; F = N; BC = N	Families attending private, low-fee and subsidised child health clinics in Mexico (n = 1124)	I_1 (private clinics) = lectures and demonstrations lasting for 6 hours. Use of audio visual material including the Injury Prevention Program I_2 (low-fee clinics) = I_1 + some participants also received clinic-based counselling I_3 (subsidised clinics) = half-hour household visits by nurses + audio visual materials used C = standard injury prevention counselling	■	■	■		■	■	■		■	■	■	
Mori 1986[428]	RCT A = U; B = Y; F = U	Preschool children aged 3–5 years (n = 30)	I_1 = children instructed by preschool teachers who had received home safety manual and professional supervision I_2 = children instructed by preschool teachers who had received home safety manual	■											
Mueller 2008[286]	RCT A = N; B = N; F = Y	Households with low to mid-level income (n = 750)	I_1 = installation of ionisation alarm, maintenance instructions given and fire extinguisher provided I_2 = installation of photoelectric alarm, maintenance instructions given and fire extinguisher provided	■								■			
Nansel 2002[287]	RCT A = Y; B = U; F = Y	Parents of children aged 6–20 months attending well child check (n = 213)	I = tailored computer-generated safety advice in well child clinic C = generic computer-generated safety advice in well child clinic	■	■	■		■	■	■			■	■	

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Nansel 2008[288]	NRCT B = N; F = N; BC = N	Parents of children aged ≤ 4 years attending well child visits at three paediatric clinics with mainly low- to middle-income patients ($n = 305$)	I_1 = tailored injury prevention advice I_2 = tailored injury prevention advice and feedback to health-care provider C = generic injury prevention advice												
Odendaal 2009[289]	RCT A = N; B = Y; F = Y	Households with children aged ≤ 10 years living in low-income communities ($n = 211$)	I = home safety check, safety advice, free safety devices (insulation tape for connecting electrical cords, safety nails for attaching electrical cords to walls or floors, paraffin storage container with CRC and warning label and bag and hook for safe storage of poisonous substances) C = usual care												
Paul 1994[292]	RCT A = U; B = U; F = N	Families with children aged 10 months to 2 years born at a local rural hospital ($n = 198$)	I = home safety check, tailored education booklet, local safety equipment retail outlets identified, mail order addresses provided or equipment ordered through research team and made available at local hospital C = none of the above												
Peterson 1984[429]	CBA B = Y; F = Y; assessment of balance of confounders not possible because of small numbers	Children who were occasionally left without parental supervision ($n = 8$)	I_1 = training on a range of emergency situations I_2 = training on a range of emergency situations as in I_1 but timed so that I_2 could act as control for I_1												

continued

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TABLE 72 Characteristics of the primary studies included in all overviews (study H), PMAs (study I) and NMAs (study J) for fire, scalds, falls and poisoning prevention (*continued*)

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Petridou 1997[293]	CBA B = N; F = Y; BC = Y	Random sample of households containing children or adolescents from towns on two Greek islands (*n* = 349)	I = community intervention including safety seminars for parents, courses with primary and secondary schoolchildren on safety and resuscitation and leaflets; focused intense intervention including lay home visitors and weekly visits to discuss home safety in households with children or older people C = none of the above												
Phelan 2009[430]/ 2011[431]	RCT A = Y; B = N; F = Y	Pregnant women, aged ≥ 18 years, < 19 weeks' gestation, attending prenatal practices (*n* = 355)	I = home safety inspection, provision and fitting of free safety equipment (stair gates, non-slip matting under rugs, window guards, repair of stair handrails, cupboard/drawer locks, doorknob covers, storage bins, socket covers, smoke detectors, carbon monoxide detectors, stove guards, stove locks) and safety advice handout C = safety advice handout												
Posner 2004[295]	RCT A = Y; B = Y; F = N	Caregivers of children aged < 5 years attending an ED for a home injury (*n* = 96)	I = home safety counselling by trained lay personnel, home safety kit (cupboard and drawer locks, socket covers, bathtub spout covers, non-slip bath decals, bathwater thermometer, PCC number stickers, free small parts tester) and home safety literature C = home safety literature												
Reich 2011[432]	RCT A = Y; B = Y; F = Y	Low-income primiparous women (*n* = 198)	I = educational book containing information on home safety C1 = book with non-educational text C2 = no book												

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Rowland 2002[433]	RCT A = Y; B = N; F = Y	Households from a local authority housing estate (n = 2145)	I_1 = ionisation smoke alarm with a zinc battery I_2 = ionisation smoke alarm with a zinc battery and pause button I_3 = ionisation smoke alarm with a lithium battery and pause button I_4 = optical smoke alarm with a lithium battery I_5 = optical smoke alarm with a zinc battery												
Runyan 1992[50]	Case–control study NOS score: 8	Fatal and non-fatal residential fires in predominantly rural areas (n = 434 fires)	Exposures = smoke detector and other characteristics of house, characteristics of people in house, fire response system and characteristics of fire												
Sangvai 2007[297]	RCT A = Y; B = N; F = N	Parents of children aged 0–5 years enrolled at three paediatric practices (n = 319)	I = safety counselling from physician and researcher, free safety equipment (smoke detectors, gun locks, cabinet locks and water temperature cards) and brief educational handout for parents C = usual care												
Scherz 1968[434]	CBA (C) B = U; F = U; BC = U	Families of army personnel (n not reported)	I = free CRC attached to boxes of children's aspirin, sold at Post Exchanges C = children's aspirin sold at other sites without CRC attached												
Schwarz 1993[300]	CBA B = N; F = N; BC = Y	Population of nine census tracts, predominantly low income, urban, African American (n = 34,203)	I = home safety inspection, modification and education in homes and at block and community meetings; provision of syrup of ipecac, smoke alarms and batteries, bathwater thermometers, night lights, emergency centre number sticker and fridge sticker with information on preventing injury C = none of the above												

continued

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TABLE 72 Characteristics of the primary studies included in all overviews (study H), PMAs (study I) and NMAs (study J) for fire, scalds, falls and poisoning prevention (*continued*)

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Schwebel 2009[301]	RCT A = U; B = U; F = Y	Female heads of household in two low-income housing districts ($n = 238$)	I = basic education and materials on safe use of kerosene and kerosene-powered appliances and treatment of kerosene-related injuries provided by trained paraprofessionals C = usual care												
Shapiro 1987[435]	RCT A = U; B = U; F = Y	Women admitted to the maternity wards of three hospitals ($n = 604$)	I = pamphlet about tap water scalds and thermometer for testing plus a 1-minute educational message summarising the pamphlet C = pamphlet and thermometer												
Smith 2006[436]	RCT A = U; B = N; F = U	Children aged 6–12 years ($n = 24$)	I_1 = parent voice smoke alarm I_2 = conventional smoke alarm												
Steele 1985[437]	CBA (C) B = U; F = U; BC = U	Populations of Escondido (intervention, $n = 62,000$) and Chula Vista (control, $n = 75,000$), California	I = community poison prevention programme including mass media, training of health-care personnel to provide poison prevention education to clients, safety fairs C = no community poison prevention programme												
Steele 1985[437]	RCT A = U; B = U; F = U	Parents of children aged 6 months to 4 years attending well baby clinics, primary caretakers aged ≥ 18 years, English speaking with a telephone available (n not reported)	I_1 = one-to-one poisoning education with reinforcement by physician $I_2 = I_1$ + burns education I_3 = one-to-one burns education with reinforcement by physician C = no education												
Swart 2008[303]	RCT A = N; B = Y; F = Y	Households with children aged < 10 years in low-income communities ($n = 410$)	I = home visits with safety advice on the prevention of burns, poisoning and falls; free safety devices (childproof locks and paraffin container safety caps) C = usual care												

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Sznajder 2003[304]	RCT A = Y; B = N; F = Y	Socioeconomically disadvantaged families with medical or psychological difficulties that place them at high risk ($n = 100$)	I = free home safety kit (cupboard and drawer locks, door handle covers, furniture corner protectors, socket covers, non-slip bath mat, smoke alarms, PCC number stickers), home safety counselling by health professionals and safety leaflets C = home safety counselling by health professionals and safety leaflets	■	■	■	■			■	■	■	■	■	■
Tan 2004[438]	NRCT B = U; F = Y; BC = Y	Caregivers and infants aged 4–5 months attending three health clinics ($n = 708$)	I = structured nurse counselling, leaflets aimed at discouraging baby walker use C = none of the above			■				■				■	
Thomas 1984[305]	RCT A = N; B = U; F = Y	Parents attending well-baby classes ($n = 55$)	I = standard information and literature plus a lecture on burn prevention provided by nurse practitioners, leaflets on protecting the home against fire, adjusting hot water settings and costs of smoke alarms at local stores and discount coupon for smoke alarms C = standard information and literature	■	■				■				■		
Vineis 1994[306]	NRCT B = N; F = N; BC = U	Parents of newborn babies ($n = 1015$)	I = 15 minutes of counselling by nurse and distribution of three educational booklets – one on prevention of home injuries in childhood, one on smoking and one on passive smoking C = None of the above			■	■								
Waller 1993[307]	RCT A = U; B = U; F = Y	A random sample of Dunedin-area children aged ≤ 3 years taken from birth records ($n = 121$)	I = free plumbing advice and home visit to measure tap water temperature and discuss dangers of hot water in the home and how to reduce tap water temperature provided by nurses C1 = no home visit C2 = no home visit and no baseline data collection		■				■				■		

continued

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TABLE 72 Characteristics of the primary studies included in all overviews (study H), PMAs (study I) and NMAs (study J) for fire, scalds, falls and poisoning prevention (*continued*)

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Watson 2005[72]	RCT A = Y; B = N; F = N	Families with children aged < 5 years on caseloads of health visitors in deprived areas (n = 3428)	I = health visitor safety consultation, free fitted safety equipment (stair gates, fireguards, cupboard and drawer locks, smoke alarms, window locks); free items supplied and fitted for families in receipt of benefits (50.0%), with free delivery for others (50.0%) C = usual care	■		■	■	■		■	■	■		■	■
Williams 1988[439]	RCT A = U; B = N; F = U	Pregnant women attending prenatal classes (n = 74)	I = 1-hour lecture, handouts on burns prevention, usual safety education C = usual safety education		■				■				■		
Williams 1989[440]	RCT A = U; B = U; F = Y	Children in the second and third grade at a school in Virginia (n = 48)	I_1 = fire safety and fear reduction education and teaching of behavioural skills I_2 = fire safety education and teaching of behavioural skills I_3 = discussion of fire safety	■											
Wissow 1989[441]	RCT A = U; B = Y; F = N	Families with children aged < 6 years attending a paediatric ED or clinic following injury (n = 62)	I = home hazard inspection, education and free safety equipment provided at home (smoke alarm battery, poison control sticker, syrup of ipecac, safety latches, outlet plugs) C = free safety equipment provided at hospital	■		■	■								
Woolf 1987[308]	RCT (C) A = U; B = Y; F = N	Families attending a medical ED with a child aged < 5 years, urban poor population (n = 202)	I = counselling by medical staff on poisoning treatment methods, leaflet on poisoning prevention, PCC number sticker and syrup of ipecac C = none of the above				■			■					■

Study	Design and risk of bias	Participants	Intervention	Included in overview (study H)				Included in PMA (study I)				Included in NMA (study J)			
				Fi	S	Fa	P	Fi	S	Fa	P	Fi	S	Fa	P
Woolf 1992[309]	RCT (C) A = U; B = Y; F = Y	Families of children aged ≤ 5 years with a poisoning who contacted the PCC and did not have syrup of ipecac (n = 301)	I = mailed $1 coupon for syrup of ipecac, one cupboard lock, checklist for poison proofing the home, leaflets C = none of the above				■				■				■
Yang 2008[310]	RCT A = U; B = N; F = Y	Rural households participating in a cohort study examining multiple health outcomes (n = 654)	I_1 = ionisation alarm and carbon zinc battery I_2 = ionisation alarm and lithium battery I_3 = photoelectric alarm and carbon zinc battery I_4 = photoelectric alarm and lithium battery	■								■			
Ytterstad 1998[442]	CBA B = U; F = Y; BC = N	Children aged ≤ 5 years in Harstad (intervention) and Trondheim (control), Norway (n = 14,573 person-years)	I = promotion of tap water thermostat setting to 55 °C and of increased parental vigilance in putative burn risk situations C = none of the above		■				■						
Zhao 2006[312]	RCT A = N; B = Y; F = Y	Primary schoolchildren aged 7–13 years (year 2000, n = 5872; year 2001, n = 5880)	I = health education on injury prevention including scalds prevention, safe storage of pots of hot water C = health education on prevention of other common childhood diseases		■		■		■		■				

A, allocation concealment; B, blinding; BC, treatment arms balanced for confounders; C, control group; (C), clustered allocation; F, follow-up of 80% of participants in each arm; Fa, falls; Fi, fire; I, intervention group; N, no; NOS, Newcastle–Ottawa Scale; NRCT, non-RCT; P, poisoning; S, scalds; U, unclear; Y, yes.
a Emetic agent.
Using data from Kendrick *et al.*[49] Young *et al.*[48] Zou *et al.*[389] and Wynn *et al.*[390]

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There were insufficient studies to undertake PMA or NMA for the effect of home safety interventions on fire-related injuries in studies I and J.

Promoting smoke alarm ownership and function and other smoke alarm outcomes

Study H

The overview included three systematic reviews and meta-analyses[33,37,40] and nine systematic reviews[36,41,42,331,353,382,383,387,391] reporting the effect of interventions on a range of smoke alarm outcomes. Evidence from the meta-analyses indicates that interventions to promote smoke alarm ownership and function are effective. The first meta-analysis combined effect sizes on smoke alarm ownership from five studies (OR 1.74, 95% CI 1.03 to 2.96),[40] the second meta-analysis combined effect sizes on smoke alarm ownership from 10 studies (OR 1.21, 95% CI 0.89 to 1.64)[37] and the third meta-analysis combined effect sizes on having a functional smoke alarm from 13 studies (OR 1.85, 95% CI 1.24 to 2.75).[33] Subgroup analyses indicate that interventions provided in the clinical setting[40] or as part of routine child health surveillance[37] are effective, whereas those delivered in other settings may be less effective.

The majority of systematic narrative reviews concluded that a diverse range of interventions to promote smoke alarm ownership and function were effective.[36,353,382,383,387,391] One systematic review confined to examining the effect of home safety equipment and risk assessment schemes[387] concluded that there is inconsistent evidence from six robust studies, using observed outcomes and a control group, about the presence of functional alarms. Four suggested that the intervention increased functioning smoke alarm presence and two suggested no significant impact on smoke alarms.

A total of 39 primary studies reporting smoke alarm ownership or functioning were identified (29 from reviews[71,72,257,261,265,267–271,273,275,277,279,281,282,284,285,287,295,297,300,304,305,393,395,403,409,423,426] and 10 from additional searches for primary studies;[266,286,288,310,397,398,412,418,431,433]). The studies not included in a review suggest that there is conflicting evidence about the effect of type of smoke alarm on smoke alarm functioning.[286,310,433] Two RCTs found that alarms with lithium batteries were more likely to remain functional than those with carbon zinc batteries.[310,433]

Seven primary studies reporting the effectiveness of interventions in promoting other smoke alarm outcomes were included in the overview. The outcomes reported include checking or changing smoke alarm batteries, false alarms, reasons for non-functional alarms, redeeming vouchers for free alarms, awakening to alarms and time to awaken or escape. There appears to be inconsistent evidence about the effect of interventions on checking or changing smoke alarm batteries.[282,287,288,295] One RCT found that photoelectric alarms were significantly less likely to cause false alarms than ionising alarms.[310] One RCT found that installing smoke alarms was more effective at increasing the prevalence of functional smoke alarms than providing vouchers for families to redeem against alarm purchase, with 47% of vouchers not redeemed.[268] Finally, one RCT found that children are significantly more likely to awaken to a parent-voice alarm than to a standard smoke alarm and that time to awaken and time to escape were significantly shortened with parent-voice compared with standard alarms.[436]

Study I

Pairwise meta-analysis of 17 studies evaluating home safety interventions (education plus provision of smoke alarms and home safety inspections in some studies),[71,72,261,265,266,269,271,275,277,284,285,297,304,395,398,426,431] which updated the meta-analysis by Kendrick *et al.*[33] described in the previous section, found that interventions significantly increased functional smoke alarm ownership (OR 1.81, 95% CI 1.30 to 2.52) (*Figure 26*). Interventions that provided smoke alarms appeared to be more effective (OR 2.49, 95% CI 1.53 to 4.06) than those that did not (OR 1.12, 95% CI 0.87 to 1.45). Seventeen studies reported ownership of alarms (as opposed to functional status)[71,261,266,267,269,270,273,277,282,287,288,295,305,395,403,418,426] and meta-analysis showed that interventions may be associated with a small increase in smoke alarm ownership (OR 1.17, 95% CI 0.97 to 1.42). Publication bias may have occurred in the functional smoke alarm ownership analysis (p-value for the tests of asymmetry = 0.063 and inspection of the funnel plot indicated the possibility of missing studies with

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Barone 1988[395]	23	24	20	22	1.6%	2.30 (0.19 to 27.30)
Bulzachelli 2009[398]	109	139	55	71	8.7%	1.06 (0.53 to 2.10)
Clamp 1998[71]	81	83	71	82	3.5%	6.27 (1.35 to 29.27)
DiGuiseppi 2002[261]	8	44	5	30	4.8%	1.11 (0.33 to 3.80)
Gielen 2002[265]	44	54	44	53	6.2%	0.90 (0.33 to 2.43)
Gielen 2007[266]	345	384	325	375	11.1%	1.36 (0.87 to 2.12)
Hendrickson 2002[269]	37	38	26	40	2.1%	19.92 (2.46 to 161.05)
Johnston 2000[271]	31	31	20	21	1.0%	4.61 (0.18 to 118.72)
Kendrick 1999[275]	249	276	246	278	10.1%	1.20 (0.70 to 2.06)
King 2001[277]	406	482	394	469	12.0%	1.02 (0.72 to 1.44)
Matthews 1988[426]	6	12	6	12	3.3%	1.00 (0.20 to 4.95)
Miller 1982[284]	12	22	9	21	4.9%	1.60 (0.48 to 5.34)
Mock 2003[285]	3	72	2	69	2.7%	1.46 (0.24 to 8.99)
Phelan 2011[431]	130	140	112	138	7.9%	3.02 (1.39 to 6.53)
Sangvai 2007[297]	16	17	5	10	1.7%	16.00 (1.50 to 171.20)
Sznajder 2003[304]	27	47	6	50	5.9%	9.90 (3.53 to 27.74)
Watson 2005[72]	692	764	619	737	12.4%	1.83 (1.34 to 2.50)
Total (95% CI)		**2629**		**2478**	**100.0%**	**1.81 (1.30 to 2.52)**
Total events	2219		1965			

Heterogeneity: $\tau^2=0.21$; $\chi^2=39.55$, df=16 ($p=0.0009$); $I^2=60\%$
Test for overall effect: $z=3.50$ ($p=0.0005$)

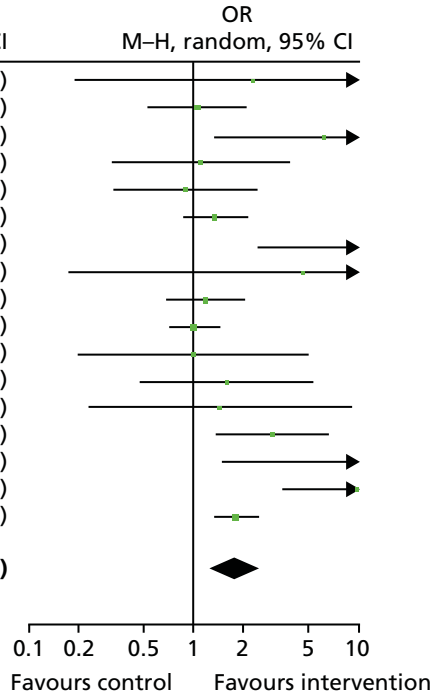


FIGURE 26 Forest plot of effect sizes for possession of a functional smoke alarm from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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non-significant findings), but findings remained significant after application of the regression bias adjustment method (OR 1.44, 95% CI 1.07 to 1.92).

Four studies that reported checking or changing smoke alarm batteries in the last 6 months were included in a meta-analysis as part of study I.[282,287,288,295] There was no evidence that home safety interventions were effective in increasing the proportion of families who had checked or changed smoke alarm batteries in the preceding 6 months (OR 1.15, 95% CI 0.63 to 2.08) (*Figure 27*).

Study J

Network meta-analysis was used to determine the effect of component elements of home safety interventions on having a functional smoke alarm in 20 of the studies identified from the overview.[71,72,261,265,266,268,269,271,275,277,284,285,297,300,304,395,398,409,426,431] Interventions used in these studies were categorised into seven distinct groupings and the NMA estimated the 21 possible pairwise comparisons between the seven interventions reported in the 20 studies. The data used in the NMA from each study for fire prevention outcomes are shown in *Table 73*. The pooled estimates, 95% CrIs and, when available, direct within-trial estimates are reported in *Table 74*. The most intensive intervention (home safety education plus equipment provision plus fitting of safety equipment plus home safety assessment) was the most likely to be the most effective (probability = 0.66), with an OR compared with usual care of 7.15 (95% CrI 2.40 to 22.73).

Three studies evaluated the effect of alarm type and battery type on alarm function.[286,310,433] The data used in the NMA from each study are shown in *Table 75* and the pooled estimates, 95% CrIs and, when available, direct within-trial estimates are reported in *Table 76*. Ionisation smoke alarms with lithium batteries were most likely to be the best type for increasing possession of a functioning alarm (p best = 0.69), although there was considerable uncertainty in these estimates as shown by the wide 95% CrIs in *Table 76*.

Study K

The findings from the decision analysis evaluating the cost-effectiveness of different interventions for promoting possession of functional smoke alarms are described below. Four of the seven interventions evaluated in the base-case analysis had higher costs or higher ICERs than more effective interventions (namely education plus free safety equipment and education plus free safety equipment and fitting of equipment plus home safety inspection) and were therefore excluded from further consideration (*Table 77*). Of the remaining three interventions, education plus free safety equipment had the lowest estimated ICER compared with usual care, at £34,200 per QALY gained.

Figure 28 shows the probability of the alternative interventions being cost-effective. At a threshold value of £30,000 per QALY gained, usual care has the highest probability of being cost-effective (0.62). However, when this threshold value is increased to £50,000, education plus low-cost/free equipment has the highest probability of being cost-effective (0.69), demonstrating that there is considerable uncertainty in decisions within the £30,000–50,000 threshold range.

Sensitivity analysis We undertook a series of sensitivity analyses assessing the robustness of the findings to modelling assumptions and data used in the modelling, as described in the methods section (*Table 78*). Dominated and extendedly dominated interventions have been removed from *Table 78*. All sensitivity analyses assessed the probability of interventions being cost-effective at a threshold of £30,000. Reducing the prevalence of smoke alarms in UK households from 80% to 50% resulted in ICERs that increased as the intensity of the intervention increased from education to education plus free equipment and fitting plus home safety inspection; however, for any of these interventions to be adopted, decision makers needed to be willing to pay or displace large amounts of funds (i.e. ICERs were ≥ £180,000 per additional QALY).

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
McDonald 2005[282]	39	54	38	54	28.7%	1.09 (0.48 to 2.52)
Nansel 2002[287]	75	80	70	84	21.0%	3.00 (1.03 to 8.76)
Nansel 2008[288]	145	180	75	88	34.7%	0.72 (0.36 to 1.44)
Posner 2004[295]	41	46	42	47	15.6%	0.98 (0.26 to 3.63)
Total (95% CI)		**360**		**273**	**100.0%**	**1.15 (0.63 to 2.08)**
Total events	300		225			

Heterogeneity: $\tau^2=0.14$; $\chi^2=4.84$, df=3 ($p=0.18$); $I^2=38\%$
Test for overall effect: $z=0.45$ ($p=0.65$)

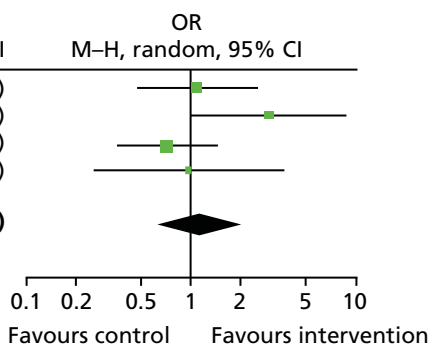


FIGURE 27 Forest plot of effect sizes for smoke alarm batteries being checked or changed from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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TABLE 73 Summary of studies and their data included in the NMA of the interventions to promote possession of functional smoke alarms

Comparison (intervention number)	Study	Study design	Follow-up (number of months)	Intervention	Study quality	Has functional smoke alarm (numbers adjusted for clustering)	
						Number of smoke alarms	Total number of households
Usual care (1) vs. education (2)	Gielen 2001[409]	RCT	12	1	A = Y, B = Y, F = N	54 (52.02)[a]	56 (53.95)[a]
				2		77 (74.18)[a]	80 (77.07)[a]
	Mock 2003[285]	CBA	6	1	B = N, F = N, C = N	10 (2.33)[b]	297 (69.18)[b]
				2		18 (3.03)[b]	308 (71.74)[b]
	Gielen 2007[266]	RCT	0.5–1	1	A = Y, B = N, F = Y	325	375
				2		345	384
	Bulzacchelli 2009[398]	NRCT	0.5	1	B = N, F = N, C = N	55	71
				2		109	139
Usual care (1) vs. education + low-cost/free equipment (3)	Miller 1982[284]	NRCT	1.5	1	B = U, F = Y, C = Y	46 (9.34)[b]	105 (21.31)[b]
				3		61 (12.38)[b]	108 (21.92)[b]
	Clamp 1998[71]	RCT	1.5	1	A = Y, B = N, F = Y	71	82
				3		81	83
Usual care (1) vs. education + low-cost/free equipment + home safety inspection (4)	Kendrick 1999[275]	NRCT	25	1	B = N, F = N, C = Y	321 (245.62)[b]	363 (277.76)[b]
				4		325 (248.68)[b]	361 (276.23)[b]
	Hendrickson 2005[269]	RCT	1.5	1	A = N, B = N, F = Y	26	40
				4		37	38
	Sangvai 2007[297]	RCT	6	1	A = Y, B = N, F = N	5	10
				4		16	17
Usual care (1) vs. education + low-cost/free equipment + fitting (5)	DiGuiseppi 2002[261]	RCT	12–18	1	A = Y, B = Y, F = N	5 (5)[c]	30 (30)[c]
				5		8 (8)[c]	44 (44)[c]
	Watson 2005[72]	RCT	12	1	A = Y, B = N, F = N	619	737
				5		692	764

Comparison (intervention number)	Study	Study design	Follow-up (number of months)	Intervention	Study quality	Has functional smoke alarm (numbers adjusted for clustering)	
						Number of smoke alarms	Total number of households
Usual care (1) vs. education + low-cost/free equipment + fitting + home safety inspection (7)	Schwarz 1993[300]	CBA	12	1	B = N, F = N, C = Y	816	1060
				7		866	902
	Phelan 2011[431]	RCT	12	1	A = Y, B = N, F = Y	112	138
				7		130	140
Education (2) vs. education + low-cost/free equipment (3)	Barone 1988[395]	RCT	6	2	A = N, B = N, F = N	34 (20.08)[b]	38 (22.45)[b]
				3		39 (23.04)[b]	41 (24.22)[b]
Education (2) vs. education + low-cost/free equipment + fitting (5)	Sznajder 2003[304]	RCT	1.5–2	2	A = Y, B = N, F = Y	6	50
				5		27	47
Education + low-cost/free equipment (3) vs. education + low-cost/free equipment + home safety inspection (4)	Gielen 2002[265]	RCT	12	3	A = U, B = U, F = N	47 (44.20)[b]	56 (52.66)[b]
				4		47 (44.20)[b]	58 (54.54)[b]
Education + low-cost/free equipment + home safety inspection (4) vs. education + home safety inspection (6)	Matthews 1988[426]	NRCT	0.5	4	B = U, F = Y, C = U	6	12
				6		6	12
	Johnston 2000[271]	RCT	3	4	A = N, B = N, F = Y	211 (20.05)[b]	211 (21.15)[b]
				6		136 (31.07)[b]	143 (31.14)[b]
	King 2001[277]	RCT	12	4	A = Y, B = Y, F = Y	394	469
				6		406	482
Education + low-cost/free equipment + home safety inspection (4) vs. education + low-cost/free equipment + fitting + home safety inspection (7)	Harvey 2004[268]	RCT	9	4	A = U, B = N, F = N	997 (781.59)[d]	1545 (1211.19)[d]
				7		1421 (1113.99)[d]	1583 (1240.98)[d]

A, adequate allocation concealment; B, blinded outcome assessment; C, prevalence of confounders does not differ by more than 10% between treatment arms; F, at least 80% of participants were followed up in each arm; N, no; RCT, randomized clinical trial; U, unclear; Y, yes.

a ICC calculated from individual participant data from Kendrick *et al.*[417]

b ICC calculated from individual participant data from Kendrick *et al.*[275]

c ICC calculated from DiGuiseppi *et al.*[261]

d ICC obtained from published estimates.[33]

Reproduced from Cooper NJ, Kendrick D, Achana F, Dhiman P, He Z, Wynn P, Le Cozannet E, Saramago P, Sutton A. Network meta-analysis to evaluate the effectiveness of interventions to increase the uptake of smoke alarms. *Epidemiologic Reviews* 2012;**34**(1):32–45,[374] by permission of Oxford University Press.

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TABLE 74 Pooled ORs (95% CrIs) from NMAs comparing the effect of different interventions on possession of a functional smoke alarm[a]

Intervention	Usual care (1)	Education (2)	Education + equipment (3)	Education + equipment + home inspection (4)	Education + equipment + fitting (5)	Education + home inspection (6)	Education + equipment + fitting + home inspection (7)
Usual care (1)		0.99 (0.39 to 2.33)	3.18 (0.98 to 11.18)	2.82[b] (1.13 to 8.93)	2.71 (0.85 to 8.88)	3.48 (0.75 to 26.53)	7.15[b] (2.40 to 22.73)
Education (2)	1.34 (0.66 to 2.65)		3.52 (0.84 to 14.46)	2.87 (0.84 to 13.19)	2.76 (0.80 to 10.27)	3.56 (0.64 to 34.50)	7.25[b] (1.87 to 30.33)
Education + equipment (3)	3.25 (0.49 to 22.95)	2.29 (0.23 to 22.61)		0.89 (0.24 to 3.57)	0.86 (0.16 to 4.51)	1.10 (0.19 to 9.00)	2.26 (0.46 to 10.55)
Education + equipment + home inspection (4)	5.94 (0.96 to 48.79)		0.82 (0.30 to 2.22)		0.98 (0.17 to, 4.49)	1.24 (0.35 to 5.55)	2.59 (0.64 to 8.13)
Education + equipment + fitting (5)	1.65 (0.30 to 7.61)	9.90[b] (3.53 to 27.74)				1.27 (0.19 to 13.37)	2.61 (0.52 to 13.26)
Education + home inspection (6)				1.17 (0.34 to 6.98)			2.09 (0.24 to 10.52)
Education + equipment + fitting + home inspection (7)	5.24 (0.84 to 26.41)			4.82[b] (3.88 to 6.00)			

a Column and row headings signify intervention or comparison (intervention number).
b Significant at 5% level.

Notes

Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 0.99 (95% CrI 0.39 to 2.33) is the estimate for education (2) vs. usual care (1) from the NMA.

Reproduced from Cooper NJ, Kendrick D, Achana F, Dhiman P, He Z, Wynn P, Le Cozannet E, Saramago P, Sutton A. Network meta-analysis to evaluate the effectiveness of interventions to increase the uptake of smoke alarms. *Epidemiologic Reviews* 2012;**34**(1):32–45,[374] by permission of Oxford University Press.

TABLE 75 Summary of studies and their data included in the NMA of types of battery-powered smoke alarms

Study	Study design	Follow-up (number of months)	Intervention	Study quality	Has functional smoke alarm	
					Number of smoke alarms	Total number of households
Rowland 2002[433]	RCT	15	Ionisation zinc	A = Y, B = N, F = Y	142	257
			Ionisation lithium		44	63
			Optical lithium		24	79
			Optical zinc		40	57
Mueller 2008[286]	RCT	9	Ionisation zinc	A = N, B = N, F = Y	264	332
			Optical zinc		322	340
Yang 2008[310]	RCT	12	Ionisation zinc	A = U, B = N, F = Y	154	157
			Ionisation lithium		154	154
			Optical lithium		178	180
			Optical zinc		149	152

A, adequate allocation concealment; B, blinded outcome assessment; C, prevalence of confounders does not differ by more than 10% between treatment arms; F, at least 80% of participants were followed up in each arm; N, no; RCT, randomized controlled trial; U, unclear; Y, yes.
Reproduced from Cooper NJ, Kendrick D, Achana F, Dhiman P, He Z, Wynn P, Le Cozannet E, Saramago P, Sutton A. Network meta-analysis to evaluate the effectiveness of interventions to increase the uptake of smoke alarms. *Epidemiologic Reviews* 2012;**34**(1):32–45,[374] by permission of Oxford University Press.

TABLE 76 Pooled ORs (95% CrIs) from NMAs of types of battery-powered smoke alarms

	Ionisation zinc	Ionisation lithium	Optical lithium	Optical zinc
Ionisation zinc		4.56 (0.45 to 247.70)	0.75 (0.06 to 15.70)	2.40 (0.21 to 21.83)
Ionisation lithium	3.02 (0.52 to 51.10)		0.17 (0.00 to 2.52)	0.52 (0.00 to 5.05)
Optical lithium	0.55 (0.10 to 4.95)	0.15 (0.01 to 1.00)		3.14 (0.14 to 38.04)
Optical zinc	2.53 (0.56 to 9.00)	0.47 (0.03 to 3.20)	2.50 (0.25 to 16.39)	

Notes
Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis.
Reproduced from Cooper NJ, Kendrick D, Achana F, Dhiman P, He Z, Wynn P, Le Cozannet E, Saramago P, Sutton A. Network meta-analysis to evaluate the effectiveness of interventions to increase the uptake of smoke alarms. *Epidemiologic Reviews* 2012;**34**(1):32–45,[374] by permission of Oxford University Press.

As the probability of accepting interventions varied considerably between the trials that informed the effectiveness model input parameters, the effect of reducing the acceptance rate from 90% to 50% was assessed. This resulted in a reduction in the ICER from £34,200 in the base case to £12,701 for education plus low-cost/free equipment compared with usual care. Reducing the probability of decay/repair of the safety equipment from 0.1 to 0 resulted in all interventions being dominated by education, which had an ICER of £80,117 compared with usual care. An increase in the number of children aged < 5 years per household from 1 to 1.8[378] resulted in a reduction in the ICER from £34,200 to £4456 for education plus low-cost/free equipment compared with usual care.

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TABLE 77 Base-case analysis results (probabilistic) for the cost-effectiveness of interventions for promoting possession of functional smoke alarms

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)[b]	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
Usual care (1)	25,056 (25,039 to 25,074)	19,317 (7850 to 40,561)	–	–	–	0.62	0.31
Education (2)	25,056 (25,039 to 25,074)	20,055 (8750 to 41,093)	–	–	Extendedly dominated	< 0.001	0.001
Education + equipment (3)	25,056 (25,039 to 25,074)	20,094 (9193 to 40,546)	0.02	777	34,200	0.38	0.69
Education + equipment + home safety inspection (4)	25,056 (25,039 to 25,074)	22,091 (11047 to 42,710)	–	–	Dominated	< 0.001	< 0.001
Education + equipment + fitting (5)	25,056 (25,039 to 25,074)	21,638 (10654 to 42,219)	–	–	Dominated	< 0.001	< 0.001
Education + home safety inspection (6)	25,056 (25,039 to 25,074)	21,991 (10673 to 43,168)	–	–	Dominated	< 0.001	< 0.001
Education + equipment + fitting + home safety inspection (7)	25,056 (25,039 to 25,074)	23,596 (12,021 to 44,319)	0.001	3502	3,466,635	< 0.001	< 0.001

CE, cost-effective.
a Expected QALYs and expected costs per 1000 households.
b Dominated = costs more but delivers fewer QALYs; extendedly dominated = ICER greater than that of a more effective intervention.
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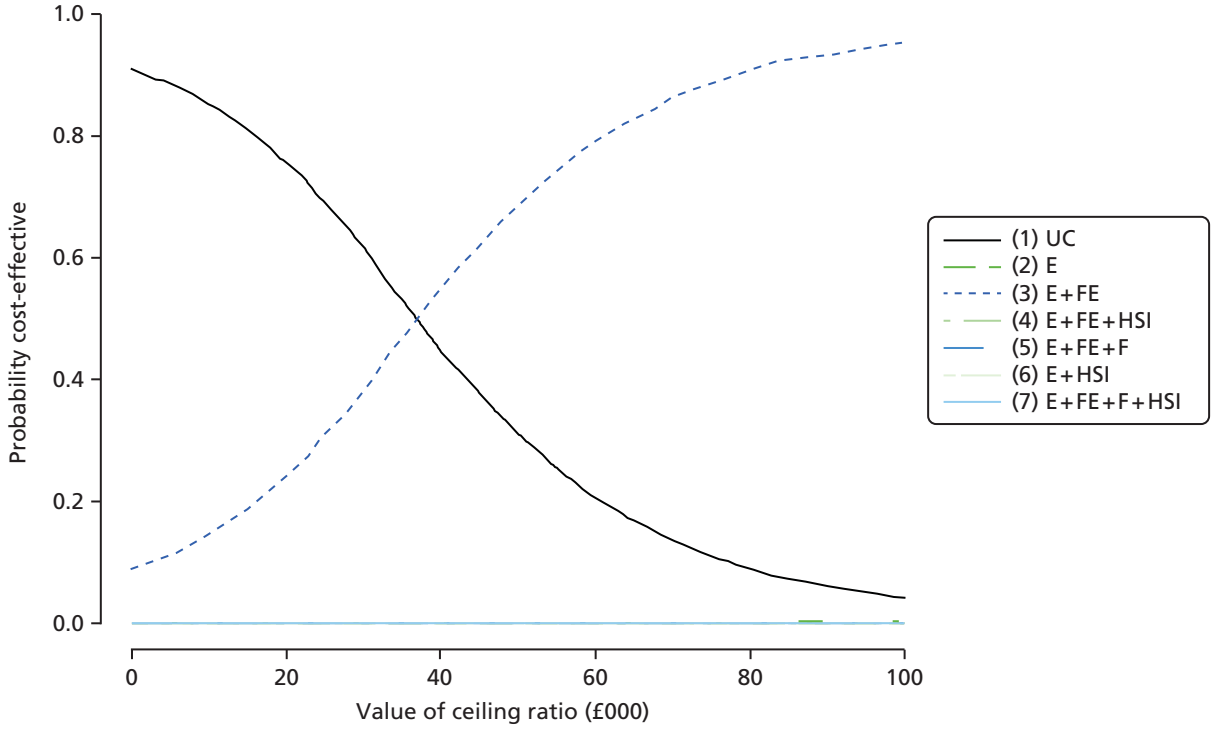


FIGURE 28 Cost-effectiveness acceptability curves for interventions promoting possession of functional smoke alarms. E, education; F, fitting; FE, low-cost/free equipment; HSI, home safety inspection; UC, usual care. Adapted from Saramago *et al.*[373] under the Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

Promoting fireguard possession and use

Study H

The overview included one systematic review and meta-analysis[33] and three systematic reviews[36,42,387] reporting the effect of interventions on the possession and use of fireguards. The meta-analysis reported some evidence that home safety education was effective in increasing the use of fire guards based on the combined effect sizes from four studies (OR 1.40, 95% CI 1.00 to 1.95), all of which included interventions that provided fireguards.[33] Of the four narrative reviews, one reported weak evidence that a free or discounted supply of fireguards, in conjunction with safety education, increased the use of fireguards and weak evidence that free home safety equipment and installation with safety education had no impact on the fitting and use of fireguards.[387] One review reported no significant increase in the use of fireguards[33] and the remaining two reviews did not draw any specific conclusions about the effect of interventions on the use of fireguards.[36,42]

Six primary studies reported the effect of interventions on the possession and use of fireguards (all from reviews[71,72,275,292,295,417]). One study reported a significant increase in the use of fireguards following the provision of safety advice, leaflets and low-cost equipment including fireguards.[71] Five studies reported no significant effect of interventions, all of which included home safety education and four of which also provided free or discounted safety equipment, with two of these including the provision of fireguards[72,275] and two not providing fireguards.[292,295] The one study not providing equipment involved information cards, fridge magnets and checklists in addition to safety education.[417]

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TABLE 78 Sensitivity analysis results for interventions promoting the possession of functional smoke alarms

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
SA1: prevalence of smoke alarms in households of 50%							
Usual care (1)	25,056.054 (25,038.86 to 25,073.69)	20,813 (8337 to 43,726)	–	–	–	0.99	0.98
Education (2)	25,056.070 (25,038.88 to 25,073.71)	23,732 (11,327 to 46,646)	0.020	2919	180,400	< 0.001	< 0.001
Education + equipment (3)	25,056.079 (25038.88 to 25073.72)	25,715 (13029 to 48245)	0.009	1983	225,545	0.01	0.02
Education + equipment + fitting + home safety inspection (7)	25,056.081 (25,038.89 to 25,073.72)	37,863 (18,872 to 61,155)	0.002	12,148	5,955,269	< 0.001	< 0.001
SA2: probability of accepting the intervention of 50%							
Usual care (1)	25,056.159 (25,038.67 to 25,074.24)	19,470 (7948 to 40,486)	–	–	–	0.24	0.09
Education + equipment (3)	25,056.177 (25,038.69 to 25,074.26)	19,695 (8618 to 39,932)	0.020	225	12,701	0.76	0.91
Education + equipment + fitting + home safety inspection (7)	25,056.177 (25,038.70 to 25,074.26)	21,656 (10,383 to 42,046)	0.000	1961	3,502,138	< 0.001	< 0.001
SA3: null decay of safety equipment							
Usual care (1)	25,056.404 (25,039.07 to 25,074.24)	18,839 (7684 to 39,507)	–	–	–	0.96	0.82
Education (2)	25,056.413 (25039.07 to 25,073.81)	19,530 (8558 to 39,944)	0.009	691	80,117	0.04	0.17
Education + equipment (3)	25,056.416 (25039.08 to 25,073.82)	20,094 (9193 to 40,546)	0.003	564	209,061	0.001	0.01
Education + equipment + fitting + home safety inspection (7)	25,056.417 (25,039.09 to 25073.82)	23,596 (12,021 to 44319)	0.001	3,502	3,466,635	< 0.001	< 0.001

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
SA4: considering 1.8 children per household							
Usual care (1)	44,349.503 (44,318.77 to 44,380.10)	32,867 (12,272 to 71,150)	–	–	–	0.11	0.03
Education + equipment (3)	44,349.544 (44,318.82 to 44,380.14)	33,050 (13,428 to 69,595)	0.040	183	4456	0.89	0.97
Education + equipment + fitting + home safety inspection (7)	44,349.546 (44,318.83 to 44,380.14)	36,531 (16,836 to 73,296)	0.002	3481	1,923,416	< 0.001	< 0.001
SA5: same probability of injury for households with functioning and non-functioning smoke alarms							
Usual care (1)	25,057.511 (25,039.23 to 25,073.87)	15,279 (6611 to 31,524)	–	–	–	0.96	0.94
Education + equipment (3)	25,057.519 (25,039.24 to 25,073.88)	16,562 (7924 to 32,584)	0.008	1283	154,513	0.04	0.06
Education + equipment + fitting + home safety inspection (7)	25,057.520 (25,039.23 to 25,073.88)	20,080 (10,842 to 35,798)	0.001	3518	9,772,579	< 0.001	< 0.001

CE, cost-effective.
a Expected QALYs and expected costs per 1000 households.
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Study I

The updated searches for study H did not find any additional studies evaluating home safety education, which also included the provision of fireguards. Therefore, the PMA includes the same four studies[71,72,275,417] reported in Kendrick *et al.*[33] There was some evidence that home safety interventions were effective in increasing the use of fire guards (OR 1.40, 95% CI 1.00 to 1.95) (*Figure 29*).

Study J

Network meta-analysis was used to determine the effect of component elements of home safety interventions on use of fireguards in four studies identified from the overview.[71,72,275,417] These studies included five interventions and the NMA estimated the 10 possible pairwise comparisons between the five interventions reported in the four studies. The data used in the NMA from each study are shown in *Table 79*. The pooled estimates, 95% CrIs and, when available, direct within-trial estimates are reported in *Table 80*. None of the interventions differed significantly from each other. The intervention with the highest probability of being the most effective was education plus equipment plus home safety inspection (p best = 0.28), but the probabilities were very similar for all interventions (range 0.20–0.28) except for education plus low-cost/free equipment (p best = 0.05).

Study K

Decision analyses were not undertaken for interventions to promote fireguard use as no interventions were found to be effective in NMAs.

Promoting fire extinguisher possession

Study H

The overview included one systematic review and meta-analysis[33] and one systematic review[42] reporting the effect of interventions on the possession of fire extinguishers. The meta-analysis, which combined effect sizes from four studies, reported that home safety education interventions, one of which included the provision of fire extinguishers, were not effective in increasing the possession of fire extinguishers (OR 0.95, 95% CI 0.40 to 2.23).[33] One systematic review[33] reported mixed findings from studies not included in the meta-analysis, but effect sizes were not reported. The other review[42] included one relevant primary study but did not draw any conclusions specific to the possession of fire extinguishers.

Nine primary studies reported the effect of interventions to promote the possession of fire extinguishers; seven of these studies were identified from reviews[269,277,279,293,304,399,441] and two from additional searches for primary studies.[257,412] One study found a significant effect on the possession of fire extinguishers of an intervention involving home safety education, home hazard assessment and the provision of items of equipment including fire extinguishers.[269] Other studies delivering home safety education, hazard identification and assistance with obtaining safety equipment did not report a significant effect on the possession of fire extinguishers.[257,277,279,304,441] Two studies involving a community injury prevention programme including seminars, workshops, courses and home visits[293] and an intervention involving a home visit from fire service personnel focusing on smoke alarms and fire escape plans[412] both reported no increase in the possession of fire extinguishers. One study did not report the effect of the intervention on the possession of fire extinguishers.[399]

Study I

Pairwise meta-analysis of five studies evaluating home safety education[257,269,277,293,304] found a lack of evidence that interventions were effective in increasing the possession of fire extinguishers (OR 0.90, 95% CI 0.53 to 1.51) (*Figure 30*).

Study J

Network meta-analysis was used to determine the effect of the component elements of home safety interventions on the possession of fire extinguishers in four studies identified from the overview.[257,269,277,293] These studies included six interventions and the NMA estimated the 15 possible pairwise comparisons

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Clamp 1998[71]	56	83	30	82	15.3%	3.60 (1.89 to 6.83)
Kendrick 1999[275]	216	309	210	309	26.0%	1.09 (0.78 to 1.54)
Kendrick 2005[417]	202	312	206	352	27.1%	1.30 (0.95 to 1.78)
Watson 2005[72]	414	763	374	735	31.6%	1.15 (0.93 to 1.40)
Total (95% CI)		**1467**		**1478**	**100.0%**	**1.40 (1.00 to 1.95)**
Total events	888		820			

Heterogeneity: $\tau^2=0.08$; $\chi^2=11.74$, df=3 ($p=0.008$); $I^2=74\%$

Test for overall effect: $z=1.97$ ($p=0.05$)

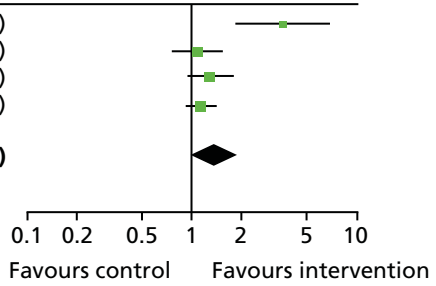


FIGURE 29 Forest plot of effect sizes for use of fire guards from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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TABLE 79 Summary of studies and their data included in the NMA of fireguards

Study	Study design	Follow-up (months)	Intervention	Study quality[a]	Has fireguard	
					Number of fireguards	Total number of households
Kendrick 2005[417]	RCT	9	Usual care (1)	A = Y, B = N, F = Y	205.91[b]	351.55[b]
			Education (2)		201.72[b]	312.21[b]
Clamp 1998[71]	RCT	1.5	Usual care (1)	A = Y, B = N, F = Y	30	82
			Education + equipment (3)		56	83
Kendrick 1999[275]	N-RCT	25	Usual care (1)	B = N, F = N, C = Y	210.54[b]	309.01[b]
			Education + equipment + home safety inspection (4)		216.48[b]	309.01[b]
Watson 2005[72]	RCT	12	Usual care (1)	A = Y, B = N, F = N	374	735
			Education + equipment + fitting (5)		414	763

a A, adequate allocation concealment; B, blinded outcome assessment; C, prevalence of confounders does not differ by > 10% between treatment arms; F, at least 80% of participants followed up in each arm; N, no; Y, yes.
b ICC calculated from individual participant data.

TABLE 80 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on fireguard use

Intervention	Usual care (1)	Education (2)	Education + equipment (3)	Education + equipment + home safety inspection (4)	Education + equipment + fitting (5)
Usual care (1)		0.77 (0.06 to 9.20)	0.28 (0.02 to 3.56)	0.91 (0.07 to 11.22)	0.87 (0.07 to 10.42)
Education (2)	0.77 (0.56 to 1.06)		0.36 (0.01 to 13.15)	1.17 (0.04 to 43.19)	1.13 (0.03 to 40.96)
Education + equipment (3)	0.28 (0.15 to 0.53)			3.28 (0.09 to 119.70)	3.15 (0.09 to 110.70)
Education + equipment + home safety inspection (4)	0.91 (0.65 to 1.29)				0.97 (0.02 to 36.89)
Education + equipment + fitting (5)	0.87 (0.71 to 1.07)				

Notes
Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 0.77 (95% CrI 0.06 to 9.20) is the estimate for education (2) vs. usual care (1) from the NMA.

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Babul 2007[257]	204	334	98	148	26.6%	0.80 (0.53 to 1.20)
Hendrickson 2002[269]	28	38	15	40	15.1%	4.67 (1.78 to 12.25)
King 2001[277]	213	482	232	469	29.5%	0.81 (0.63 to 1.04)
Petridou 1997[293]	5	98	13	100	13.5%	0.36 (0.12 to 1.05)
Sznajder 2003[304]	9	46	14	48	15.3%	0.59 (0.23 to 1.54)
Total (95% CI)		**998**		**805**	**100.0%**	**0.90 (0.53 to 1.51)**
Total events	459		372			

Heterogeneity: $\tau^2=0.22$; $\chi^2=15.19$, df=4 ($p=0.004$); $I^2=74\%$
Test for overall effect: $z=0.40$ ($p=0.69$)

FIGURE 30 Forest plot of effect sizes for possession of a fire extinguisher from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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between the six interventions reported in the four studies. The data used in the NMA from each study are shown in *Table 81*. The pooled estimates, 95% CrIs and, when available, direct within-trial estimates are reported in *Table 82*. None of the interventions differed significantly from each other. The intervention with the highest probability of being the most effective was community campaign plus education plus home visit (p best = 0.63).

Study K

Decision analyses were not undertaken for interventions to promote the possession of fire extinguishers, as none of the interventions was found to be effective in NMA.

Safe storage of matches and other matches-related outcomes

Study H

Two meta-analyses[33,40] and one systematic review[354] reporting the effect of interventions on the storage of matches out of reach of children were included in the overview. One meta-analysis[40] reported that there was a modest but non-significant effect on safe storage of matches based on the findings of two studies reporting this outcome (no effect size reported). The second meta-analysis[33] pooled the findings of five studies and found a lack of evidence that home safety inspection was effective in increasing the safe storage of matches (OR 1.23, 95% CI 0.56 to 2.68). The systematic review[354] identified only one relevant study, which did not find a significant effect of the intervention on the safe storage of matches.

Six primary studies reporting the effect of interventions on the safe storage of matches were identified from reviews.[269,273,275,277,304,404] No further studies were identified from additional searches for primary studies. All six studies found no significant effect on the safe storage of matches of interventions involving safety education,[273,404] provision of a safety kit[304] and safety education combined with home hazard checks and provision of equipment or assistance with obtaining equipment.[269,275,277]

TABLE 81 Summary of studies and their data included in the NMA of fire extinguishers

Study	Study design	Follow-up (months)	Intervention	Study quality[a]	Has fire extinguisher	
					Number of fire extinguishers	Total number of households
Hendrickson 2002[269]	RCT	1.5	Usual care (1)	A = N, B = N, F = Y	15	40
			Education + equipment + home safety inspection (3)		28	38
Babul 2007[257]	RCT	12	Usual care (1)	A = Y, B = N, F = N	98	148
			Education + equipment (2)		110	172
			Education + home safety inspection (5)		94	162
Petridou 1997[293]	CBA	20	Usual care (1)	B = N, F = Y, C = Y	12.99[b]	100.12[b]
			Community campaign + education + home visits (6)		5.35[b]	97.83[b]
King 2001[277]	RCT	12	Education + equipment (not fire extinguishers) + home safety inspection (4)	A = Y, B = Y, F = Y	232	469
			Education + home safety inspection (5)		213	482

a A, adequate allocation concealment; B, blinded outcome assessment; C, prevalence of confounders does not differ by > 10% between treatment arms; F, at least 80% of participants followed up in each arm; N, no; Y, yes.
b ICC obtained from published estimates.[33]

TABLE 82 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on the possession of fire extinguishers

Intervention	Usual care (1)	Education + equipment (2)	Education + equipment + home safety inspection (3)	Education + equipment (not fire extinguishers) + home safety inspection (4)	Education + home safety inspection (5)	Community campaign + education + home visits (6)
Usual care (1)		1.11 (0.09 to 14.21)	0.21 (0.01 to 2.91)	0.64 (0.02 to 23.48)	0.78 (0.06 to 10.32)	2.64 (0.18 to 37.76)
Education + equipment (2)	1.10 (0.08 to 0.56)		0.19 (0.00 to 6.96)	0.58 (0.02 to 20.76)	0.70 (0.05 to 9.37)	2.34 (0.06 to 91.83)
Education + equipment + home safety inspection (3)	0.21 (0.70 to 1.75)			3.12 (0.04 to 285.70)	3.81 (0.09 to 161.2)	13.07 (0.26 to 582.30)
Education + equipment (not fire extinguishers) + home safety inspection (4)					1.22 (0.10 to 15.16)	4.06 (0.05 to 334.50)
Education + home safety inspection (5)	0.78 (0.50 to 1.21)	0.71 (0.44 to 1.12)		1.24 (0.96 to 1.60)		3.34 (0.08 to 138.10)
Community campaign + education + home visits (6)	2.58 (0.90 to 1.60)					

Notes
Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 1.11 (95% CrI 0.09 to 14.21) is the estimate for education (2) vs. usual care (1) from the NMA.

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Study I

Pairwise meta-analysis of six studies reporting the effect of interventions on the storage of matches out of reach of children[269,273,275,277,304,404] found a lack of evidence that home safety education was effective (OR 1.03, 95% CI 0.63 to 1.68) (*Figure 31*).

Two primary studies reported other matches-related outcomes, neither of which was included in a systematic review. One study provided training and teaching resources to teachers of children and reported a significant improvement in the number of children never using matches.[418] The other study provided a home visit from fire service personnel and did not report any reduction in the rate of lighting of matches or lighters.[412]

Study J

Network meta-analysis was used to determine the effect of component elements of home safety interventions on the safe storage of matches in five studies identified from the overview.[269,273,275,304,404] These studies included four interventions and the NMA estimated the six possible pairwise comparisons between the four interventions reported in the five studies. The data used in the NMA from each study are shown in *Table 83*. The pooled estimates, 95% CrIs and, when available, direct within-trial estimates are reported in *Table 84*. None of the interventions differed significantly from each other. The intervention with the highest probability of being the most effective was education + equipment + home safety inspection (p best = 0.40).

Study K

Decision analyses were not undertaken for interventions to promote the storage of matches out of reach of children, as none of the interventions was found to be effective in NMA.

Having or practising a fire escape plan

Study H

Two systematic narrative reviews reported outcomes related to having or practising a fire escape plan.[33,387] The first review[33] found four studies reporting this outcome, two of which reported a significant difference that favoured the intervention group. The second review[387] included one relevant study and reported that home risk assessment and free/discounted supply and installation of safety equipment had a positive effect on having a fire escape plan.

A total of six primary studies reporting fire escape plan outcomes were identified, five from systematic reviews[293,295,300,399,441] and one from additional searches for primary studies.[412] Interventions that were effective included multimedia first aid and home safety training,[399] a home visit from fire service personnel,[412] a community programme including safety seminars for parents, workshops with teachers, courses for schoolchildren and weekly home visits[293] and a home visit involving safety education, modification and provision of safety items.[300] Two studies that did not demonstrate an effect of interventions on having or practising a fire escape plan both involved home safety education that targeted a range of injuries, one with a safety kit[295] and one with hazard identification and free safety equipment.[441]

Study I

Pairwise meta-analysis of four studies reporting on having or practising a fire escape plan[293,295,399,412] found that home safety interventions increased the proportion of families with a fire escape plan (OR 2.01, 95% CI 1.45 to 2.77) (*Figure 32*).

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Dershewitz 1977[404]	54	101	61	104	31.4%	0.81 (0.47 to 1.41)
Hendrickson 2002[269]	36	38	33	40	7.6%	3.82 (0.74 to 19.70)
Kelly 1987[273]	51	55	49	54	10.2%	1.30 (0.33 to 5.13)
Kendrick 1999[275]	356	363	364	366	8.1%	0.28 (0.06 to 1.35)
King 2001[277]	66	482	62	469	40.1%	1.04 (0.72 to 1.51)
Sznajder 2003[304]	47	47	46	50	2.6%	9.19 (0.48 to 175.58)
Total (95% CI)		**1086**		**1083**	**100.0%**	**1.03 (0.63 to 1.68)**
Total events	610		615			

Heterogeneity: $\tau^2=0.12$; $\chi^2=8.00$, df=5 ($p=0.16$); $I^2=38\%$
Test for overall effect: $z=0.13$ ($p=0.89$)

FIGURE 31 Forest plot of effect sizes for storing matches out of reach of children from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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TABLE 83 Summary of studies and their data included in the NMA of the safe storage of matches

Study	Study design	Follow-up (months)	Intervention	Study quality[a]	Safe storage of matches	
					Number of households with safe storage of matches	Total number of households
Kelly 1987[273]	RCT	7	Usual care (1)	A = U, B = Y, F = N	49	54
			Education (2)		51	55
Hendrickson 2002[269]	RCT	1.5	Usual care (1)	A = N, B = N, F = Y	33	40
			Education + equipment + home safety inspection (3)		36	38
Kendrick 1999[275]	RCT	25	Usual care (1)	B = N, F = N, C = Y	364	366
			Education + equipment + home safety inspection (3)		356	363
Dershewitz 1977[404]	RCT	2	Usual care (1)	A = U, B = Y, F = N	61	104
			Education + equipment + home safety inspection (3)		54	101
Sznajder 2003[304]	RCT	2	Education (2)	A = Y, B = N, F = Y	46	50
			Education + equipment + fitting (4)		47	47

a A, adequate allocation concealment; B, blinded outcome assessment; C, prevalence of confounders does not differ by > 10% between treatment arms; F, at least 80% of participants followed up in each arm; Y, yes; N, no; U, unclear.

TABLE 84 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on the storage of matches out of reach of children

Intervention	Usual care (1)	Education (2)	Education + equipment (3)	Education + equipment + home safety inspection (4)
Usual care (1)		0.78 (0.04 to 11.95)	1.09 (0.21 to 5.26)	0.04 (0.00 to 4.24)
Education (2)	0.77 (0.19 to 3.03)		1.40 (0.06 to 36.58)	0.06 (0.00 to 2.12)
Education + equipment + home safety inspection (3)	1.08 (0.21 to 5.29)			0.04 (0.00 to 5.37)
Education + equipment + fitting (4)		0.11 (0.01 to 2.08)		

Notes
Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 0.78 (95% CrI 0.04 to 11.95) is the estimate for education (2) vs. usual care (1) from the NMA.

Study or subgroup	log(OR)	SE	Weight	OR IV, random, 95% CI
Campbell 2001[399]	0.6671717	0.2521465	42.5%	1.95 (1.19 to 3.19)
Hwang 2006[412]	0.8329091	0.3646191	20.3%	2.30 (1.13 to 4.70)
Petridou 1997[293]	0.8887232	0.3541994	21.6%	2.43 (1.21 to 4.87)
Posner 2004[295]	0.3300413	0.4170063	15.6%	1.39 (0.61 to 3.15)
Total (95% CI)			**100.0%**	**2.01 (1.45 to 2.77)**

Heterogeneity: $\tau^2=0.00$; $\chi^2=1.22$, df=3 ($p=0.75$); $I^2=0\%$
Test for overall effect: $z=4.23$ ($p<0.0001$)

FIGURE 32 Forest plot of effect sizes for having a fire escape plan from studies evaluating home safety educational interventions. IV, inverse variance. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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Study J

Network meta-analysis was used to determine the effect of component elements of home safety interventions on the possession of a fire escape plan in three studies identified from the overview.[293,295,399] These studies included four interventions and the NMA estimated the six possible pairwise comparisons between the four interventions reported in the three studies. The data used in the NMA from each study are shown in *Table 85*. The pooled estimates, 95% CrIs and, when available, direct within-trial estimates are reported in *Table 86*. None of the interventions differed significantly from each other. The intervention with the highest probability of being the most effective was usual care (p best = 0.53).

Study K

Decision analyses were not undertaken for interventions to promote the possession of fire escape plans, as none of the interventions was found to be effective in NMAs.

TABLE 85 Summary of studies and their data included in the NMA of a fire escape plan

Study	Study design	Follow-up (months)	Intervention	Study quality[a]	Has fire escape plan	
					Number of households with plan	Total number of households
Petridou 1997[293]	CBA	20	Usual care (1)	B = N, F = Y, C = Y	15.29[b]	100.12[b]
			Community campaign + education + home visits (4)		29.81[b]	97.83[b]
Posner 2004[295]	RCT	2.5	Education (2)	A = Y, B = Y, F = N	26	47
			Education + equipment (3)		31	49
Campbell 2001[399]	RCT	12	Usual care (1)	A = U, B = Y, F = N	52.51[c]	168.19[c]
			Education (2)		52.51[c]	111.87[c]

a A, adequate allocation concealment; B, blinded outcome assessment; C, prevalence of confounders does not differ by > 10% between treatment arms; F, at least 80% of participants followed up in each arm; N, no; U, unclear; Y, yes.
b ICC obtained from published estimates.[33]
c ICC obtained from Murray *et al.*[443]

TABLE 86 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on possession of a fire escape plan

Intervention	Usual care (1)	Education (2)	Education + equipment (3)	Community campaign + education + home visits (4)
Usual care (1)		0.71 (0.05 to 9.86)	0.07 (0.00 to 2.90)	0.40 (0.03 to 5.47)
Education (2)	0.51 (0.31 to 0.84)		0.10 (0.01 to 1.39)	0.56 (0.01 to 23.41)
Education + equipment (3)		0.72 (0.32 to 1.62)		5.70 (0.06 to 503.10)
Community campaign + education + home visits (4)	0.41 (0.21 to 0.82)			

Notes
Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 0.71 (95% CrI 0.05 to 9.86) is the estimate for education (2) vs. usual care (1) from the NMA.

Interventions to promote other fire prevention practices

Study H

No meta-analyses were found for other outcomes related to fire prevention practices. One narrative review[354] reported interventions to teach safer fire responses, based on six primary studies.[411,414,415,428,429,440] It concluded that school-based programmes using active participation of children in learning fire responses were more effective than programmes using passive methods. It also concluded that skill retention was poor but was improved by periodic repetition and by the addition of fear reduction techniques and teaching the rationale behind behaviours. Two primary studies reporting this outcome were identified from further searches. One of these studies found a significant improvement in the demonstration of the correct action to take in a clothing fire and in knowledge of the correct actions to take in a house fire following delivery of a school-based injury prevention curriculum.[418] The other study reported that a significantly higher proportion of children who visited a learning centre performed the correct response and displayed the correct knowledge about a fire escape routine.[421]

The overview included one review reporting the effectiveness of interventions to prevent fire setting or match play,[33] which included three primary studies.[392,406,419] Two of these studies reported significant reductions in the incidence of fire setting or match play behaviour that favoured the intervention group.[406,419]

The overview included one systematic review[33] and six primary studies[288,292,295,401,412,418] reporting outcomes related to cooking safety. One study found that significantly more intervention arm parents childproofed their boiler and rice cooker.[401] No significant differences were found between treatment arms for other cooking safety outcomes, including children cooking on the stove[412] or without an adult present,[418] for keeping children away from the stove,[288] for turning pan handles away from the room[288,295] or for using cooker guards.[292]

Three studies reported outcomes related to the safe use of paraffin appliances.[289,301,303] All reported composite scores of paraffin safety practices, with two failing to find a significant difference between intervention arms[289,303] and the third finding significantly safer scores in intervention arm families.[301] Two studies also reported the individual items that constituted the paraffin safety scores.[301,303] These included a range of safety practices, none of which was found to differ significantly between treatment arms in either study.

Two studies reported candle safety,[295,303] with neither finding a significant difference between treatment groups for leaving burning candles in an empty room,[295] leaving candles on unstable surfaces[303] or using candles < 30 cm from flammable materials.[303]

Two studies reported electrical safety outcomes.[289,295] One of the studies reported no significant difference between intervention arms in the proportion of families with overloaded electrical sockets[295] and the other reported a composite electrical safety score, failing to find a significant difference between intervention arms.[289]

One study reported two outcomes related to safe smoking practices, finding no significant difference between intervention arms with respect to smoking in bed or safe disposal of ashes.[295] The same study also found no significant difference between intervention arms in the proportion of families using an oven to heat the kitchen.[295] Finally, one study reported no significant difference between intervention arms in the safe storage of irons.[275]

It was not possible to undertake pairwise meta-analyses (study I), NMA (study J) or decision analyses (study K) for any of these other fire prevention outcomes because of the small number of studies reporting each outcome.

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Scalds prevention

Figure 33 shows the process of identification and selection of reviews and primary studies included in the overview and in the NMA for scalds prevention interventions (studies H and J). Ten narrative systematic reviews, four meta-analyses including a narrative systematic review and 39 primary studies were included in the overview and 22 primary studies in the NMA for scalds outcomes.

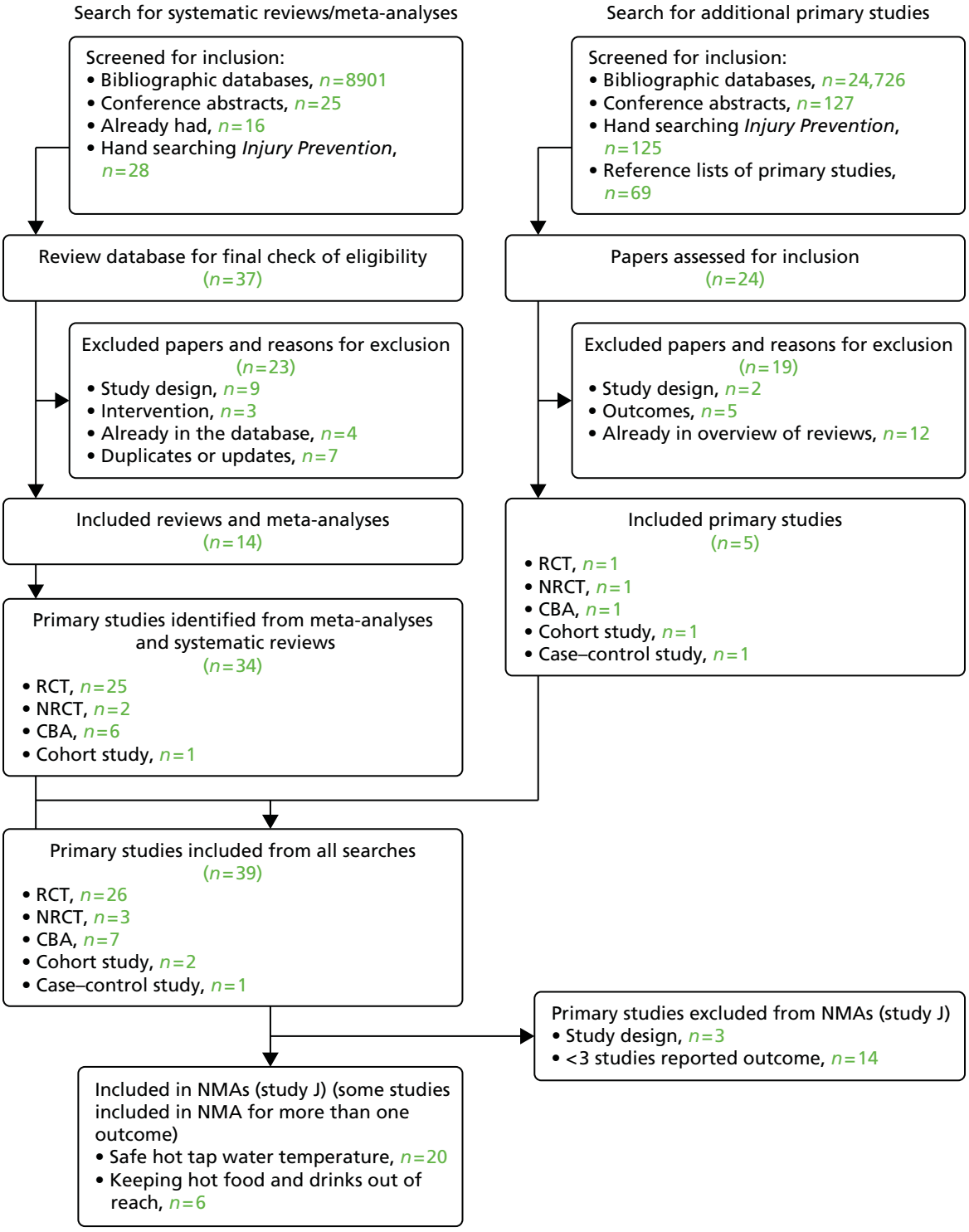


FIGURE 33 Process of study identification and selection for the overview of reviews and NMAs for scalds prevention. NRCT, non-RCT. From Zou *et al.*[389] under the Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

Characteristics of included reviews and primary studies

The characteristics and quality assessment of the reviews included in the scalds prevention overview (study H) are shown in *Table 71*. One review evaluated community-based scald prevention interventions[337] and stated that there was a lack of studies from which to draw conclusions about the effectiveness of community-based programmes to prevent burns and scalds. The other reviews examined a number of different injury mechanisms, including scalds, but did not draw any conclusions specific to scalds prevention interventions. The risk of bias in included reviews was variable, with OQAQ scores ranging from 2 to 7 (median 5) out of a maximum possible of 7.

The characteristics of the primary studies included in the scalds prevention overview (study H), the systematic review and PMA (study I) and the NMAs (study J) are shown in *Table 72*. Twenty-six (67%) primary studies were RCTs, four (10%) were non-RCTs, six (15%) were CBAs, two (5%) were cohort studies and one (3%) was a case–control study. Tables of excluded reviews and primary studies are available on request from the authors. The risk of bias in included primary studies was also variable; 42% of RCTs had adequate allocation concealment, 58% followed up at least 80% of participants in each arm and 38% demonstrated blinded outcome assessment. None of the 10 non-RCTs and CBAs demonstrated blinded outcome assessment, three followed up at least 80% of participants in each arm and two had a balanced distribution of confounders between intervention arms. The two cohort studies scored 6 and 7 (out of a maximum of 9) on the Newcastle–Ottawa scale, indicating that they were of high quality. The case–control study scored 7 on the same scale.

Preventing scald injuries

Study H

Four narrative reviews[36,49,337,385] reported the effectiveness of interventions for the prevention of scald injuries based on two primary studies.[312,442] One review of home safety interventions concluded that there was a lack of evidence that home safety interventions were effective in reducing rates of thermal (fire and scald) injuries.[49] One review concluded that there is little evidence that educational approaches alone have achieved any reductions in rates of burn and scald injuries.[36] One review concluded that there was a paucity of studies of the effectiveness of community-based injury prevention programmes for preventing burns and scalds in children.[337] The final review drew no conclusions specific to scald injury prevention.[385] No meta-analyses reported the effect of interventions on scald injuries. The first primary study was a CBA study and reported a reduction in the number of scalds and the severity of scald injuries following a community campaign and education from public health nurses at home visits and at childhood immunisations promoting lowering of tap water thermostat temperature.[442] However, the statistical significance of these findings was not reported. The second study, a RCT, found a significant reduction in the occurrence of scalds and burns in an intervention group receiving school-based health education delivered to children and parents.[312]

It was not possible to undertake PMA, NMA or decision analyses for interventions to prevent scalds because of the small number of studies.

Safe hot tap water temperature

Study H

All 14 reviews reported the effect of interventions on safe hot water temperature,[36,40,49,331,332,337,338,340,382,383,385–388] two of which included meta-analyses combining effect sizes for having a safe hot tap water temperature.[40,49] Both meta-analyses showed a significant effect favouring the intervention group, with pooled ORs of 2.32 (95% CI 1.46 to 3.68) based on combining effect sizes from four studies[40] and 1.41 (95% CI 1.07 to 1.86) based on combining effect sizes from 16 studies,[49] four of which were the same studies as in the DiGuiseppi and Roberts review.[40] Three reviews concluded that interventions had a positive effect on safe hot tap water temperature.[36,331,382] One review recommended periodic counselling of parents on measures to reduce the risk of unintentional injuries from hot tap water.[388]

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Twenty-nine primary studies reported the effect of interventions promoting safe hot water temperature, 26 of which were identified from reviews[257,264,265,272,273,275–277,285,287,288,292,295,297,300,304,305,307,395,422,427,431,432,435,439] and three of which were identified from additional searches for primary studies.[99,402,424] Eighteen of the studies gave an explicit definition of safe water temperature, ranging from ≤ 46 °C[276] to ≤ 60 °C.[307]

Interventions were effective at promoting safe hot tap water temperature in six studies.[257,276,277,287,431,439] In three of these studies, interventions combined safety education, a home safety assessment and items of equipment that targeted a number of hazards.[257,277,431] Of these, one study reported the provision of an item relating to hot tap water temperature (water temperature card).[257] The other interventions demonstrating a significant effect included an educational leaflet on bathwater scalds plus the fitting of a TMV[276] and a handout targeting burn and scald prevention combined with a 10-minute[287] or 1-hour[439] safety lecture.

Families in the intervention groups in five studies were significantly more likely to check or test hot tap water temperature compared with control group families.[257,272,295,422,435] Of these studies, one provided safety education, a home safety assessment and safety items including a water temperature card[257] and one delivered safety counselling to prevent a range of injuries and a free home safety kit, which included a bathwater thermometer and bath tap spout covers among other items.[295] The other studies reporting a significant effect evaluated interventions providing a bathwater thermometer during paediatric clinic consultations,[272] a 1-minute educational message about tap water scalds delivered in maternity wards[435] and a national 1-week safety campaign delivered via the media, community partners and retail stores, where free water temperature testing cards were available.[422]

The studies described above also reported that significantly more intervention families lowered their hot water temperature[422] and significantly more intervention families used spout covers for bath taps.[295]

Nineteen studies reported no significant effect of interventions on a range of outcomes related to safe hot water temperature.[99,264,265,273,275,285,287,288,292,297,300,304,307,395,402,424,427,432] They evaluated integrated or individual interventions including home visits, safety checks, safety education, counselling and safety devices.

Study I

The PMA evaluating home safety interventions (education plus provision of home safety inspections and safety equipment in some studies) included the same 16 studies as the meta-analysis by Kendrick *et al.*[49] described in study H. Intervention group families were more likely to have a safe hot tap water temperature than control group families (OR 1.41, 95% CI 1.07 to 1.86) (*Figure 34*).

Study J

Network meta-analysis explored the effects of component elements of the interventions on safe hot water temperature among 20 studies.[257,264,265,272,273,275–277,287,288,297,300,304,305,307,395,402,431,432,439] The data used in the NMA from each study are shown in *Table 87*. *Table 88* reports the pooled estimates, 95% CrIs and, when available, direct within-trial estimates. The NMA estimated the 36 possible pairwise comparisons between the nine included interventions. Home safety education plus free or low-cost provision and fitting of TMVs was most likely to be effective (p best = 0.97) with an OR compared with usual care of 38.82 (95% CrI 3.58 to 599.10).

Study K

This section reports the findings from the decision analysis evaluating the cost-effectiveness of different interventions promoting a safe hot tap water temperature. Seven of the nine interventions evaluated in the base-case analysis had higher costs than more effective interventions and were therefore excluded from further consideration (*Table 89*). Of the remaining two interventions, education had the lowest estimated ICER compared with usual care, at £40,271 per QALY gained.

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Georgieff 2004[264]	3	26	5	35	2.6%	0.78 (0.17 to 3.62)
Nansel 2002[287]	25	85	27	89	7.5%	0.96 (0.50 to 1.83)
Gielen 2002[265]	27	57	27	57	6.7%	1.00 (0.48 to 2.09)
Kelly 1987[273]	41	55	34	54	6.0%	1.72 (0.76 to 3.91)
Kendrick 1999[275]	103	350	88	354	10.8%	1.26 (0.90 to 1.76)
King 2001[277]	257	482	218	469	11.5%	1.32 (1.02 to 1.70)
Thomas 1984[305]	22	29	6	26	3.6%	10.48 (3.01 to 36.47)
Katcher 1989[272]	76	100	28	31	3.4%	0.34 (0.09 to 1.22)
Waller 1993[307]	21	51	31	97	7.0%	1.49 (0.74 to 3.01)
Barone 1988[395]	16	40	15	38	5.4%	1.02 (0.41 to 2.53)
Williams 1988[439]	22	38	11	34	5.0%	2.88 (1.10 to 7.55)
Phelan 2010[431]	109	146	94	148	9.0%	1.69 (1.03 to 2.79)
Babul 2007[257]	234	336	80	149	10.1%	1.98 (1.33 to 2.94)
Nansel 2008[288]	42	206	26	98	8.4%	0.71 (0.40 to 1.24)
Sangval 2007[297]	6	9	6	7	1.1%	0.33 (0.03 to 4.19)
Kendrick 2011[276]	13	16	2	15	1.8%	28.17 (4.02 to 197.45)
Total (95% CI)		**2026**		**1701**	**100.0%**	**1.41 (1.07 to 1.86)**
Total events	1017		698			

Heterogeneity: $\tau^2=0.16$; $\chi^2=40.27$, df = 15 ($p=0.0004$); $I^2=63\%$

Test for overall effect: $z=2.42$ ($p=0.02$)

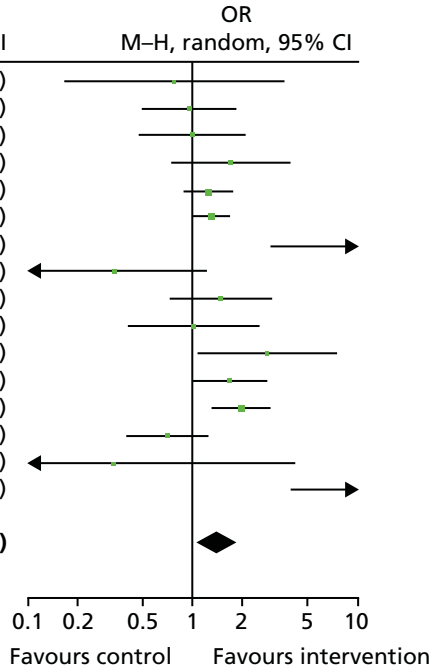


FIGURE 34 Forest plot of effect sizes for safe hot tap water temperature from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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TABLE 87 Summary of studies and their data included in the NMA of the interventions promoting a safe hot water temperature

Pairwise comparison[a]	Study	Study design	Follow-up (months)	Intervention[a]	Number of households with safe water (adjusted for clustering)	Total number of households
2 vs. 1	Williams 1988[439]	RCT	1	1	10.78[b]	34.30[b]
				2	21.56[b]	38.23[b]
	Nansel 2002[287]	RCT	0.75	1	27	89
				2	25	85
	Kelly 1987[273]	RCT	7	1	34	54
				2	41	55
	Thomas 1984[305]	RCT	1.5	1	6	26
				2	22	29
	Nansel 2008[288]	Non-RCT	1	1	26	98
				2	42	206
	Christakis 2006[402]	RCT	0.5–1	1	14	200
				2	48	384
	Reich 2011[432]	RCT	2–18	1 vs. 2	OR 1.44 (SE 0.44)	
3 vs. 1	Babul 2007[257]	RCT	10	1	80	149
				3	113	163
	Barone 1988[395]	RCT	6	1	14.52[b]	36.79[b]
				3	16.46[b]	39.70[b]
	Sangvai 2007[297]	RCT	6	1	6	7
				3	6	9
4 vs. 1	Kendrick, 1999[275]	Non-RCT	25	1	87.72[c]	353.82[c]
				4	103.49[c]	349.88[c]
	King 2001[277]	RCT	12	1	218	469
				4	257	482
5 vs. 1	Babul 2007[257]	RCT	10	1	80	149
				5	121	173
	Schwarz 1993[300]	CBA	12	1	770.9[b]	1053[b]
				5	566[b]	896[b]
	Georgieff 2004[264]	CBA	Unknown	1	4.99[b]	34.95[b]
				5	4.99[b]	30.96[b]
6 vs. 1	Kendrick 2011[276]	RCT	12	1	2	15
				6	13	16
7 vs. 1	Georgieff 2004[264]	CBA	Unknown	1	4.99[b]	34.95[b]
				7	3.00[b]	25.97[b]
8 vs. 1	Waller 1993[307]	RCT	4	1	31	97
				8	21	51
3 vs. 2	Katcher, 1989[272]	RCT	1	2	28	31
				3	76	100

TABLE 87 Summary of studies and their data included in the NMA of the interventions promoting a safe hot water temperature (*continued*)

Pairwise comparison[a]	Study	Study design	Follow-up (months)	Intervention[a]	Number of households with safe water (adjusted for clustering)	Total number of households
5 vs. 3	Babul 2007[257]	RCT	10	3	113	163
				5	121	173
	Gielen 2002[265]	RCT	12	3	26.92[b]	56.83[b]
				5	26.92[b]	56.83[b]
7 vs. 5	Georgieff 2004[264]	CBA	Unknown	5	4.99[b]	30.96[b]
				7	3.00[b]	25.97[b]
9 vs. 2	Phelan 2011[431]	RCT	12	2	94	148
				9	109	146
	Sznajder 2003[304]	RCT	2	2	3	47
				9	0	42

a 1 = usual care; 2 = education; 3 = education + equipment (thermometer); 4 = education + equipment (not scald related) + home safety inspection; 5 = education + equipment (thermometer) + home safety inspection; 6 = education + TMV + fitting; 7 = education + TMV + fitting + home safety inspection; 8 = education + home safety inspection; 9 = education + equipment (not scald related) + fitting + home safety inspection.
b ICC calculated from individual participant data from Kendrick *et al.*[275]
c ICC calculated from individual participant data.

Figure 35 shows the probability of the alternative interventions being cost-effective. At a threshold value of £30,000 per QALY gained, usual care has the highest probability of being cost-effective (0.75). However, when this threshold value is increased to £50,000, education has the highest probability of being cost-effective (0.54), demonstrating considerable uncertainty in the decisions within the £30,000–50,000 threshold range.

Sensitivity analysis A range of sensitivity analyses varying the base-case assumptions and inputs, as outlined in the methods section, were implemented (*Table 90*). Reducing the probability of a scald to zero for households with a safe hot water temperature for all interventions (SA2), not just TMV interventions, and removing the fixed costs of setting up a safe hot water scheme (SA3) resulted in the ICER for education compared with usual care decreasing from £40,271 per QALY gained to £30,571 and £23,975. The cost-effectiveness results were found to be very sensitive to the probability of a scald. When this parameter was changed to the estimated probability of a scald among children living in social housing (653/582,700 from Phillips *et al.*[140]) to reflect provision of the intervention to families living in social housing, the ICER for education plus TMV and fitting compared with usual care reduced from £68,455 to –£20,828 (i.e. cost saving).

Safe handling of hot food and drinks

Study H

The overview included one systematic review and meta-analysis[49] and three systematic reviews[337,340,387] reporting the effect of interventions on the safe handling of hot food and drinks. The meta-analysis estimated the pooled OR for six studies for the effect of home safety education on keeping hot food and drinks out of the reach of children.[49] Families receiving home safety education were not significantly more likely to keep hot drinks out of the reach of children than control group families (OR 0.95, 95% CI 0.61 to 1.48). No reviews drew conclusions specific to the effectiveness of interventions for promoting the safe handling of hot food or drinks.

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TABLE 88 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on safe hot water temperature

Intervention	Usual care (1)	Education (2)	Education + equipment (thermometer) (3)	Education + equipment (not scald related) + home safety inspection (4)	Education + equipment (thermometer) + home safety inspection (5)	Education + TMV + fitting (6)	Education + TMV + fitting + home safety inspection (7)	Education + home safety inspection (8)	Education + equipment (not scald related) + fitting + home safety inspection (9)
Usual care (1)		1.73 (0.98 to 3.20)	0.97 (0.41 to 2.14)	1.29 (0.46 to 3.56)	0.99 (0.43 to 2.24)	38.82 (3.58 to 599.10)	0.67 (0.09 to 4.34)	1.48 (0.30 to 7.03)	1.77 (0.33 to 6.81)
Education (2)	1.64 (0.66 to 4.29)		0.56 (0.21 to 1.38)	0.75 (0.22 to 2.37)	0.58 (0.20 to 1.52)	22.58 (1.93 to 366.00)	0.39 (0.04 to 2.79)	0.86 (0.15 to 4.48)	1.03 (0.21 to 3.42)
Education + equipment (thermometer) (3)	1.66 (1.11 to 2.50)	0.34 (0.09 to 1.22)		1.32 (0.38 to 5.19)	1.02 (0.42 to 2.62)	40.71 (2.21 to 706.40)	0.69 (0.08 to 5.11)	1.52 (0.26 to 9.34)	1.81 (0.30 to 8.54)
Education + equipment (not scald related) + home safety inspection (4)	1.30 (1.01 to 1.59)				0.77 (0.20 to 2.88)	30.78 (2.23 to 553.90)	0.52 (0.05 to 4.48)	1.14 (0.17 to 7.53)	1.37 (0.19 to 7.39)
Education + equipment (thermometer) + home safety inspection (5)	0.75 (0.64 to 0.90)		1.02 (069 to 1.52)			39.47 (3.08 to 672.20)	0.68 (0.09 to 4.40)	1.49 (0.25 to 8.73)	1.78 (0.28 to .38)
Education + TMV + fitting (6)	28.17 (4.01 to 197.46)						0.02 (0.00 to 0.37)	0.04 (0.00 to 0.67)	0.04 (0.00 to 0.68)
Education + TMV + fitting + home safety inspection (7)	0.78 (0.31 to 1.97)				0.68 (0.13 to 3.46)			2.22 (0.19 to 28.58)	2.62 (0.21 to 29.37)
Education + home safety inspection (8)	1.49 (0.74 to 3.01)								1.19 (0.12 to 9.28)
Education + equipment (not scald related) + fitting + home safety inspection (9)		1.53 (0.94 to 2.47)							

Notes

Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 1.73 (95% CrI 0.98 to 3.20) is the estimate for education (2) vs. usual care (1) from the NMA.

TABLE 89 Base-case analysis results (probabilistic) for the cost-effectiveness of interventions promoting a safe hot tap water temperature

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)[b]	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
Usual care (1)	27,111 (27,092 to 27,130)	9,246 (7390 to 11,133)				0.75	0.26
Education (2)	27,111 (27,093 to 27,130)	11,289 (9848 to 12,828)	0.05	2042	40,271	0.25	0.54
Education + equipment (thermometer) (3)	27111 (27,092 to 27,130)	12,507 (10,803 to 14,343)			Dominated	0.006	0.02
Education + equipment (not scald related) + home safety inspection (4)	27,111 (27,092 to 27,130)	21,273 (18,738 to 23,825)			Dominated	< 0.001	< 0.001
Education + equipment (thermometer) + home safety inspection (5)	27,111 (27,092 to 27,130)	21,407 (18,742 to 24,084)			Dominated	< 0.001	< 0.001
Education + TMV + fitting (6)	27,111 (27,093 to 27,129)	15,726 (14,246 to 17,702)	0.07	4437	68,455	0.003	0.18
Education + TMV + fitting + home safety inspection (7)	27,111 (27,092 to 27,130)	28,972 (25,081 to 32,961)			Dominated	< 0.001	< 0.001
Education + home safety inspection (8)	27,111 (27,092 to 27,130)	21,056 (18,359 to 23,876)			Dominated	< 0.001	< 0.001
Education + equipment (not scald related) + fitting + home safety inspection (9)	27,111 (27,092 to 27,130)	20,929 (18,295 to 23,776)			Dominated	< 0.001	< 0.001

CE, cost-effective.
a Expected QALYs and expected costs per 1000 households.
b Dominated = costs more but delivers fewer QALYs.

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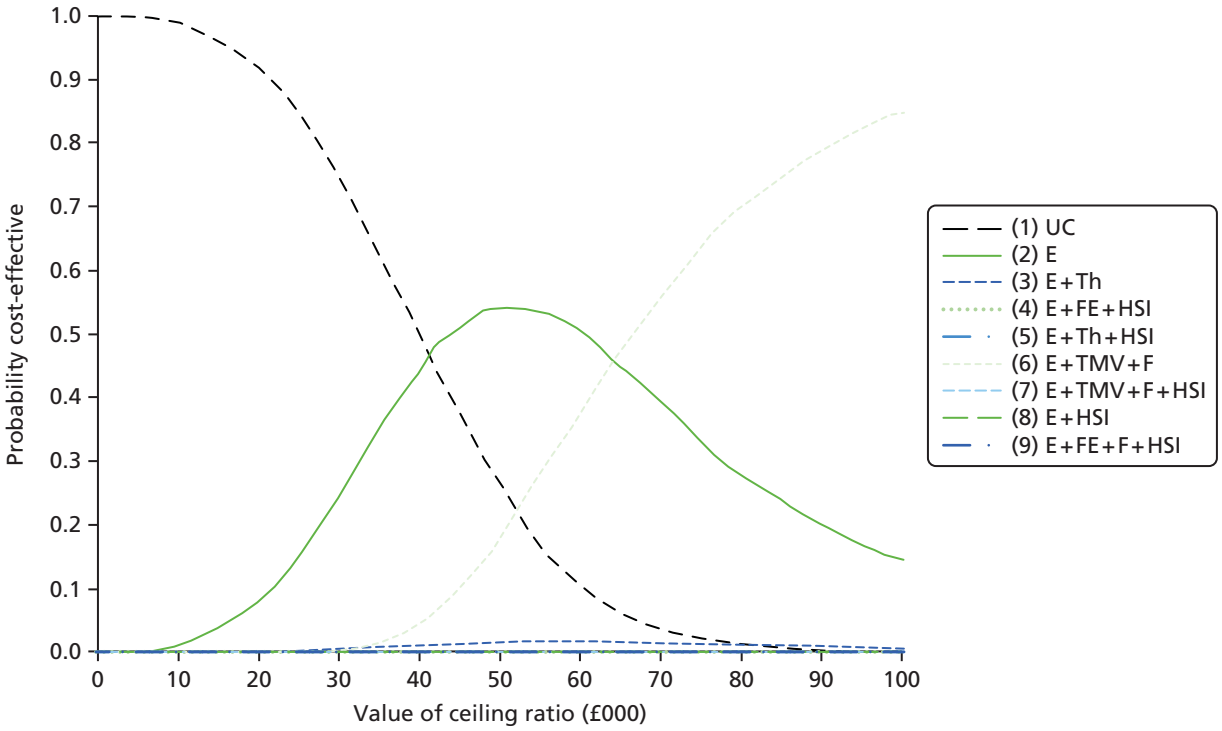


FIGURE 35 Cost-effectiveness acceptability curves for interventions to promote safe hot tap water temperature. E, education; F, fitting; FE, equipment (not scald related); HSI, home safety inspection; Th, equipment (thermometer); UC, usual care.

A total of 10 primary studies were identified for the overview, eight from reviews[257,269,275,287,288,295,422,444] and two from additional searches for primary studies.[400,410]

One study reported that significantly more families in the intervention group than control families tested the temperature of food prepared in a microwave oven.[444] The study delivered an intervention that included home visits with active guidance on injury prevention and regular monthly telephone follow-ups. The remaining eight studies evaluated a range of interventions including home safety education, tailored safety advice, home safety assessments, the provision of discounted or free home safety equipment and exposure to a child safety campaign and all reported no significant differences in the safe handling of hot food and drinks between the intervention group and the control group.[257,269,275,287,288,400,410,422]

Study I

Pairwise meta-analysis of six studies evaluating home safety education, the same six studies as in the meta-analysis of Kendrick *et al.*[49] described in study H, found no effect of interventions promoting the safe handling of hot food and drinks (OR 0.95, 95% CI 0.61 to 1.48) (*Figure 36*).

Study J

Network meta-analysis was used to determine the effect of component elements of home safety interventions explored in the six studies included in the PMA on keeping hot food and drinks out of the reach of children.[257,269,275,287,288,295] The NMA estimated the six possible pairwise comparisons between the four interventions reported in the six studies, finding no significant difference between any of the interventions. The data used from each study are shown in *Table 91* and the pooled estimates and 95% CrIs are shown in *Table 92*.

Study K

As none of the interventions for promoting the safe handling of hot food and drinks was found to be effective in the NMA, decision analyses were not undertaken for this outcome.

TABLE 90 Sensitivity analysis results for interventions promoting a safe hot tap water temperature

Intervention	Expected QALYs	Expected costs (£)	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
SA1: probability accept intervention assumed higher for non-TMV interventions, i.e. 0.9 (as in smoke alarm decision model)							
Usual care (1)	27,111	9278				0.70	0.23
Education (2)	27,111	11,593	0.06	2314	37,852	0.29	0.62
Education + TMV + fitting (6)	27,111	15,675	0.06	4081	74,075	0.002	0.14
SA2: probability of scald set to 0 for all interventions not just TMV when safe hot water temperature							
Usual care (1)	27,111	8767				0.48	0.13
Education (2)	27,111	10,498	0.06	1730	30,571	0.50	0.80
Education + TMV + fitting (6)	27,111	15,702	0.05	5203	103,344	< 0.001	0.03
SA3: fixed costs removed (i.e. set to £0) as 'safe hot water temperature' likely to be part of a wider home safety scheme							
Usual care (1)	27,111	9,268				0.36	0.07
Education (2)	27,111	10,489	0.05	1221	23,975	0.62	0.71
Education + TMV + fitting (6)	27,111	14,906	0.07	4416	68,194	0.006	0.20
SA4: number of scalds increased to 653 per year from 582,700 households[140] to reflect providing intervention to families in social housing[a]							
Usual care (1)	27,111	30,631				< 0.001	< 0.001
Education + TMV + fitting (6)	27,111	22,072	0.41	–8559	–20,828	0.98	0.98
SA5: assumed TMVs fitted separately (i.e. not part of a refurbishment or rebuild scheme) – cost for TMVs increased to £150 (SE £55) based on range £40 for TMV to £260 for complex fitting[140]							
Usual care (1)	27,111	9,299,220				0.74	0.30
Education (2)	27,111	11,321,380	0.05	2022	39,756	0.25	0.67
(Education + TMV + fitting (6)	27,111	102,345,625	0.06	91,024	1,394,153	0.005	0.006

CE, cost-effective.
a Education + TMV + fitting has the highest probability of being CE under this scenario.

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Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Babul 2007[257]	325	335	147	149	7.6%	0.44 (0.10 to 2.04)
Hendrickson 2002[269]	37	38	36	40	3.8%	4.11 (0.44 to 38.57)
Kendrick 1999[275]	191	318	201	320	48.7%	0.89 (0.65 to 1.22)
Nansel 2002[287]	78	85	84	89	11.7%	0.66 (0.20 to 2.18)
Nansel 2008[288]	125	131	55	62	12.5%	2.65 (0.85 to 8.25)
Posner 2004[295]	34	46	38	47	15.8%	0.67 (0.25 to 1.79)
Total (95% CI)		**953**		**707**	**100.0%**	**0.95 (0.61 to 1.48)**
Total events	790		561			

Heterogeneity: $\tau^2=0.08$; $\chi^2=6.66$, df=5 ($p=0.25$); $I^2=25\%$

Test for overall effect: $z=0.23$ ($p=0.82$)

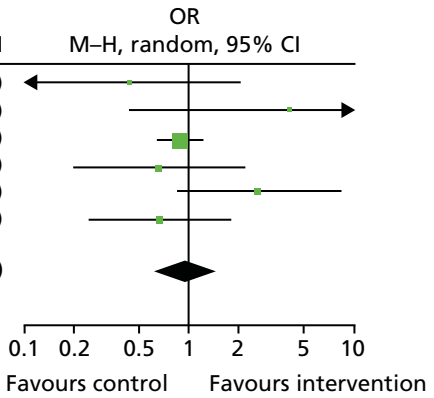


FIGURE 36 Forest plot of effect sizes for keeping hot food or drinks out of reach of children from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

TABLE 91 Summary of studies and their data included in the NMA of interventions promoting the safe handling of hot food and drinks

Pairwise comparison	Study	Study design	Follow-up (months)	Intervention	Number of households with hot food and/or drinks out of reach (nos adjusted for clustering)	Total number of households (nos adjusted for clustering)
Usual care (1) vs. education (2)	Nansel 2002[287]	RCT	0.75	1	84	89
				2	78	85
	Nansel 2008[288]	Non-RCT	1	1	55	62
				2	125	131
Usual care (1) vs. education + equipment (3) vs. education + equipment + home safety inspection (4)	[a]Babul 2007[257]	RCT	10	1	147	149
				3	158	163
				4	167	172
Usual care (1) vs. education + equipment + home safety inspection (4)	Kendrick 1999[275]	Non-RCT	25	1	230 (200.91)[b]	336 (319.70)[b]
				4	219 (191.30)[b]	364 (317.96)[b]
	Hendrickson 2002[269]	RCT	1.5	1	36	40
				4	37	38
Education (2) vs. education + equipment (3)	Posner 2004[295]	RCT	2.5	2	38	47
				3	34	46

a Home safety kit was considered as home safety equipment + education, hence the kit-only intervention was classed as education + low-cost/free equipment and the kit + home visit intervention was classed as education + low-cost/free equipment + home visit.
b ICC calculated from individual participant data from Kendrick *et al.*[275]

TABLE 92 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions for promoting the safe handling of hot food and drinks

Intervention	Usual care (1)	Education (2)	Education + equipment (3)	Education + equipment + home safety inspection (4)
Usual care (1)		1.29 (0.34 to 4.84)	0.76 (0.17 to 3.66)	0.98 (0.32 to 3.78)
Education (2)			0.59 (0.12 to 2.90)	0.77 (0.15 to 4.80)
Education + equipment (3)				1.29 (0.26 to 7.68)
Education + equipment + home safety inspection (4)				

Notes
Values above the shaded diagonal are the results from the NMA. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 1.29 (95% CrI 0.34 to 4.84) is the estimate for education (2) vs. usual care (1) from the NMA.

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Kitchen and cooking safety practices

Study H

The overview included nine systematic reviews reporting on the effectiveness of interventions to promote kitchen and cooking safety practices.[36,49,331,332,337,338,340,385,387] The reviews drew no conclusions specific to the effectiveness of interventions to promote kitchen and cooking safety practices and no meta-analyses were identified for these outcomes.

Eight primary studies reported kitchen and cooking safety practices, with six identified from the reviews[260,288,295,418,422,444] and two identified from additional searches for primary studies.[99,400] One of the eight studies reported that intervention group families were significantly more likely to have childproofed electrical kitchen heating devices (e.g. boiler, rice cooker).[444] Intervention group families received a programme that involved four quarterly home visits and monthly telephone follow-ups targeting a range of injuries including scalds. Another study found that intervention group homes were significantly more likely to have a 'child-protected' cooker (not defined) and to have removed objects that could allow a child to climb and reach the sink following a group scald and burn prevention workshop and a home visit delivering tailored child injury prevention information.[400] No significant differences between intervention and control groups with regard to kitchen and cooking safety practices were reported in the remaining studies. These included evaluations of the effectiveness of a school-based injury prevention programme for improving practices of children when cooking without an adult,[418] home safety assessments, education plus discount vouchers for safety, equipment on use of cooker guards and on keeping heating devices out of the reach of children,[277] an ED-based home safety intervention to promote cooking on the back burners of cookers or turning pan handles towards the back of the cooker,[295] tailored home safety education about keeping children away from the cooker or oven or turning pan handles away from the edge of the cooker[288] and a scald and burn prevention media campaign to promote using the back burners of cookers, keeping children out of the kitchen when cooking, turning pot handles to the back of the cooker and removing dangling cords of heating devices.[422] Finally, there were no significant differences between cases (children who presented with injuries from falls, burns, scalds, ingestions or choking) and controls with regard to having a cooker guard or dangling cords of heating devices.[99]

Pairwise meta-analysis and NMA were not undertaken for interventions promoting kitchen and cooking safety practices as the number of studies reporting each outcome was small.

Other scald prevention practices

Study H

Eight reviews were included in the overview evaluating the effect of interventions on other scald-related outcomes.[36,49,331,332,338,340,385,387] The reviews drew no conclusions specific to the effectiveness of interventions for other scald prevention practices and no meta-analyses were identified for these outcomes. Four primary studies identified from the reviews reported other scald-related outcomes,[260,295,303,407] with no further studies identified from subsequent searches for primary studies. Of these four studies, two observed significant effects on burn safety scores (representing safer burn prevention practices) of interventions involving home safety education, home safety assessments and free home safety equipment.[295,303] In another study, significantly more families in the intervention group made their home safer after a television campaign, home safety advice, a home safety assessment check and advice on welfare benefits available to purchase safety equipment and the local availability of equipment.[260] A multifaceted campaign aimed at reducing the occurrence of scalds in children aged 0–4 years reported no significant effect of the intervention on scald prevention behaviours.[407]

Pairwise meta-analysis and NMA were not undertaken for interventions promoting other scald prevention practices as the number of studies reporting each outcome was small.

Falls prevention

Figure 37 shows the process of identification and selection of reviews and primary studies included in the overview and NMAs for falls prevention outcomes. Twelve narrative systematic reviews, one meta-analysis including a narrative systematic review and 29 primary studies were included in the overview, and 16 primary studies were included in the NMAs for falls prevention outcomes.

Characteristics of included reviews and primary studies

The characteristics and quality assessment of reviews included in the overview are shown in *Table 71*. One review focused specifically on falls prevention interventions,[333] with the remainder including interventions addressing a range of injury mechanisms. The risk of bias in included reviews was variable, with OQAQ scores ranging from 2 to 7 (median 4) out of a maximum possible score of 7.

The characteristics of the primary studies included in the overview, the systematic review and PMA and the NMAs are shown in *Table 72*. Most ($n = 20$, 69%) primary studies were RCTs, five (17%) were non-RCTs, three (10%) were CBAs and one (3%) was a cohort study. Tables of excluded reviews and primary studies are available on request from the authors. The risk of bias in included primary studies was also variable; at least half of the RCTs had adequate allocation concealment (55%) and follow-up of at least 80% of participants in each arm (50%). One-third of RCTs carried out blinded outcome assessments (35%). None of the non-RCTs and CBAs carried out blinded outcome assessments, one-third (38%) followed up at least 80% of participants in each arm and half (50%) had a balanced distribution of confounders between intervention arms. The cohort study scored 9 (out of a maximum of 9) on the Newcastle–Ottawa scale, indicating that it was of high quality.

Preventing falls or fall-related injuries

Study H

The overview included nine systematic reviews reporting interventions to prevent falls or fall-related injuries,[33,36,41,331,333–335,383,445] drawing on data from only three primary studies.[267,416,438] Two reviews drew conclusions about the effectiveness of interventions to prevent falls or fall-related injuries, with both concluding that there was a paucity of evidence in this area.[33,333] The three primary studies included in the reviews consisted of one non-RCT,[438] one CBA study[267] and one cohort study.[416] The cohort study found fewer self-reported fall-related injuries among those receiving home safety information, but the statistical significance was not reported.[416] The CBA study found some evidence of a reduction in fall-related injuries (OR 0.78, 95% CI 0.61 to 1.00) from a community-based injury prevention programme.[267] The non-RCT found no significant effect on falls or fall-related injuries of nurse counselling to reduce baby walker use.[438] It was not possible to combine effect sizes from these last two studies in PMA or NMA as the numerators and denominators were not published and individual participant data, from which they could be calculated, was provided by only one study.[438]

Pairwise meta-analyses and NMAs were not undertaken for interventions to reduce falls or fall-related injuries, as the number of studies reporting these outcomes was small.

Promoting safety gate possession and use

Study H

The overview included one systematic review and meta-analysis[33] and five reviews[42,332,338,383,387] reporting the effect of interventions on the possession and use of safety gates. The meta-analysis, which combined effect sizes from 10 studies, reported that home safety education interventions, some of which included the provision of safety gates, were effective in increasing safety gate possession and use (OR 1.26, 95% CI 1.05 to 1.51). There was some evidence that interventions that provided safety gates may have slightly

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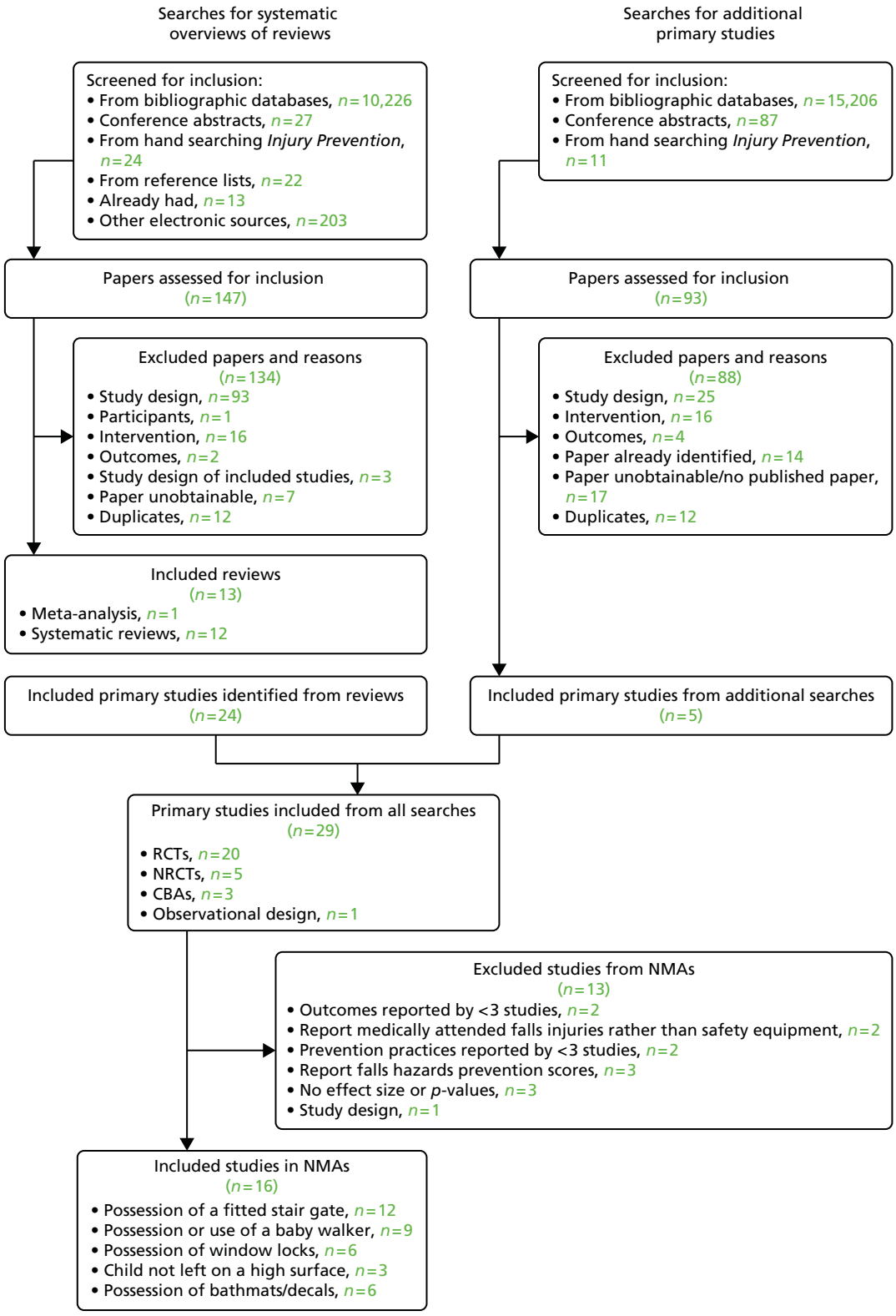


FIGURE 37 Process of study identification and selection for the overview of reviews and NMAs for falls prevention outcomes. NRCT, non-RCT. Using data from Young *et al.*[48] and Hubbard *et al.*[446]

larger effect sizes (OR 1.37, 95% CI 1.15 to 1.62) than those that did not (OR 1.24, 95% CI 0.94 to 1.64).[33] Of the six reviews, that by Lyons *et al.*[332] and a subsequent update that utilised different eligibility criteria[42] found no increase in the possession or use of safety gates. The other reviews reported conflicting or unclear evidence on the effect of interventions to increase safety gate possession and use.[33,338,383,387] Three of these reviews each found only single studies reporting a significant effect of the intervention.[33,338,387] The other review[383] reported that intervention families obtained and fitted safety gates but did not report the significance of this finding.

A total of 16 primary studies reporting safety gate possession and use were identified (14 from reviews[71,72,257,260,265,275,277,282,287,295,304,413,417,441] and two from additional searches for primary studies[288,431]). Three studies reported a significant increase in the possession and use of safety gates on stairs,[72,413,431] two of which provided home safety education and fitted free or low-cost safety gates,[72,431] with the third providing only home safety education.[413] The remaining 13 studies reported no significant effect of the interventions, only three of which provided low-cost safety gates[71,275] or discount vouchers,[277] with none fitting safety gates.

Study I

Pairwise meta-analysis of 12 studies evaluating home safety education, which in some studies also included the provision of safety gates and home safety inspections,[71,72,265,275,277,282,287,288,295,304,417,431] found that interventions significantly increased the possession of a fitted safety gate (OR 1.61, 95% CI 1.19 to 2.17) (*Figure 38*). Interventions providing safety gates appeared to be more effective (OR 2.05, 95% CI 1.08 to 3.89) than those that did not (OR 1.26, 95% CI 0.96 to 1.64).

Study J

Network meta-analysis was used to determine the effect of component elements of home safety interventions explored in the 12 studies included in the PMAs for safety gate possession and use.[71,72,265,275,277,282,287,288,295,304,417,431] These studies included seven interventions and the NMA estimated the 21 possible pairwise comparisons between the seven interventions reported in the 12 studies. The data used in the NMA from each study for each of the falls prevention outcomes are shown in *Table 93*. The pooled estimates, 95% CrIs and, when available, direct within-trial estimates are reported in *Table 94*. The most intensive intervention (home safety education plus equipment provision plus fitting of safety equipment plus home safety inspection) was the most likely to be the most effective (p best = 0.97), with an OR compared with usual care of 7.80 (95% CrI 3.18 to 21.30). This combination of interventions resulted in significantly more households having fitted safety gates than any of the other combinations of interventions, with effect sizes being between five and eight times greater with the most intensive intervention.

Study K

This section describes the findings from the decision analysis evaluating the cost-effectiveness of different interventions to increase possession of fitted safety gates to prevent stairway falls. In the base-case analysis, seven interventions were evaluated (*Table 95*), of which four were found to have higher costs or a higher ICER than more effective interventions (namely education plus free or low-cost safety equipment, education plus free or low-cost safety equipment plus home safety inspection, education plus free or low-cost safety equipment plus fitting of the equipment and education plus home safety inspection). Of the remaining three interventions, education had the lowest estimated ICER compared with usual care, at £284,068 per QALY gained. *Figure 39* shows the probability of the alternative interventions being cost-effective. At a threshold value of £30,000 per QALY gained, usual care had the highest probability of being cost-effective (0.999).

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Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Clamp 1998[71]	52	64	50	69	6.9%	1.65 (0.72 to 3.74)
Gielen 2002[265]	13	48	11	48	6.0%	1.25 (0.49 to 3.16)
Kendrick 1999[275]	223	323	214	323	11.9%	1.14 (0.82 to 1.58)
Kendrick 2005[417]	311	377	348	436	11.6%	1.19 (0.84 to 1.70)
King 2001[277]	158	482	166	469	12.5%	0.89 (0.68 to 1.16)
McDonald 2005[282]	30	63	17	58	7.5%	2.19 (1.03 to 4.65)
Nansel 2002[287]	76	85	70	89	6.6%	2.29 (0.97 to 5.40)
Nansel 2008[288]	60	69	29	38	5.3%	2.07 (0.74 to 5.77)
Phelan 2011[431]	131	146	78	147	8.7%	7.73 (4.14 to 14.43)
Posner 2004[295]	28	49	25	47	7.0%	1.17 (0.52 to 2.62)
Sznajder 2003[304]	44	47	45	50	3.2%	1.63 (0.37 to 7.23)
Watson 2005[72]	408	742	328	718	13.0%	1.45 (1.18 to 1.78)
Total (95% CI)		**2495**		**2492**	**100.0%**	**1.61 (1.19 to 2.17)**
Total events	1534		1381			

Heterogeneity: $\tau^2=0.17$; $\chi^2=45.47$, df=11 ($p<0.00001$); $I^2=76\%$

Test for overall effect: $z=3.07$ ($p=0.002$)

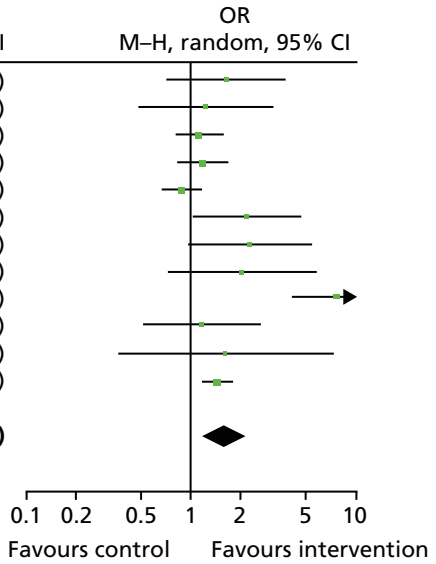


FIGURE 38 Forest plot of effect sizes for having a fitted safety gate from studies evaluating home safety educational interventions (some of which included the provision of safety gates). M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

TABLE 93 Summary of studies and their data included in the NMA of interventions to prevent falls injuries in children aged < 5 years[a]

Pairwise comparison	Study	Study design	Follow-up (months)	Study quality[b]	Intervention	Safety gate (*n*/*N*)	Baby walker (*n*/*N*)	Window locks (*n*/*N*)	High surfaces (*n*/*N*)	Bath mat (*n*/*N*)
Usual care (1) vs. education (2)	[c]Nansel 2002[287]	RCT	0.75	A = Y, B = Y, F = Y	1	70/89	30/89			
					2	76/85	19/85			
	Kendrick 2005[417]	RCT	9	A = Y, B = N, F = Y	1	418/524 (348.4/436.8)[d]	230/543 (105.3/248.5)[d]			
					2	373/452 (310.9/376.8)[d]	131/463 (60.0/211.9)[d]			
	[e]Nansel 2008[288]	NRCT	1	B = N, F = N, C = N	1	29/38	12/38		21/24	
					2	60/69	13/69		55/62	
	[f]Tan 2004[438]	NRCT	5	B = U, F = Y, C = Y	1		393/480			
					2		143/228			
Usual care (1) vs. education + equipment (3)	[g]Babul 2007[257]	RCT	10	A = Y, B = N, F = N	1		31/148		69/148	
					3		22/162		89/161	
	Clamp 1998[71]	RCT	1.5	A = Y, B = N, F = Y	1	50/69		72/82		
					3	52/64		80/83		
	McDonald 2005[282]	RCT	1	A = Y, B = U, F = N	1	10/41				
					3	23/54				

continued

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TABLE 93 Summary of studies and their data included in the NMA of interventions to prevent falls injuries in children aged < 5 years[a] (*continued*)

Pairwise comparison	Study	Study design	Follow-up (months)	Study quality[b]	Intervention	Safety gate (*n*/*N*)	Baby walker (*n*/*N*)	Window locks (*n*/*N*)	High surfaces (*n*/*N*)	Bath mat (*n*/*N*)
Usual care (1) vs. education + equipment + home safety inspection (4)	[9]Babul 2007[257]	RCT	10	A = Y, B = N, F = N	1		31/148		69/148	
					4		26/173		84/170	
	Kendrick 1999[275]	NRCT	25	B = N, F = N, C = Y	1	241/364 (214.3/323.6)[h]		339/336		
					4	251/364 (223.2/323.6)[h]		323/362		
	Hendrickson 2002[269]	RCT	1.5	A = N, B = N, F = Y	1			21/39		
					4			24/34		
Usual care (1) vs. education + equipment + fitting (5)	Watson 2005[72]	RCT	12	A = Y, B = N, F = N	1	328/718		493/741		
					5	408/742		550/767		
Usual care (1) vs. education + home safety inspection (6)	Petridou 1997[293]	CBA	20	B = N, F = Y, C = Y	1					64/128 (50.4/100.1)[i]
					6					66/131 (48.9/97.8)[i]
Usual care (1) vs. education + equipment + fitting + home safety inspection (7)	Phelan 2011[431]	RCT	12	A = Y, B = N, F = Y	1	78/147	29/138	145/150		59/149
					7	131/146	24/140	146/149		56/150
Education (2) vs. education + equipment (3)	Posner 2004[295]	RCT	2.5	A = Y, B = Y, F = N	2	25/47	4/8		44/50	34/47
					3	28/49	4/7		12/17	44/49
Education (2) vs. education + equipment + fitting (5)	Sznajder 2003[304]	RCT	1.5 to 2	A = Y, B = N, F = Y	2	45/50	14/50			37/49
					5	44/47	19/47			31/48

Pairwise comparison	Study	Study design	Follow-up (months)	Study quality[b]	Intervention	Safety gate (*n*/*N*)	Baby walker (*n*/*N*)	Window locks (*n*/*N*)	High surfaces (*n*/*N*)	Bath mat (*n*/*N*)
Education + equipment (3) vs. education + equipment + home safety inspection (4)	Gielen 2002[265]	RCT	12	A = U, B = U, F = N	3	11/48 (12.9/47.4)[j]				
					4	13/48 (10.9/47.4)[j]				
	Babul 2007[257g]	RCT	10	A = Y, B = N, F = N	3		22/162		89/161	
					4		26/173		84/170	
Education + equipment + home safety inspection (4) vs. education + home safety inspection (6)	King 2001[277]	RCT	12	A = Y, B = Y, F = Y	4	158/482	29/482	285/469		
					6	166/469	33/469	299/482		

n/*N*, number with outcome/total number in group; NRCT, non-randomised controlled trial.

a A, adequate allocation concealment; B, blinded outcome assessment; C, prevalence of confounders does not differ by > 10% between treatment arms; F, at least 80% of participants followed up in each arm; N, no; U, unclear; Y, yes.

b Numbers adjusting for clustering in parentheses.

c Two intervention arms were combined (tailored advice and tailored advice + care provider feedback).

d ICC calculated from individual participant data from Kendrick *et al.*[417]

e Generic safety advice was counted as usual care.

f Two control arms were combined (usual care and usual care + baseline questionnaire).

g The study by Babul *et al.*[257] has been included in the NMA as a three-arm trial but is listed above as three separate comparisons.

h ICC calculated from individual participant data from Kendrick *et al.*[275]

i The study by Petridou *et al.*[293] was adjusted for clustering using an ICC of 0.0024 (estimated as the midpoint of a range of ICCs published for health outcomes at the level of health authority, local authority or town).[49]

j ICC calculated from individual participant data from Kendrick *et al.*[275] and Kendrick *et al.*[417]

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TABLE 94 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on having a fitted safety gate

Intervention	Usual care (1)	Education (2)	Education + equipment (3)	Education + equipment + home safety inspection (4)	Education + equipment + fitting (5)	Education + home safety inspection (6)	Education + equipment + fitting + home safety inspection (7)
Usual care (1)		1.43 (0.90 to 2.49)	1.63 (0.93 to 3.03)	1.28 (0.69 to 2.79)	1.52 (0.84 to 3.38)	1.43 (0.56 to 4.42)	7.80[a] (3.08 to 21.3)
Education (2)	1.48 (0.97 to 2.25)		1.14 (0.56 to 2.23)	0.90 (0.41 to 2.07)	1.07 (0.51 to 2.41)	1.01 (0.33 to 3.25)	5.46[a] (1.75 to 16.1)
Education + equipment (3)	1.92 (1.05 to 3.51)[a]	1.17 (0.52 to 2.63)		0.78 (0.38 to 1.77)	0.94 (0.42 to 2.41)	0.88 (0.32 to 2.80)	4.77 (1.56 to 15.2)[a]
Education + equipment + home safety inspection (4)	1.13 (0.82 to 1.58)		1.25 (0.49 to 3.17)		1.20 (0.45 to 3.25)	1.12 (0.52 to 2.49)	6.13 (1.75 to 18.7)[a]
Education + equipment + fitting (5)	1.45 (1.18 to 1.79)[a]	1.63 (0.37 to 7.23)				0.94 (0.27 to 3.28)	5.07 (1.47 to 15.9)[a]
Education + home safety inspection (6)				1.12 (0.86 to 1.47)			5.48 (1.23 to 20.7)[a]
Education + equipment + fitting + home safety inspection (7)	7.73 (4.14 to 14.4)[a]						

a Significant at 5% level.

Notes

Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 1.43 (95% CrI 0.90 to 2.49) is the estimate for education (2) vs. usual care (1) from the NMA.

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TABLE 95 Base case cost-effectiveness results for safety gates to prevent stairway falls

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)[b]	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
Usual care (1)	25,056.326 (25,039.202 to 25,073.452)	3431 (2446 to 4826)				0.999	0.999
Education (2)	25,056.334 (25,039.207 to 25,073.460)	5529 (4543 to 6859)	0.007	2089	284,068	< 0.001	0.001
Education + equipment (3)	25,056.334 (25,039.209 to 25,073.462)	18,358 (13,338 to 23,472)			Extendedly dominated	< 0.001	< 0.001
Education + equipment + home safety inspection (4)	25,056.334 (25,039.211 to 25,073.458)	21,252 (15,203 to 27,432)			Dominated	< 0.001	< 0.001
Education + equipment + fitting (5)	25,056.334 (25,039.207 to 25,073.462)	25,017 (17,621 to 32,589)			Dominated	< 0.001	< 0.001
Education + home safety inspection (6)	25,056.334 (25,039.209 to 25,073.458)	8454 (6803 to 10240)			Dominated	< 0.001	< 0.001
Education + equipment + fitting + home safety inspection (7)	25,056.335 (25,039.212 to 25,073.462)	26,227 (18,409 to 34,246)	0.009	22,745	2,405,800	< 0.001	< 0.001

CE, cost-effective.
a Expected QALYs and expected costs per 1000 households.
b Dominated = costs more but delivers fewer QALYs; extendedly dominated = ICER greater than that of a more effective intervention.

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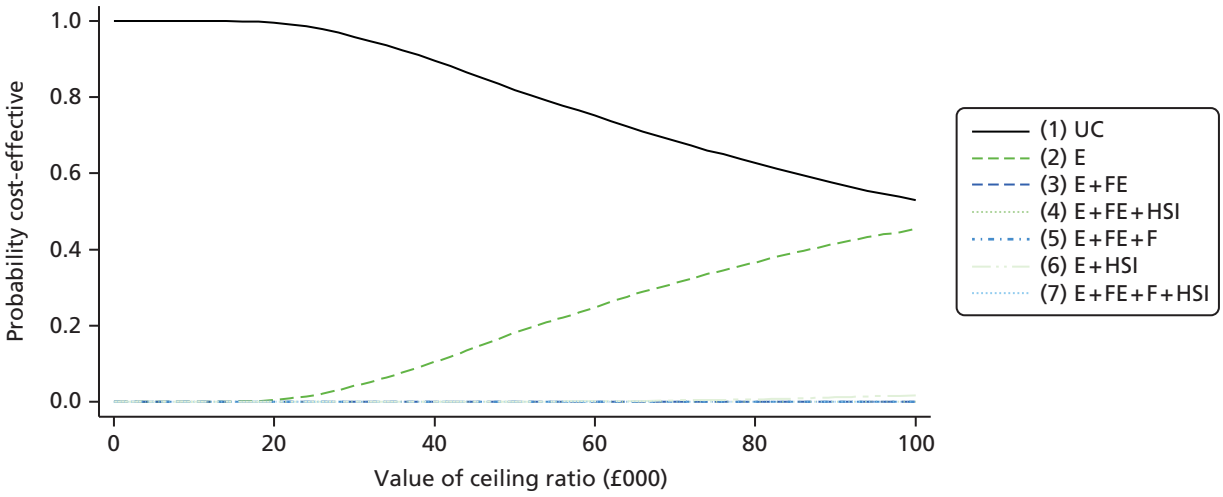


FIGURE 39 Cost-effectiveness acceptability curves for the base-case analysis indicating the probability that each intervention is the most cost-effective for a range of willingness–to-pay ratios. E, education; F, fitting; FE, low-cost/free equipment; HSI, home safety inspection; UC, usual care.

Sensitivity analysis A range of sensitivity analyses varying the base-case assumptions and inputs was carried out (*Table 96*). All assessed the probability of interventions being cost-effective at thresholds of £30,000 and £50,000. The sensitivity analyses carried out involved reducing the number of safety gates fitted to one; reducing the cost of education by using the cost of providing a leaflet only; providing low-cost (£5) rather than free safety gates; halving the fixed cost of an intervention programme; changing the number of children per household from 1 to 1.8;[378] reducing the probability of possessing a fitted safety gate from 0.56 to 0.45 to reflect the baseline possession of a fitted and used stair gate by families in deprived areas of Nottingham;[72] and changing the utility deficits from 0.05, 0.1 and 0.2 for mild, moderate and severe injuries, respectively, to 0.07, 0.19 and 0.34.[143]

The results were not particularly sensitive to any of the changes.

Promoting the possession and use of non-slip bathroom items

Study H

The overview included one systematic review and meta-analysis[33] and three reviews[332,338,387] reporting the effect of interventions on the possession and use of non-slip bathroom items. The meta-analysis, which combined effect sizes from three studies, reported that home safety education interventions, some of which included the provision of bath mats or decals, were not effective in increasing the possession of non-slip bathroom items (OR 1.16, 95% CI 0.51 to 2.63).[33] Of the three reviews, one[332] found a significant increase in the possession of non-slip bath mats and two[338,387] reported no significant increase in possession of non-slip bathroom items.

Five primary studies reported the effect of interventions to promote the possession and use of non-slip bathroom items (four from reviews[293,295,304,441] and one from additional searches for primary studies[431]). One study reported a significant increase in the use of non-slip bath decals following home safety education and the provision of a home safety kit that included bath decals.[295] The other four studies reported no significant effect of the interventions. All included home safety education, with two including a home safety assessment[431,441] and one providing non-slip bath mats.[304]

Study I

Pairwise meta-analysis of four studies evaluating home safety education,[293,295,304,431] which in some studies included the provision of non-slip bathroom items and home safety inspections, found that interventions were not effective in increasing the possession of non-slip bathroom items (OR 1.10, 95% CI 0.68 to 1.79) (*Figure 40*).

TABLE 96 Sensitivity analysis results for intervention promoting the use of safety gates to prevent stairway falls

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (£) (95% CrI)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
SA1: number of safety gates reduced from two to one							
Usual care (1)	25,056 (25,039 to 25,073)	3427 (2446 to 4847)				0.999	0.999
Education (2)	25,056 (25,039 to 25,073)	5529 (4543 to 6883)	0.007	2090	283,228	< 0.001	0.001
Education + equipment + fitting + home safety inspection (7)	25,056 (25,039 to 25,073)	17,361 (12,683 to 22,083)	0.009	13,860	1,466,433	< 0.001	< 0.001
SA2: reducing the cost of education by using the cost of providing a leaflet only							
Usual care (1)	25,056 (25,039 to 25,073)	3428 (2446 to 4847)				0.996	0.961
Education (2)	25,056 (25,039 to 25,073)	4,482 (3537 to 5854)	0.007	1053	143,846	0.0	0.039
Education + equipment + fitting + home safety inspection (7)	25,056 (25,039 to 25,073)	25,217 (17,712 to 32842)	0.009	21,714	2,296,038	< 0.001	< 0.001
SA3: providing low-cost (£5) rather than free safety gates							
Usual care (1)	25,056 (25,039 to 25,073)	3428 (2446 to 4847)				0.999	0.999
Education (2)	25,056 (25,039 to 25,073)	5529 (4543 to 6883)	0.007	2090	283,228	< 0.001	< 0.001
Education + equipment + fitting + home safety inspection (7)	25,056 (25,039 to 25,073)	22,919 (16,233 to 29,678)	0.009	19,411	2,053,078	< 0.001	< 0.001
SA4: fixed costs of intervention reduced to £40,000							
Usual care (1)	25,056 (25,040 to 25,073)	3428 (2446 to 4847)				0.999	0.999
Education (2)	25,056 (25,040 to 25,073)	5529 (4543 to 6884)	0.007	2090	157,348	< 0.001	0.001
Education + equipment + fitting + home safety inspection (7)	25,056 (25,040 to 25,073)	26,252 (18,372 to 34,271)	0.009	22,752	1,336,429	< 0.001	< 0.001

continued

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TABLE 96 Sensitivity analysis results for intervention promoting the use of safety gates to prevent stairway falls (*continued*)

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (£) (95% CrI)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
SA5: increased number of children per household from 1 to 1.8[378]							
Usual care (1)	25,056 (25,039 to 25,073)	3236 (2229 to 4685)				0.999	0.999
Education (2)	25,056 (25,039 to 25,074)	5572 (4582 to 6866)	0.008	2319	292,258	< 0.001	0.001
Education + equipment + fitting + home safety inspection (7)	25,056 (25,039 to 25,074)	29,867 (18,141 to 41,807)	0.01	26,566	2,585,853	< 0.001	< 0.001
SA6: changing the baseline probability of possession of a fitted safety gate from 0.56 to 0.45 to reflect a deprived area[72]							
Usual care (1)	25,056 (25,039 to 25,074)	3141 (2258 to 4428)				1	0.999
Education (2)	25,056 (25,039 to 25,074)	5569 (4591 to 6866)	0.008	2436	291,812	< 0.001	0.001
Education + equipment + fitting + home safety inspection (7)	25,056 (25,039 to 25,074)	31,690 (23,318 to 36,884)	0.011	28,522	2,612,847	< 0.001	< 0.001
***SA7: changing utility deficits to 0.07, 0.19 and 0.34 for mild, moderate and severe injuries, respectively, to reflect Brussoni* et al.**[143]							
Usual care (1)	25,056 (25,039 to 25,073)	3424 (2450 to 4819)				1	0.999
Education (2)	25,056 (25,039 to 25,073)	5524 (4538 to 6847)	0.008	2086	267,482	< 0.001	0.001
Education + equipment + fitting + home safety inspection (7)	25,056 (25,039 to 25,073)	26,195 (18,262 to 34,310)	0.01	22,686	2,257,270	< 0.001	< 0.001

CE, cost-effective.
a Expected QALYs and expected costs per 1000 households.

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Petridou 1997[293]	49	98	50	100	31.3%	1.00 (0.57 to 1.75)
Phelan 2010[431]	59	149	56	150	35.8%	1.10 (0.69 to 1.75)
Posner 2004[295]	44	49	34	47	13.7%	3.36 (1.09 to 10.36)
Sznajder 2003[304]	31	48	37	49	19.3%	0.59 (0.25 to 1.43)
Total (95% CI)		**344**		**346**	**100.0%**	**1.10 (0.68 to 1.79)**
Total events	183		177			

Heterogeneity: $\tau^2=0.11$; $\chi^2=5.81$, df=3 ($p=0.12$); $I^2=48\%$

Test for overall effect: $z=0.40$ ($p=0.69$)

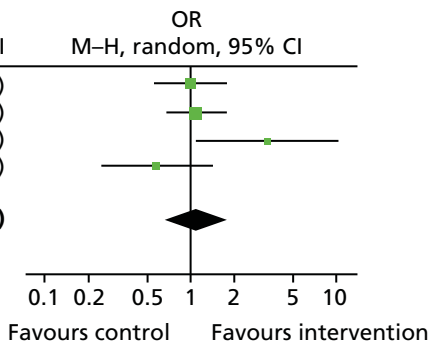


FIGURE 40 Forest plot of effect sizes for possession of non-slip bathroom items from studies evaluating home safety educational interventions (some of which included provision of non-slip bathroom items). M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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Study J

Network meta-analysis was not possible for possession of non-slip bathroom items as there were only two unconnected networks of three interventions.

Promoting the possession and use of window safety devices

Study H

The overview included one systematic review and meta-analysis[33] and five reviews[42,332,338,383,387] reporting the effect of interventions on the possession and use of window safety devices (locks, restrictors or screens). The meta-analysis, which combined effect sizes from five studies, found that home safety education interventions, some of which included the provision of window locks or restrictors, were not effective in increasing the possession of window safety devices (OR 1.16, 95% CI 0.84 to 1.59).[33] Of the reviews, two reported significant improvements in the use, frequency of use and location of window locks,[42,338] and one reported a significant increase in the use of window locks.[387] Two reviews reported conflicting findings[33,332] and one review reported findings in which the significance level was not reported.[383]

Ten primary studies, nine identified from reviews[71,72,260,269,275,277,292,304,444] and one identified from additional searches for primary studies,[431] reported the effect of interventions to promote the possession and use of window safety devices. Two studies reported a significant effect, one on fitted window locks[72] and one on childproofed window frames.[444] One of these studies provided home safety education and supplied and fitted window locks for free to low-income families, with free delivery of low-cost window locks to other families.[72] The second study provided only home safety education.[444] Eight studies did not report a significant increase in the possession and use of window safety devices. All included home safety education and five included the identification or provision of free or low-cost window safety devices.

Study I

Pairwise meta-analysis of six studies evaluating home safety education,[71,72,269,275,277,431] which in some studies included the provision of window safety devices and home safety inspections, found that interventions were not effective in increasing the possession of window safety devices (OR 1.10, 95% CI 0.68 to 1.79) (*Figure 41*).

Study J

Network meta-analysis explored the effects of component elements of the interventions among the six studies included in the PMA for possession of window safety devices.[71,72,269,275,277,431] These included six interventions as listed in *Table 97* (see also *Table 93*) The NMA estimated the 15 possible pairwise comparisons between these interventions. Education plus home safety inspection was most likely to be effective (p best = 0.26), but there was very little difference between any of the interventions.

Study K

Decision analyses were not undertaken for interventions to promote the possession of window locks as none of the interventions was significantly better than any other in the NMA.

Promoting the possession and use of furniture corner covers

Study H

The overview included five systematic reviews[33,332,338,383,387] reporting the effect of interventions promoting the possession and use of furniture corner covers. No meta-analyses were found for this outcome. Two reviews reported interventions associated with significant reductions in sharp-edged bench tops,[332,383] two reviews reported conflicting evidence of the effect of interventions on furniture corner cover use[33,387] and one review included a study reported elsewhere as significantly increasing the use of furniture corner covers although the review did not specifically report this finding.[338]

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Clamp 1998[71]	80	83	72	82	4.5%	3.70 (0.98 to 13.99)
Hendrickson 2002[269]	24	34	21	39	7.7%	2.06 (0.78 to 5.43)
Kendrick 1999[275]	323	362	339	366	18.6%	0.66 (0.39 to 1.10)
King 2001[277]	299	482	285	469	31.5%	1.05 (0.81 to 1.37)
Phelan 2010[431]	146	149	145	150	3.8%	1.68 (0.39 to 7.15)
Watson 2005[72]	550	767	493	741	34.0%	1.27 (1.02 to 1.59)
Total (95% CI)		**1877**		**1847**	**100.0%**	**1.17 (0.87 to 1.57)**
Total events	1422		1355			

Heterogeneity: $\tau^2=0.06$; $\chi^2=10.38$, df=5 ($p=0.07$); $I^2=52\%$
Test for overall effect: $z=1.03$ ($p=0.30$)

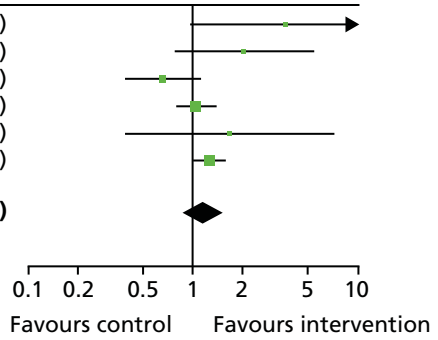


FIGURE 41 Forest plot of effect sizes for possession of window safety devices from studies evaluating home safety educational interventions (some of which included the provision of window safety devices). M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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TABLE 97 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on the possession of window safety devices

Intervention	Usual care (1)	Education + equipment (3)	Education + equipment + home safety inspection (4)	Education + equipment + fitting (5)	Education + home safety inspection (6)	Education + equipment + fitting + home safety inspection (7)
Usual care (1)		4.09 (0.27 to 67.9)	1.05 (0.19 to 6.89)	1.28 (0.11 to 14.2)	1.10 (0.057 to 25.2)	1.74 (0.11 to 30.5)
Education + equipment (3)	0.27 (0.46 to 1.11)		0.26 (0.01 to 7.29)	0.31 (0.007 to 11.4)	0.27 (0.004 to 17.1)	0.42 (0.008 to 21.0)
Education + equipment + home safety inspection (4)	0.93 (0.31 to 2.80)			1.24 (0.054 to 22.1)	1.06 (0.092 to 12.6)	1.65 (0.055 to 44.1)
Education + equipment + fitting (5)	0.78 (0.63 to 0.98)				0.85 (0.020 to 44.8)	1.38 (0.034 to 57.2)
Education + home safety inspection (6)			0.95 (0.72 to 1.24)			1.56 (0.024 to 89.8)
Education + equipment + fitting + home safety inspection (7)	0.60 (0.09 to 3.13)					

Notes

Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 4.09 (95% CrI 0.27 to 67.9) is the estimate for education (2) vs. usual care (1) from the NMA.

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Four studies reported the effect of interventions to promote the possession and use of furniture corner covers.[257,273,292,304] Two studies found a significant effect of the intervention on use of protective devices on table corners or bench tops.[292,304] One of these studies provided the item to intervention families as part of a free home safety kit[304] and the other study provided assistance with identifying retail outlets selling the item in addition to a home safety assessment and home safety education.[292] Two studies found no significant effect of the intervention, with one study delivering home safety education, which included the provision of furniture corner covers,[257] and the other study providing only home safety education.[273]

It was not possible to undertake a PMA or NMA for possession and use of furniture corner covers as only two studies reported numerators and denominators in all arms of the study.[273,304]

Promoting the possession and use of high-chair harnesses

Study H

The overview included three systematic narrative reviews[33,332,338] reporting the effect of interventions on the possession and use of high-chair harnesses. No meta-analyses were found for this outcome. All three reviews found no evidence that interventions were effective in increasing the use of high-chair harnesses.

Two studies reported interventions to promote the use of high-chair harnesses, neither of which found evidence that interventions were effective at increasing use of this item. The interventions involved home safety education, a home safety assessment and advice on where to purchase equipment,[292] and home safety education plus a free home safety kit that did not include a high-chair harness.[304] It was not possible to undertake PMA or NMA for this outcome because of the small number of studies included.

Reducing baby walker possession or use

Study H

The overview included one meta-analysis[33] and three reviews[332,338,387] reporting the effect of interventions on baby walker possession or use. The meta-analysis, which combined effect sizes from six studies, found some evidence that interventions were effective in reducing baby walker possession or use (OR for having or using a walker 0.66, 95% CI 0.43 to 1.00). One review[338] reported conflicting evidence on the effect of interventions to prevent baby walker use and two reviews found no evidence of a reduction in baby walker use.[332,387]

Nine studies reported interventions to reduce baby walker use.[257,277,287,288,295,304,417,431,438] Two studies, focusing solely on preventing baby walker-associated injuries, reported a significant reduction in ownership and use of baby walkers.[417,438] The first study provided education to reduce walker use from nurses during child visits for immunisation[438] and the second provided an educational package delivered by health visitors and midwives before and after childbirth.[417] The remaining studies all provided education about baby walkers as part of interventions aimed at preventing a range of childhood injuries.

Study I

Pairwise meta-analysis of the nine studies of home safety education for the reduction of baby walker use[257,277,287,288,295,304,417,431,438] found that interventions were effective in increasing the proportion of families who did not have or use a walker (OR 1.57, 95% CI 1.18 to 2.09) (*Figure 42*).

Study J

Network meta-analysis explored the effects of component elements of the interventions from the nine studies included in the PMA for baby walker possession or use.[257,277,287,288,295,304,417,431,438] The data for these studies are provided in *Table 93*. The studies included seven interventions, which are listed in *Table 98*. The NMA estimated the 21 possible pairwise comparisons between the seven interventions. The education-only intervention was the most effective (p best = 0.65), with families in the education-only

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Study or subgroup	Control Events	Control Total	Intervention Events	Intervention Total	Weight	OR M–H, random, 95% CI
Babul 2007[257]	31	148	48	335	13.9%	1.58 (0.96 to 2.61)
Kendrick 2005[417]	105	248	60	212	16.6%	1.86 (1.26 to 2.75)
King 2001[277]	33	469	29	182	13.5%	1.18 (0.71 to 1.98)
Nansel 2002[287]	30	89	19	85	10.3%	1.77 (0.90 to 3.46)
Nansel 2008[288]	12	38	13	69	7.0%	1.99 (0.80 to 4.95)
Phelan 2011[431]	29	138	24	140	11.7%	1.29 (0.71 to 2.34)
Posner 2004[295]	4	8	4	7	1.8%	0.75 (0.10 to 5.77)
Sznajder 2003[304]	14	50	19	47	7.7%	0.57 (0.25 to 1.34)
Tan 2004[438]	393	480	143	228	17.6%	2.69 (1.88 to 3.83)
Total (95% CI)		**1668**		**1605**	**100.0%**	**1.57 (1.18 to 2.09)**
Total events	651		359			

Heterogeneity: $\tau^2=0.09$; $\chi^2=16.42$, df=8 ($p=0.04$); $I^2=51\%$

Test for overall effect: $z=3.10$ ($p=0.002$)

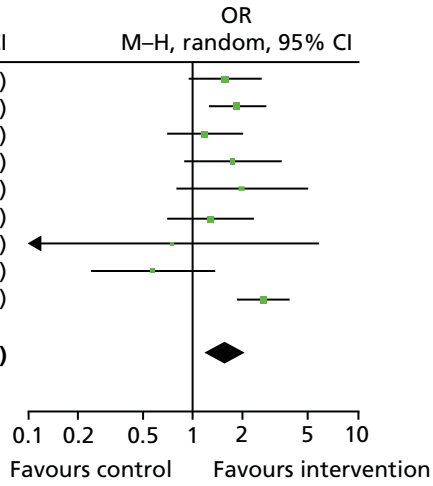


FIGURE 42 Forest plot of effect sizes for not having or using a baby walker from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

TABLE 98 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on baby walker possession or use

Intervention	Usual care (1)	Education (2)	Education + equipment (3)	Education + equipment + home safety inspection (4)	Education + equipment + fitting (5)	Education + home safety inspection (6)	Education + equipment + fitting + home safety inspection (7)
Usual care (1)		0.48 (0.31 to 0.84)[a]	1.51 (0.56 to 3.65)	1.07 (0.37 to 2.89)	0.85 (0.29 to 3.35)	1.28 (0.29 to 5.06)	0.78 (0.27 to 2.22)
Education (2)	0.46 (0.36 to 0.58)[a]		3.15 (1.02 to 8.38)[a]	2.25 (0.66 to 6.24)	1.80 (0.53 to 6.24)	2.68 (0.55 to 10.93)	1.63 (0.47 to 4.96)
Education + equipment (3)	0.59 (0.33 to 1.08)	1.33 (0.17 to 10.3)		0.70 (0.26 to 2.02)	0.56 (0.13 to 2.97)	0.84 (0.21 to 3.52)	0.52 (0.13 to 2.22)
Education + equipment + home safety inspection (4)	0.67 (0.38 to 1.19)		0.89 (0.48 to 1.64)		0.79 (0.16 to 4.71)	1.20 (0.43 to 3.26)	0.73 (0.17 to 3.24)
Education + equipment + fitting (5)		1.75 (0.75 to 4.08)				1.51 (0.20 to 9.30)	0.91 (0.16 to 4.47)
Education + home safety inspection (6)				0.85 (0.51 to 1.42)			0.61 (0.10 to 3.69)
Education + equipment + fitting + home safety inspection (7)	0.78 (0.43 to 1.42)						

a Significant at 5% level.

Notes

Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 0.48 (95% CrI 0.31 to 0.84) is the estimate for education (2) vs. usual care (1) from the NMA.

Reproduced from Hubbard S, Cooper N, Kendrick D, Young B, Wynn PM, He Z, Miller P, Achana F, Sutton A. Network meta-analysis to evaluate the effectiveness of interventions to prevent falls in children under age 5 years. *Injury Prevention* 2015;**21**(2):98–108.[446] Copyright © 2015 by the BMJ Publishing Group Ltd. All rights reserved.

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intervention group being less likely to possess or use a baby walker than those in the usual-care group (OR 0.48, 95% CrI 0.31 to 0.84).

Study K

Baby walker use may impact differentially on different mechanisms of falls.[447] For example, using baby walkers has been associated with an increased risk of head injuries from stair falls and their use may also increase the risk of falls on one level from tipping over. However, baby walkers may reduce the risk of falls from furniture if they prevent infants from reaching furniture to climb on or reduce the risk of falls on one level if infants spend less time walking and more time in the baby walker. Using baby walkers has been identified as a risk factor for poisonings and burns as they can allow infants to reach hazards that they would not be able to reach if they not using a baby walker. Furthermore, since these risks were described, some countries, for example Canada, have banned the sale of baby walkers[447] and design changes introduced by the 2005 European standard[448] may have altered the risk of walker-associated injuries. More complex decision analyses are therefore required to evaluate the cost-effectiveness of interventions to reduce baby walker use and this is included in the recommendations for research resulting from the KCS programme.

Preventing children being left unattended on high surfaces

Study H

The overview included two systematic narrative reviews[33,387] reporting the effect of interventions on preventing children being left unattended on high surfaces. No meta-analyses were found for this outcome. Neither review reported a significant effect of interventions.

Three primary studies included in the systematic reviews reported this outcome. There was no evidence of the effectiveness of interventions to prevent children being left unattended on a high surface. The studies delivered interventions involving home safety education and a free safety kit[257,295] and home safety education alone.[288]

Study I

Pairwise meta-analysis of three studies of home safety education for preventing children being left unattended on high surfaces[257,288,295] found no evidence that education was effective (OR for does not leave child alone on high surfaces 0.84, 95% CI 0.58 to 1.20) (*Figure 43*).

Study J

Network meta-analysis estimated the six possible pairwise comparisons between the four interventions listed in *Table 99* (data for these studies are shown in *Table 93*). There was very little difference between the interventions, but education only was the least likely to be effective in preventing children being left on high surfaces (p best = 0.10), with an OR of 0.56 (95% CrI 0.06 to 4.65) compared with education plus low-cost/free equipment and an OR of 0.50 (95% CrI 0.03 to 8.76) compared with education plus low-cost/free equipment plus home safety inspection.

Study K

Decision analyses were not undertaken for interventions to prevent children being left unattended on high surfaces, as none of the interventions was significantly better than any other in the NMA.

Interventions to promote stairway safety

Study H

The overview included four systematic narrative reviews[33,36,332,383] reporting the effect of interventions on stairway safety. No meta-analyses were found for this outcome. The reviews all found no evidence that interventions were effective in promoting safe indoor stairways. One review reported mixed findings regarding the effect of interventions on outdoor stair safety.[33]

Study or subgroup	Control Events	Total	Intervention Events	Total	Weight	OR M–H, random, 95% CI
Babul 2007[257]	69	148	173	331	85.7%	0.80 (0.54 to 1.18)
Nansel 2008[288]	21	24	55	62	6.2%	0.89 (0.21 to 3.77)
Posner 2004[295]	6	47	5	49	8.1%	1.29 (0.37 to 454)
Total (95% CI)		**219**		**442**	**100.0%**	**0.84 (0.58 to 1.20)**
Total events	96		233			

Heterogeneity: $\tau^2=0.00$; $\chi^2=0.51$, df=2 ($p=0.77$); $I^2=0\%$
Test for overall effect: $z=0.98$ ($p=0.33$)

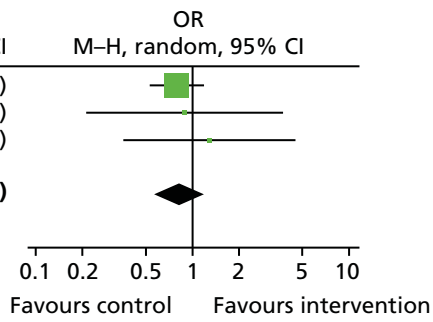


FIGURE 43 Forest plot of effect sizes for preventing children being left unattended on high surfaces from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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TABLE 99 Pooled ORs (95% CrIs) from NMA comparing the effect of different interventions on preventing children being left unattended on high surfaces

Intervention	Usual care (1)	Education (2)	Education + equipment (3)	Education + equipment + home safety inspection (4)
Usual care (1)		1.94 (0.20 to 14.4)	1.13 (0.12 to 6.75)	1.01 (0.089 to 9.18)
Education (2)	0.89 (0.18 to 5.84)		0.56 (0.064 to 4.65)	0.50 (0.032 to 8.76)
Education + equipment (3)	0.71 (0.44 to 1.13)	3.06 (0.61 to 14.3)		0.89 (0.099 to 9.67)
Education + equipment + home safety inspection (4)	0.89 (0.56 to 1.42)		1.27 (0.80 to 2.00)	

Notes
Values above the shaded diagonal are the results from the NMA; those below are direct estimates from a trial or, when data from more than one trial were available, a meta-analysis. Blank cells indicate that no direct evidence on specific pairwise comparisons was available. The intervention with the lowest number is always the comparator, for example OR 1.94 (95% CrI 0.20 to 14.4) is the estimate for education (2) vs. usual care (1) from the NMA.
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Six primary studies reported interventions to promote stairway safety practices, five identified from reviews[269,277,292,293,300] and one identified from additional searches for primary studies.[418] The interventions in these studies included home safety education plus home safety assessments[269,277,292] and an injury prevention curriculum including falls prevention education delivered to children in a school setting.[418] There was no evidence that these interventions were effective in preventing children playing on stairs or in promoting safe indoor stairways, including the presence of handrails, railings or adequate lighting on stairs, a reduction in the number of railings or stairs in disrepair, a reduction in the ease of opening doors to cellars or basements and stairs properly designed in terms of safety features. There was a significant improvement observed in the modification of safety features of outdoor stairs[293] following a multifaceted community intervention and a significant reduction in missing or loose porch railings after home safety education, a home safety assessment and modification of hazards.[300] It was not possible to undertake PMA or NMA or decision analyses for these stairway safety outcomes because of the small number of studies.

Interventions to reduce tripping hazards

Study H

The overview included five systematic narrative reviews[33,36,332,338,383] reporting the effect of interventions on tripping hazards. No meta-analyses were found for this outcome. Four reviews reported the effect of interventions on the fixing of rugs or carpets.[33,36,338,383] One review found a significant reduction in tripping hazards from rugs or floor coverings.[383] Another review included the same primary study but did not report the relevant outcome.[36] Two reviews did not find a significant effect of interventions on the fixing of rugs or carpets.[33,338] Four reviews reported the effect of interventions on other tripping hazards.[33,36,332,338] Two reviews[36,332] found a reduction in tripping hazards from electrical cords but not tripping hazards from floors in need of repair, although the reviews did not specifically report these outcomes. One review[33] reported conflicting evidence regarding interventions to reduce tripping hazards from floors in disrepair and cables or leads likely to cause falls. One review[338] found no evidence that interventions were effective in reducing other tripping hazards.

Four primary studies, all included in the reviews described above, reported on the effect of interventions on tripping hazards.[269,275,300,304] One study included home safety education, a home safety assessment and modification of hazards and found a significant reduction in tripping hazards from loose floor coverings.[300] Other outcomes related to tripping hazards reported by this and the other studies did not differ

significantly between treatment groups, including tripping hazards posed by electrical cables, floors in disrepair and unsafe rugs and carpets. The interventions in the other studies included home safety education and home safety assessment[269,275] and a free safety kit.[304] It was not possible to undertake PMA or NMA or decision analyses for tripping hazard outcomes because of the small number of studies.

Interventions to promote other falls prevention practices

Study H

The overview included two systematic narrative reviews[33,332] reporting the effect of interventions on other falls prevention practices. No meta-analyses were found for this outcome. Both reviews reported on interventions to reduce the accessibility of roofs,[33,332] with both including evidence demonstrating a significant effect favouring the intervention group. Both reviews also reported on the effect of interventions on balcony safety,[33,332] with both finding no evidence that interventions were effective in promoting balcony safety. One review[33] reported the effect of interventions on safe furniture layout, reporting that significantly more intervention group families rearranged furniture to avoid staggering the layout. One review[332] reported an intervention that demonstrated a significant improvement in lighting in corridors. Both reviews[33,332] reported an intervention to reduce the amount of climbable fencing, with neither review reporting a significant effect.

One primary study demonstrated a significant effect of an intervention to reduce the accessibility of roofs,[292] one study reported that significantly more intervention group families rearranged furniture to avoid staggering the layout[401] and one study[293] demonstrated a significant improvement in lighting in corridors. Other studies found no significant effects of interventions with regard to balcony safety or climbable fencing or gates.

It was not possible to undertake PMA or NMA as the number of studies reporting each outcome was small.

Poisoning prevention

Figure 44 shows the process of identification and selection of reviews and primary studies included in the overview and in the NMA for poisoning prevention interventions. Thirteen narrative systematic reviews, two meta-analyses including a narrative systematic review and 47 primary studies were included in the overview, 28 of which were included in the NMA for poisoning outcomes.

Characteristics of included reviews and primary studies

The characteristics and quality assessment of the reviews included in the overview are shown in *Table 71*. One review focused specifically on community-based poisoning prevention interventions[336] and the others evaluated interventions to prevent a range of injury mechanisms. The risk-of-bias assessment of included reviews produced OQAQ scores ranging from 2 to 7 (median 4) out of a maximum possible score of 7.

The characteristics of the primary studies included in the overview, systematic review, PMA and NMA are shown in *Table 72*. Thirty-one (66%) of the 47 primary studies in the overview were RCTs, eight (17%) were non-RCTs, seven (15%) were CBAs and one (2%) was a case–control study. Tables of excluded reviews and primary studies are available on request from the authors. The risk-of-bias assessment of included primary studies indicated that just under half the RCTs reported adequate allocation concealment (42%), follow-up of at least 80% of participants in each arm (48%) and blinded outcome assessment (48%). None of the non-RCTs and CBAs demonstrated blinded outcome assessment, five (33%) followed up at least 80% of participants in each arm and five (33%) had a balanced distribution of confounders between treatment arms. The case–control study scored 7 (out of a maximum of 9) on the Newcastle–Ottawa scale, indicating that it was of good quality.

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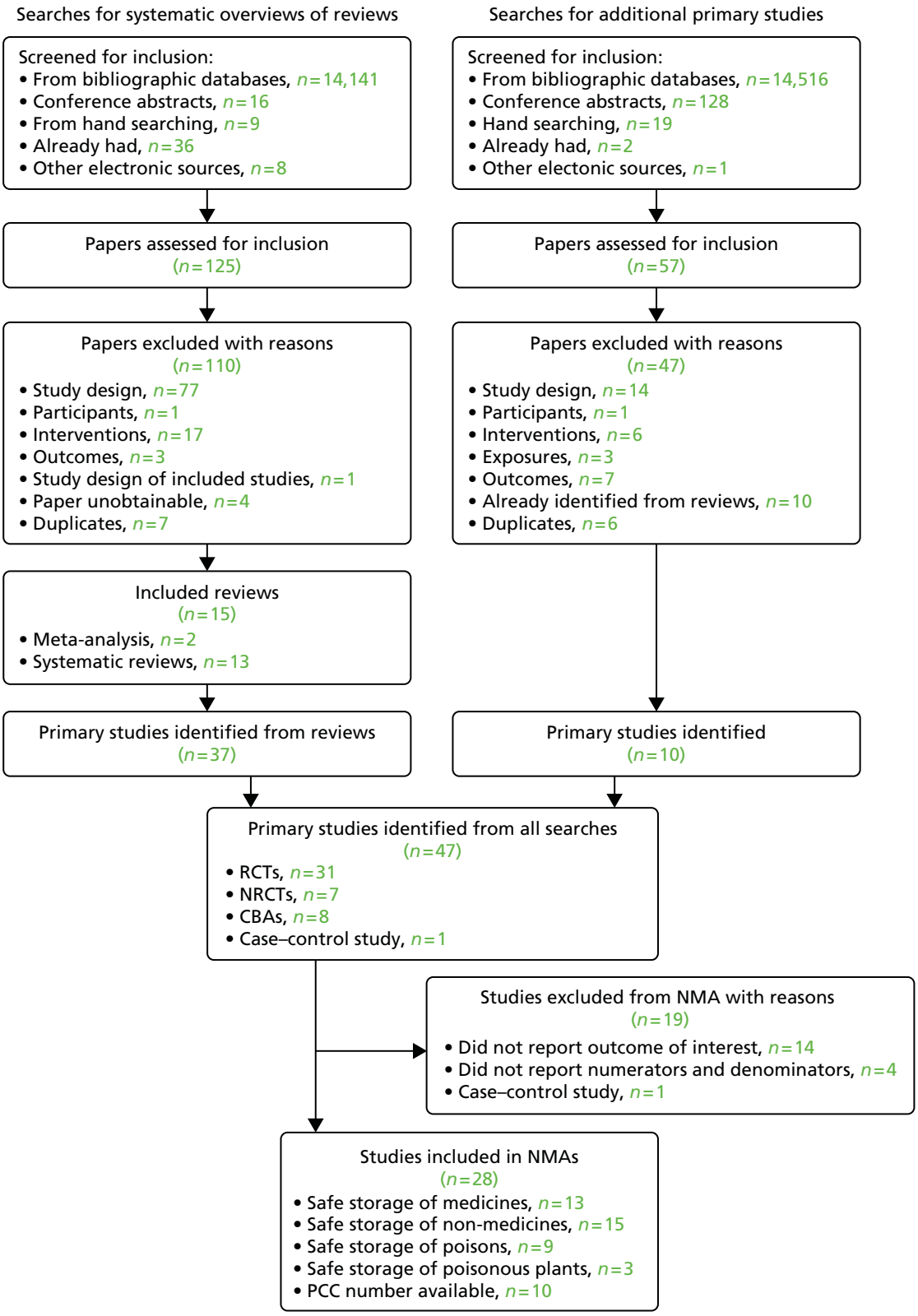


FIGURE 44 Process of study identification and selection for the overview of reviews and NMA for poisoning prevention. NRCT, non-RCT. Using data from Wynn *et al.*[390] and Achana *et al.*[449]

Preventing poisoning-related injuries

Study H

The overview included nine systematic reviews reporting interventions to prevent poisoning-related injuries.[33,36,334–336,383,387,388,445] The reviews included a total of seven different primary studies reporting this outcome.[263,267,275,309,434,437] In addition, one study did not report poisoning rates[72] but did provide individual participant data for inclusion in a meta-analysis[33] combining poisoning rates from three studies. The meta-analysis found a lack of evidence that interventions reduced poisoning rates (rate ratio 1.03, 95% CI 0.78 to 1.36). The seven primary studies reporting poisoning-related injuries included in the reviews consisted of two RCTs,[309,437] two non-RCTs[263,275] and three CBA studies.[267,434,437] The study that did not report poisoning rates but that did provide IPD was a RCT.[72] One further primary study, a RCT reporting poisoning rates, was identified by systematic review searches.[312]

Two of the eight primary studies reported significantly lower rates of medically attended or self-reported poisonings in the intervention groups. The studies evaluated child-resistant aspirin containers,[434] reporting a reduction in the proportion of medically attended aspirin poisonings in the intervention area, and a school-based educational intervention targeting a range of injuries and involving teachers, parents and pupils.[312]

The remaining six studies reported no significant effect of interventions on medically attended poisonings. These interventions included the provision of 'Mr Yuk' stickers (depicting a green-faced grimacing man with a protruding tongue) for alerting children to poisoning hazards,[263] the provision of safety items [telephone stickers, coupon for syrup of ipecac (emetic agent), cabinet lock, checklist for 'poison proofing' the home and pamphlets],[309] safety education and safety equipment provision covering a range of injuries[275,437] and community injury prevention programmes.[267,437] The study not reporting poisoning rates but providing IPD did not find a significant effect of education and the provision and fitting of free safety equipment.[72]

Study I

Meta-analysis of four studies evaluating home safety interventions (education plus in some studies the provision of home safety inspections and safety equipment)[72,263,275,312] found a lack of evidence that interventions reduced the rate of poisoning (IRR 0.93, 95% CI 0.65 to 1.32) (*Figure 45*).

It was not possible to undertake NMA for interventions to prevent poisonings because of the small number of studies.

Promoting the safe storage of medicines

Study H

The overview included one meta-analysis[33] and 10 systematic reviews[33,40,42,332,338,383,385,387,388,445] reporting the effect of interventions on the safe storage of medicines. The meta-analysis found evidence that education, with or without the provision of safety equipment, was effective in increasing the safe storage of medicines (OR 1.57, 95% CI 1.22 to 2.02).[33]

A total of 25 primary studies reporting on interventions promoting the safe storage of medicines were identified, 18 from reviews[71,72,257,260,273,282,287,292,295,297,300,304,306,396,399,405,427] and seven from additional searches for primary studies.[99,266,288,303,398,431,432] Of the 25 studies, seven reported that significantly more intervention than control group families stored medicines safely,[71,72,260,266,292,300,396] all of which evaluated interventions targeting multiple injury mechanisms. The interventions in these studies consisted of GP safety advice with access to low-cost safety equipment (including cupboard locks) for families receiving means-tested state benefits,[71] a home visit with safety checks and tailored safety advice including assistance in obtaining home safety devices,[72,260,292], a home safety inspection, education and modification,[300] a standardised safety consultation and the provision and fitting of safety equipment (including cupboard locks) free to low-income families,[292] a personalised safety report (including the promotion of the safe storage of poisons)

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Study or subgroup	log(IRR)	SE	Intervention Total	Control Total	Weight	IRR IV, random, 95% CI
Fergusson 1982[263]	–0.0222	0.3977	120	112	16.4%	0.98 (0.45 to 2.13)
Kendrick 1999[275]	0.0879	0.245	2277	2141	32.5%	1.09 (0.68 to 1.76)
Watson 2005[72]	0.0105	0.1904	3583	3884	42.6%	1.01 (0.70 to 1.47)
Zhao 2006[312]	–1.206776	0.5838742	3226	2654	8.5%	0.30 (0.10 to 0.94)
Total (95% CI)			**9206**	**8791**	**100.0%**	**0.93 (0.65 to 1.32)**

Heterogeneity: $\tau^2=0.04$; $\chi^2=4.34$, df=3 ($p=0.23$); $I^2=31\%$

Test for overall effect: $z=0.41$ ($p=0.68$)

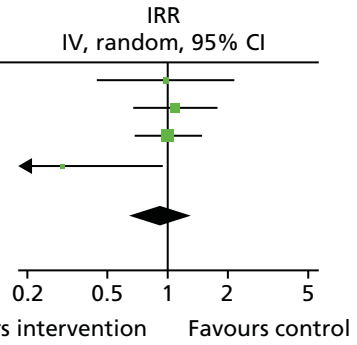


FIGURE 45 Forest plot of effect sizes for poisoning injury rates from studies evaluating home safety educational interventions. IV, inverse variance. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

printed at a computer kiosk in an ED[266] and prevention lessons delivered by teachers to children in schools with take-home materials and posters displayed for parents.[396]

The remaining 18 studies, evaluating a range of interventions including safety education, tailored safety education, or safety education plus equipment, demonstrated no significant difference between treatment groups in the safe storage of medicines.

Study I

Meta-analysis of 13 studies evaluating home safety interventions (education plus the provision of home safety assessments and safety equipment in some studies),[71,72,257,266,273,282,287,288,295,300,303,304,404] which updated the meta-analysis described in study H,[33] found that interventions were effective in increasing the storage of medicines out of reach (OR 1.53, 95% CI 1.27 to 1.84) (*Figure 46*). Storing medicines out of reach was defined as stored in locked cupboards, drawers or cabinets; stored at or above adult waist level; or stored so that they are inaccessible to a child.

Study J

Data from studies included in the NMAs of poisoning outcomes are shown in *Table 100*. NMA was used to estimate the 21 possible pairwise comparisons between seven interventions to promote the safe storage of medicines from 13 studies (*Figure 47*). Home safety interventions with education and low-cost or free equipment were the most likely to be effective (p best = 0.39), with an estimated OR compared with usual care of 2.51 (95% CrI 1.01 to 6.00).

Study K

Seven interventions were evaluated, of which three were excluded from further consideration because they had higher costs than more effective interventions (*Table 101*). Home safety education had the lowest estimated ICER compared with usual care, at £41,330 per QALY gained, followed by education and the provision of free equipment, with an ICER of £90,615 compared with usual care. *Figure 48* shows the probability of the alternative interventions being cost-effective. At a threshold value of £30,000 per QALY gained, usual care had the highest probability of being cost-effective (0.83) followed by education (0.17).

Sensitivity analysis A range of sensitivity analyses varying the base-case assumptions and inputs, as outlined in the methods section, was implemented (*Table 102*). All assessed the probability of interventions being cost-effective at a threshold of £30,000 and £50,000. The results were mainly sensitive to the baseline incidence of unintentional injuries; when this was increased to reflect a higher incidence rate among children aged < 5 years living in the two most disadvantaged quintiles (SA9 and SA10), the ICER for education compared with usual care reduced from £41,330 to < £20,000 per QALY gained.

Promoting the safe storage of household and other products

Study H

The overview included two systematic reviews and meta-analyses[33,40] and nine narrative reviews[36,42,332,338,383,385,387,388,445] reporting the effect of interventions on the safe storage of household and other products (defined as the use of safety catches or locks on cupboards/drawers, the use of CRCs and storage out of the reach of children). One meta-analysis reported evidence that education, with or without the provision of safety equipment, was effective in increasing the safe storage of household products (OR 1.63, 95% CI 1.22 to 2.17).[33] The other meta-analysis of similar interventions delivered in a clinical setting reported that intervention families were 1.8 times more likely to store cleaning agents safely.[40]

A total of 31 primary studies reporting the safe storage of household and other products were identified (24 from reviews[71,72,257,260,263,265,269,273,275,277,282,287,292,295,297,304,306,309,396,399,405,413,427] and seven from additional searches for primary studies[99,266,288,303,398,431,432]). Six studies reported that significantly more intervention group families stored household and other products safely.[72,260,269,292,295,309] One of these studies provided safety education plus equipment,[309] four provided safety education, equipment and home safety

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Study or subgroup	Intervention Events	Intervention Total	Control Events	Control Total	Weight	OR M–H, random, 95% CI
Babul 2007[257]	331	336	147	149	1.3%	0.90 (0.17 to 4.70)
Clamp 1998[71]	79	83	68	82	2.6%	4.07 (1.28 to 12.94)
Dershewitz 1977[404]	22	101	20	104	7.6%	1.17 (0.59 to 2.31)
Gielen 2007[266]	188	249	178	271	24.1%	1.61 (1.10 to 2.36)
Kelly 1987[273]	55	55	54	54		Not estimable
McDonald 2005[282]	6	60	4	57	2.0%	1.47 (0.39 to 5.51)
Nansel 2002[287]	79	85	83	89	2.6%	0.95 (0.29 to 3.08)
Nansel 2008[288]	140	144	72	74	1.2%	0.97 (0.17 to 5.43)
Posner 2004[295]	19	49	14	47	4.9%	1.49 (0.64 to 3.49)
Schwarz 1993[300]	128	248	88	248	27.2%	1.94 (1.35 to 2.78)
Swart 2008[303]	74	80	70	79	3.0%	1.59 (0.54 to 4.69)
Sznajder 2003[304]	43	45	44	49	1.2%	2.44 (0.45 to 13.28)
Watson 2005[72]	712	762	683	738	22.3%	1.15 (0.77 to 1.71)
Total (95% CI)		**2297**		**2041**	**100.0%**	**1.53 (1.27 to 1.84)**
Total events	1876		1525			

Heterogeneity: $\tau^2=0.00$; $\chi^2=8.70$, df=11 ($p=0.65$); $I^2=0\%$

Test for overall effect: $z=4.42$ ($p<0.00001$)

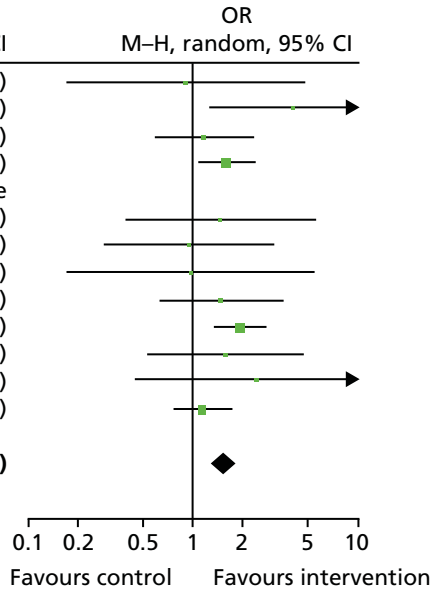


FIGURE 46 Forest plot of effect sizes for storage of medicines out of reach from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

TABLE 100 Summary of studies and their data included in the NMA of the interventions to prevent poisonings

Pairwise comparison	Study	Study quality[a]	Intervention	Safe storage of medicines	Safe storage of other household products	Safe storage of poisons	Possession of PCC telephone number	Safe storage of poisonous plants
Usual care (1) vs. education (2)	Kelly 1987,[273] RCT, USA[b]	A = U, B = Y, F = N	1	54/54	43/54			
			2	55/55	49/55			
	Nansel 2002,[287] RCT, USA[c]	A = Y, B = U, F = Y	1	83/89	65/89		59/89	
			2	79/85	66/85		63/85	
	Kelly 2003,[274] cluster RCT, USA[d]	A = U, B = Y, F = Y	1				45.56/136.68[d]	
			2				112.95/137.63[d]	
	McDonald 2005,[282] RCT, USA	A = Y, B = U, F = N	1	6/60	3/57			
			2	4/57	6/61			
	Gielen 2007,[266] RCT, USA	A = Y, B = N, F = Y	1	178/271	44/62	222/333		
			2	188/249	57/73	245/322		
	Nansel 2008,[288] non-RCT, USA	A = U, B = N, F = N	1	72/74	59/73		50/59	
			2	140/144	117/144		90/119	
	Reich 2011,[432] RCT, USA[d]	A = Y, B = Y, F = Y	1			Log-OR (SE) = –0.192 (0.2863)[e]		
			2					
Equipment only (1) vs. education + equipment (3)	Woolf 1987,[308] cluster RCT, USA	A = U, B = Y, F = N	1				29/143	
			3				47/119	
	Woolf 1992,[309] cluster RCT, USA	A = U, B = Y, F = N	1		60/151		59/151	
			3		89/150		117/150	
	Clamp 1998,[71] RCT, UK	A = U, B = N, F = Y	1	68/82	49/82			
			3	79/83	59/83			

continued

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TABLE 100 Summary of studies and their data included in the NMA of the interventions to prevent poisonings (*continued*)

Pairwise comparison	Study	Study quality[a]	Intervention	Safe storage of medicines	Safe storage of other household products	Safe storage of poisons	Possession of PCC telephone number	Safe storage of poisonous plants
Usual care (1) vs. education + equipment (3) vs. education + equipment + home safety inspection (4)	Babul 2007,[257] RCT, Canada	A = Y, B = N, F = N	1	147/149				112/147
			3	171/173				136/172
			4	160/163				123/160
Usual care (1) vs. education + equipment + home safety inspection (4)	Kendrick 1999,[275] cluster non-RCT, UK	B = N, F = N, C = Y	1		317/367			
			4		322/363			
	Sangvai 2007,[297] RCT, USA	A = Y, B = Y, F = N	1			3/10		
			4			13/16		
	Swart 2008,[303] non-RCT, South Africa	A = U, B = Y, F = Y	1	70.26/79.58[c]	46.86/57.96[d]			
			4	74.07/80[c]	50.87/58.27[d]			
	Hendrickson 2002,[269] USA, RCT	A = N, B = N, F = Y	1		14/40		8/40	
			4		34/38		34/38	
Usual care (1) vs. education + equipment (3)	Watson 2005,[72] cluster RCT, UK	A = Y, B = N, F = Y	1	683/738	327/669			
			3	712/762	368/693			
Usual care (1) vs. education + home safety inspection (6)	Petridou 1997,[293] cluster non-RCT, Greece	B = N, F = Y, C = Y	1				67.26/100.12[d]	
			6				71.08/97.83[d]	
Usual care (1) vs. education + equipment + home safety inspection + fitting (7)	Schwarz 1993,[300] cluster non-RCT, USA	B = N, F = N, C = Y	1	88.42/248.37[d]				
			7	128.16/ 248.37[d]				
	Phelan 2011,[431] RCT, USA	A = Y, B = N, F = Y	1			17/149	16/138	
			7			2/150	71/139	
Usual care (1) vs. education + home visit (8)	Minkovitz 2003,[427] RCT, USA[f]	A = Y, B = N, F = Y	1			463/761		
			8			523/832		
			1			596/955		

Pairwise comparison	Study	Study quality[a]	Intervention	Safe storage of medicines	Safe storage of other household products	Safe storage of poisons	Possession of PCC telephone number	Safe storage of poisonous plants
	Minkovitz 2003,[427] cluster non-RCT, USA[f]	B = N, F = Y, C = Y	8			754/1189		
	Johnston 2006,[413] non-RCT, USA	B = N, F = Y, C = Y	1			155/232	82/91	
			8			71/91	222/232	
Education (2) vs. education + equipment (3)	Posner 2004,[295] RCT, USA	A = Y, B = Y, F = N	2	14/47	22/47		27/47	9/16
			3	19/49	34/49		35/49	11/16
	Bulzacchelli 2009,[398] non-RCT, USA	A = U, B = N, F = N	2			5/49		
			3			10/105		
Education (2) vs. education + equipment + fitting (5)	Sznajder 2003,[304] RCT, France	A = Y, B = N, F = Y	2	44/49	32/41			48/49
			5	43/45	40/48			41/48
Education + equipment (3) vs. education + equipment + home safety inspection (4)	Gielen 2002,[265] cluster RCT, USA[d]	A = U, B = U, F = N	3			6.87/56.93[d]		
			4			5.89/58.89[d]		
Education + equipment (3) vs. equipment only (9)	Dershewitz 1977,[404] non-RCT, USA	A = U, B = Y, F = N	3	22/102	1/101			
			9	20/104	0/104			
Education + equipment + home safety inspection (4) vs. education + equipment + home safety inspection + fitting (7)	King 2001,[277] RCT, USA	A = Y, B = Y, F = Y	4		261/469			
			7		273/482			

a A, adequate allocation concealment; B, blinded outcome assessment; C, prevalence of confounders does not differ by > 10% between treatment arms; F, at least 80% of participants followed up in each arm; N, no; U, unclear; Y, yes.
b Study was excluded from analysis for safe storage of medicines because both treatment and control arms reported a 100% event rate.
c Two intervention arms were combined (tailored advice and tailored advice + care provider feedback).
d Figures adjusted for the effect of clustering using ICC and method reported in Kendrick *et al.*[49]
e Combined from two log-ORs for education book vs. no book (OR 0.80, SE 0.41) and education book vs. non-education book (OR 0.85, SE 0.40) reported in Reich *et al.*[432]
f Minkovitz *et al.*[427] included as two separate studies (reason given in the results section).

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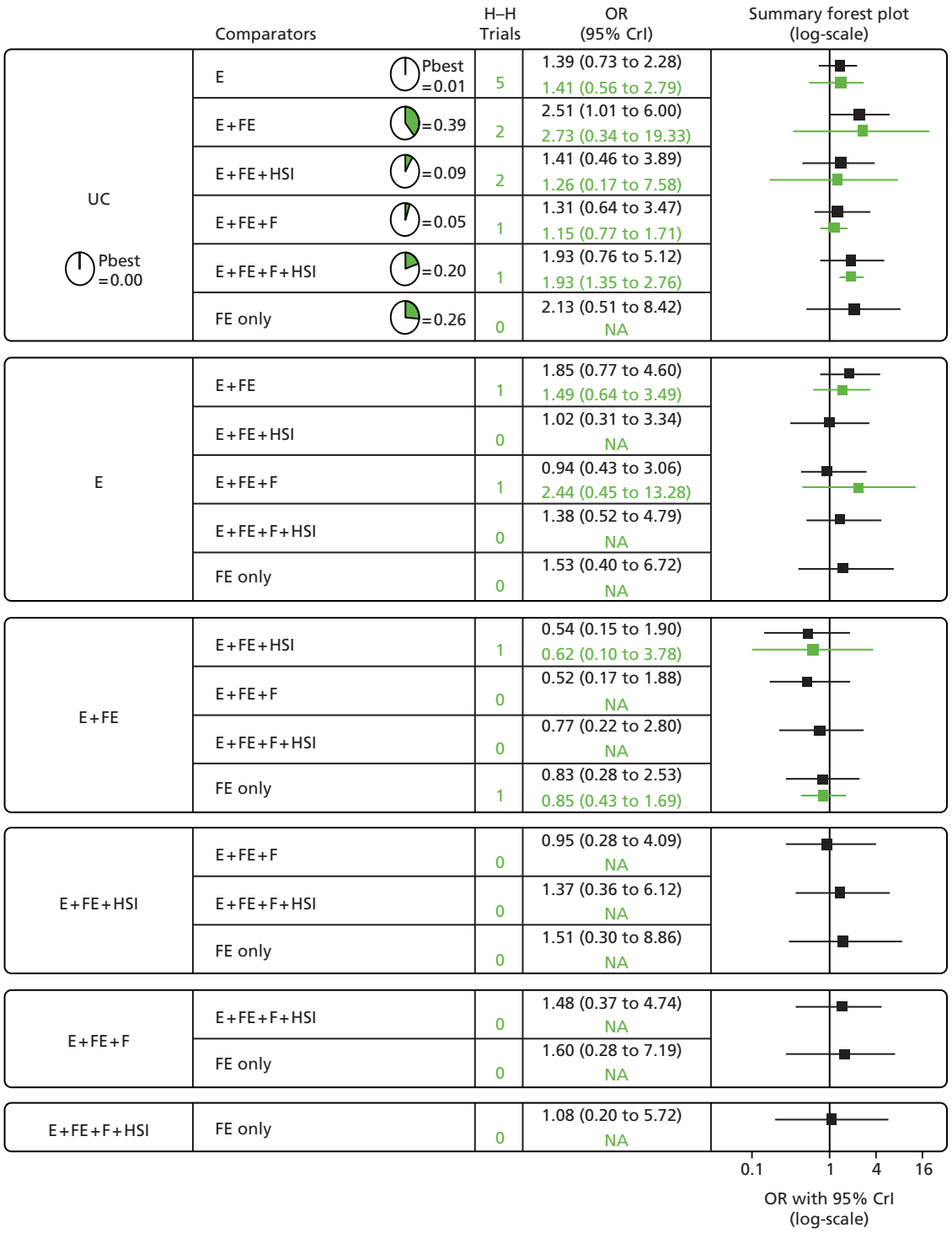


FIGURE 47 Network meta-analysis and PMA results for the safe storage of medicines. Heterogeneity: between-study variance = 0.06 (95% CrI 0.000 to 1.087). Key: NMA results in black; PMA results in green. Interventions are displayed in the order that they were entered in the analysis. E, education; F, fitting; FE, low-cost/free equipment; H–H, head to head; HSI, home safety inspection; HV, home visit; NA, not applicable; Pbest, probability that intervention is the best; UC, usual care. From Achana *et al.*[449] under Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

TABLE 101 Base-case cost-effectiveness results for interventions to promote the safe storage of medicines

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
Usual care (1)	25,056.559 (25,039.293 to 25,073.828)	4169 (2872 to 6045)				0.828	0.301
Education (2)	25,056.578 (25,039.328 to 25,073.855)	5435 (4197 to 7271)	0.031	1273	41,330	0.172	0.698
Education + equipment (3)	25,056.578 (25,039.328 to 25,073.857)	7089 (5829 to 8,921)	0.032	2927	90,615	0.000	0.000
Education + equipment + home safety inspection (4)	25,056.578 (25,039.326 to 25,073.857)	9051 (7737 to 10,930)	0.030	4881	Dominated	0.000	0.000
Education + equipment + fitting (5)	25,056.578 (25,039.326 to 25,073.855)	8695 (7392 to 10,570)	0.030	4522	Dominated	0.000	0.000
Education + equipment + home safety inspection + fitting (6)	25,056.580 (25,039.328 to 25,073.857)	9506 (8166 to 11,410)	0.031	5338	Dominated	0.000	0.000
Equipment (7)	25,056.578 (25,039.322 to 25,073.855)	6270 (5027 to 8099)	0.031	2111	Dominated	0.000	0.002

CE, cost-effective.
a Expected QALYs and expected costs per 1000 households.

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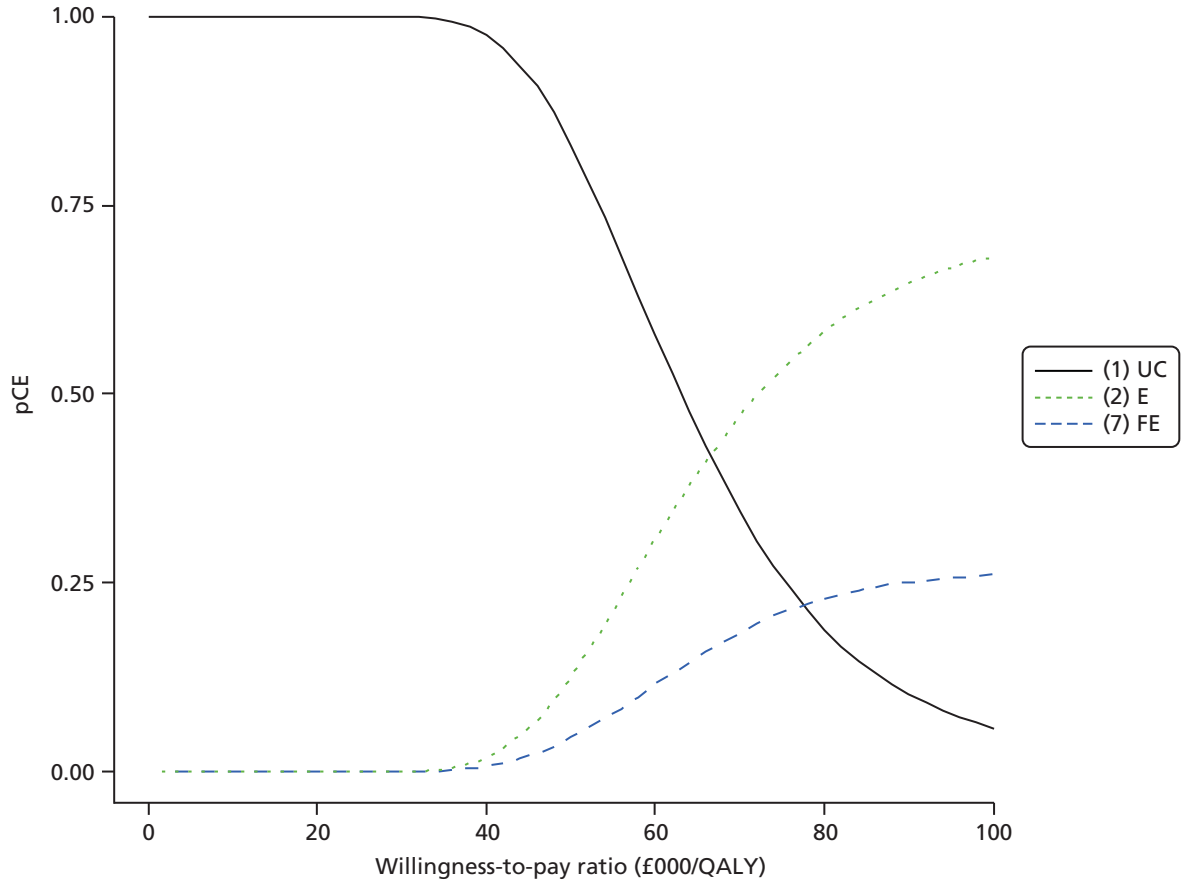


FIGURE 48 Cost-effectiveness acceptability curves for interventions to promote safe storage of medicines. E, education; FE, low-cost/free equipment; pCE, probability cost-effective; UC, usual care.

inspections,[72,260,269,292] and one delivered home safety counselling and safety equipment with specific injury-focused instructions.[295] The remaining 25 studies found no significant differences between groups in the safe storage of household and other products, evaluating a range of interventions including general or tailored safety education, home safety equipment and home safety inspections.

Study I

Pairwise meta-analysis of 15 studies,[71,72,266,269,273,275,277,282,287,288,295,303,304,309,404] which updated the meta-analysis described in study H,[33] found that home safety interventions (education plus the provision of home safety inspections and home safety equipment in some studies) increased the safe storage of cleaning products (defined as for the safe storage of medicines) (OR 1.55, 95% CI 1.22 to 1.96) but there was significant heterogeneity between effect sizes (*Figure 49*). Interventions providing locks appeared to be more effective (OR 1.87, 95% CI 1.28 to 2.72) than those providing education without locks (OR 1.13, 95% CI 0.92 to 1.40). Interventions delivered at home also appeared to be more effective (OR 2.14, 95% CI 1.06 to 4.32) than those provided in clinical settings (OR 1.29, 95% CI 1.10 to 1.51).

Study J

Network meta-analysis estimated the 21 possible pairwise comparisons between the seven interventions promoting the safe storage of household products other than medicines in the 15 studies listed in *Table 100*. The most intensive home safety intervention (education plus low-cost/free equipment and fitting plus home safety inspection) was most likely to be effective (p best = 0.37), with an estimated OR compared with usual care of 2.59 (95% CrI 0.59 to 15.16), but no interventions were significantly more effective than usual care (*Figure 50*).

TABLE 102 Sensitivity analysis results for interventions promoting the safe storage of medicines

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
SA1: probability that intervention is effective changed from posterior to predictive distribution of intervention effects and baseline rate							
Usual care (1)	25,060 (25,040 to 25,070)	4169 (2872 to 6045)				0.850	0.453
Education (2)	25,060 (25,040 to 25,070)	5463 (4221 to 7319)	0.027	1298	47,160	0.150	0.540
Equipment (7)	25,060 (25,040 to 25,070)	6300 (5032 to 8163)	0.028	2140	74,625	0.000	0.006
SA2: baseline probability of safe storage changed from 75% (KCS community controls) to 93%[56]							
Usual care (1)	25,060 (25,040 to 25,070)	3158 (2030 to 4720)				0.998	0.867
Education (2)	25,060 (25,040 to 25,070)	4056 (2938 to 5599)	0.013	898	71,065	0.002	0.133
Equipment (7)	25,060 (25,040 to 25,070)	4302 (3184 to 5850)	0.013	1139	87,285	0.000	0.000
SA3: baseline probability of safe storage changed from 75% (KCS community controls) to 50% (assumption)							
Usual care (1)	25,060 (25,040 to 25,070)	4903 (3542 to 7022)				0.942	0.59
Education (2)	25,060 (25,040 to 25,070)	6885 (5585 to 8921)	0.037	1985	53,970	0.058	0.41
Equipment (7)	25,060 (25,040 to 25,070)	8567 (7273 to 10,620)	0.036	3671	101,700	0.000	0.000
SA4: probability intervention is accepted changed from 90% to 50% (assumption)							
Usual care (1)	25,060 (25,040 to 25,070)	4169 (2,872 to 6045)				0.979	0.745
Education (2)	25,060 (25,040 to 25,070)	5227 (3,965 to 7059)	0.017	1061	62,195	0.02	0.254
Equipment (7)	25,060 (25,040 to 25,070)	5693 (4429 to 7527)	0.017	1526	87,356	0.000	0.001
SA5: proportion admitted changed from 63%[450] to 83.3% (Phil Miller, Nottingham University Hospitals NHS Trust, January 2014, personal communication)							
Usual care (1)	25,060 (25,040 to 25,070)	5140 (3430 to 7606)				0.625	0.146
Education (2)	25,060 (25,040 to 25,070)	6358 (4711 to 8776)	0.036	1214	33,630	0.374	0.852
Equipment (7)	25,060 (25,040 to 25,070)	7202 (5548 to 9627)	0.036	2043	55,495	0.000	0.002

continued

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TABLE 102 Sensitivity analysis results for interventions promoting the safe storage of medicines (*continued*)

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
SA6: provided with two Pop-It locks costing £2.65 per lock							
Usual care (1)	25,060 (25,040 to 25,070)	4169 (2872 to 6045)				0.828	0.298
Education (2)	25,060 (25,040 to 25,070)	5435 (4197 to 7271)	0.031	1273	41,330	0.17	0.677
Equipment	25,060 (25,040 to 25,070)	5787 (4548 to 7596)	0.031	1629	51,685	0.002	0.026
SA7: provided with two magnetic locks costing £4.80 per lock							
Usual care (1)	25,060 (25,040 to 25,070)	4169 (2872 to 6045)				0.828	0.301
Education (2)	25,060 (25,040 to 25,070)	5435 (4197 to 7271)	0.031	1273	41,330	0.172	0.698
Equipment (7)	25,060 (25,040 to 25,070)	6751 (5491 to 8585)	0.031	2592	82,570	0.000	0.000
SA8: increased number of children per household from 1 to 1.8[378]							
Usual care (1)	25,060 (25,040 to 25,070)	4169 (2872 to 6045)				0.242	0.026
Education (2)	25,060 (25,040 to 25,070)	5435 (4197 to 7271)	0.031	1273	22,960	0.755	0.962
Equipment (7)	25,060 (25,040 to 25,070)	6270 (5027 to 8099)	0.031	2111	37,210	0.003	0.012
SA9: change incidence of medically reported poisonings from 30.1 to 44.9 per 10,000 person-years (rate of unintentional poisonings among children aged < 5 years in the fourth most deprived quintile[451])							
Usual care (1)	25,060 (25,040 to 25,070)	5963 (3814 to 8986)				0.226	0.040
Education (2)	25,060 (25,040 to 25,070)	7110 (5119 to 10,070)	0.06	1171	19,315	0.764	0.929
Equipment (7)	25,060 (25,040 to 25,070)	7958 (5944 to 10,882)	0.062	2002	32,025	0.010	0.030
SA10: change incidence of medically reported poisonings from 30.1 to 48.5 per 10,000 person-years (rate of unintentional poisonings among children aged < 5 years in the fifth most deprived quintile[451])							
Usual care (1)	25,060 (25,040 to 25,070)	6380 (4239 to 9731)				0.172	0.031
Education (2)	25,060 (25,040 to 25,070)	7539 (5451 to 10,751)	0.062	1149	18,275	0.818	0.938
Equipment (7)	25,060 (25,040 to 25,070)	8375 (6296 to 11,590)	0.063	1983	30,760	0.010	0.030

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
SA11: change estimate of SE of utility decrements from 10% to 20% of mean utility decrement value (assumption)							
Usual care (1)	25,060 (25,040 to 25,070)	4131 (2842 to 6011)				0.800	0.800
Education (2)	25,060 (25,040 to 25,070)	5409 (4187 to 7176)	0.031	1289	40,770	0.200	0.200
Equipment (7)	25,060 (25,040 to 25,070)	6283 (5038 to 8041)	0.032	2152	66,850	0.000	0.000
SA12: change estimate of SE of utility decrements from 10% to 50% of mean utility decrement value (assumption)							
Usual care (1)	25,060 (25,040 to 25,070)	4095 (2899 to 6038)				0.794	0.304
Education (2)	25,060 (25,040 to 25,070)	5382 (4238 to 7217)	0.031	1290	41,265	0.206	0.696
Equipment (7)	25,060 (25,040 to 25,070)	6257 (5082 to 8100)	0.032	2155	66,825	0.000	0.000

CE, cost-effective.
a Expected QALYs and expected costs per 1000 households.

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Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Clamp 1998[71]	59	83	49	82	7.5%	1.66 (0.87 to 3.17)
Dershewitz 1977[404]	1	102	0	104	0.5%	3.09 (0.12 to 76.71)
Gielen 2007[266]	57	73	44	62	6.0%	1.46 (0.67 to 3.18)
Hendrickson 2002[269]	34	38	14	40	3.1%	15.79 (4.65 to 53.62)
Kelly 1987[273]	49	55	43	54	3.8%	2.09 (0.71 to 6.13)
Kendrick 1999[275]	322	363	317	367	10.6%	1.24 (0.80 to 1.93)
King 2001[277]	273	482	261	469	14.0%	1.04 (0.81 to 1.34)
McDonald 2005[282]	6	61	3	57	2.4%	1.96 (0.47 to 8.25)
Nansel 2002[287]	66	85	65	89	6.9%	1.28 (0.64 to 2.56)
Nansel 2008[288]	117	144	59	73	6.6%	1.03 (0.50 to 2.11)
Posner 2004[295]	34	49	22	47	5.5%	2.58 (1.12 to 5.94)
Swart 2008[303]	51	58	47	58	4.1%	1.71 (0.61 to 4.76)
Sznajder 2003[304]	40	48	32	41	3.9%	1.41 (0.49 to 4.06)
Watson 2005[72]	368	693	327	669	14.8%	1.18 (0.96 to 1.46)
Woolf 1992[309]	89	150	60	151	10.3%	2.21 (1.40 to 3.51)
Total (95% CI)		**2484**		**2363**	**100.0%**	**1.55 (1.22 to 1.96)**
Total events	1566		1343			

Heterogeneity: $\tau^2=0.09$; $\chi^2=30.04$, df=14 ($p=0.008$); $I^2=53\%$

Test for overall effect: $z=3.59$ ($p=0.0003$)

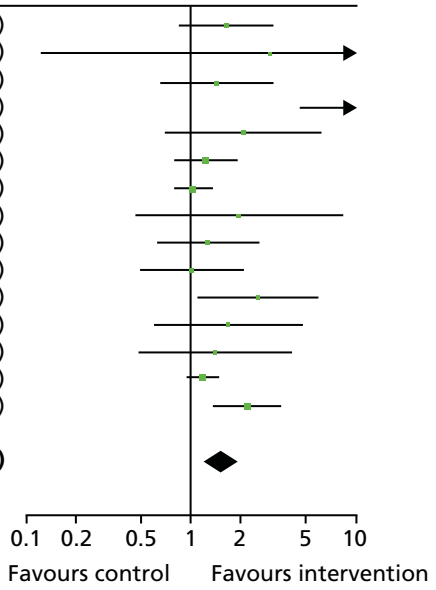


FIGURE 49 Forest plot of effect sizes for storage of household products out of reach from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

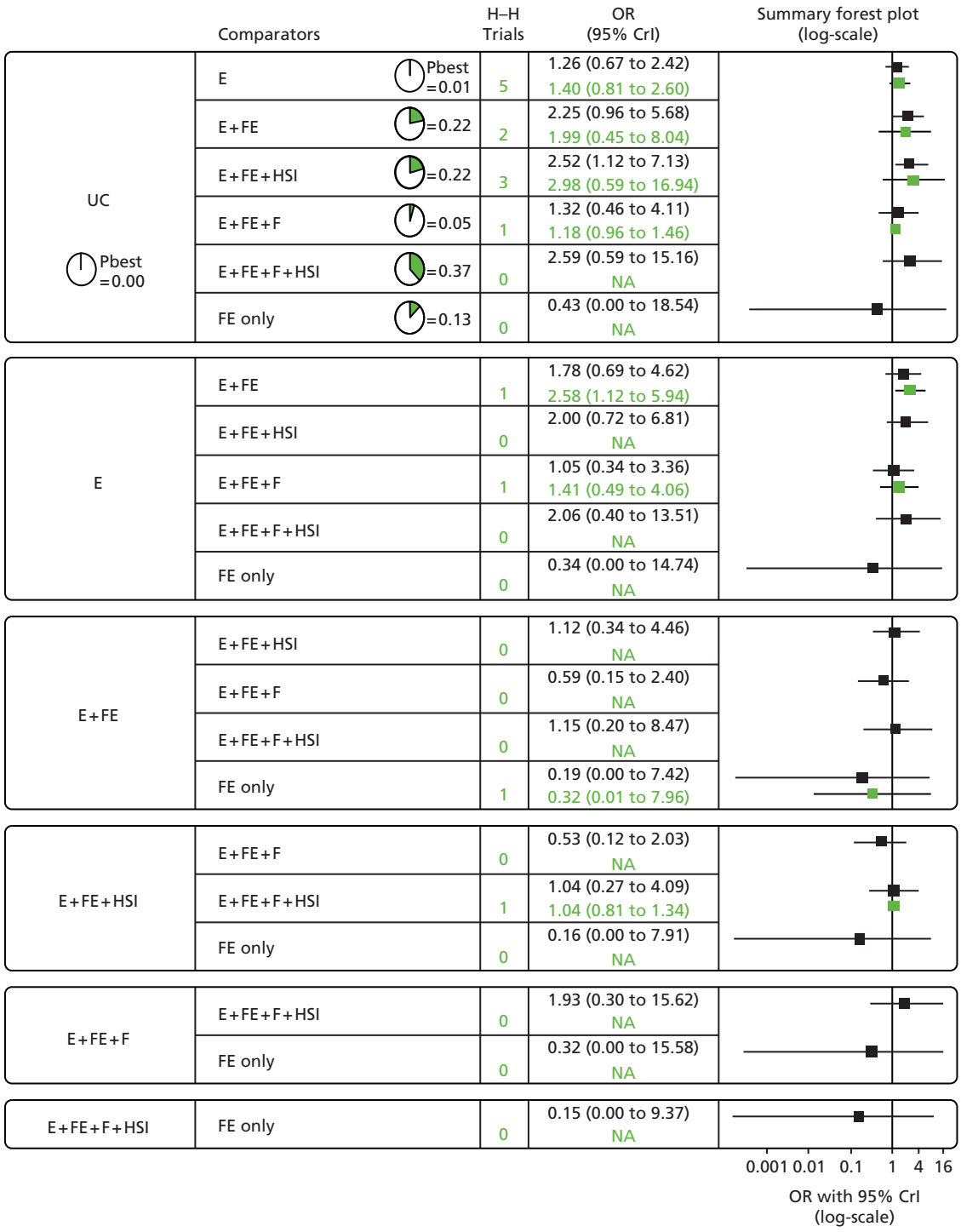


FIGURE 50 Network meta-analysis and PMA results for the safe storage of household products. Heterogeneity: between-study variance = 0.3 (95% CrI 0.018 to 1.562). Key: NMA results in black; PMA results in green. Interventions are displayed in the order that they were entered in the analysis. E, education; F, fitting; FE, low-cost/free equipment; H–H, head to head; HSI, home safety inspection; NA, not applicable; Pbest, probability that intervention is the best; UC, usual care. From Achana *et al.*[449] under Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

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Study K

Seven interventions were evaluated (*Table 103*) but all interventions were more costly and less effective than usual care. This is likely to reflect the OR being < 1.0 for the safe storage of household products comparing children with a poisoning to community controls in study A (i.e. OR 0.77, 95% CI 0.59 to 0.99). In sensitivity analyses, all interventions remained more costly and less effective than usual care (results available from the authors on request).

Promoting the safe storage of poisons

Study H

Interventions promoting the safe storage of poisons (i.e. when the type of poisonous product was not specified) are reported with those promoting the safe storage of medicines and the safe storage of household products.

Study I

Studies reporting the safe storage of unspecified poisons were analysed separately from those reporting the safe storage of medicines or household products in study I. PMA of five studies reporting interventions promoting the safe storage of poisons[265,266,297,398,431] found some evidence that home safety education (plus the provision of locks and home safety inspections in some studies) was associated with poisons being stored more safely (OR 2.07, 95% CI 0.92 to 4.66) (*Figure 51*).

Study J

Network meta-analysis estimated the 10 possible pairwise comparisons between five interventions promoting the safe storage of poisons in the nine studies listed in *Table 100*. The most intensive home safety intervention (education plus low-cost/free equipment and fitting plus home safety inspection) was most likely to be effective (*p* best = 0.78), with an estimated OR compared with usual care of 11.10 (95% CrI 1.60 to 141.50) (*Figure 52*).

Study K

A decision analysis for the safe storage of poisons was not conducted as the exposures studied in study A were specific types of medicine or household products as opposed to non-specific 'poisonous substances'. Consequently, data were not available for decision analyses for this outcome.

Promoting the use of child-resistant caps

Study H

Six systematic narrative reviews reporting the use of CRCs were included in the overview.[33,42,332,383,387,445] No meta-analyses reporting this outcome were found.

Four primary studies reported use of CRCs, two identified from the included reviews[277,300] and two identified from additional searches for primary studies.[99,303] Of the four studies, one reported that significantly more intervention group families stored paraffin in containers with CRCs.[303] This study evaluated the effect of four home visits providing safety education on several injury mechanisms, with home safety inspections and provision of safety devices including childproof locks and CRCs. The remaining three studies evaluated interventions including safety education, safety equipment and home safety inspections, but no significant effects were reported for this outcome.[277,300]

It was not possible to undertake PMA or NMA as the number of studies was small.

TABLE 103 Base-case cost-effectiveness results for interventions promoting the safe storage of household products

Intervention	Expected QALYs (95% CrI)[a]	Expected costs (95% CrI) (£)[a]	Incremental QALYs	Incremental costs (£)	ICER (£/QALY gained)	Probability CE (at £30,000 threshold)	Probability CE (at £50,000 threshold)
Usual care (1)	25,060 (25,040 to 25,070)	2504 (1770 to 3623)				1	1
Education (2)	25,060 (25,040 to 25,070)	3813 (3057 to 4969)	–0.0063	1308	–199,600	0	0
Education + equipment (3)	25,060 (25,040 to 25,070)	6249 (5361 to 7415)	–0.0073	3731	–489,250	0	0
Education + equipment + home safety inspection (4)	25,060 (25,040 to 25,070)	6013 (5136 to 7170)	–0.0076	3495	–438,600	0	0
Education + equipment + fitting (5)	25,060 (25,040 to 25,070)	6553 (5655 to 7722)	–0.0063	4035	–615,350	0	0
Education + equipment + fitting + home safety inspection (6)	25,060 (25,040 to 25,070)	4374 (3591 to 5494)	–0.000042	1863	–1,729,000	0	0
Equipment (7)	25,060 (25,040 to 25,070)	4924 (4123 to 6053)	–0.000042	2416	–2,233,000	0	0

CE, cost-effective.
a Expected QALYs and expected costs per 1000 households.

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Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Bulzachelli 2009[398]	10	105	5	49	20.3%	0.93 (0.30 to 2.87)
Gielen 2002[265]	6	60	7	58	20.0%	0.81 (0.25 to 2.57)
Gielen 2007[266]	245	322	222	333	31.7%	1.59 (1.13 to 2.24)
Phelan 2011[431]	17	149	2	150	15.8%	9.53 (2.16 to 42.03)
Sangvai 2007[297]	13	16	3	10	12.3%	10.11 (1.60 to 64.01)
Total (95% CI)		**652**		**600**	**100.0%**	**2.07 (0.92 to 4.66)**
Total events	291		239			

Heterogeneity: $\tau^2=0.51$; $\chi^2=11.71$, df=4 ($p=0.02$); $I^2=66\%$

Test for overall effect: $z=1.76$ ($p=0.08$)

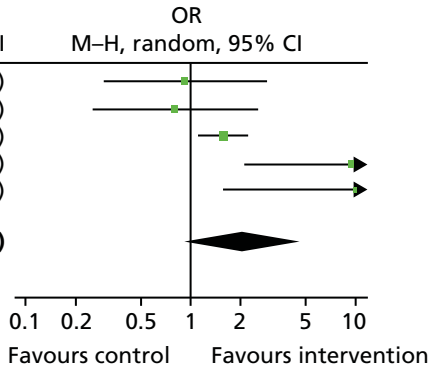


FIGURE 51 Forest plot of effect sizes for the storage of poisons out of reach from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

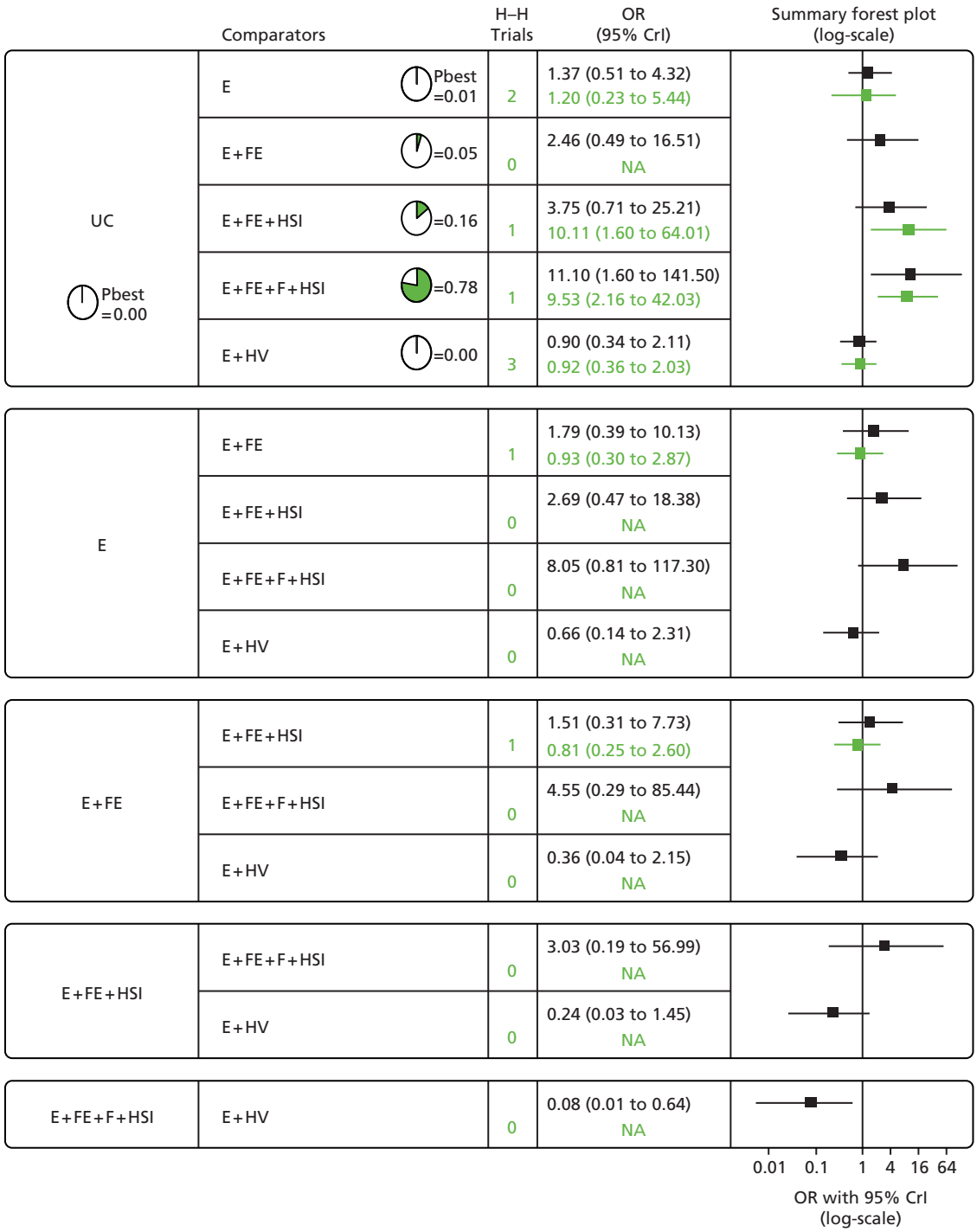


FIGURE 52 Network meta-analysis and PMA results for interventions promoting the safe storage of poisons. Heterogeneity: between-study variance = 0.24 (95% CrI 0.005 to 2.647). Key: NMA results in black; PMA results in green. Interventions are displayed in the order that they were entered in the analysis. E, education; F, fitting; FE, low-cost/free equipment; H–H, head to head; HSI, home safety inspection; HV, home visit; NA, not applicable; Pbest, probability that intervention is the best; UC, usual care. From Achana *et al.*[449] under Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

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Promoting the possession and use of syrup of ipecac

Study H

The overview included one systematic review and meta-analysis[33] and eight systematic narrative reviews[36,40,332,338,383,387,388,445] reporting the effect of interventions on the possession and use of syrup of ipecac. The meta-analysis[33] found evidence that education, with or without the provision of safety equipment, was effective in increasing possession of syrup of ipecac (OR 3.34, 95% CI 1.50 to 7.41).

Fifteen primary studies reporting possession or use of syrup of ipecac were identified from the included reviews.[265,271,273,274,279,282,287,292,293,300,308,309,420,437,441] Searches for additional primary studies identified no further eligible studies reporting this outcome. Eight of the 15 studies reported that significantly more families in the intervention group possessed or used syrup of ipecac.[271,279,282,292,293,300,308,420] Of the eight studies, two focused specifically on poisoning prevention. One evaluated the provision of counselling about poisoning treatment methods, a leaflet on poison prevention, a PCC number sticker and free syrup of ipecac with instructions delivered to parents during consultations at a children's hospital emergency clinic.[308] The other assessed the impact of a community education programme aimed predominantly at school pupils and involving information on the risks of products, methods of poison prevention and the correct use of a poison centre.[420] The other six studies reporting a positive effect evaluated a home visit, safety inspection, educational materials and safety equipment including syrup of ipecac,[271] safety equipment and safety counselling by a physician,[279] home safety checks and a tailored education booklet plus assistance in locating and obtaining home safety devices,[292] a tailored safety report generated by an interactive computer kiosk in a well-child clinic, information on safety equipment savings at a child safety centre and a feedback report for the paediatrician to encourage safety counselling,[282] and multifaceted community programmes providing home safety inspections and education with the provision of safety items including syrup of ipecac[300] or home safety inspections with the discussion of specific home safety issues.[293]

The remaining seven studies evaluated interventions involving safety education, tailored safety education, the provision of syrup of ipecac and community programmes providing safety education, but reported no significant difference in the possession or use of syrup of ipecac favouring the intervention group.

Study I

Pairwise meta-analysis of 10 studies evaluating home safety education (including the provision of syrup of ipecac in some studies)[265,271,273,274,282,287,293,300,308,309] found that interventions were effective in increasing syrup of ipecac possession (OR 3.34, 95% CI 1.50 to 7.44) (*Figure 53*). Interventions providing syrup of ipecac appeared to be more effective (OR 10.41, 95% CI 2.40 to 45.09) than those not providing it (OR 1.77, 95% CI 1.08 to 2.91). Interventions provided at home appeared to be more effective (OR 5.45, 95% CI 1.22 to 24.32) than those provided in clinical settings (OR 2.02, 95% CI 1.08 to 3.75).

Network meta-analysis or decision analyses were not carried out for interventions to promote the possession of syrup of ipecac, as the use of syrup of ipecac by lay people has never been recommended in the UK and is no longer recommended for managing poisoning in children in the USA.[452]

Promoting the use of poison control centre stickers and telephone numbers

Study H

The overview included one systematic review and meta-analysis[33] and seven systematic narrative reviews[36,40,42,338,387,388,445] reporting the effect of interventions on the use of PCC stickers and telephone numbers. The meta-analysis[33] found evidence that education, with or without the provision of safety equipment, was effective in increasing the availability of PCC telephone numbers (OR 3.67, 95% CI 1.84 to 7.33).

Thirteen primary studies (11 identified from reviews[257,263,269,274,287,293,295,308,309,413,441] and two identified from additional searches for primary studies[288,431]) reported the effect of interventions promoting the use of

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Gielen 2002[265]	19	60	16	58	10.1%	1.22 (0.55 to 2.69)
Johnston 2000[271]	72	78	22	53	9.5%	16.91 (6.25 to 45.78)
Kelly 1987[273]	44	55	34	54	9.9%	2.35 (0.99 to 5.57)
Kelly 2003[274]	31	138	35	137	10.6%	0.84 (0.49 to 1.47)
McDonald 2005[282]	21	61	5	58	9.4%	5.57 (1.93 to 16.03)
Nansel 2002[288]	22	85	18	89	10.3%	1.38 (0.68 to 2.80)
Petridou 1997[293]	17	98	2	100	8.0%	10.28 (2.31 to 45.83)
Schwarz 1993[300]	177	248	25	248	10.7%	22.24 (13.53 to 36.54)
Woolf 1987[308]	81	119	60	143	10.7%	2.95 (1.77 to 4.90)
Woolf 1992[309]	86	150	79	151	10.8%	1.22 (0.78 to 1.93)
Total (95% CI)		**1092**		**1091**	**100.0%**	**3.34 (1.50 to 7.44)**
Total events	570		296			

Heterogeneity: $\tau^2 = 1.49$; $\chi^2 = 123.59$, df = 9 ($p < 0.00001$); $I^2 = 93\%$

Test for overall effect: $z = 2.96$ ($p = 0.003$)

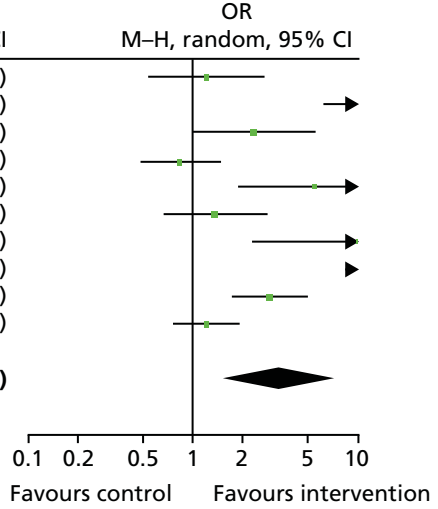


FIGURE 53 Forest plot of effect sizes for the possession of syrup of ipecac from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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PCC stickers and/or telephone numbers. Six of the 13 studies reported a significant effect favouring the intervention group.[269,274,308,309,413,431] These studies evaluated safety education, the provision of PCC stickers and telephone numbers, home safety inspections and the Healthy Steps child development and behaviour programme, in which one intervention group received the Healthy Steps programme and another intervention group received the programme and antenatal home visits. The study found a significant effect only for the Healthy Steps programme compared with usual care.[413] The remaining seven studies did not report a significant improvement in the use of PCC stickers and telephone numbers in the intervention groups, having evaluated a range of interventions including education, tailored safety education, the provision of PCC stickers and home safety inspections.

Study I

Pairwise meta-analysis of nine studies evaluating home safety education (including the provision of PCC number stickers in some studies),[269,274,287,288,293,295,308,309,431] which updated the meta-analysis reported in study H,[33] found that interventions were effective in increasing the proportion of families who had the PCC number accessible (OR 3.30, 95% CI 1.70 to 6.39) (*Figure 54*). Interventions providing PCC stickers may be more effective (OR 4.44, 95% CI 2.08 to 9.49) than those not providing stickers (OR 2.66, 95% CI 0.93 to 7.67). Interventions delivered at home (OR 5.99, 95% CI 2.08 to 17.26) may be more effective than those delivered in clinical settings (OR 2.10, 95% CI 0.85 to 5.15).

Study J

Network meta-analysis estimated the 21 possible pairwise comparisons between six interventions to promote having a PCC number available in 10 of the studies included in the PMA, as listed in *Table 100*. Interventions delivering education, low-cost or free equipment and home safety inspection were more likely to be effective in increasing possession of a PCC number (p best = 0.76; OR 38.82, 95% CrI 2.19 to 687.10) (*Figure 55*).

Study K

Decision analyses were not undertaken for interventions to promote having a PCC number available because the exposures studied in study A did not include having a PCC number available as PCCs are not provided for public use in the UK. Consequently, data were not available for decision analyses for this outcome.

Promoting other poisoning prevention practices

Study H

Twelve reviews[33,36,42,332,334–336,338,383,387,388,445] reporting other poisoning prevention outcomes were included in the overview.

A total of 13 primary studies reporting other poisoning prevention practices were identified, nine from the reviews[257,263,267,271,295,304,408,437] and four from additional searches for primary studies.[289,303,418,432]
Of the 13 studies, two evaluated the effect of education, provision of safety equipment and home safety inspections on poisoning hazards scores, with both finding significant effects favouring the intervention group.[289,303] One reported a significant improvement in intervention group poison safety scores after a school safety fair[408] and one observed significantly safer storage of beauty products and paraffin properly labelled and stored in tightly closed non-glass containers.[303] The remaining studies evaluated a range of interventions including community injury prevention programmes, safety education, tailored safety education and the provision of safety equipment, but reported no significant effects favouring the intervention groups.

Study I

Meta-analysis of three studies reporting storing plants out of reach,[257] plants not being accessible[295] or not having any toxic plants in the home[304] found a lack of evidence that home safety education was effective in promoting the safe storage of plants (OR 1.18, 95% CI 0.40 to 3.48) (*Figure 56*).

Study or subgroup	Intervention Events	Total	Control Events	Total	Weight	OR M–H, random, 95% CI
Hendrickson 2002[269]	34	38	8	40	8.6%	34.00 (9.32 to 123.97)
Kelly 2003[274]	113	138	46	137	11.8%	8.94 (5.11 to 15.65)
Nansel 2002[287]	63	85	59	89	11.4%	1.46 (0.76 to 2.80)
Nansel 2008[288]	90	119	50	59	10.7%	0.56 (0.25 to 1.27)
Petridou 1997[293]	71	98	67	100	11.6%	1.30 (0.70 to 2.38)
Phelan 2011[431]	71	139	16	138	11.5%	7.96 (4.29 to 14.77)
Posner 2004[295]	35	49	27	47	10.6%	1.85 (0.79 to 4.32)
Woolf 1987[308]	47	119	29	143	11.8%	2.57 (1.48 to 4.44)
Woolf 1992[309]	117	150	59	151	11.9%	5.53 (3.33 to 9.17)
Total (95% CI)		**935**		**904**	**100.0%**	**3.30 (1.70 to 6.39)**
Total events	641		361			

Heterogeneity: $\tau^2=0.89$; $\chi^2=71.98$, df=8 ($p<0.0001$); $I^2=89\%$

Test for overall effect: $z=3.53$ ($p=0.0004$)

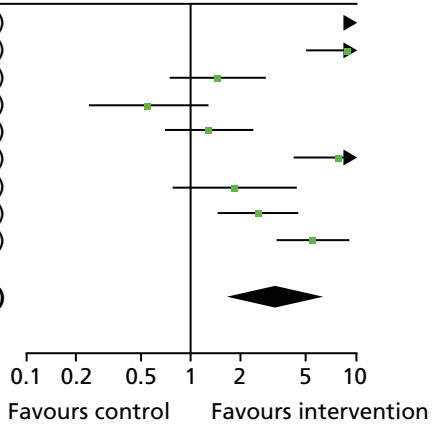


FIGURE 54 Forest plot of effect sizes for having a PCC sticker available from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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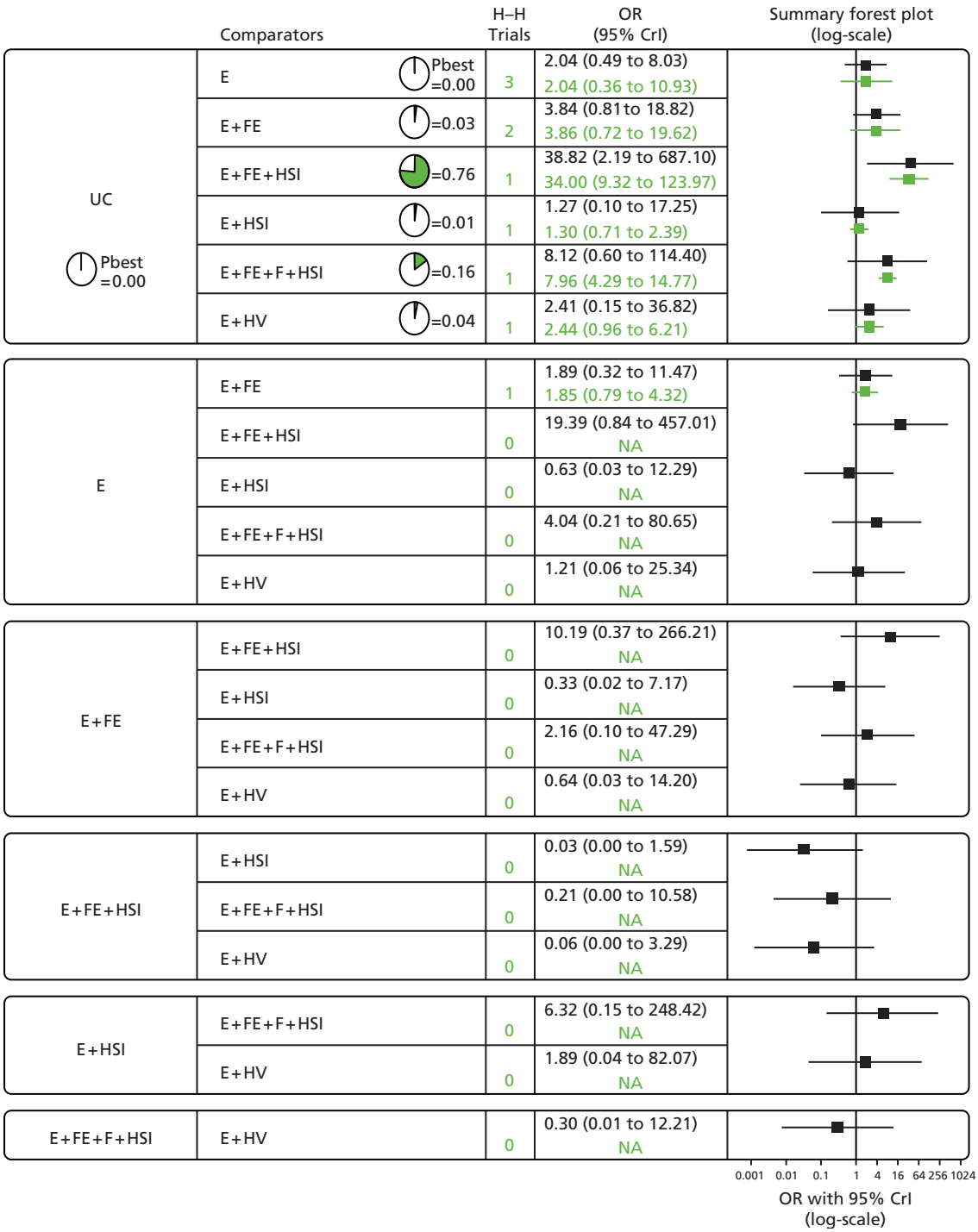


FIGURE 55 Network meta-analysis and PMA results for interventions to promote having a PCC number available. Heterogeneity: between-study variance = 1.35 (95% CrI 0.328 to 3.709). Key: NMA results in black; PMA results in green. Interventions are displayed in the order that they were entered in the analysis. E, education; F, fitting; FE, low-cost/free equipment; H–H, head to head; HSI, home safety inspection; HV, home visit; NA, not applicable; Pbest, probability that intervention is the best; UC, usual care. From Achana *et al.*[449] under Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

Study or subgroup	Control Events	Total	Intervention Events	Total	Weight	OR M–H, random, 95% CI
Babul 2007[257]	112	147	259	332	53.5%	0.90 (0.57 to 1.43)
Posner 2004[295]	9	16	11	16	28.7%	0.58 (0.14 to 2.48)
Sznajder 2003[304]	48	49	41	48	17.8%	8.20 (0.97 to 69.40)
Total (95% CI)		**212**		**396**	**100.0%**	**1.18 (0.40 to 3.48)**
Total events	169		311			

Heterogeneity: $\tau^2=0.51$; $\chi^2=4.47$, df=2 ($p=0.11$); $I^2=55\%$
Test for overall effect: $z=0.30$ ($p=0.76$)

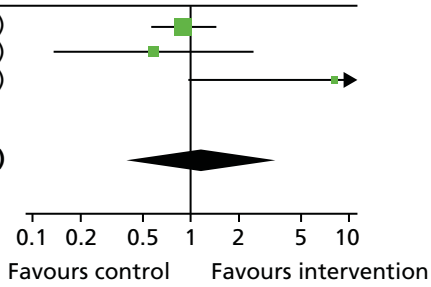


FIGURE 56 Forest plot of effect sizes for storage of plants out of reach from studies evaluating home safety educational interventions. M–H, Mantel-Haenszel. Originally published in Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney CA, Watson MC, Coupland C. Home safety education and provision of safety equipment for injury prevention. *Cochrane Database of Systematic Reviews* 2012, Issue 9. Art. No.: CD005014. http://dx.doi.org/10.1002/14651858.CD005014.pub3.[49]

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Study J

Network meta-analysis estimated the 10 possible pairwise comparisons between five interventions to promote the safe storage of poisonous plants in three studies as listed in *Table 100*. There was no evidence that any one of the interventions was more likely to be effective than the others in promoting safe storage of poisonous plants (*Figure 57*).

Study K

Decision analysis was not undertaken for interventions to promote the safe storage of plants, as none of the interventions in the NMA was any more effective than any other.

Discussion

Main findings

Fire-related injury prevention

There was a paucity of evidence relating to the impact of home safety interventions on the risk of fire-related injury or death. Most evidence related to the promotion of smoke alarms. A small number

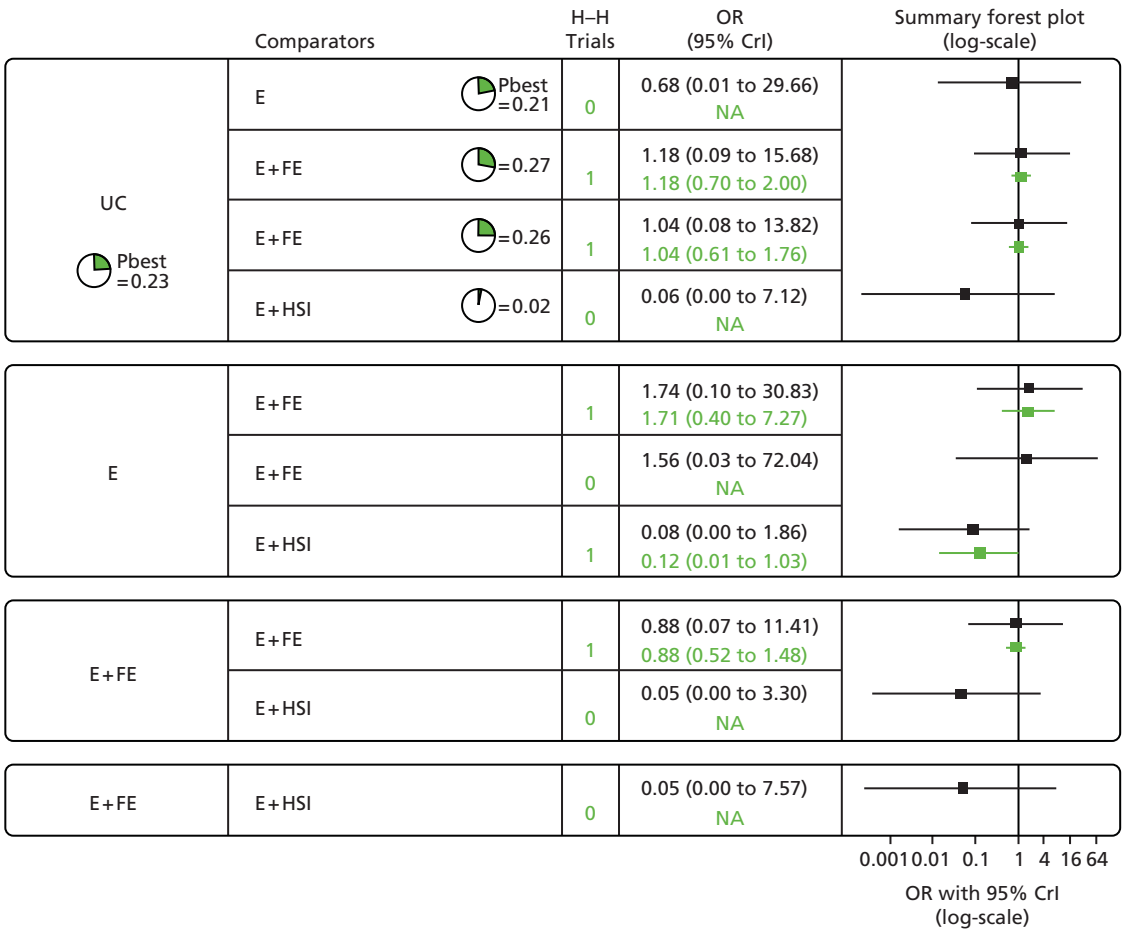


FIGURE 57 Network meta-analysis and PMA results for the safe storage of poisonous plants. Heterogeneity: between-study variance = 1.00 (95% CrI 0.003 to 3.818). Key: NMA results in black; PMA results in green. Interventions are displayed in the order that they were entered in the analysis. E, education; FE, low-cost/free equipment; H–H, head to head; HSI, home safety inspection; NA, not applicable; Pbest, probability that intervention is the best; UC, usual care. From Achana *et al.*[449] under Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

of case–control studies have demonstrated that households with smoke alarms have a lower risk of death and injury from house fires than households without smoke alarms. Narrative review- and PMA-level evidence demonstrated that interventions to promote smoke alarm ownership significantly increase the proportion of homes with a functional alarm, but there is a lack of evidence about whether or not these interventions reduce the risk of injury or death from house fires. NMA demonstrated that more intensive interventions [i.e. those including components that provided equipment (with or without fitting), home safety inspection or both in addition to education] were the most effective. The most effective intervention included education, the provision of low-cost/free equipment, fitting and home safety inspection. Ionisation smoke alarms with lithium batteries were most likely to be the best type of alarm for increasing possession of a functioning alarm. Data from the case–control studies identified in study H were used in the decision analysis for smoke alarms. The most effective intervention was not the most cost-effective. Decision analyses demonstrated that providing education and low-cost/free equipment was the most cost-effective intervention (£34,200 per QALY gained). The cost per QALY gained reduced to £4500 when it was assumed that there were 1.8 children aged < 5 years per household.

Evidence relating to the effect of other fire-prevention interventions was very limited. There was narrative review-level evidence and evidence from PMA of four studies that home safety interventions were effective in increasing the proportion of families having or practising a fire escape plan; however, NMA found no significant difference between interventions consisting of various combinations of education, home safety inspection, community campaigns and provision of safety equipment, and so the most effective type of home safety intervention remains unclear. There was some evidence from narrative reviews and PMA that home safety interventions may be effective in increasing the possession of fireguards, but, again, NMA found no significant difference between interventions including various combinations of education, home safety inspection and the provision and fitting of safety equipment, and so the most effective intervention remains unclear. There was no consistent review-, PMA- or NMA-level evidence that home safety interventions were effective in promoting the possession of fire extinguishers, the safe storage of matches or the checking or changing of smoke alarm batteries. There was review-level evidence from one narrative review that school-based education was effective in improving fire responses among children, and there was review-level evidence from one narrative review that two very different interventions (one multidisciplinary single-day programme and one course of cognitive–behavioural therapy) may be effective in reducing fire setting or match play.

Scalds prevention

There was a paucity of evidence relating to the impact of home safety interventions on the risk of scald-related injury or death. Most evidence related to the effect of interventions promoting having a ‘safe’ hot tap water temperature. Most, but not all studies, gave an explicit definition of a ‘safe’ temperature, but there was no consensus, with the criterion values ranging from ≤ 46 °C to ≤ 60 °C. There was evidence from narrative reviews and PMA that home safety interventions were effective in promoting having a safe hot water temperature. NMA demonstrated that education plus free or low-cost provision and fitting of TMVs was most likely to be effective. Decision analyses indicated that this was the most cost-effective intervention only if TMVs were provided as part of major refurbishment or new builds and to families living in social housing; otherwise, usual care or education was most cost-effective but with considerable uncertainty in the threshold range of £30,000–50,000 per QALY gained.

There was very limited evidence relating to the effect of interventions on promoting the safe handling of hot food or drinks. Narrative reviews and PMA did not demonstrate that home safety interventions were effective in promoting the safe handling of food or drinks. NMA found no significant difference between groups for interventions consisting of education, home safety inspections and the provision of safety equipment. There was no consistent narrative review-level evidence of the effectiveness of home safety interventions for promoting a range of other cooking safety practices or other scald prevention practices.

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Falls prevention

There was a paucity of evidence relating to the impact of home safety interventions on the risk of fall-related injury or death. Most evidence related to the promotion of safety gate use and the reduction of baby walker use. Narrative review and PMA demonstrated that home safety interventions were effective in promoting safety gate use. NMA demonstrated that the most intensive intervention (education, equipment provision, fitting of safety equipment and home safety inspection) was most likely to be the most effective intervention. Decision analyses demonstrated that, at a threshold of £30,000 per QALY gained, usual care had the highest probability of being cost-effective. Findings were sensitive to the cost of the education package; when this was reduced to reflect a less intensive education package (e.g. a leaflet) while assuming that effectiveness was the same, usual care and education had similar probabilities (0.56 and 0.44, respectively) of being cost-effective at a threshold of £30,000 per QALY gained. Narrative review and PMA demonstrated that home safety interventions were effective in reducing baby walker use and NMA demonstrated that interventions that consisted of education only were the most effective. Decision analyses were not undertaken for interventions to reduce baby walker use as more complex analyses are required to take account of the potential protective effect of walkers on some types of falls, changes in risk of walker-related falls from changes to EU standards for baby walkers and some countries banning baby walker sales.

There was very limited evidence about the effect of other falls prevention interventions. Narrative reviews, PMAs and NMAs did not demonstrate that interventions to promote the use of window safety devices (locks, guards or devices to limit opening width) or those to prevent children being left on high surfaces were effective. Narrative reviews and PMA did not demonstrate that interventions to promote the use of non-slip bathroom products (mats, decals) were effective. There was no consistent narrative review-level evidence that interventions to promote the use of furniture corner covers or high-chair harnesses were effective, nor that other interventions to promote stairway safety or balcony safety or to reduce tripping hazards were effective.

Poisoning prevention

There was a paucity of evidence relating to the impact of home safety interventions on the risk of poisoning-related injury or death. PMA did not demonstrate that home safety interventions were effective in reducing poisoning rates based on the findings from four studies. Most evidence related to the effect of interventions on promoting the safe storage of medicines or household products. Narrative reviews and PMA demonstrated that home safety interventions were effective in promoting the storage of medicines out of reach of children. NMA demonstrated that education with the provision of low-cost or free equipment was the intervention most likely to be effective. Decision analyses demonstrated that, at a threshold of £30,000 per QALY gained, usual care had the highest probability of being cost-effective. Findings were very sensitive to the cost of the education package; when this was reduced to reflect a less intensive education package (e.g. a leaflet) while assuming that effectiveness was the same, education had the highest probability of being cost-effective at a threshold of £30,000 per QALY gained. Narrative reviews and PMA demonstrated that home safety interventions were effective in promoting the storage of household products out of reach. NMA demonstrated that, although the most intensive home safety intervention (education, low cost or free equipment, home safety inspection and fitting) was most likely to be effective, none of the interventions was significantly more effective than usual care. Decision analysis demonstrated that all interventions were more costly and less effective than usual care.

There was evidence from narrative reviews and PMA that home safety interventions were effective in increasing the proportion of families with a PCC number available. NMA demonstrated that interventions consisting of education, the provision of safety equipment and home safety inspections were more effective than other interventions. Decision analysis was not undertaken for this outcome as publicly available PCCs are not available in the UK. There was evidence from narrative reviews and PMA that home safety interventions were effective in promoting the possession of syrup of ipecac but, as the use of syrup of ipecac by lay people has never been recommended in the UK and is no longer recommended for managing poisoning in children in the USA,[452] NMA and decision analyses for this outcome were not undertaken.

There was very limited evidence relating to interventions to promote other poison prevention practices. Narrative reviews and PMA did not demonstrate that home safety interventions were effective in promoting the safe storage of unspecified poisons, but NMA demonstrated that education plus low-cost or free equipment plus home safety inspections was more effective than other interventions in promoting this outcome. Narrative reviews, PMA and NMA did not demonstrate that home safety interventions were effective at promoting the safe storage of poisonous plants out of reach. There was no consistent narrative review-level evidence that home safety interventions were effective in promoting the use of CRCs or other poisoning prevention practices.

Strengths and limitations of the studies

Study H

Our series of overviews are the first to address the prevention of fire-related injuries, scalds, falls and poisonings in childhood. Our inclusion of primary studies published since the most recent comprehensive systematic review ensured that our overviews included the most up-to-date evidence. As we identified and examined all primary studies from the reviews included in the overview, this should limit bias arising from selective reporting of findings in reviews. Although our overviews focused on interventions that could be implemented in children's centres in England and Wales, the findings should be more broadly generalisable to providers of community health and social care in other high-income countries.

There are several limitations to our overviews. The quality of the included studies was variable and for most outcomes there was a limited number of available studies. Studies showed wide variation in terms of the content of the intervention, population size, socioeconomic background, delivery method of the intervention and follow-up period. Many studies had small sample sizes and limited power. For multifaceted interventions it was not possible to determine which components were responsible for the observed effects. The interventions included in all overviews came almost exclusively from higher-income countries, therefore the findings are unlikely to be generalisable to low- and middle-income counties. The overview included non-legislative interventions, but legislative or regulatory interventions have been effective in preventing some injuries[453] and it is possible that adding a legislative component to the education or engineering interventions that we reviewed may further enhance their effectiveness. Outcome reporting bias may have occurred because some primary studies reported insufficient data for relevant outcomes.

Study I

The update[49] to the Cochrane review of home safety interventions[33] is the largest and most comprehensive published review of home safety interventions to prevent a range of childhood injuries to date. It is the only published review in the field of child home injury prevention to obtain and use individual participant data. This has allowed inclusion of unpublished data from a number of studies in meta-analyses, helping to minimise outcome reporting bias and increase the power of meta-analyses. The small number of studies included in some of our analyses led to a lack of precision in effect size estimates. As discussed in the published review, the quality of included studies was very variable, and sensitivity analyses restricting analyses to RCTs indicated that most findings were robust to this.[49] However, some analyses were not robust to restricting analyses to studies with adequate allocation concealment, blinded outcome assessment or follow-up of at least 80% of participants, with smaller effect sizes seen in higher-quality studies. However, caution must be exercised in interpretation of these subgroup analyses because of the small number of studies in the subgroups. Many of our PMAs were found to have significant heterogeneity between effect sizes. This may have been partly because interventions providing safety equipment were more effective than those not providing safety equipment and interventions provided in the home or community were more effective than those provided in clinical settings. Significant heterogeneity often remained within subgroup analyses, highlighting the importance of the NMAs undertaken in study J, which allowed for much finer categorisation of interventions. As study I included a subset of studies included in the overviews, many of the limitations of the primary studies included in the overviews were also relevant to study I.

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Study J

To our knowledge, study J represents the first NMA of interventions to prevent fire-related injuries, scalds, falls or poisonings at home in childhood. We have demonstrated the usefulness of NMA for comparing multiple injury prevention interventions and for teasing out the relative effectiveness of each, even when the number of studies evaluating the same comparison is small. NMA will also become increasingly useful as more studies are completed, as some of our effect size estimates lacked precision because of the small numbers of studies. As our NMAs characterise interventions more finely than previous PMAs, our findings are likely to be more useful for policy makers, service commissioners and providers when choosing between interventions.

As discussed in the published papers from study J, there was some inconsistency between direct and indirect evidence between studies comparing education with education plus the provision and fitting of equipment in the NMA for smoke alarms,[374] but not in the other NMAs that we undertook.[446,449] We removed the single study that provided direct evidence comparing education with education and the provision and fitting of safety equipment to assess if this contributed to the inconsistency, but the ranking of which intervention was most effective remained unchanged. We also found considerable heterogeneity between studies in the NMAs for smoke alarms, window locks, not leaving children on high surfaces, having a PCC number available and the safe storage of poisonous plants and, because the numbers of studies were small, there was considerable uncertainty surrounding these estimates. Despite being able to more finely categorise interventions than in previous PMAs,[33,37,40] some 'lumping' of interventions (and of control treatments) will still remain within categories. For example, some education-only interventions provide only leaflets, whereas others provide intensive face-to-face teaching sessions on home safety), but a lack of detail in the primary study reports about the interventions precluded further subcategorisation. In addition, the low-cost/free safety equipment provided in some studies may not have been relevant to the outcome concerned (i.e. equipment may have included socket covers and smoke alarms, which would not prevent fall injuries). We were able to explore this for the NMA for stair gates by splitting the equipment provision into relevant/not relevant or not stated, with findings similar to those of the main analysis.

As discussed for studies H and I, the quality of studies included in our analyses was variable. Restricting NMAs to RCTs only (as described in published papers[374,446,449]) produced similar findings to those reported above. We were unable to explore the effect of restricting analyses by other quality markers such as allocation concealment, blinding of outcome assessments or completeness of follow-up, as the number of studies included was too small. The other limitations of the studies included in studies H and I, as discussed above, are also relevant to study J.

Study K

The decision analyses undertaken for study K for interventions to prevent falls and poisonings are, to our knowledge, the first studies of this type to evaluate home safety interventions for the prevention of these injuries in the UK. Our decision analyses for interventions promoting the possession and use of smoke alarms and for interventions promoting a safe hot tap water temperature add to the very limited data in these two areas. There are a range of limitations to our decision analyses. Difficulties in categorising interventions and control conditions, as described in the previous section, also apply to the decision analyses. A range of assumptions was made in each decision analysis and, although we used sensitivity analyses to assess the impact of varying these assumptions, not all assumptions were able to be investigated. For example, there is some evidence that a child admitted to hospital with a burn or a poisoning is more likely to be admitted in the future with the same type of injury than with another injury,[454] but our analyses did not take this into account. Social inequalities exist in the possession of items of safety equipment such as smoke alarms and safety gates[455] in families with children aged < 5 years in the UK, and some interventions may be more cost-effective if targeted at particular groups, but our analysis did not take this into account. Throughout the decision analyses it was assumed that the probability of accepting an intervention by households was the same; however, lack of evidence meant that it was not possible to investigate the validity of this assumption. It is plausible that different interventions may have different probabilities of acceptance by households. For example, householders may be less likely to accept interventions that require

house inspections as this may be seen as an intrusion on family life. Finally, data on injury treatment costs are country specific and hence our findings may not be generalisable to other countries with different health-care systems.

Economic evaluation has only recently been applied to public health interventions.[255,370,456,457] There are specific challenges to evaluating public health interventions including attributing the effects (intended and unintended) of the intervention on the target population, deciding which costs and consequences should be included, the acceptability of the intervention to a range of stakeholders and maintaining a balance between efficiency and equity of resource allocation.[458,459] In addition, particularly for public health interventions, a key issue relates to 'who pays and who benefits', as cost savings will vary when a wider societal perspective is taken.[140] The analyses presented here were conducted from a public sector perspective and included costs incurred by different stakeholders including the NHS, social services and the fire and rescue service, who are often responsible for home safety checks and the supply of smoke alarms. However, these analyses were limited to HRQL outcomes expressed in terms of QALYs. Future studies may want to consider both welfare and quality of life more broadly by adopting a cost–consequence approach[371] or a multi-criteria decision-making approach.[459] Such an endeavour would need to consider thresholds carefully because it is unclear whether or not the same threshold (i.e. £30,000 per QALY gained) is relevant to different sectors of the economy beyond health care.

In terms of our analyses, estimates of the effectiveness of interventions have been based on data from the NMAs from RCTs, non-RCTs and CBA studies. These studies usually reported the effect of the intervention on intermediate outcomes such as the possession of safety equipment rather than on injury occurrence. The associations between intermediate outcomes and injury occurrence were therefore obtained from observational studies, including the case–control studies undertaken in study A. We acknowledge that there is greater potential for bias in observational studies than in RCTs and effect sizes obtained from RCTs may vary from those obtained from observational studies. We also attempted to minimise bias in the NMAs by restricting analyses to RCTs and findings were robust to these sensitivity analyses. There are several factors that our analyses did not take account of, which, had we done so, would be likely to increase the cost-effectiveness of the interventions. First, we did not take account of the lost productivity of more severely injured children, who will have many years to live with reduced productivity. Second, some interventions, such as smoke alarms and TMVs, will benefit all household members not just children aged < 5 years. Third, we did not take account of the long-term costs of care for disabled children, for example the costs of residential care. Fourth, we did not take account of the personal costs of caring for disabled children or the lost productivity of parents and other carers. Finally, our decision analyses assumed that interventions were aimed at preventing only one type of injury. However, in practice, interventions such as home safety equipment schemes provide education and fit equipment aimed at preventing a range of injuries. This means that costs such as set-up costs, travel costs and the cost of safety equipment fitters' time used in our models will overestimate costs if interventions to prevent more than one type of injury are provided simultaneously. More complex decision analyses are required to incorporate costs and benefits across multiple interventions and injury types.

Comparisons with existing literature

Study H

In terms of the overviews, our findings are consistent with those of previous systematic reviews.[33–42,331–337] Our findings extend those of previous systematic reviews by including more recently published studies but, despite this, there is still a paucity of evidence that home safety interventions to prevent fire-related injuries, scalds, falls or poisonings in children aged < 5 years are effective in reducing injury rates, with only a small number of studies reporting these outcomes. Our overviews demonstrate that the body of evidence on the effectiveness of interventions to promote the possession and use of functional smoke alarms, safe hot tap water temperatures, the possession and use of safety gates and the safe storage of medicines and household cleaners out of reach and to reduce baby walker use is becoming stronger as more studies are published.

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Study I

The findings of the PMAs build on the findings from the three previously published relevant reviews containing meta-analyses[33,37,40] but are more positive than these in terms of the effect of home safety interventions on safety practices. The review and meta-analysis by DiGuiseppi and Roberts[40] found that interventions delivered in a clinical setting were effective in promoting a safe hot tap water temperature, in increasing smoke alarm ownership and in increasing the safe storage of cleaning products. It concluded that clinical counselling had little effect on most home safety practices designed to childproof the home and there was limited evidence about the impact of counselling on childhood injuries. The review and meta-analysis by DiGuiseppi and Higgins[37] found that interventions were effective in increasing functional smoke alarm ownership only when these interventions were delivered in clinical settings and there was a smaller effect size than we found. Our findings are likely to be more positive as we included a larger number of studies and obtained and used individual participant data, which allowed for analysis of previously unpublished data. In addition, some studies not included in the DiGuiseppi and Higgins[37] review had large sample sizes[312,460,461] and some studies for which we had individual participant data and which were not included in the DiGuiseppi and Higgins review demonstrated very positive effects for some outcomes.[269,295,304,312,431,462] As expected, our findings are consistent with the review and meta-analysis by Kendrick *et al.*,[33] as study I was an update of that review. The publication of new studies since the original review allowed meta-analyses to be undertaken for additional outcomes (e.g. fire escape plans) and strengthened the evidence for the effect of interventions to promote safety gate use and prevent baby walker use.

Study J

To our knowledge, there are no published NMAs comparing different interventions to prevent fire-related injuries, scalds, falls and poisonings in childhood with which to compare our findings. By categorising interventions more finely in our NMAs, we have been able to demonstrate the important elements of interventions that contribute to their effectiveness. Our NMA finding that more intensive interventions, all of which included the provision of free or low-cost safety equipment, were more effective than interventions consisting of education alone for the promotion of smoke alarms, safe hot water temperatures, safety gates and the storage of medicines and household products out of reach strengthens the evidence from previous meta-analyses suggesting that interventions providing free or low-cost safety equipment may be more effective than those not providing free or low-cost safety equipment.[37,418]

Study K

We have only been able to find economic analyses of interventions to promote functional smoke alarm ownership[347,463] and TMVs[140] in a UK setting with which to compare our findings. The two smoke alarm studies evaluated the provision and installation of free smoke alarms compared with 'no intervention', based on the findings of one trial[261] of a smoke alarm giveaway programme in disadvantaged areas in London, UK. The first found a higher number of injuries and deaths and higher costs in intervention areas and concluded that a smoke alarm programme as delivered in the trial was unlikely to be cost-effective.[347] The second, a decision analysis, was based on the findings from the first study but used an estimate of the relative risk of suffering injury from a fire at home for households without a smoke alarm compared with those with a functioning alarm from other studies (this was not estimated as part of the trial). The ICER was £23,046, suggesting that smoke alarm giveaway programmes were likely to be cost-effective at the threshold used by NICE of £30,000 per QALY. Our analyses of smoke alarms have extended those of the previous studies by assessing the cost-effectiveness of a range of interventions. We were able to do this by using effect size estimates for a range of interventions (i.e. ranging from usual care to multifaceted interventions including a combination of education, free or low-cost safety equipment, equipment fitting and home safety inspections) obtained from our NMAs. This has enabled us to establish the most cost-effective intervention and to show that, when analyses take account of the average number of children in households with children, education plus providing low-cost/free equipment is highly cost-effective with a cost per QALY gained of £4500.

In terms of TMVs, the previous economic evaluation was based on a trial that evaluated the provision of an educational leaflet with free fitting of a TMV in households with children aged < 5 years living in social housing in Glasgow, UK. This analysis assumed that TMVs were fitted as part of refurbishment or new builds as opposed to stand-alone interventions. The study found that TMVs were associated with a saving to the public purse of £1.41 for every £1 spent and concluded that fitting TMVs for families with young children in social housing as part of major refurbishment or new builds was very likely to represent good value for money.[140] Our decision analyses, which used some of the data from the same economic evaluation,[140] also found that TMVs were very likely to be cost-effective if fitted in households with young children living in social housing as part of major refurbishment or new builds. The decision analyses extended the previous analyses by demonstrating that TMVs were very unlikely to be cost-effective if fitted under different circumstances.

How these findings inform other research within the Keeping Children Safe programme

The findings from studies H–K have been used to produce two IPBs as part of the KCS programme. These resources incorporate evidence on the effectiveness and cost-effectiveness of home safety interventions with best practice obtained from those running injury prevention programmes. The first IPB covered the prevention of fire-related injury. The provision of the IPB and a package to support its use was evaluated using a RCT (study M) described in work stream 6 of the KCS programme (see *Chapter 7*). The second IPB was produced at the end of the KCS programme of work and covered fire-related injuries, scalds, falls and poisonings.[464]

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Chapter 7 Multicentre cluster randomised controlled trial evaluating implementation of a fire-prevention injury prevention briefing in children's centres (work stream 6)

Abstract

Research question

How effective and cost-effective is implementing an IPB for one exemplar injury prevention intervention?

Methods

Work stream 6 consisted of a review of reviews on implementation and facilitation of health promotion interventions (study L) and a RCT evaluating the effectiveness and cost-effectiveness of an IPB for the prevention of fire-related injuries (study M) with a nested economic analysis and qualitative study. The findings were incorporated into the development of a second IPB covering fire-related injuries, falls, poisonings and scalds.

Study M was a three-arm multicentre cluster RCT set in 36 children's centres in Nottingham, Bristol, Norwich and Newcastle. Families with a child aged < 3 years were eligible to participate. Children's centres were randomly allocated to one of three arms: IPB plus support (training and facilitation) (IPB+ arm), IPB without support (IPB-only arm) and control (usual care). IPB+ arm children's centres were provided with training as well as facilitation contacts at 1, 3, 5 and 8 months. The intervention period was 12 months. The primary outcome measure was the proportion of families with a fire escape plan. Secondary outcomes included other fire safety behaviours and measures of IPB implementation, resource use and expenditure. Random-effects modelling was used to compare outcomes between treatment arms and for the economic analysis. Qualitative data were subject to thematic analysis.

Results

In study L, 10 reviews were identified. A number of common themes emerged about factors affecting the implementation of community prevention programmes. The review identified the Promoting Action on Research in Health Services (PARIHS) framework and Carroll *et al.*'s fidelity framework, which informed intervention design and the measurement of fidelity and implementation.

Thirty-six children's centres and 1112 families participated in study M. Follow-up data were obtained from all children's centres and from 751 (68%) families.

The IPB was implemented by children's centres in both intervention arms, with greater implementation in the IPB+ arm. Compared with control arm families, more IPB+ arm families received advice on key safety messages and more families in each intervention arm attended fire safety sessions. The intervention did not increase fire escape plan prevalence (AOR IPB only vs. control 0.93, 95% CI 0.58 to 1.49; AOR IPB+ vs. control 1.41, 95% CI 0.91 to 2.20) but did increase the proportion of families reporting more fire escape behaviours (AOR IPB only vs. control 2.56, 95% CI 1.38 to 4.76; AOR IPB+ vs. control 1.78, 95% CI 1.01 to 3.15). IPB-only arm families were less likely to report children playing with matches or lighters (AOR 0.27, 95% CI 0.08 to 0.94) and reported more bedtime fire safety routines (AOR for a 1-unit increase in the number of routines 1.59, 95% CI 1.09 to 2.31) than control arm families. The IPB-only intervention was less costly and marginally more effective than usual care, whereas the IPB+ intervention was both more costly and marginally more effective than usual care.

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Conclusions

Neither intervention was effective at increasing the proportion of families with a fire escape plan, but both IPB+ and IPB increased the delivery of fire safety messages by children's centres and improved some fire prevention behaviours by families.

Chapter summary

Work stream 6 consisted of a review of the literature on the implementation and facilitation of health promotion interventions (study L) and a RCT set in children's centres that evaluated the effectiveness of an IPB for the prevention of fire-related injuries (study M). The RCT also contained a nested cost-effectiveness analysis and a qualitative study evaluating the implementation of the IPB. Work stream 6 also contained the final phase of the KCS programme of research, in which the findings from studies A and studies D–M were used to inform the development of a second IPB for the prevention of fire-related injuries, falls, poisonings and scalds.

Introduction

Fires are an important cause of morbidity and mortality in childhood. The UK has one of the highest mortality rates among high-income countries for deaths from fire and flames in children aged 0–14 years.[465] In 2011–12, English fire and rescue services attended > 44,000 house fires, which resulted in 21 child deaths, with a further 35 children injured for each fatality.[377] Deaths from fire and flames show the steepest social gradient of all injuries.[13] In England and Wales, children whose parents have never worked or are long-term unemployed have death rates from exposure to smoke, fire and flames that are 38 times higher than those of children whose parents have managerial/professional occupations.[13]

Some interventions are effective at reducing the risk of fire-related injuries and promoting fire prevention practices. Use of smoke alarms reduces the risk of death in house fires.[50,425] Education, with or without safety equipment being provided, is effective at increasing the prevalence of functioning smoke alarms[37,49] and home safety education increases the prevalence of fire escape planning.[49] Despite this, there is little evidence of systematic implementation of such injury prevention in the NHS,[19] and it is unlikely that this is any different in the social care or the voluntary sectors. A national survey of children's centres undertaken in work stream 3 (study D) of the KCS programme (see *Chapter 4*) and a systematic review (study E) undertaken in work stream 4 (see *Chapter 5*) identified the main barriers to, and facilitators of, implementing injury prevention interventions. These included the type of approach used (one-to-one, group work, partnership working, tailored methods), the characteristics of the deliverer, complexity of the intervention, resources, accessibility to safety equipment and importance of achieving behavioural change.[217,252] It is therefore important that interventions to promote injury prevention take these barriers and facilitators into account.

As described in work stream 4, children's centres provide community-based integrated services, information and support for families with young children. They aim to improve outcomes for young children and their families, with a particular focus on the most disadvantaged, to reduce inequalities in health.[210,466] They have a remit to promote child safety and the potential to reach a population at particular risk of fire-related injury. We therefore developed a fire prevention intervention for use in children's centres. This was based on evidence gathered in previous work streams in the KCS programme and consisted of an IPB for children's centres and a training and facilitation package to support implementation of the IPB. The IPB combined evidence on the effectiveness of fire safety interventions with best practice from those who had experience of running injury prevention programmes. The five key messages in the IPB were:

1. the importance of smoke alarm use and maintenance
2. having a family fire escape plan
3. identifying potential causes of house fires
4. the safe storage of matches and lighters
5. having a bedtime fire safety routine.

Methods

The methods are described in full in the published protocol[467] and summarised in the following sections.

Objective

The objective was to evaluate the effectiveness and cost-effectiveness of an educationally based intervention (IPB) with or without facilitation as a means of changing the behaviours of families and children's centre staff to improve fire safety in the home.

Design

We undertook a three-arm multicentre cluster RCT with an economic analysis and a nested qualitative study set in children's centres in four trial sites in England (Nottingham, Bristol, Norwich and Newcastle). A cluster RCT was appropriate because the intervention was delivered at the level of the children's centres and individual allocation of families living in close proximity could lead to contamination.

Participants

Children's centres

Children's centres were established in phases. Phase 1 (2004–6) targeted the 20% most deprived wards in England and phase 2 (2006–8) included the 30% most deprived wards and expanded into some of the 70% less deprived communities. Phase 3 (2008–10) extended to all remaining areas.[468] Phase 1 and phase 2 children's centres were eligible to participate, with priority given to phase 1 centres. Children's centres were recruited by postal invitation, followed by a telephone call and introductory recruitment visit. Children's centres provided written informed consent to participate.

Families

Families living in the catchment areas of children's centres with a child aged < 3 years who had attended the children's centre in the preceding 3 months were eligible to participate. Families in which a parent was aged < 16 years were excluded.

Families were recruited using a range of strategies including postal invitation and face-to-face invitation by children's centre staff or researchers. They provided written informed consent and were considered recruited to the trial on receipt of a completed consent form and baseline questionnaire.

Intervention

The intervention consisted of an IPB and a training and support package to facilitate its implementation. The intervention was developed using the UK MRC guidance for the development and evaluation of complex interventions[469] and included the following stages:

1. *Identifying the evidence base*. Evidence about the effectiveness of interventions was ascertained from preceding work in the KCS programme. This included systematic reviews of interventions to prevent injuries from house fires (study H) in work stream 5[49,374] (see *Chapter 6*) and a systematic review of facilitators of and barriers to home injury prevention interventions for preschool children (study E)[252] in work stream 4 (see *Chapter 5*). Evidence about the design, content and delivery of the intervention came from several sources. These included the Health Development Agency's Effective Action Briefing for putting evidence into practice for the promotion of domestic smoke alarms[470] and a review of reviews of the literature on the implementation and facilitation of health promotion interventions undertaken as preliminary work for this trial (study L). The objectives of the literature review were to determine factors affecting implementation of health promotion programmes, identify frameworks to assist in the measurement of the implementation process and consider the application of this information to the design of the intervention for work stream 6. Ten key reviews were identified.[248,249,251,471–477] The reviews found that careful implementation of programmes enhanced outcomes and the level of implementation achieved was an important determinant of programme outcomes. A number of common themes

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emerged about factors affecting the implementation of community prevention programmes. Four reviews had convergent findings for 11 explanatory factors, including funding, a positive work climate, shared decision making, co-ordination with other agencies, formulation of tasks, leadership, programme champions, administrative support, providers' skill proficiency, training and technical assistance.[248,251,475,476] One framework identified, the PARIHS framework,[478] was used to guide the design and evaluation of the facilitation package and another, Carroll *et al.*'s[472] fidelity framework, was used to measure the fidelity of the intervention. The PARIHS framework provides three interacting core elements of evidence, context and facilitation and Carroll *et al.*'s[472] framework informs the measurement of fidelity in terms of adherence to an intervention, exposure or dose, quality of delivery, participant responsiveness and programme differentiation.

2. *Identifying appropriate theory*. The intervention was developed based on five behavioural change theories (health belief model, social cognitive theory, theory of reasoned action, theory of self-regulation and self-control, and theory of subjective culture and interpersonal relations) identified from a review of behaviour change theories for injury prevention.[479] Our intervention aimed to address the three factors described as necessary and sufficient for producing a behaviour change by helping participants (both children's centre staff and families) to form intentions to change behaviour and remove environmental barriers, and providing participants with the knowledge and skills to perform the behaviour.
3. *Modelling processes and outcomes*. We undertook stakeholder interviews with people who had a national insight into both the policy framework within which children's centres operated and the overarching operational issues to provide an understanding of the context within which the trial was set. We undertook four workshops, one in each trial site, which provided a mix of large and medium-sized urban locations as well as more rural settings. Workshop delegates included local practitioners and policy makers, including children's centre managers and staff, fire and rescue services, NHS staff and commissioners of children's services. Workshops ensured that the IPB and the training and facilitation package complemented and recognised existing fire-prevention initiatives, built on existing knowledge about implementation in children's centres and how to reach families in the community, and provided input from potential end users and those with specialist expertise in implementation. A postal survey from study D in work stream 3 (see *Chapter 4*)[217] and interviews with children's centre managers and staff (study F) in work stream 4 (see *Chapter 5*) gave information about current injury prevention activity, barriers to, and facilitators of, injury prevention activity and the context within which children's centres operated. Interviews with parents of injured and uninjured children (study G) in work stream 4 (see *Chapter 5*) provided us with information about parents' barriers to, and facilitators of, home injury prevention. In addition, we undertook structured interviews with 200 parents from children's centres in the four study centres to understand their current injury prevention activity, determine their understanding and use of fire escape plans and estimate the prevalence of fire escape plans and the ICC for fire escape plans. The questionnaire is shown in *Appendix 6, Parents' survey for measuring the prevalence of fire protection practices* and the methods for this are described in full in the associated publication.[480] As a result of the findings in relation to the prevalence of working smoke alarms, the proposed primary outcome measure for the trial was changed to having a fire escape plan, as described in *Definition of primary and secondary outcome measures*. A composite secondary outcome measure describing five key component elements of a fire escape plan using latent variable analysis was also developed.

Allocation to the intervention and delivery of the intervention

Once the required number of families for each children's centre had been recruited, children's centres were stratified by trial site (four strata: Nottingham, Bristol, Norwich and Newcastle) and randomly allocated within strata to one of three arms using permuted block randomisation with a block size of 3. The allocation schedule was produced by an independent statistician using the randomisation algorithm in Stata/SE version 11 and was provided to an independent administrator who prepared sequentially numbered sealed opaque envelopes (one set for each of the four trial co-ordinating centres) containing allocations. Children's centres were randomised in trios; once each stratum contained three children's centres, the administrator opened envelopes for each block of three children's centres.

The three trial arms consisted of:

1. IPB plus facilitation (IPB+ arm)
2. IPB without facilitation (IPB-only arm)
3. usual care (control arm).

The intervention was delivered over a period of 12 months. Children's centres in the IPB+ arm were provided with the IPB, a training session (immediately before the start of the 12-month intervention period) and a facilitation package, described later in this section.

The IPB contained information:

- for managers on why preventing fire-related injuries is important, who the target group is, what effective interventions can be provided, creative ways of reaching the target group and how to evaluate use of the IPB
- for staff on why preventing fire-related injuries is important, who is at greatest risk, the main causes of house fires, what staff can do to help, what works to prevent house fires, where to get specialist advice and help and activities for use with parents, including session plans and resources covering five key messages (use of smoke alarms, fire escape plans, causes of house fires, children's development and risk of house fires and bedtime safety routines).

Children's centres were asked to deliver the fire prevention messages to participating families using the format that they considered most appropriate to their target audience. If they were unable to deliver all five messages, they were asked to focus on use of smoke alarms and fire escape plans, as these have the strongest evidence base. The IPB is provided in *Appendix 6, Injury prevention briefing 1*.

Children's centres were provided with a training session prior to commencing delivery of the intervention. The aims of the training were to ensure that key staff:

- were familiar with the IPB and confident about its authority, reflecting how it had been developed
- understood the information that it contained
- felt confident about delivering the key safety messages to parents
- were aware of the support that the local fire and rescue service was able to offer to staff and parents
- understood their obligations as part of the trial and the support that the local research teams would be providing.

The training was participative in nature and started with injury epidemiology and why children are at risk of injuries and progressed to the content of the IPB and how to use the IPB. The training allowed people to try out an exercise from the IPB and to ask for further information. Training was led by the same person from the Child Accident Prevention Trust in conjunction with local research teams and the local fire and rescue services. When the detailed content of the IPB was introduced to participants, it was stressed that it was the key messages that they needed to present to parents. The exercises in the IPB were seen as one means of doing this, but centres were given the freedom to choose how best to deliver the key messages, having regard for the way that they interact with parents (e.g. group sessions, outreach, one-to-one opportunities, displays). The final part of the training programme ('Using the IPB as effectively as possible') was key to ensuring that children's centres developed and implemented a plan for delivering the IPB. A draft implementation plan was provided, and this was incorporated into the facilitation package to enable researchers to assess progress with implementing the IPB.

The training session was piloted with nine staff covering a range of roles and seniorities from two children's centres that were not participating in the trial. Piloting led to several small changes in the programme. Training was provided at venues away from children's centres. To ensure consistency of training, the content of the presentations and discussions was monitored and recorded by the research

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teams. The training was evaluated by a questionnaire (shown in *Appendix 6, Injury prevention briefing training evaluation questionnaire*) completed by delegates at the end of the session.

The facilitation package consisted of the training plus contacts at months 1, 3 and 8. These used a two-stage approach with a postal or electronic questionnaire followed by a face-to-face or telephone interview, depending on progress with implementing the IPB. A fourth contact was made at months 4–5 if there was no progress with implementation of the IPB at month 3. The facilitation contacts collected information on progress with implementing the IPB, addressed children's centre staff questions and discussed barriers to implementation, gave advice and examples of good practice from other centres and provided a resource list and list of contacts for other organisations. The facilitation package was designed to be similar to the advice and support that might be provided by an injury prevention co-ordinator (as recommended in the NICE guidance on injury prevention[25]).

Children's centres in the IPB-only arm were mailed the IPB and covering letter encouraging them to use the IPB. They were not provided with any training or facilitation. Children's centres in the usual-care arm were asked to continue to provide their usual information on home safety. The IPB was posted to usual care arm children's centres after collection of post-intervention data.

Outcome measures

Outcome measures were ascertained at 12 months' follow-up, defined as 12 months post commencement of the intervention in the IPB+ and IPB-only arms and 12 months post randomisation in the usual-care arm.

Definition of primary and secondary outcome measures

The primary outcome was the proportion of families reporting having a fire escape plan. The primary outcome measure for the trial described in the original proposal was possession of a functional smoke alarm. However, the findings from the structured interviews with parents attending children's centres as part of the preliminary work for the trial indicated that the reported prevalence of functional smoke alarms was high (91%; see *Table 108*), thus precluding the use of this as the primary outcome measure. This was therefore changed to families having a fire escape plan because the systematic reviews (studies H and I) in work stream 5 indicated that there was more evidence that interventions could be effective at increasing fire escape planning than evidence for other fire safety behaviours.

Secondary outcome measures included:

- family participants:
    - the proportions of families with more and fewer fire escape behaviours using a binary measure derived from five component items shown in *Table 110*
    - the proportion of families with smoke alarms fitted and working on every level of their home
    - the proportion of families reporting fire setting or match play by their children
    - a bedtime fire safety routine score consisting of 10 items (see *Table 116*)
    - the proportion of families accessing smoking cessation services
    - the number of correct responses to fire safety knowledge questions
    - the proportion of families satisfied with the home safety information provided by children's centres
    - implementation of the IPB assessed by:
        - the proportion of families receiving advice on each of the five key messages
        - the proportion of families attending a fire safety session
        - the number of fire safety sessions attended
        - the proportion of families attending a fire safety session at a children's centre
        - the proportion of families attending sessions about each of the five key messages
    - families' resource use and expenditure in relation to fire safety practices

- children's centres as participants:
  - the proportion of children's centres providing information and advice on the topics of the five key messages
  - resource use and expenditure incurred in relation to fire safety practices
  - implementation of the IPB assessed by:
    - the proportion of children's centres with an implementation plan (IPB+ and IPB-only arms)
    - the month at which the implementation plan was finalised (IPB+ arm only)
    - the proportion of children's centres using each of the five exercises in the IPB (IPB+ and IPB-only arm)
    - the proportion of children's centres using methods other than the IPB sessions to deliver the five key messages (IPB+ and IPB-only arms)
    - the number of fire safety sessions provided (all three arms)
    - the number of parents exposed to IPB sessions (IPB+ and IPB-only arms).
  - barriers to, and facilitators of, children's centres implementing the IPB (IPB+ and IPB-only arms) and barriers to, and facilitators of, injury prevention work (all three arms).

Ascertainment of outcomes

Outcomes were ascertained using a range of tools as summarised in *Table 104* and described in the following sections.

Ascertaining family outcomes

The baseline self-completion questionnaire included questions on sociodemographic and economic characteristics, household information, previous fire-related injuries, fire safety behaviours and fire safety equipment, knowledge and understanding of what causes fires, home safety information provided by children's centres and satisfaction with this information (see *Appendix 6, Baseline self-completion*

TABLE 104 Tools for measuring parent and children's centre outcomes by treatment arm

Data collection tool[a]	IPB+ arm	IPB-only arm	Usual-care arm
Data collected from families			
Baseline self-completion questionnaire	■	■	■
Follow-up self-completion questionnaire	■	■	■
Data collected from children's centres			
Baseline manager/staff questionnaire	■	■	■
Follow-up manager/staff questionnaire	■	■	■
Facilitation contacts questionnaire at 1, 3, 4/5 and 8 months	■		
Facilitation contacts interview at 1, 3, 4/5 and 8 months	■		
Activity logs	■	■	■
Follow-up facilitation and implementation fidelity questionnaire	■	■	
Follow-up facilitation and implementation fidelity interview	■	■	

a All follow-up tools were administered at 12 months' follow-up unless stated otherwise.

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questionnaire for parents). Questions on fire safety behaviours and fire safety equipment were developed from the structured interviews of parents undertaken to inform the trial.[480] The questionnaire was piloted on families attending children's centres that were not taking part in the trial.

The baseline questionnaire was adapted for follow-up by adding questions on resource use and expenditure incurred (see *Appendix 6, Follow-up self-completion questionnaire for parents*). A shorter version of the questionnaire was used for reminders, with up to two reminders used. Questionnaires were administered by post, telephone or face to face. Families who completed a questionnaire were provided with a £5 gift voucher.[69,70]

Ascertaining children's centre outcomes

Postal questionnaires were used to collect information from children's centre managers or staff on the promotion of fire prevention activity (see *Appendix 6, Baseline manager/staff questionnaire*). Questions were based on those used in the national survey of injury prevention activity among children's centres in England undertaken in work stream 3 (study D)[217] (see *Chapter 4*). Questions on resource use were added to follow-up questionnaires (see *Appendix 6, Follow-up manager/staff questionnaire*). The baseline questionnaire was piloted on 10 children's centres across England that were not taking part in the trial.

Data for assessing implementation of the IPB were obtained from facilitation contacts questionnaires and interviews (e.g. time at which an implementation plan was finalised) in the IPB+ arm, from the 12-month follow-up implementation fidelity questionnaires and interviews (e.g. having an implementation plan, providing sessions on the five key messages, barriers to and facilitators of implementing the IPB) in the IPB+ and IPB-only arms and from activity logs (data on parents' attendance at sessions) from all arms. The questionnaires and interview schedules for facilitation contacts are given in *Appendix 6, Facilitation contacts questionnaires* and *Facilitation contacts interview*, respectively.

The implementation fidelity questionnaire and interview schedule were based on Carroll *et al.*'s[472] framework, the review of the literature on the implementation and facilitation of health promotion interventions (study L), the systematic review of barriers to and facilitators of home injury prevention undertaken in work stream 4 (study E),[252] findings from the national survey of children's centre managers and staff undertaken in work stream 3 (study D)[217] and interviews with children's centre managers and staff undertaken in work stream 4 (study G). Questionnaires were administered to, and interviews undertaken with, managers and/or staff responsible for the delivery of the IPB in the IPB+ and the IPB-only arms. Interviews covered the topics outlined in Carroll *et al.*'s[472] implementation fidelity framework: adherence to the intervention; exposure or dose (whether or not the frequency and content of the fire safety messages were delivered as planned); quality of delivery (how staff perceived the quality of the fire safety messages that were delivered); participant responsiveness (whether or not families were fully engaged with the intervention); and programme differentiation (elements of the intervention that were considered essential for fire safety). They also contained questions about children's centre staff experiences of IPB implementation, including barriers and facilitators and suggested improvements to the IPB. The 12-month follow-up facilitation and implementation fidelity questionnaire and interview schedule are shown in *Appendix 6, 12-month follow-up facilitation and implementation fidelity questionnaires* and *12-month follow-up facilitation and implementation fidelity interview schedules,* respectively.

Sample size

Eleven children's centres per arm were required to detect an absolute difference in the percentage of families with a fire escape plan of 20% in either of the two intervention arms compared with the usual-care arm. This was based on 80% power and a 5% significance level (two sided), and assumed a usual-care arm prevalence of 42% and an ICC of 0.05 (ascertained from structured interviews with families attending children's centres in the four trial sites[480]) and that outcomes were assessed on 20 families per children's centre. In total, 33 children's centres were required, which was increased to 36 to allow for potential dropouts. Allowing for 33% loss to follow-up among families, 30 families per children's centre (total 1080) were required.

Blinding

It was not possible to blind children's centre managers and staff, researchers providing the facilitation package or families to treatment arm allocation. When parents required support from a researcher to complete the follow-up questionnaire, or when questionnaires were completed by telephone, researchers were not blinded to treatment arm allocation. Quantitative analyses were undertaken blind to treatment arm allocation for the primary and secondary outcomes but not for the economic analysis.

Withdrawals

Participants were free to withdraw from the trial at any stage, but their data were included up to the date of withdrawal.

Analysis

This section describes the quantitative analysis for the primary and secondary outcomes followed by the health economic analysis and the qualitative analysis.

Baseline characteristics are described informally by treatment arm. All analyses of primary and secondary outcomes were conducted on an intention-to-treat basis in that families and children's centres were analysed in the arm to which they were randomised. Quantitative analyses for the primary and secondary outcomes were undertaken using Stata versions 11 and 13.

Primary outcome measure

The proportion of families reporting a fire escape plan was compared between treatment arms (IPB+ vs. usual care and IPB only vs. usual care, with a significance level of 0.05 for each comparison) using random-effects logistic regression, including children's centre as a random effect. The model included randomisation stratum as a fixed effect and adjusted for two cluster-level variables (lead agency of the children's centre and Office for Standards in Education (Ofsted) report scores for overall effectiveness) and two family-level variables (having a fire escape plan at baseline and IMD 2010 score[65]). Subgroup analyses explored differential effects of the intervention by IMD score by adding interaction terms to the regression model. The ICC was estimated using one-way ANOVA.

Secondary outcome measures

Family-level outcome measures

Binary outcomes were compared between treatment arms (IPB+ vs. usual care and IPB only vs. usual care) using random-effects logistic regression, and ordinal outcomes were compared between treatment arms using random-effects ordinal regression, with regression models including children's centre as a random effect. Models included randomisation stratum as a fixed effect and adjusted for lead agency of the children's centre, Ofsted report scores for overall effectiveness, baseline value of the secondary outcome measure and IMD score.

Children's centre-level outcome measures

The provision of information and advice on the five key IPB messages, provision of fire prevention sessions for families and use of methods other than the IPB were described by treatment arm. Quantitative comparisons were not made because of the small numbers.

Barriers to and facilitators of children's centres implementing the IPB were coded and categorised and described for the IPB+ and IPB-only arms.

Missing data

The main analysis was a complete-case analysis. Sensitivity analyses were undertaken for the primary outcome and included multiple imputation assuming that data were missing at random and analyses assuming no change in the primary outcome compared with the baseline value in families lost to follow-up.[481] Fifty data sets were imputed and combined using Rubin's rules.[77] The imputation model included all variables in the model for the main analysis plus baseline variables, which were age of youngest child, number of children in

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the family, maternal age, accommodation type, housing tenure, ethnic group, number of adults in the household, number of smokers and whether or not there is a heavy drinker in the household. English as a first language was not included as a variable in the multiple imputation model because of problems with perfect prediction. Cluster number (as a categorical variable) was not included as a variable in the imputation model as the imputation model would not converge when it was included, but the multilevel logistic model run on the imputed data set took clustering into account.

Health economic analysis

The cost-effectiveness analysis of the trial utilised the primary effectiveness end point – whether a family reported having a fire escape plan – and the economic end point of total cost of the intervention. A summary of the base-case analysis is provided in *Table 105* and includes the items recommended by the Consolidated Health Economic Evaluation Reporting Standards (CHEERS)[482] when reporting economic evaluations of health interventions.

Data on the effectiveness end point – whether a family reported having a fire escape plan – were extracted from the parent 12-month follow-up questionnaires.

Resource use and cost data were obtained from three different sources:

1. trial site (i.e. Nottingham, Norwich, Newcastle and Bristol) researchers' logbooks, which were used to record all of the activities relating to IPB implementation and, when applicable, facilitation
2. children's centre follow-up questionnaires detailing their fire safety activities
3. parent 12-month follow-up questionnaires, which provided information about the resources and costs related to fire safety sessions that they attended and home safety inspections undertaken at their homes.

The cost-effectiveness analysis was conducted from a societal perspective and included costs incurred by children's centres, fire and rescue services and other agencies that provide home safety advice/inspections such as local councils and family costs. Costs were analysed at the family level. To achieve this, the trial site and children's centre-level costs were averaged equally across families randomised within each trial site and cluster, respectively, and then combined with the family-level costs to give a total cost per family.

As the inverse of the difference in probabilities of having a fire escape plan, say between IPB only and usual care, is equal to the number needed to treat (NNT), the cost-effectiveness ratio can be interpreted as the cost per additional fire escape plan under the intervention. The cost per additional fire escape plan (i.e. the primary outcome) was estimated for the IPB-only and IPB+ facilitation arms of the trial compared with the usual-care arm. In addition, the cost of developing the IPB was estimated from developers'

TABLE 105 Summary of the base-case analysis

Description	Base-case analysis
Type of evaluation	Prospective cost–utility analysis alongside a cluster RCT
Time horizon	1 year
Perspective	Societal
Comparators	Usual care, IPB only and IPB+
Cost categories	Children's centre; fire and rescue service; other agencies including local councils; family
Base year for calculating costs/prices	2012 UK£
Analytical methods	Hierarchical model allowing for clustering and adjusting for the baseline covariates included in the primary effectiveness analysis
Outcome	Cost per additional fire escape plan

logbooks, but was not incorporated into the cost-effectiveness analysis as this is a fixed one-off cost that would not be encountered again if this intervention was implemented in practice.

The economic analysis was carried out with the family as the unit of analysis, and had to take account of the clustered nature of the trial design (i.e. randomisation was at the children's centre level),[483] adjusting for the baseline covariates included in the primary effectiveness analysis. Additionally, the clinical and economic end points may themselves be correlated within families as well as within children's centre clusters, thus the analysis needed to simultaneously allow for this. Methods for such an analysis have recently been reviewed and compared[484] (although they have rarely been used in practice), and guidance for good practice has been written. We adopted a random-effects modelling approach[485] that extended the random-effects model used to analyse the effectiveness data on their own, as described above. A further complicating factor was that our effectiveness outcome (proportion of families reporting having a fire escape plan) was dichotomous, unlike many cost-effectiveness analyses for which both effectiveness and cost outcomes are continuous and often assumed to be multivariate normal.[485] Multivariate methods for analysing a mixture of continuous and dichotomous outcomes have been developed[486] including approaches that allow for clustering.[487] We approached this complication by a factorisation of the model likelihood for costs and effects into the product of a marginal and conditional likelihood (continuous for costs and logistic for effects).[486,488] Such a factorisation also allowed the specification of distributions other than normal for the costs and, following a preliminary examination of the cost data, which were heavily (right) skewed, it was decided to model total costs at the family level using a gamma distribution (which has been advocated in the literature).[489] This required adding £1 to each family cost for the analysis and then subtracting £1 from the results.

To construct an appropriate but somewhat 'non-standard' model we used WinBUGS[488] software, which allows great flexibility in model specification and estimates model parameters using MCMC methods.[488] An algebraic outline of the model is provided in *Appendix 6, Statistical appendix* and the associated WinBUGS code is available from the authors on request.

For the estimated model parameters, we report means, SEs and 95% CrIs, taken as the medians, SDs and 2.5–97.5% centiles from the samples of the posterior distributions. Cost-effectiveness acceptability curves were calculated by estimating the probability that the intervention was cost-effective for each value of the ceiling ratio (this is the value of the willingness to pay per additional fire escape plan) from the posterior distributions. The results tables present IPB only and IPB+ compared with usual care (but not compared with each other) to be consistent with the effectiveness analysis presented. However, the cost-effectiveness acceptability curves give the probability of each comparator being the most cost-effective for a range of willingness-to-pay thresholds and intrinsically compare all comparators simultaneously, which facilitates identification of the optimal intervention.

As a sensitivity analysis to check the robustness of the findings to missing data, a multiple imputation analysis was conducted. Following the same method as for the effectiveness imputation analysis described earlier, we extended the imputation model to include the four cost components (listed in *Table 127*), which sum together with the intervention costs (excluded from the imputation model because of no missing data) to produce the total overall cost per family. Because of non-normality of the cost component variables, predictive mean matching was used for imputation as well as for IMD score (as opposed to regression-based estimates for the other variables). As data analysis was carried out using MCMC in WinBUGS, it was not practical to perform 50 imputations (as performed for effectiveness); instead, 10 imputations were conducted and combined using Rubin's rules[77] as before.

Qualitative analysis

Data from the facilitation contacts were analysed manually using content analysis after categorisation into main subheadings[256] followed by a thematic analysis. Data from the implementation fidelity interviews were subject to framework analysis[490] using the NVivo 10 software package (QSR International, Warrington, UK). A priori themes were identified that reflected the structure of questions within the 12-month follow-up facilitation and implementation fidelity interview schedules.

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Initial analysis was carried out by two researchers who identified levels of implementation and emergent major and minor themes through cycles of coding. Levels of implementation were described based on recommendations for use contained in the IPB and the four elements of 'adherence' in the 'implementation fidelity framework' (content, coverage, frequency and duration of delivery). The initial coding framework was reviewed by the principal investigator and two senior researchers. Further cycles of coding enabled researchers to identify, develop and refine more detailed themes within the data and to classify them within the framework.[472] Discrepancies and disagreements were identified and addressed. The final classification was reviewed by researchers from all four trial sites based on their more detailed local knowledge of their children's centres, IPB implementation and the 12-month interview data. When necessary, the categorisation was also verified against facilitation interviews at earlier time points and study activity logs. This was particularly important in cases in which there had been staff changes between RCT inception and completion. Adjustments were made in three cases following this process.

Incorporating findings from the trial into the development of a second injury prevention briefing

Following completion of the trial, we incorporated evidence from the trial into the development of a second IPB. This covered the prevention of fire-related injuries, falls, poisonings and scalds, based on findings from studies A and D–M in the KCS programme of research. We undertook four workshops, one in each trial site, with users of the fire prevention IPB in the trial and with potential future users of a future IPB to inform decisions about the content of the second IPB, the preferred structure and how to make the IPB more user-friendly.

Ethics and organisational review

Ethics approval was provided by Derbyshire Research Ethics Committee (reference number 11/EM/0011) and the University of the West of England Bristol Research Ethics Committee (reference number HSC/11/06/61). The trial received NHS organisational approval from PCTs when staff who worked in children's centres were employed by PCTs.

Trial registration

This trial was registered as ClinicalTrials.gov NCT01452191 (13 October 2011) and ISRCTN65067450 (6 December 2012).

Results

Developing the injury prevention briefing

Stakeholder interviews

Two interviews were conducted, one with a children's centre leaders' network co-ordinator, at the time part of Together for Children, an organisation working in partnership with the Department for Education to support local authorities in their delivery of Sure Start children's centres, and the second with a regional programme lead with Together for Children.

The key points from the interviews were:

- There was uncertainty with regard to the policy framework for children's centres resulting from the change of government in May 2010.
- There was little national guidance on how children's centres should operate. The autonomy afforded to children's centres was reducing as was input from parents into how centres operated. There was a target for reducing hospital attendances for accidents but this was (unhelpfully) combined with other conditions. Local priorities were often decided on the basis of interests of centre staff members.
- Children's centre staff who work with families were considered the most appropriate to involve in accident prevention, but centres tended not to have subject specialist staff.
- Parents did not raise accident prevention as a topic although they were interested in first aid. Centres often had difficulty engaging 'hard-to-reach' groups.

Workshops

A total of 162 delegates were invited to the four workshops and 83 (51%) attended, with the number of delegates per workshop ranging from 19 (Bristol and Newcastle) to 24 (Nottingham). The four most common occupational groups attending were children's centre managers and staff ($n = 32$, 39%), health visiting team staff ($n = 16$, 19%), fire and rescue service staff ($n = 15$, 18%) and other health sector personnel ($n = 8$, 10%). Other delegates included directors/managers of children's or community services, safeguarding managers or board members, commissioning managers, health promotion specialists, unintentional injury co-ordinators/public health nurses, a youth engagement manager, a director of a child safety project, a home safety equipment scheme manager/co-ordinator, a consumer advisor and a child accident prevention consultant.

The key points to emerge from the workshops were:

- The IPB needed to be directed at three audiences – commissioners, managers and practitioners – with varying content for each audience.
- Decisions on activities undertaken by children's centres varied between centres and localities.
- Local data were needed to assist in making the case for action but were difficult to obtain.
- Injury prevention was not embedded in the everyday work of a children's centre and was in competition with other topics during home visits.
- The importance of ensuring that all staff with the opportunity to deliver safety messages delivered the same message.
- Messages for parents should be kept simple.
- Injury prevention may be challenging because of parental apathy, an attitude that their own homes are not at risk, a lack of awareness of the consequences of injuries, low levels of education and literacy among parents or cultural differences.
- Group sessions in children's centres were not always well attended. Families at highest risk often did not attend children's centres. Home visits might be more effective.

Drafting the injury prevention briefing

The drafting of the IPB was undertaken by the researchers who led the workshops. Drafts were reviewed and commented on by all members of the research team, several of whom were in regular contact with children's centres. In response to the workshops, the IPB was divided into three sections that were capable of being read independently:

1. advice for commissioners
2. advice for children's centre managers
3. advice for practitioners.

The IPB is shown in *Appendix 6, Injury prevention briefing 1*. The main part of the document focused on providing children's centre staff with information and tools to enable them to provide appropriate and consistent safety advice to families using key safety messages for five fire prevention topics. Exercises for use with groups of families were provided for each of the five topics, with recognition that these would not be suitable in all circumstances, for example when outreach workers were visiting families' homes.

The five key safety topics included in the practitioners' section were:

1. the importance of having working smoke alarms
2. understanding the potential causes of fires
3. understanding children's development and its association with the need to store matches and lighters safely
4. the need for a bedtime safety routine
5. the need for and components of a family fire escape plan.

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Research evidence from studies H and I in work stream 5 (see *Chapter 6*) was strongest for the first and last of these topics and, therefore, if time did not permit all topics to be addressed, the importance of covering these issues was emphasised.

Developing the facilitation package

The facilitation package consisted of a combination of face-to-face and telephone contacts at 1, 3, 4/5 and 8 months using structured electronic questionnaires and interviews. The questionnaires and interview schedules are provided in *Appendix 6*. They were intended to address the barriers to undertaking injury prevention identified in earlier work in the KCS programme (studies D–F) and the key issues that emerged from the workshops. In addition, they were also designed to raise the profile of fire prevention within children's centres and ensure that it was kept on their agenda throughout the intervention period, allow assessment of progress with IPB implementation, identify difficulties and solutions to these, identify examples of good practice to share with other centres, provide information (e.g. a resources list, contact details for other agencies who could contribute to delivering fire prevention safety messages) and provide support to help implement the IPB.

The injury prevention briefing training sessions

A total of 31 children's centre staff from the IPB+ arm attended training sessions at four locations. Their roles are presented in *Table 106*. Twenty-eight attenders completed the evaluation questionnaire wholly or in part. The responses to the questions are shown in *Figures 58* and *59*. Attenders were generally very positive about the training and stated that the training achieved its aims. One possible exception to this was that only 71% of attenders agreed or strongly agreed that they felt confident about presenting the key fire safety messages to parents at their children's centre.

TABLE 106 Roles of children's centre staff attending training sessions

Role	Bristol	Newcastle	Norwich	Nottingham
Community health support worker				1
Community health assistant practitioner				2
Children's centre manager	1	3		1
Children's centre nursery nurse			1	
Children's centre programme co-ordinator		1		
Children's centre safeguarding and family support manager			1	
Children's centre senior family support worker			1	
Children's centre session worker	1	2		
Children's worker manager				1
Community support manager	1			
Deputy children's centre leader	1			
Family support worker	2	1	3	2
Health and family support worker				1
Health visitor (attached to a children's centre; conducts health and safety training)		1		
Play workers				2
Special needs co-ordinator	1			
Total	7	8	6	10

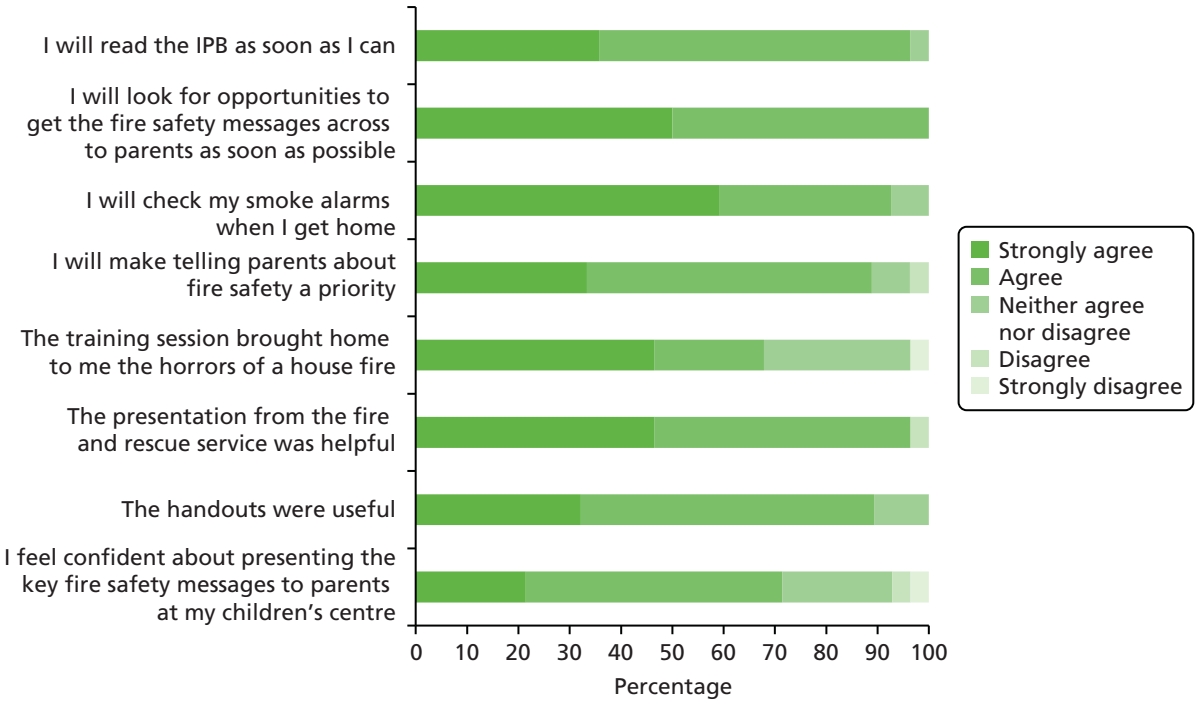


FIGURE 58 Responses to positively worded statements about the IPB training in IPB+ arm training session attenders.

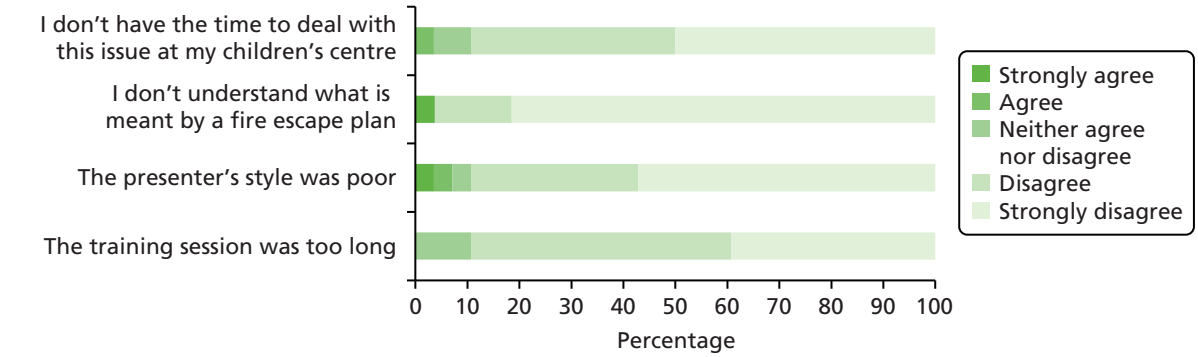


FIGURE 59 Responses to negatively worded statements about the IPB training in IPB+ arm training session attenders.

Structured interviews with parents to ascertain fire safety practices and fire escape behaviours

Twenty-one children's centres were invited to participate and all agreed to participate. This included five centres each from Nottingham, Newcastle and Norwich and six from Bristol. Interviews were conducted with a total of 200 parents across the four centres, representing an 84% response rate. The characteristics of participants are shown in *Table 107*. Most respondents (92%) were mothers and described themselves as being white British (83%), 50% lived in rented accommodation and 19% lived in single parent households, with 45% of households having only one child.

Table 108 shows that smoke alarms were reported in the vast majority of homes (96%), of which virtually all (95% of those reporting a smoke alarm) were reported to be functional. Just over two-thirds (71%) of parents reported having functional smoke alarms on at least two levels of their home. Just over half of the respondents (54%) reported having a bedtime safety routine, but most described only one element of this

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TABLE 107 Characteristics of participants

Characteristic	*n* (%)[a]
Age group (years) of parent	
< 20	17 (9)
21–30	90 (45)
31–40	75 (38)
41–50	15 (8)
> 50	3 (2)
Ethnicity	[1]
White British	166 (83)
Black Caribbean/African	9 (5)
Asian	5 (3)
Chinese	4 (2)
Other	15 (8)
Sex of respondent	[2]
Female	182 (92)
Male	16 (8)
Accommodation type	
Private rented	58 (29)
Social housing	42 (21)
Owner-occupied	94 (47)
Temporary/living with parents	6 (3)
Number of adults in household	[2]
1	38 (19)
2	148 (75)
≥ 3	12 (6)
Number of children in household	
1	89 (45)
2	69 (35)
≥ 3	42 (21)
Age (years) of children in household	
< 1	23 (12)
1	55 (28)
2	30 (15)
3	26 (13)
≥ 4	66 (33)

a Numbers in square brackets represent missing values.

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TABLE 108 Fire safety practices reported by participants

Fire safety practices	*n* (%)[a]
Smoke alarms	
At least one smoke alarm in residence	191 (96)
First alarm reported to be working	182 (95)
Alarm working on at least two levels of residence	136 (71)
Have bedtime routine	[5]
No	90 (46)
Yes	105 (54)
Descriptive elements of bedtime routine ($n = 228$ elements)	
Turn off all electric items	87 (38)
Indoor doors closed	60 (26)
Turn oven/cooker off	21 (9)
Fire turned off	15 (7)
Keys accessible	12 (5)
Outside door closed	11 (5)
Windows closed	7 (3)
Lights off	6 (3)
Ensure cigarettes/candles extinguished	5 (2)
Turn appliances off	4 (2)
Other	9 (4)
Has a fire escape plan	[9]
Yes	81 (42)
Those with a plan who have practised it	
Yes	9 (11)

a Numbers in square brackets represent missing values.

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routine (median 1, IQR 0–1, range 0–3). Eighty-one parents (42% of the 191 respondents answering that question) reported having a fire escape plan. The ICC for having a fire escape plan was 0.049 (95% CI 0.004 to 0.259). Only nine parents (11%) had practised their plan.

When asked to describe their fire escape plan, most respondents described one element (median 1, IQR 0–1, range 0–4). The elements described by families are shown in *Table 109*. The descriptions given were insufficiently detailed to allow for assessment of the comprehensiveness or adequacy of the plan.

Findings from these interviews illustrated that it was not feasible to use functional smoke alarms as a trial outcome measure because of its high prevalence. The lower prevalence of having a fire escape plan would enable this to be used as an outcome measure but the open-ended question did not produce sufficiently detailed responses to enable understanding of what parents meant when they reported having a fire escape plan. It was therefore decided that separate closed questions about component elements of a fire

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TABLE 109 Elements of fire escape plans described by participants who reported having a plan

Elements of fire escape plans ($n = 168$ elements)	*n* (%)
Escaping from main exit	44 (26)
Jump out onto balcony/extension roof	41 (24)
Exit from window higher than ground floor	27 (16)
Exit from downstairs window	27 (16)
Lower from window on to mattress	9 (5)
Just have one door/exit so have to use that	9 (5)
Keys are near windows/door	5 (3)
Ring 999	3 (2)
Blanket/fire extinguisher	1 (1)
Make sure exits are clear	1 (1)
Have ladder upstairs	1 (1)

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escape plan would be used to assess the contents of fire escape plans. These questions covered five key components of fire escape plans that were included in the IPB, namely having a smoke alarm and knowing what it sounded like, having door keys accessible, having window keys accessible, keeping exits clear and having a torch next to the bed. To reduce type 1 error arising from multiple significance testing, it was decided that a composite measure would be developed describing behaviour across these five components for use as a secondary outcome measure. Latent variable analysis was undertaken for this purpose and the results of this are outlined in the following section. Similarly, an open question about bedtime safety routines produced a limited number and type of responses, with most parents describing only one element. Closed questions covering the elements of a bedtime safety routine used in the IPB were therefore included in the trial questionnaires.

Developing a composite fire escape behaviour variable

Data from the baseline trial questionnaire completed by 1112 parents were used to develop the composite fire escape behaviour variable. The frequency of reporting of each of the five component elements is shown in *Table 110*.

A two-class model provided the best fit to the data, categorising participants into 'more fire escape behaviours' (87% of participants) and 'fewer fire escape behaviours' (13% of participants). *Table 111* presents the posterior probabilities for each component element for the two groups.

A typical member of the 'more fire escape behaviours group' had a torch, was aware of how their smoke alarm sounded, had door and window keys accessible for > 2–3 days per week and had exits clear for > 4–5 days per week. A typical member of the 'fewer fire escape behaviours' group did not have a torch, was not aware of how their smoke alarm sounded, had door and window keys accessible on ≤ 1 day per week and had exits clear on ≤ 1 day per week. The question about whether participants had a fire escape plan was used as an external validation criterion for the new composite measure. A multivariable logistic regression model estimated the association between parents reporting that they had a fire escape plan and the binary composite measure. After adjusting for potential confounders, participants allocated to the 'more fire escape behaviours' group had a 2.5 times higher odds of reporting having an escape plan (OR 2.48, 95% CI 1.59 to 3.86).

TABLE 110 Frequency of reporting of the five component elements of a fire escape plan

Elements of a fire escape plan	*n* (%)[a]
Has torch	[24]
Yes	347 (31.9)
No	741 (68.1)
Knows sound of alarm	[82]
Yes	1006 (97.7)
No	24 (2.3)
External door keys accessible (days per week)	[31]
Never	67 (6.2)
≤ 1	47 (4.3)
2–3	25 (2.3)
4–5	16 (1.5)
6–7	926 (85.7)
Window keys accessible (days per week)	[56]
Never	145 (13.7)
≤ 1	75 (7.1)
2–3	26 (2.5)
4–5	14 (1.3)
6–7	796 (75.4)
Exits clear (days per week)	[53]
Never	86 (8.1)
≤ 1	51 (4.8)
2–3	44 (4.2)
4–5	40 (3.8)
6–7	838 (79.1)

a Numbers in square brackets represent missing values.

Trial results

Recruitment and retention

Thirty-eight children's centres were recruited to the trial. This included two pairs of children's centres that shared the same management team. Each pair was therefore treated as one children's centre for trial purposes, giving a total of 36 children's centres. A total of 1112 parents were recruited to the trial from the 36 children's centres. Recruitment commenced in June 2011 and was completed in May 2012. The flow of children's centres and parents through the trial is shown in *Figures 60* and *61*, respectively.

Outcome data were collected from all 36 children's centres and from 751 (68%) parents. Follow-up rates did not differ significantly between treatment arms (IPB+ 65%, IPB only 68%, usual care 70%; OR for IPB+ vs. usual care 0.79, 95% CI 0.49 to 1.27; OR for IPB only vs. usual care 0.96, 95% CI 0.59 to 1.55). Follow-up rates did differ by baseline characteristics as shown in *Table 112*. Families with mothers aged 16–20 years (AOR 0.44, 95% CI 0.24 to 0.81 vs. families with older mothers), those in non-owner-

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TABLE 111 Posterior probabilities derived from the categorical latent variable model

Elements of fire escape plan	Class 1: more fire escape behaviours	Class 2: fewer fire escape behaviours
Has torch		
Yes	0.334	0.223
No	0.666	0.777
Knows sound of alarm		
Yes	0.982	0.944
No	0.018	0.056
External door keys accessible (days per week)		
Never	0.037	0.225
≤ 1	0.009	0.265
2–3	0.005	0.143
4–5	0.008	0.059
6–7	0.942	0.308
Window keys accessible (days per week)		
Never	0.095	0.403
≤ 1	0.033	0.31
2–3	0.01	0.114
4–5	0.011	0.028
6–7	0.85	0.144
Exits clear (days per week)		
Never	0.051	0.276
≤ 1	0.005	0.328
2–3	0.021	0.177
4–5	0.034	0.061
6–7	0.889	0.158

occupied accommodation (AOR 0.48, 95% CI 0.35 to 0.66 vs. those in owner-occupied accommodation) and those living in more disadvantaged areas (AOR 0.47, 95% CI 0.29 to 0.78 comparing the most disadvantaged quintile of the IMD with the least disadvantaged quintile[65]) were significantly less likely to be retained in the trial.

Characteristics of participants

The characteristics of the children's centres that participated in the trial are shown in *Table 113*, and the fire safety advice that they provided at baseline is shown in *Table 114*. The characteristics of parents at baseline are shown in *Table 115* and the fire safety practices reported by parents at baseline are shown in *Table 116*. The characteristics of children's centres and parents appeared well balanced between treatment arms. Most children's centres (72%) were managed by the local authority and were phase 1 centres (89%), one-quarter (26%) were rated by Ofsted as outstanding for overall effectiveness and the median catchment population was 811 (IQR 574–998). Most children's centres reported providing advice on each of the key messages from the IPB. More than 75% provided advice on fire escape planning, > 80% provided advice on smoke alarms and keeping cigarettes/matches/lighters out of reach and > 90% provided advice on other causes of house fires and bedtime safety routines.

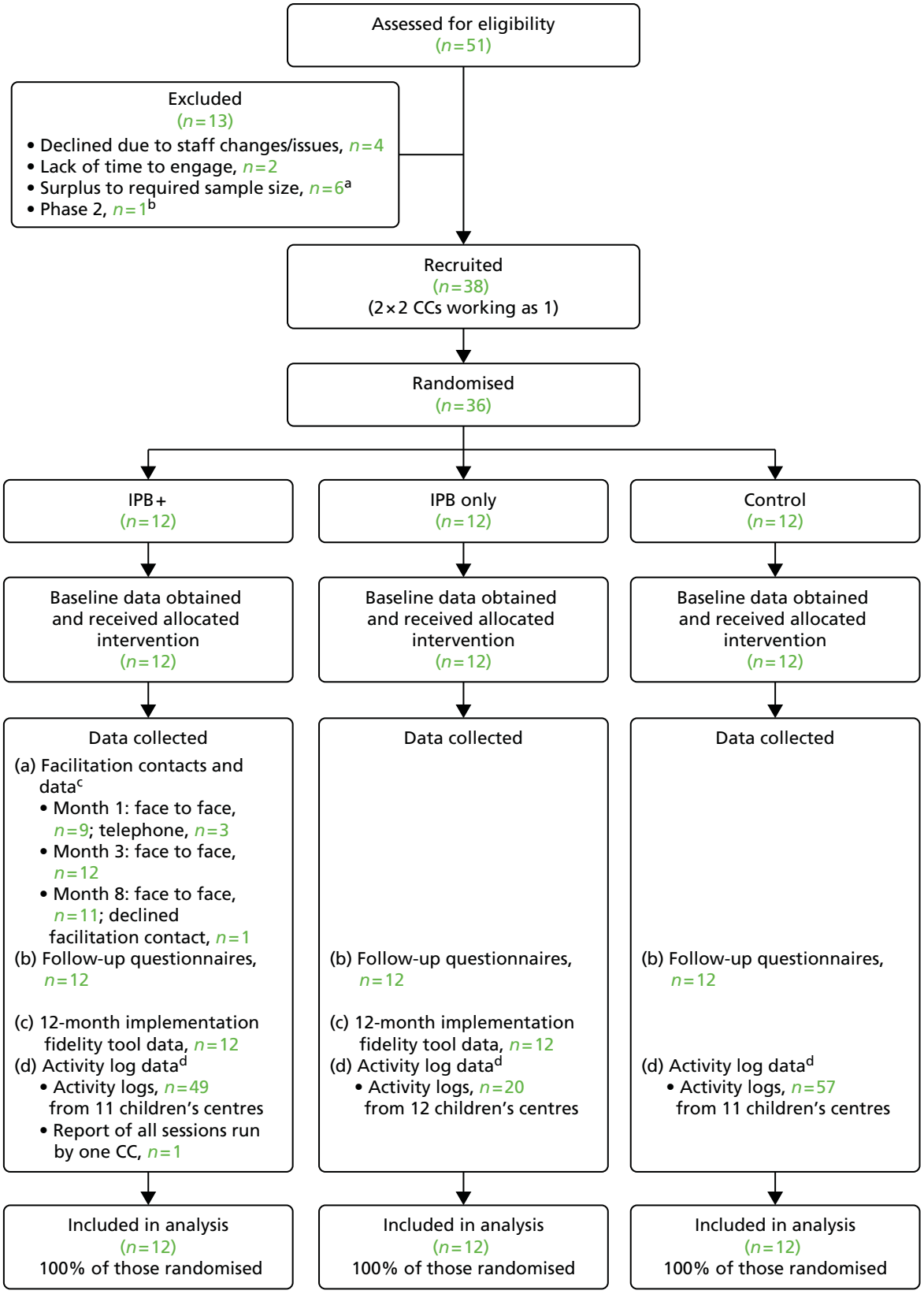


FIGURE 60 Recruitment of children's centres and flow of children's centres through the trial. a, When there were more children's centres than were required we randomly sampled those to participate; b, sample size fulfilled in study centre with phase 1 children's centres; c, no facilitation contact necessary at month 5; d, data not used in analysis because of poor quality of data provided by some children's centres. CC, children's centre.

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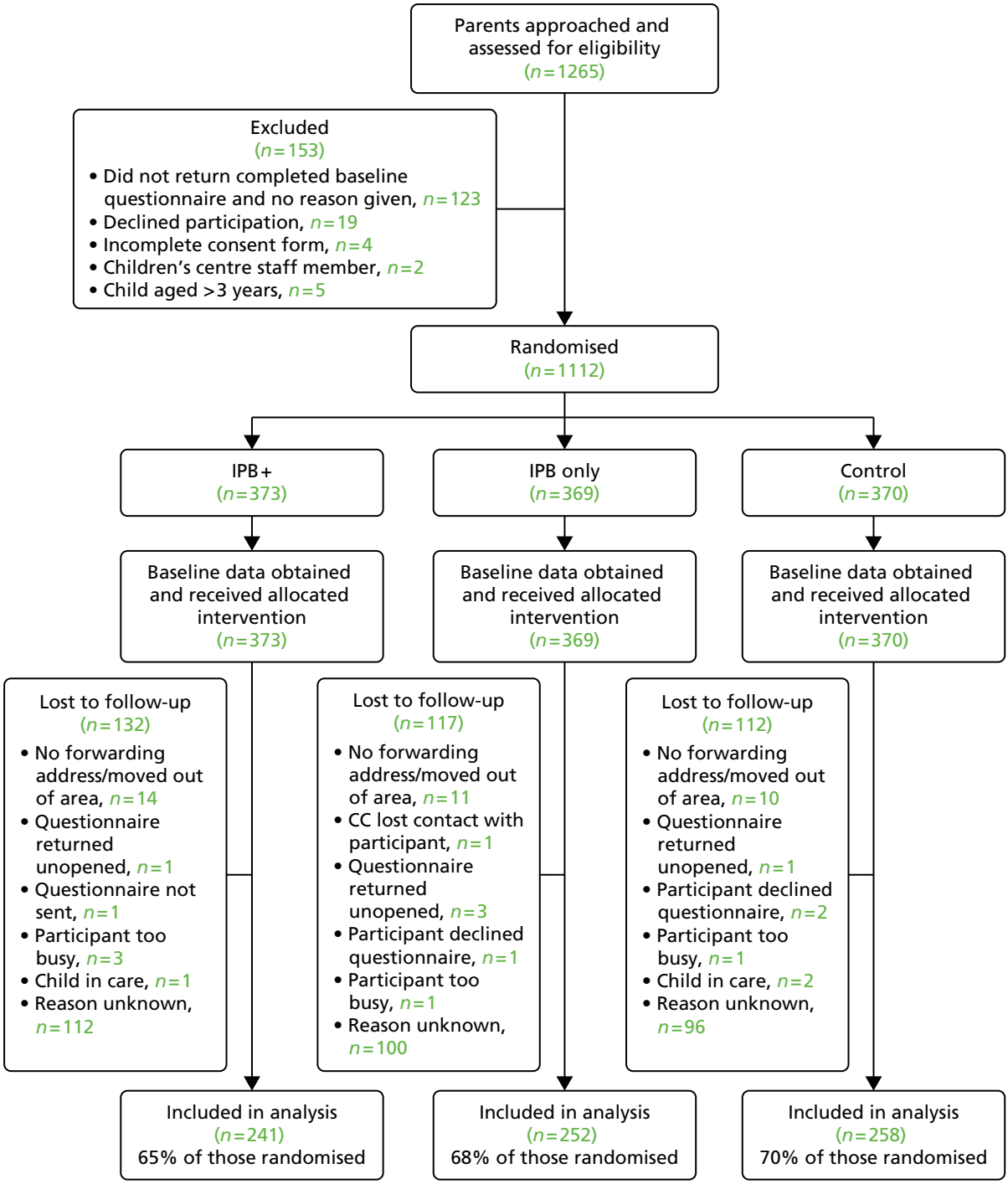


FIGURE 61 Recruitment of parents and flow of parents through the trial. CC, children's centre. From Hindmarch *et al.*[491] under the Creative Commons Attribution License 4.0 (see https://creativecommons.org/licenses/by/4.0/legalcode).

One-fifth of parents (18%) lived in single adult households, 51% had only one child, 57% did not own their accommodation, 95% classed themselves as white British and 92% spoke English as their first language. The mean IMD score was 31.7 (SD 16.6).

Two-fifths (42%) of parents had a fire escape plan, of whom 89% had discussed the plan with other adults in the house and 28% had practised the plan. Four of the five component elements of the fire

TABLE 112 Univariate and multivariable analysis of baseline factors associated with retention in the trial

Characteristic[a]	Retained, *n* (%)	Lost to follow-up, *n* (%)	Univariate OR (95% CI)	AOR (95% CI): model with factors significant at $p \leq 0.02$ on univariate analysis	AOR (95% CI): final model
Youngest child aged [25]					
0–1 years	333 (69)	151 (31)	1.00		
1–2 years	405 (67)	198 (33)	0.94 (0.72 to 1.23)		
Number of children in family [41]					
1	383 (71)	159 (29)	1.00		
2	238 (68)	113 (32)	0.88 (0.65 to 1.19)	0.93 (0.67 to 1.29)	
3	71 (59)	50 (41)	0.59 (0.39 to 0.90)	0.75 (0.46 to 1.21)	
≥ 4	37 (65)	20 (35)	0.77 (0.43 to 1.40)	1.00 (0.52 to 1.93)	
Mother aged [52]					
> 20 years	701 (70)	305 (30)	1.00		
16–20 years	25 (46)	29 (54)	0.34 (0.19 to 0.61)	0.48 (0.24 to 0.94)	0.44 (0.24 to 0.81)
Lives in [17]					
House	616 (70)	265 (30)	1.00		
Flat or other	126 (59)	88 (41)	0.62 (0.45 to 0.86)	0.89 (0.60 to 1.31)	
Tenure [25]					
Owner-occupied	368 (79)	96 (21)	1.00		
Non-owner-occupied	369 (59)	254 (41)	0.39 (0.30 to 0.52)	0.60 (0.42 to 0.85)	0.48 (0.35 to 0.66)
Ethnic group [50]					
White British	685 (68)	323 (32)	1.00		
Other	32 (59)	22 (41)	0.76 (0.41 to 1.40)		
English is first language [12]					
No	57 (59)	39 (41)	1.00		
Yes	688 (69)	316 (31)	1.49 (0.95 to 2.34)	1.33 (0.80 to 2.22)	
Single adult household [43]					
No	622 (71)	255 (29)	1.00		
Yes	109 (57)	83 (43)	0.56 (0.40 to 0.78)	0.71 (0.49 to 1.03)	
Any smoker in household [30]					
No	534 (70)	225 (30)	1.00		
Yes	199 (62)	124 (38)	0.72 (0.54 to 0.96)	0.88 (0.63 to 1.21)	
Household member drinks six or more drinks on one occasion [110]					
No	292 (70)	128 (30)	1.00		
Yes	401 (68)	191 (32)	0.94 (0.71 to 1.25)		
IMD quintile (range) [4]					
1 (2.4–15.6)	176 (79)	46 (21)	1.00		
2 (15.7–25.7)	171 (75)	58 (25)	0.76 (0.48 to 1.20)	0.81 (0.49 to 1.35)	0.83 (0.50 to 1.35)

continued

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TABLE 112 Univariate and multivariable analysis of baseline factors associated with retention in the trial (*continued*)

Characteristic[a]	Retained, *n* (%)	Lost to follow-up, *n* (%)	Univariate OR (95% CI)	AOR (95% CI): model with factors significant at $p \leq 0.02$ on univariate analysis	AOR (95% CI): final model
3 (25.8–34.6)	147 (67)	71 (33)	0.55 (0.35 to 0.86)	0.70 (0.42 to 1.18)	0.65 (0.40 to 1.06)
4 (34.7–46.6)	134 (61)	84 (39)	0.44 (0.28 to 0.69)	0.53 (0.32 to 0.87)	0.56 (0.34 to 0.91)
5 (46.7–74.8)	123 (56)	98 (44)	0.35 (0.23 to 0.56)	0.50 (0.30 to 0.86)	0.47 (0.29 to 0.78)
Had fire escape plan [19]					
No	436 (69)	196 (31)	1.00		
Yes	304 (66)	157 (34)	0.90 (0.69 to 1.17)		

a Numbers in square brackets represent missing values.

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TABLE 113 Characteristics of the children's centres at baseline

Characteristic	Trial arm[a]		
	Usual care ($n = 12$), *n* (%)	IPB only ($n = 12$), *n* (%)	IPB+ ($n = 12$), *n* (%)
Lead agency			
Local authority	10 (83.3)	7 (58.3)	9 (75.0)
NHS	2 (16.7)	0 (0.0)	1 (8.3)
Voluntary sector led	0 (0.0)	5 (41.7)	2 (16.7)
Phase of children's centre			
1	10 (83.3)	11 (91.7)	11 (91.7)
2	2 (16.7)	1 (8.3)	1 (8.3)
3	0 (0.0)	0 (0.0)	0 (0.0)
Number of children in catchment area, median (IQR)	754 (529–999)	776 (565–905)	854 (608–1076)
Characteristics from Ofsted reports			
Overall effectiveness			[1]
Outstanding	3 (25.0)	2 (16.7)	4 (36.4)
Good	5 (41.7)	10 (83.3)	6 (54.5)
Satisfactory	4 (33.3)	0 (0.0)	1 (9.1)
Capacity for sustained improvement	[1]	[5]	[4]
Outstanding	3 (27.3)	1 (14.3)	2 (25.0)
Good	4 (36.4)	6 (85.7)	6 (75.0)
Satisfactory	4 (36.4)	0 (0.0)	0 (0.0)

a Numbers in square brackets represent missing values.

TABLE 114 Fire safety advice provided by children's centres at baseline

Topics that children's centre provides advice on	Trial arm		
	Usual care ($N = 12$), *n* (%)	IPB only ($N = 12$), *n* (%)	IPB+ ($N = 12$), *n* (%)
Smoke alarms			
No advice/don't know	0 (0.0)	2 (16.7)	0 (0.0)
Advice provided[a]	12 (100.0)	10 (83.3)	12 (100.0)
How to make a fire escape plan		[1]	
No advice/don't know	3 (25.0)	2 (18.2)	3 (25.0)
Advice provided[a]	9 (75.0)	9 (81.8)	9 (75.0)
Other causes of house fires (cooking safety, electrical safety or handling hot irons safely)			
No advice/don't know	0 (0.0)	1 (8.3)	0 (0.0)
Advice provided[a]	12 (100.0)	11 (91.7)	12 (100.0)
Child behaviour and fire prevention (use and storage of cigarettes, lighters and matches)			[1]
No advice/don't know	2 (16.7)	2 (16.7)	2 (18.2)
Advice provided[a]	10 (83.3)	10 (83.3)	9 (81.8)
Bedtime routines to prevent fires			
No advice/don't know	0 (0.0)	1 (8.3)	0 (0.0)
Advice provided[a]	12 (100.0)	11 (91.7)	12 (100.0)

a Provides face-to-face advice either one-to-one or in groups or provides leaflets.

TABLE 115 Sociodemographic characteristics of participating families at baseline

Characteristic	Trial arm[a]		
	Usual care ($N = 370$), *n* (%)	IPB only ($N = 369$), *n* (%)	IPB+ ($N = 373$), *n* (%)
Study centre			
Nottingham	89 (24.1)	98 (26.6)	91 (24.4)
Newcastle	86 (23.2)	88 (23.8)	87 (23.3)
Norwich	95 (25.7)	82 (22.2)	93 (24.9)
Bristol	100 (27.0)	101 (27.4)	102 (27.3)
Adults in household (aged ≥ 18 years)	[13]	[15]	[15]
1	61 (17.1)	72 (20.3)	59 (16.5)
2	276 (77.3)	254 (71.8)	280 (78.2)
≥ 3	20 (5.6)	28 (7.9)	19 (5.3)
Children in household (aged < 18 years)	[12]	[13]	[16]
1	169 (47.2)	173 (48.6)	200 (56.0)
2	132 (36.9)	115 (32.3)	104 (29.1)
≥ 3	57 (15.9)	68 (19.1)	53 (14.8)
Number of other families living in the same household			
0	341 (92.2)	332 (90.0)	336 (90.1)
1	16 (4.3)	23 (6.2)	20 (5.4)
≥ 2	13 (3.5)	14 (3.8)	17 (4.6)

continued

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TABLE 115 Sociodemographic characteristics of participating families at baseline (*continued*)

Characteristic	Trial arm[a]		
	Usual care (*N* = 370), *n* (%)	IPB only (*N* = 369), *n* (%)	IPB+ (*N* = 373), *n* (%)
Number of families with children aged	[10]	[6]	[9]
< 1 year	163 (45.3)	143 (39.4)	178 (48.9)
1–2 years	197 (54.7)	220 (60.6)	186 (51.1)
Mother's age group 16–20 years	[16]	[19]	[17]
Yes	17 (4.8)	17 (4.9)	20 (5.6)
No	337 (95.2)	333 (95.1)	336 (94.4)
Father's age group 16–20 years	[57]	[67]	[59]
Yes	6 (1.9)	6 (2.0)	8 (2.5)
No	307 (98.1)	296 (98.0)	306 (97.5)
Family ethnicity	[20]	[18]	[12]
White British	337 (96.3)	323 (92.0)	348 (96.4)
Asian/Asian British	5 (1.4)	13 (3.7)	6 (1.7)
Black/black British	5 (1.4)	15 (4.3)	2 (0.6)
Mixed	3 (0.9)	0 (0.0)	5 (1.4)
English as first language	336 (92.1) [5]	319 (87.6) [5]	349 (94.1) [2]
Household type	[13]	[6]	[6]
Rented	193 (54.1)	203 (55.9)	193 (52.6)
Owner-occupied	154 (43.1)	148 (40.8)	162 (44.1)
Lives with parents	9 (2.5)	12 (3.3)	12 (3.3)
Shared ownership	1 (0.3)	0 (0.0)	0 (0.0)
Lives above ground floor (if lives in a flat)	[29]	[17]	[23]
Yes	50 (14.7)	39 (11.1)	50 (14.3)
No	5 (1.5)	10 (2.8)	8 (2.3)
NA (i.e. does not live in a flat)	286 (83.9)	303 (86.1)	292 (83.4)
Deprivation (IMD score of household)	[2]	[1]	[1]
Mean (SD)	31.0 (16.9)	34.7 (16.5)	29.6 (16.1)
Smokers in household	[11]	[9]	[10]
None	245 (68.2)	251 (69.7)	263 (72.5)
1	76 (21.2)	81 (22.5)	69 (19.0)
2	31 (8.6)	27 (7.5)	27 (7.4)
≥ 3	7 (1.9)	1 (0.3)	4 (1.1)
Total cigarettes smoked per day in households with at least one smoker, median (IQR)	10 (10–20) [3]	10 (6–20) [7]	10 (10–20) [7]
At least one person in household drinks four or more times a week	21 (5.8) [10]	19 (5.3) [8]	24 (6.6) [12]
At least one person in household drinks six or more drinks on one occasion	208 (61.7) [33]	173 (52.3) [38]	211 (61.3) [29]

NA, not applicable.
a Numbers in square brackets represent missing values.

TABLE 116 Fire safety practices reported by parents at baseline

Safety practices	Trial arm[a]		
	Usual care ($N = 370$), *n* (%)	IPB only ($N = 369$), *n* (%)	IPB+ ($N = 373$), *n* (%)
Family have a fire escape plan	[7]	[5]	[7]
No	204 (56.2)	211 (58.0)	217 (59.3)
Yes	159 (43.8)	153 (42.0)	149 (40.7)
Component elements of fire escape plan			
Torch next to bed	[6]	[8]	[10]
No	246 (67.6)	253 (70.1)	242 (66.7)
Yes	118 (32.4)	108 (29.9)	121 (33.3)
Knows sound of smoke alarm	[27]	[23]	[32]
No	9 (2.6)	10 (2.9)	5 (1.5)
Yes	334 (97.4)	336 (97.1)	336 (98.5)
Front door key accessible	[10]	[16]	[5]
≥ 4 days per week	317 (88.1)	304 (86.1)	321 (87.2)
Never/< 4 days per week	43 (11.9)	49 (13.9)	47 (12.8)
Window keys accessible	[18]	[24]	[14]
≥ 4 days per week	278 (79.0)	267 (77.4)	265 (73.8)
Never/< 4 days per week	74 (21.0)	78 (22.6)	94 (26.2)
Exits clear	[18]	[24]	[11]
≥ 4 days per week	297 (84.4)	284 (82.3)	297 (82.0)
Never/< 4 days per week	55 (15.6)	61 (17.7)	65 (18.0)
Fire escape behaviours composite variable			
More fire escape behaviours	329 (88.9)	319 (86.4)	320 (85.8)
Fewer fire escape behaviours	41 (11.1)	50 (13.6)	53 (14.2)
Those with fire escape plan who have discussed it with adults in the house	[1]	[3]	[2]
No	16 (10.1)	17 (11.3)	18 (12.2)
Yes	142 (89.9)	133 (88.7)	129 (87.8)
Those with fire escape plan who have practised it	[2]		[1]
No	110 (70.1)	104 (68.0)	116 (78.4)
Yes	47 (29.9)	49 (32.0)	32 (21.6)
Those with fire escape plan who have a second fire escape plan	[6]	[2]	[3]
No	100 (65.4)	110 (72.8)	114 (78.1)
Yes	53 (34.6)	41 (27.2)	32 (21.9)
Smoke alarms fitted and working on every level	[17]	[20]	[24]
No	89 (25.2)	89 (25.5)	89 (25.5)
Yes	264 (74.8)	260 (74.5)	260 (74.5)

continued

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TABLE 116 Fire safety practices reported by parents at baseline (*continued*)

Safety practices	Trial arm[a]		
	Usual care ($N = 370$), *n* (%)	IPB only ($N = 369$), *n* (%)	IPB+ ($N = 373$), *n* (%)
Child(ren) found playing with matches/lighters	[2]		[8]
No	353 (95.9)	354 (95.9)	352 (96.4)
Yes	15 (4.1)	15 (4.1)	13 (3.6)
Fire safety routines when going to bed			
Closes all internal doors	[22]	[15]	[13]
≥ 4 days per week	203 (58.3)	223 (63.0)	199 (55.3)
Never/< 4 days per week	145 (41.7)	131 (37.0)	161 (44.7)
Checks front door locked	[4]	[14]	[4]
≥ 4 days per week	345 (94.3)	326 (91.8)	334 (90.5)
Never/< 4 days per week	21 (5.7)	29 (8.2)	35 (9.5)
Turns off lights	[5]	[11]	[8]
≥ 4 days per week	343 (94.0)	332 (92.7)	337 (92.3)
Never/< 4 days per week	22 (6.0)	26 (7.3)	28 (7.7)
Turns electrical appliances off at the sockets	[7]	[11]	[7]
≥ 4 days per week	193 (53.2)	214 (59.8)	197 (53.8)
Never/< 4 days per week	170 (46.8)	144 (40.2)	169 (46.2)
Turns off electric/gas fires	[15]	[22]	[8]
≥ 4 days per week	333 (93.8)	329 (94.8)	345 (94.5)
Never/< 4 days per week	22 (6.2)	18 (5.2)	20 (5.5)
Makes sure a fireguard/spark guard is in place	[34]	[35]	[25]
≥ 4 days per week	302 (89.9)	293 (87.7)	303 (87.1)
Never/< 4 days per week	34 (10.1)	41 (12.3)	45 (12.9)
Checks that the oven and all the rings on the cooker are turned off	[7]	[7]	[5]
≥ 4 days per week	333 (91.7)	320 (88.4)	318 (86.4)
Never/< 4 days per week	30 (8.3)	42 (11.6)	50 (13.6)
Makes sure cigarettes are put out	[29]	[23]	[20]
≥ 4 days per week	331 (97.1)	328 (94.8)	341 (96.6)
Never/< 4 days per week	10 (2.9)	18 (5.2)	12 (3.4)
Puts matches/lighters out of reach of children	[18]	[19]	[13]
≥ 4 days per week	328 (93.2)	328 (93.7)	337 (93.6)
Never/< 4 days per week	24 (6.8)	22 (6.3)	23 (6.4)
Blows out candles	[16]	[17]	[18]
≥ 4 days per week	319 (90.1)	320 (90.9)	325 (91.5)
Never/< 4 days per week	35 (9.9)	32 (9.1)	30 (8.5)
Bedtime fire safety routine score, median (IQR)	9 (8–10) [36]	9 (8–10) [39]	9 (8–10) [23]

TABLE 116 Fire safety practices reported by parents at baseline (*continued*)

Safety practices	Trial arm[a]		
	Usual care (*N* = 370), *n* (%)	IPB only (*N* = 369), *n* (%)	IPB+ (*N* = 373), *n* (%)
Families' knowledge of the causes of fires in the home[b]			
0	48 (13.0)	49 (13.3)	38 (10.2)
1	198 (53.5)	198 (53.7)	201 (53.9)
2	119 (32.2)	113 (30.6)	130 (34.9)
3	5 (1.4)	9 (2.4)	4 (1.1)
Satisfaction with home safety advice received from children's centre staff	[9]	[12]	[14]
Very/fairly satisfied	221 (61.2)	199 (55.7)	206 (57.4)
Less than very/fairly satisfied	36 (10.0)	45 (12.6)	41 (11.4)
Haven't received information	104 (28.8)	113 (31.7)	112 (31.2)
Have spoken to FRS about fire safety	[3]	[3]	[6]
No	250 (68.1)	263 (71.9)	280 (76.3)
Yes	117 (31.9)	103 (28.1)	87 (23.7)
Of those who had spoken to FRS, had a home safety check from FRS	[3]	[1]	[2]
No	59 (51.8)	35 (34.3)	38 (44.7)
Yes	55 (48.2)	67 (65.7)	47 (55.3)
Have received advice about preventing fires	[12]	[10]	[8]
No	165 (46.1)	191 (53.2)	209 (57.3)
Yes	193 (53.9)	168 (46.8)	156 (42.7)

FRS, fire and rescue service.
a Numbers in square brackets represent missing values.
b Missing values coded as 0.

escape plan were reported by > 75% of parents, with only 32% reporting having a torch next to the bed. Most parents (87%) were in the 'more fire escape behaviours' group for the composite fire escape behaviours variable. Most parents (75%) reported that they had a smoke alarm fitted and working on every level of their home. Only 4% of parents had found their children playing with matches or lighters. Most parents undertook most bedtime safety practices on at least 4 days per week, with 41% of parents not closing all internal doors and 44% not turning electrical appliances off at the sockets on at least 4 days per week.

Implementation of the injury prevention briefing

Analysis of data from the implementation fidelity interviews suggested that there were four levels of IPB implementation, which were associated with different levels of delivery. A description of the criteria for each level of implementation is given in *Table 117*. Most children's centres achieved extended implementation, followed by essential implementation. Only six (25%) children's centres achieved minimal or non-implementation. It appeared that more IPB+ children's centres than IPB-only children's centres achieved extended levels of implementation.

Quotations from the implementation fidelity interviews for children's centres in each of the levels of implementation are provided in *Boxes 5–8* to illustrate the varying degrees of implementation.

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TABLE 117 Classification criteria for levels of implementation of the IPB and numbers of children's centres achieving each level by treatment arm

	Level			
Criteria	Extended – diverse delivery methods, wide coverage and additional content	Essential – minimum delivery methods and key content	Minimal – considered implementation but little evidence of successful engagement or delivery	Non-implementation – did not actively engage with the study specifications or implement any aspect of the IPB
	• Two or more delivery methods • Two or more messages[a] • Fully integrated into existing children's centre health promotion activity • Active engagement with wide population of parents (beyond trial participants) • Use of IPB and additional information or content • Delivered to more than one group	• Delivered via at least one group session • Two messages[a] • Discrete delivery or limited integration into other children's centre sessions • Engaged with trial parents and/or passive involvement of wider community • Used IPB information • Delivery to one group of parents	• Recorded attempt at IPB-related activity but insufficient to fulfil 'essential implementation' criteria	• No evidence of any IPB-related activity although this may have included providing usual fire safety activity
Arm	***n* (%)**	***n* (%)**	***n* (%)**	***n* (%)**
IPB+	8 (66.7)	3 (25.0)	1 (8.3)	0 (0.0)
IPB only	2 (16.7)	5 (41.7)	4 (33.3)	1 (8.3)

a Including 'Importance of smoke alarms' and 'fire escape planning'.

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BOX 5 Examples of fire safety promotion at a children's centre classified as achieving extended implementation (children's centre B3; IPB+)

Used more than two delivery methods

We had boards and things up and children centre reception and after the fire engine had been there were photographs of the fire engine and all the children and the fire safety in the home booklet pages photocopied out of books and stuck up again . . . we try to encourage people to come along to the workshops as well.

Used additional information or content (beyond injury prevention briefing)

We've tried to do it in a couple of different ways so we set up the large training room sort of in a comedy fashion . . . We have clothes all over a heater that wasn't turned on to try and make it a bit more interactive.

We watched the fancy a cuppa DVD which is from the child accident prevention people as well. So we tried doing a lot of different things to make it a bit more interesting, but it's actually pinning people down to come along to a session so the community fire officers came in and spoke to everybody within the group.

BOX 5 Examples of fire safety promotion at a children's centre classified as achieving extended implementation (children's centre B3; IPB+) (*continued*)

Used more than two messages

We did cover the IPB and that's what we used to get the information out to the parents. We used the IPB in the safety workshops and then we took information to talk to the parents in groups about smoke alarms and particular age-appropriate behaviour with children making sure that your lighters and your candles and your matches were out of reach . . . I think over the course of the year, we probably covered every exercise with parents where everybody is being given pretty much all the information out of the booklet.

Every few weeks after the fire safety message we'd put up a display with pictures around what we've just done to back up information that would be given out in the groups. So we had a display around Christmas safety and not leaving your Christmas tree light on and candles . . . so, we were trying to link quite a lot of things back to fire safety.

Active engagement with wide population of parents

The feedback from parents has been really positive . . . very sort of like oh yes! I went home and we talked about the safety plan and we checked the smoke alarm, so actually the parents who I've spoken to have been picking up the safety messages.

Delivered to more than one group

We did the sessions and included everybody but knowing that it was important to get the people who were part of the survey involved as much as possible . . . each parent who was part of the study received either in the hand or through the post the fire safety booklet and then the information that you sent out, everybody got a copy of that, and everybody was invited to take part in the safety workshops, the event days with the fire engine, and the chip pans.

Provided usual non-injury prevention briefing-related fire safety activities

We've had community fire people to come into the groups and fill in questionnaires about having fire service come out to your home and have a wander round so we had a few parents have had those home visits.

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BOX 6 Examples of fire safety promotion at a children's centre classified as achieving essential implementation (children's centre D1; IPB+)

Delivered via at least one group session

The event was just lots of different activities. It was held in the hall as well as outside so it was kind of quite spread out. So there was just different types of activities to get parents and children involved in different kind of key fire messages.

Delivered two messages

We had smoke alarms and we were getting children used to like the sounds of smoke alarm and just talking to parents.

The children made a big fire engine from junk and we talked about the fire and rescue services. I can't think what else but yes it was just lots of different activities, just getting different messages across really in a fun way.

Discrete delivery or limited integration into other children's centre sessions

We had the one big event and then within . . . other activities like home visits where we have done home safety checks or talks.

Study recruited parents and/or passive involvement of wider community

Yes, the leaflet that we sent out and . . . yes, obviously with those that have had home visits.

Attendance at groups and things is so hit and miss that I don't think it's a reflection on what the activity was at all because obviously other families came, I just think it's . . . the nature of the game really. Like I said we don't tend to have . . . I don't know . . . you don't have static attendance at stuff.

Injury prevention briefing information only

Only IBP information described in the interviews.

May or may not have provided additional non-injury prevention briefing-related fire safety activities

No other fire safety activities mentioned in the interviews.

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BOX 7 Examples of fire safety promotion at a children's centre classified as achieving minimal implementation (children's centre D2; IPB+)

Some recorded attempt at injury prevention briefing-related activity but insufficient to fulfil 'essential implementation' criteria

Interviewee: *The fire safety stuff has not been a priority . . .*

Interviewer: *And the next question was around had anything gone particularly well in relation to using the IPB? You responded no to that. You only delivered it with a couple of parents didn't you?*

Interviewee: *Yes, I did a couple of things . . . I mean it was helpful in terms of kind of doing 'walkarounds' and things in peoples' homes and going through that side of things but no we've not really done much more.*

May or may not have provided additional non-injury prevention briefing-related fire safety activities

That's not to say that fire safety isn't a massive priority in a family home but if you walk into a home and they've not got any money, the bank account has been shut or they've not got any food . . . I don't know, they've had a letter from children's services or something like that, you need to deal with that on that day. You know and yes, if there's a lighter on the table you'll deal with that at the same time but your biggest kind of issue is what you're faced with.

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BOX 8 Example of fire safety promotion at a children's centre classified as achieving non-implementation (children's centre C7; IPB only)

Initially we didn't know anything about the injury prevention briefing, E [the manager of the children's centre] and one of the team leaders arranged that. But I didn't realise the extent to which we never had the injury prevention briefing book so we were just thinking that you wanted to talk to parents so I think right from the beginning we have been at a misunderstanding. Also our manager at that time, two of the staff that set it up have left, our strategic manager has also been on long-term sick, the manager of our team has retired and we are going through a management of change so we have been short-staffed.

I thought I don't really know what IPB is . . . I am thinking we must have got something somewhere so I went and got it.

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All ($n = 12$, 100%) of the IPB+ arm children's centres and 58% ($n = 7$) of the IPB-only arm children's centres developed a plan for implementing the IPB. Two-thirds ($n = 7/11$, 64%) of the IPB+ arm children's centres had developed their plan by the 3-month facilitation contact. *Figures 62* and *63* show the percentage of children's centres that reported giving advice on each of the five key IPB messages and reported the use of the IPB exercises, respectively. The numbers were too small to compare these quantitatively. Fire-safety promotion activities reported by children's centres on the follow-up questionnaire, by treatment arm, are shown in *Table 118*. From *Table 118* and *Figures 61* and *62* it appears that more of the IPB+ arm children's centres than IPB-only arm children's centres gave advice on each of the key safety messages and used each of the exercises. In addition, 92% ($n = 11$) of the IPB+ arm children's centres and 50% ($n = 6$) of the IPB-only arm children's centres reported using methods other than the IPB to deliver fire safety messages.

Table 119 shows parent-reported receipt of advice and other fire prevention promotion. These data are consistent with the findings above regarding implementation of the IPB and suggest that the IPB+ arm achieved significantly greater implementation of the IPB than the usual-care arm. The IPB-only arm achieved a lesser degree of implementation, with significant differences between the IPB-only arm and the usual-care arm only in terms of parents attending fire safety sessions. Significantly more parents in the IPB+ arm than in the usual-care arm reported receiving advice on each of the five key IPB messages, with ORs ranging from 2.21 (95% CI 1.18 to 4.12) (bedtime safety routines) to 3.35 (95% CI 1.98 to 5.68)

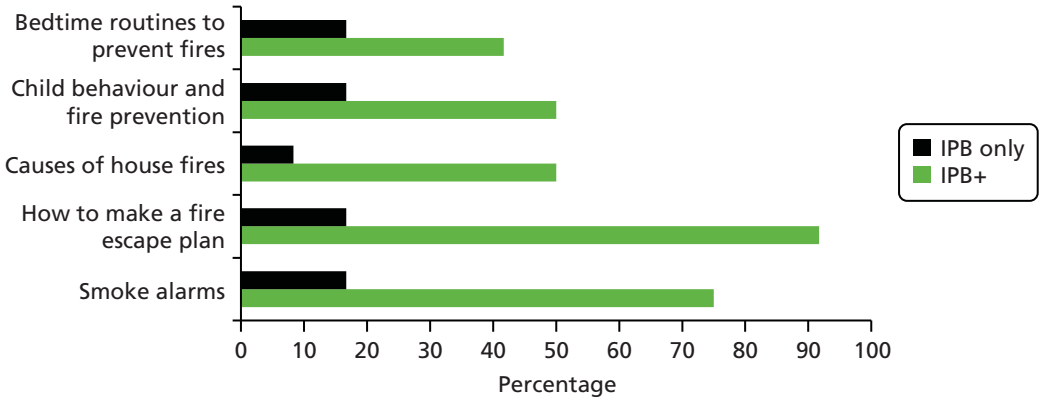


FIGURE 62 Provision of advice on each of the five key IPB messages by children's centres in the IPB-only and IPB+ arms reported in the implementation fidelity interviews at follow-up.

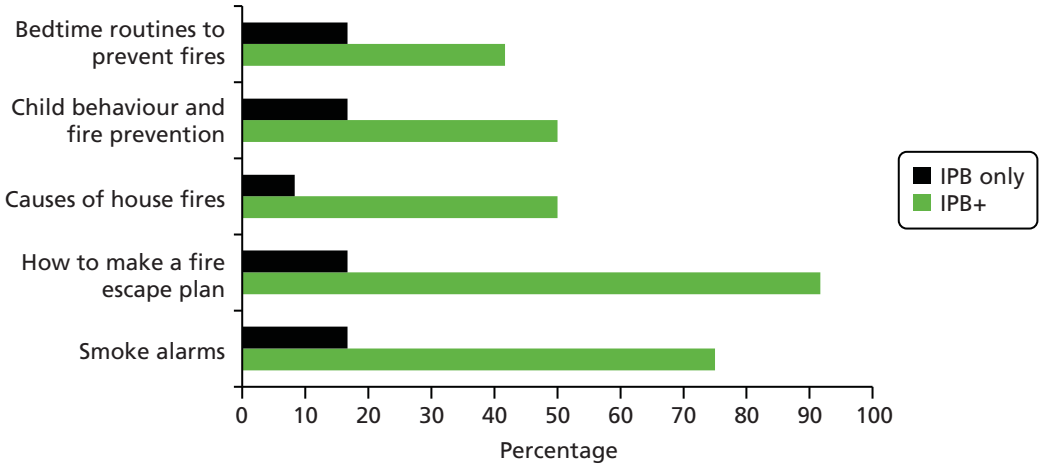


FIGURE 63 Use of the IPB exercises by children's centres in the IPB-only and IPB+ arms reported in the implementation fidelity interviews at follow-up.

TABLE 118 Fire safety promotion activities reported by children's centres on the follow-up questionnaire by treatment arm

Secondary outcome measures	Trial arm[a]		
	Usual care ($N = 12$), n (%)	IPB only ($N = 12$), n (%)	IPB+ ($N = 12$), n (%)
Advice provided on			
Smoke alarms		[1]	
No advice/don't know	1 (8.3)	0 (0.0)	1 (8.3)
Advice provided (one to one, in groups or leaflets)	11 (91.7)	11 (100.0)	11 (91.7)
How to make a fire escape plan	[1]		
No advice/don't know	3 (27.3)	3 (25.0)	0 (0.0)
Advice provided (one to one, in groups or leaflets)	8 (72.7)	9 (75.0)	12 (100.0)
Causes of house fires (advice provided on one or more of cooking safety, electrical safety, handling hot irons safely)			
No advice/don't know	1 (8.3)	0 (0.0)	0 (0.0)
Advice provided (one to one, in groups or leaflets)	11 (91.7)	12 (100.0)	12 (100.0)
Child behaviour and fire prevention (safe use and storage of cigarettes, lighters and matches)			
No advice/don't know	4 (33.3)	1 (8.3)	0 (0.0)
Advice provided (one to one, in groups or leaflets)	8 (66.7)	11 (91.7)	12 (100.0)
Bedtime routines to prevent fires	[1]		[1]
No advice/don't know	6 (54.5)	4 (33.3)	0 (0.0)
Advice provided (one to one, in groups or leaflets)	5 (45.5)	8 (66.7)	11 (100.0)
Ran fire safety sessions			
Yes	5 (41.7)	7 (58.3)	11 (91.7)
No/don't know	7 (58.3)	5 (41.7)	1 (8.3)
Number of sessions run[b]			[2]
0	7 (58.3)	5 (41.7)	1 (10.0)
1	4 (33.3)	1 (8.3)	2 (20.0)
2	1 (8.3)	5 (41.7)	2 (20.0)
3	0 (0.0)	0 (0.0)	3 (30.0)
4	0 (0.0)	1 (8.3)	0 (0.0)
5	0 (0.0)	0 (0.0)	0 (0.0)
6	0 (0.0)	0 (0.0)	1 (10.0)
7	0 (0.0)	0 (0.0)	1 (10.0)
Number of sessions run[b]			[2]
0 or 1	11 (91.7)	6 (50.0)	3 (30.0)
≥ 2	1 (8.3)	6 (50.0)	7 (70.0)
FRS attended to help provide any sessions	[1]		[1]
No	8 (72.7)	6 (50.0)	4 (36.4)
Yes	3 (27.3)	6 (50.0)	7 (63.6)

FRS, fire and rescue service.
a Numbers in square brackets represent missing values.
b Assumes that those who said that they ran a session but who didn't answer the question on the number of sessions ran only one session. Quantitative analyses not undertaken for these outcomes because of small numbers.

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TABLE 119 Reported receipt of fire safety advice and other fire safety promotion at follow-up by treatment arm

Receipt of fire safety advice and promotion	Trial arm[a]			IPB only vs. usual care		IPB+ vs. usual care	
	Usual care ($N = 258$), n (%)	IPB only ($N = 252$), n (%)	IPB+ ($N = 241$), n (%)	AOR (95% CI)[b]	p-value	AOR (95% CI)[b]	p-value
Received advice on the five key IPB messages							
Smoke alarms[c]	[54]	[52]	[54]				
No	155 (76.0)	132 (66.0)	107 (57.2)	1.00		1.00	
Yes	49 (24.0)	68 (34.0)	80 (42.8)	1.36 (0.82 to 2.26)	0.23	2.27 (1.40 to 3.67)	< 0.01
Matches[c]	[56]	[57]	[58]				
No	177 (87.6)	167 (85.6)	133 (72.7)	1.00		1.00	
Yes	25 (12.4)	28 (14.4)	50 (27.3)	1.05 (0.54 to 2.04)	0.89	2.74 (1.51 to 4.96)	< 0.01
Fire escape plans	[55]	[58]	[57]				
No	175 (86.2)	168 (86.6)	133 (72.3)	1.00		1.00	
Yes	28 (13.8)	26 (13.4)	51 (27.7)	0.79 (0.40 to 1.55)	0.50	2.38 (1.35 to 4.21)	< 0.01
Bedtime safety routines	[54]	[56]	[56]				
No	183 (89.7)	173 (88.3)	147 (79.5)	1.00		1.00	
Yes	21 (10.3)	23 (11.7)	38 (20.5)	0.89 (0.44 to 1.82)	0.76	2.21 (1.18 to 4.12)	0.01
Causes of fires	[57]	[56]	[57]				
No	169 (84.1)	149 (76.0)	113 (61.4)	1.00		1.00	
Yes	32 (15.9)	47 (24.0)	71 (38.6)	1.50 (0.85 to 2.65)	0.17	3.35 (1.98 to 5.68)	< 0.01
Number of key safety messages had advice on	[53]	[52]	[52]				
≤ 2	180 (87.8)	170 (85.0)	132 (69.8)	1.00		1.00	
3–5	25 (12.2)	30 (15.0)	57 (30.2)	1.09 (0.57 to 2.10)	0.80	3.06 (1.72 to 5.43)	< 0.01
Attended a fire safety session in the last year	[53]	[50]	[49]				
No	197 (96.1)	178 (88.1)	155 (80.7)	1.00		1.00	
Attended one or more	8 (3.9)	24 (11.9)	37 (19.3)	3.20 (1.27 to 8.06)	0.01	7.07 (3.05 to 16.38)	< 0.01
Attended a fire safety session at children's centre	[53]	[50]	[49]				
No	197 (96.1)	185 (91.6)	163 (84.9)	1.00		1.00	
Attended one or more	8 (3.9)	17 (8.4)	29 (15.1)	2.18 (0.85 to 5.63)	0.11	5.14 (2.20 to 12.03)	< 0.01

TABLE 119 Reported receipt of fire safety advice and other fire safety promotion at follow-up by treatment arm (*continued*)

Receipt of fire safety advice and promotion	Trial arm[a]			IPB only vs. usual care		IPB+ vs. usual care	
	Usual care (*N* = 258), *n* (%)	IPB only (*N* = 252), *n* (%)	IPB+ (*N* = 241), *n* (%)	AOR (95% CI)[b]	*p*-value	AOR (95% CI)[b]	*p*-value
Attended fire safety session about each of the five key messages in the IPB in the last year[d]	[53]	[50]	[49]				
Smoke alarms							
No	198 (96.6)	180 (89.1)	158 (82.3)	1.00		1.00	
Yes	7 (3.4)	22 (10.9)	34 (17.7)	3.34 (1.30 to 8.58)	0.01	6.71 (2.80 to 16.04)	< 0.01
Matches							
No	201 (98.0)	189 (93.6)	169 (88.0)	1.00		1.00	
Yes	4 (2.0)	13 (6.4)	23 (12.0)	2.80 (0.85 to 9.29)	0.09	6.78 (2.24 to 20.55)	< 0.01
Fire escape plans							
No	201 (98.0)	188 (93.1)	162 (84.4)	1.00		1.00	
Yes	4 (2.0)	13 (6.9)	30 (15.6)	3.48 (1.06 to 11.44)	0.04	9.88 (3.31 to 29.43)	< 0.01
Bedtime safety routines							
No	202 (98.5)	189 (93.6)	172 (89.6)	1.00		1.00	
Yes	3 (1.5)	13 (6.4)	20 (10.4)	3.93 (1.04 to 14.93)	0.04	7.83 (2.23 to 27.55)	< 0.01
Causes of fires							
No	198 (96.6)	184 (91.1)	162 (84.4)	1.00		1.00	
Yes	7 (3.4)	18 (8.9)	30 (15.6)	0.56 (0.0 to 11.9)	0.06	5.52 (2.29 to 13.30)	< 0.01

a Numbers in square brackets represent missing values.
b Adjusted for study centre, lead agency of the children's centre (local authority, NHS or voluntary sector), Ofsted overall effectiveness score (outstanding, good, satisfactory, missing), baseline value of the secondary outcome measure and IMD score of family (continuous). Not adjusted for Ofsted capacity for sustained improvement as this variable had more missing data and, when recorded, the values were the same as for Ofsted overall effectiveness score.
c IMD quintiles used because of non-linear association with the outcome.
d Some families attended more than one session. All questions asked only on the full follow-up questionnaire. Parents completing the mini follow-up questionnaire are coded as missing on all questions.

(causes of fires). There were no significant differences in the proportion of parents who reported receiving advice for each of the five key IPB messages between the IPB-only arm and the usual-care arm. The proportion of parents who received advice ranged from 10% to 24% in the usual-care arm, from 12% to 34% in the IPB-only arm and from 21% to 43% in the IPB+ arm. In total, 28% of the IPB+ arm, 13% of the IPB-only arm and 14% of the usual-care arm parents received advice about fire escape planning. Significantly more IPB+ arm parents than usual-care arm parents received advice on more than two safety messages (30% vs. 12%; AOR 3.06, 95% CI 1.72 to 5.43), but there was no significant difference in this item between IPB-only and usual-care arm parents (15% vs. 12%; AOR 1.09, 95% CI 0.57 to 2.10).

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Significantly more families in the IPB+ and IPB-only arms than usual-care arm parents had attended one or more fire safety sessions in the last year (19%, 12% and 4%, respectively; AOR IPB+ vs. usual care 7.07, 95% CI 3.05 to 16.38; AOR IPB only vs. usual care 3.20, 95% CI 1.27 to 8.06) and significantly more IPB+ and IPB-only parents than usual-care arm parents had attended a fire safety session at a children's centre (15%, 8% and 4%, respectively; AOR IPB+ vs. usual care 5.14, 95% CI 2.20 to 12.03; AOR IPB only vs. usual care 2.18, 95% CI 0.85 to 5.63). Significantly more parents in the IPB+ arm than usual-care arm parents had attended a fire safety session on each of the key IPB messages, with AORs ranging from 5.52 (95% CI 2.29 to 13.30) (session on causes of fires) to 9.88 (95% CI 3.31 to 29.43) (session on fire escape planning). Significantly more parents in the IPB-only arm than usual-care arm parents had attended a fire safety session on three of the key IPB messages [session on smoke alarms: AOR 3.34, 95% CI 1.30 to 8.58; session on fire escape planning: AOR 3.48, 95% CI 1.06 to 11.44; session on bedtime safety routines: AOR 3.93, 95% CI 1.04 to 14.93).

Primary and secondary outcome measures

Table 120 shows the primary and secondary outcome measures by treatment arm. There was no significant difference between treatment arms in the proportion of families who reported having a fire escape plan (AOR IPB only vs. usual care 0.93, 95% CI 0.58 to 1.49; AOR IPB+ vs. usual care 1.41, 95% CI 0.91 to 2.20) and this did not vary by family-level deprivation measured using the IMD 2010 score (*p*-value for interaction 0.86). Significantly more IPB-only families (AOR 2.56, 95% CI 1.38 to 4.76) and IPB+ families (AOR 1.78, 95% CI 1.01 to 3.15) were in the 'more fire escape planning behaviours' group than usual-care arm families. Parents in the IPB-only arm were significantly less likely to have found their children playing with matches or lighters than usual-care arm parents (AOR 0.27, 95% CI 0.08 to 0.94) and they also reported significantly more bedtime fire safety routines than usual-care arm parents (AOR for a 1-unit increase in the number of bedtime fire safety routines 1.59, 95% CI 1.09 to 2.31). There were no other significant differences in other secondary outcome measures. The ICC for the primary outcome measure was 0.00261 (95% CI 0.00000 to 0.02737).

TABLE 120 Primary and secondary outcome measures at follow-up, by treatment arm

	Trial arm[a]			IPB only vs. usual care		IPB+ vs. usual care	
Outcome measures	Usual care (*N* = 258), *n* (%)	IPB-only (*N* = 252), *n* (%)	IPB+ (*N* = 241), *n* (%)	AOR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
Primary outcome measure[b]							
Family have fire escape plan	[4]	[9]	[5]				
No	135 (53.2)	135 (55.6)	116 (49.2)	1.00		1.00	
Yes	119 (46.9)	108 (44.4)	120 (50.8)	0.93 (0.58 to 1.49)	0.76	1.41 (0.91 to 2.20)	0.13
Secondary outcome measures[c]							
Fire escape behaviours composite variable							
Fewer fire escape behaviours	45 (17.4)	29 (11.5)	32 (13.3)	1.00		1.00	
More fire escape behaviours	213 (82.6)	223 (88.5)	209 (86.7)	2.56 (1.38 to 4.76)	< 0.01	1.78 (1.01 to 3.15)	0.05

TABLE 120 Primary and secondary outcome measures at follow-up, by treatment arm (*continued*)

Outcome measures	Trial arm[a]			IPB only vs. usual care		IPB+ vs. usual care	
	Usual care ($N = 258$), *n* (%)	IPB-only ($N = 252$), *n* (%)	IPB+ ($N = 241$), *n* (%)	AOR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
Component elements of fire escape plan (presented for descriptive purposes only)							
Torch next to bed	[38]	[40]	[34]				
No	130 (59.1)	133 (62.7)	121 (58.5)				
Yes	90 (40.9)	79 (37.3)	86 (41.5)				
Knows sound of smoke alarm	[8]	[14]	[8]				
No	7 (2.8)	6 (2.5)	9 (3.9)				
Yes	243 (97.2)	232 (97.5)	224 (96.1)				
Front door key accessible	[4]	[5]	[1]				
Never/< 4 days	31 (12.2)	28 (11.3)	18 (7.5)				
≥ 4 days per week	223 (87.8)	219 (88.7)	222 (92.5)				
Window keys accessible	[7]	[14]	[8]				
Never/< 4 days	71 (28.3)	45 (18.9)	51 (21.9)				
≥ 4 days per week	180 (71.7)	193 (81.1)	182 (78.1)				
Exits clear	[8]	[5]	[5]				
Never/< 4 days	35 (14.0)	31 (12.6)	35 (14.8)				
≥ 4 days per week	215 (86.0)	216 (87.4)	201 (85.2)				
Smoke alarms fitted and working on every level	[7]	[12]	[8]				
No	22 (8.8)	14 (5.8)	13 (5.6)	1.00		1.00	
Yes	229 (91.2)	226 (94.2)	220 (94.4)	1.61 (0.71 to 3.66)	0.25	1.56 (0.71 to 3.42)	0.27
Fire setting or match play by children	[52]	[49]	[49]				
No	197 (95.6)	198 (97.5)	181 (94.3)	1.00		1.00	
Yes	9 (4.4)	5 (2.5)	11 (5.7)	0.27 (0.08 to 0.94)	0.04	1.2 (0.43 to 3.08)	0.77
Bedtime fire safety routine score, median (IQR)[d]	8 (8–9) [9]	9 (8–10) [16]	8.5 (8–9) [11]	1.59 (1.09 to 2.31)	0.02	1.22 (0.85 to 1.76)	0.28
Took part in smoking cessation courses/ support	[60]	[43]	[43]				
No	5 (19.2)	8 (33.3)	5 (23.8)	1.00		1.00	
Yes	21 (80.8)	16 (66.7)	16 (76.2)	0.23 (0.04 to 1.43)	0.12	0.61 (0.11 to 3.40)	0.57

continued

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TABLE 120 Primary and secondary outcome measures at follow-up, by treatment arm (*continued*)

Outcome measures	Trial arm[a]			IPB only vs. usual care		IPB+ vs. usual care	
	Usual care (*N* = 258), *n* (%)	IPB-only (*N* = 252), *n* (%)	IPB+ (*N* = 241), *n* (%)	AOR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
Families' knowledge of the causes of fires in the home[d]							
0	78 (30.2)	81 (32.1)	70 (29.1)	1.10 (0.77 to 1.57)	0.61	1.22 (0.86 to 1.73)	0.26
1	93 (36.1)	86 (34.1)	76 (31.5)				
2	80 (31.0)	81 (32.1)	85 (35.3)				
3	7 (2.7)	4 (1.6)	10 (4.2)				
Home safety information provided by children's centre[e]	[57]	[55]	[53]				
Neither satisfied nor dissatisfied, fairly dissatisfied, very dissatisfied	16 (8.0)	22 (11.2)	23 (12.2)	1.00		1.00	
Very satisfied, fairly satisfied	31 (15.4)	46 (23.4)	73 (38.8)	1.08 (0.4 to 2.8)	0.87	1.79 (0.7 to 4.4)	0.20
Haven't received information	154 (76.6)	129 (65.5)	92 (48.9)				

a Numbers in square brackets represent missing values.
b Adjusted for study centre, lead agency of the children's centre (local authority, NHS or voluntary sector), Ofsted overall effectiveness score (outstanding, good, satisfactory, missing), fire escape plan at baseline (no/yes) and IMD score of family (continuous). Not adjusted for Ofsted capacity for sustained improvement as this variable had more missing data and, when recorded, the values were the same as for the Ofsted overall effectiveness score.
c Adjusted for lead agency of the children's centre, Ofsted overall effectiveness score (outstanding, good, satisfactory, missing), baseline value of the secondary outcome measure and IMD score of family (continuous).
d OR for a 1-unit increase in the outcome measure.
e Participants who had not received information were excluded from the analysis.

Adjusted ORs for the primary outcome measure from the complete-case analysis (AOR IPB only vs. usual care 0.93, 95% CI 0.58 to 1.49; AOR IPB+ vs. usual care 1.41, 95% CI 0.91 to 2.20) differed from those in the analysis using multiply imputed data by only 1% for the IPB only arm compared with the usual-care arm (AOR 0.92, 95% CI 0.58 to 1.46) and by < 1% for the IPB+ arm compared with the usual-care arm (AOR 1.40, 95% CI 0.89 to 2.21).

Assuming that participants with missing data at follow-up had a baseline value for having a fire escape plan, there were similar results for the IPB-only arm compared with the usual-care arm (AOR 0.95, 95% CI 0.60 to 1.51; 2% difference in AORs between the complete-case analysis and the analysis assuming no change from baseline) and for the IPB+ arm compared with the usual-care arm (AOR 1.39, 95% CI 0.91 to 2.12; 1% difference in AORs between the complete-case analysis and the analysis assuming no change from baseline).

Cost-effectiveness

The cost of developing the IPB was estimated from researchers' logbooks to be £15,860. *Table 121* presents the unit costs applied to the resource use data that were obtained from the questionnaires and logbooks to obtain the overall costs. The cost of implementing the IPB with or without facilitation is

TABLE 121 Unit costs (UK£, 2012)

Resource	Value	Source
Parental costs		
Time costs	£45.70 per hour	Department for Transport[493]
Travel costs by car	£0.18 per km	Department for Transport[493]
IPB implementation costs		
Researcher's time	£19.04 per hour	University of Nottingham pay scale
Administrator's time	£11.24 per hour	University of Nottingham pay scale
Children's centre, FRS and other agency costs		
FRS staff time	£36.00 per hour	Adam Shaw, Cheshire fire and Rescue Service, 20 September 2012, personal communication
Children's centre staff time	£18.00 per hour	Curtis, 2012[30] (assumed same as home care worker)
Home safety inspection	£15.33	Based on 40-minute visit by children's centre, FRS or other agency (as in decision models)

FRS, fire and rescue service.

presented in *Table 122*. The costs are reported as both a cost per children's centre (i.e. cluster) and a cost per family randomised; the latter is used in the cost-effectiveness analysis. It can be observed that the costs associated with facilitation of the IPB varied across study centres (range £84.74–327.84).

Tables 123 and *124* present details about the fire safety activities, including home safety inspections, undertaken by the different agencies (i.e. children's centres, fire and rescue service, parents, etc.). This information was combined with the unit costs presented in *Table 121* to obtain the cost estimates incurred by the different agencies by treatment arm (*Table 125*). When these 'other intervention costs' were aggregated across agencies, costs in the usual-care arm were estimated to be highest.

One children's centre was identified as a potential outlier with maximum costs incurred by the centre estimated at £1800. However, when this centre was removed, costs in the usual-care arm still remained higher than in the IPB-only or IPB+ arms (mean £254.25 with a maximum per cluster of £792.00) because of the fire safety sessions run by children's centres being, on average, longer in duration and more staff intensive *Table 119*. The distribution of costs by cluster within a trial site is presented separately in *Figure 64* for each of the intervention arms.

Table 126 presents the results of the cost-effectiveness analysis comparing the IPB-only and IPB+ arms with usual care. As stated in the methods section, the inverse of the difference in the probabilities of having a fire escape plan, say between IPB only and usual care, is equal to the NNT and therefore the cost-effectiveness ratio can be interpreted as the cost per additional fire escape plan under the intervention. The results of the analysis ignoring the effect of clustering, covariates and correlation between costs and effects show that IPB only is less costly and only marginally more effective than usual care, resulting in an ICER of –£1260 per additional fire escape plan, whereas IPB+ is more costly and only marginally more effective than usual care, resulting in an ICER of £616.13 per additional fire escape plan. It can be observed that, when allowing for the effect of clustering and correlation between costs and effects, the uncertainty is reduced.

In a sensitivity analysis, the children's centre with the potentially outlying cost (as noted above) was removed from the analysis (see *Table 126*). The resulting ICERs were –£53.01 for the IPB-only group compared with usual care and £3778.55 for the IPB+ group compared with usual care. Cost-effectiveness

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TABLE 122 Costs of providing the IPB, training and facilitation (UK£, 2012)

Arm	Study centre	Number of families randomised	Number of children's centres	IPB printing and distribution cost (£)	IPB training session cost (£)	IPB facilitation cost (£)	Total cost per study centre (£)	Total cost per children's centre (£)	Total cost per family randomised (£)
Usual care	Bristol	100	3	0.00	0.00	0.00	0.00	0.00	0.00
	Newcastle	86	3	0.00	0.00	0.00	0.00	0.00	0.00
	Norwich	95	3	0.00	0.00	0.00	0.00	0.00	0.00
	Nottingham	89	3	0.00	0.00	0.00	0.00	0.00	0.00
IPB only	Bristol	101	3	152.50	0.00	0.00	152.50	50.83	1.51
	Newcastle	88	3	152.50	0.00	0.00	152.50	50.83	1.73
	Norwich	82	3	152.50	0.00	0.00	152.50	50.83	1.86
	Nottingham	98	3	152.50	0.00	0.00	152.50	50.83	1.56
IPB+	Bristol	102	3	152.50	1328.95	327.84	1809.29	603.10	17.74
	Newcastle	87	3	152.50	1408.84	220.57	1781.91	593.97	20.48
	Norwich	93	3	152.50	1488.74	127.90	1769.14	589.71	19.02
	Nottingham	91	3	152.50	1568.63	84.74	1805.87	601.96	19.84

TABLE 123 Summary of the fire safety activities at children's centres

Fire safety activity summary	Trial arm		
	Usual care	IPB only	IPB+
Proportion of children's centres that ran fire safety sessions	5/11[a]	7/12	11/12
Of those that ran fire safety sessions			
Mean number of fire safety sessions (min. to max.)	1.2 (1 to 2)	2.1 (1 to 4)	3.1 (1 to 7)
Mean session length (min. to max.)	116.25 (90 to 120)	90.25 (30 to 120)	89 (30 to 130)
Mean number of children's centre staff providing fire safety session (min. to max.)	4.25 (2 to 20)	2.03 (0 to 2)	3.34 (1 to 5)
Mean number of fire and Rescue Service staff providing fire safety session (min. to max.)	1.85 (1 to 5)	0.6 (0 to 2)	0.78 (0 to 6)
Proportion of children's centres that received other help from FRS staff	5/12	3/12	8/12
Proportion of children's centres that received visits from FRS staff	4/12	1/12	3/12
Proportion of children's centre staff attending fire safety training	6/11[a]	10/10[a]	3/12

FRS, fire and rescue service; max., maximum; min., minimum.
a The denominator is < 12 because of missing children's centre follow-up questionnaire data.

TABLE 124 Summary of fire safety activities attended by parents and home safety inspections

Fire safety activity and home safety inspection summary	Trial arm		
	Usual care, *n*/*N* (%)	IPB only, *n*/*N* (%)	IPB+, *n*/*N* (%)
Parents attending fire safety sessions	8/205 (4)	24/178 (13)	34/189 (18)
Parents who had a home safety inspection	23/202 (11)	34/201 (17)	45/146 (31)
Home safety inspection by[a]			
Children's centre	3/23	4/34	6/45
Fire and rescue service	10/23	16/34	24/45
Other agency (e.g. council)	10/23	19/34	16/45

a Some parents reported having a home safety inspection by more than one provider.

acceptability curves for the base-case analysis and the sensitivity analysis removing the outlying children's centre are presented in *Figure 65*.

Table 127 shows the extent of the missing data within the cost components, which ranged from just under 50% (parental costs) to nearly 60% (children's centre costs). Because of the extent of the missing values, the results of the imputation analysis should be interpreted with caution.

Table 128 displays the results of the cost-effectiveness analysis based on the imputed data set. It can be observed that the average total costs per family and thus the differences between the arms are broadly similar to those in the primary (non-imputed) analysis reported in *Table 126*. For example, in the imputed

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TABLE 125 Other intervention costs expressed per cluster (i.e. children's centre) and per family

	Usual care, mean (min. to max.)		IPB only, mean (min. to max.)		IPB+, mean (min. to max.)	
Cost components	**Per cluster**	**Per family**	**Per cluster**	**Per family**	**Per cluster**	**Per family**
Number of clusters/ families	9	151	9	140	9	123
Fire safety sessions (£)						
Children's centre costs	421.00 (0.00 to 1800[a])	13.72 (0.00 to 62.07)	63.00 (0.00 to 198.00)	2.06 (0.00 to 7.07)	222.00 (0.00 to 900.00)	7.63 (0.00 to 32.14)
FRS costs	74.38 (0.00 to 378.00)	2.57 (0.00 to 13.03)	68.66 (0.00 to 288.00)	2.20 (0.00 to 9.60)	136.49 (0.00 to 372.00)	4.38 (0.00 to 11.63)
Parental costs to attend sessions	2.59 (0.00 to 22.85)	0.15 (0.00 to 22.85)	9.15 (0.00 to 22.85)	0.59 (0.00 to 17.14)	14.83 (0.00 to 62.32)	1.09 (0.00 to 35.18)
Home safety inspections (£)						
Children's centre costs	3.41 (0.00 to 15.33)	0.20 (0.00 to 15.33)	6.81 (0.00 to 30.66)	0.44 (0.00 to 15.33)	8.52 (0.00 to 30.66)	0.62 (0.00 to 15.33)
FRS costs	13.63 (0.00 to 30.66)	0.76 (0.00 to 15.33)	13.63 (0.00 to 30.66)	1.07 (0.00 to 15.33)	22.14 (0.00 to 76.65)	1.62 (0.00 to 15.33)
Other agency costs	10.22 (0.00 to 45.99)	0.61 (0.00 to 15.33)	22.14 (0.00 to 45.99)	1.42 (0.00 to 45.99)	15.33 (0.00 to 45.99)	1.12 (0.00 to 15.33)
Total (£)						
Other intervention costs	303.01 (30.66 to 1367.67)	18.06 (0.00 to 90.43)	117.87 (45.89 to 210.58)	7.58 (0.00 to 45.06)	224.97 (110.66 to 497.62)	16.46 (2.70 to 51.33)
IPB provision, training and facilitation costs plus other intervention costs	303.01 (30.66 to 1367.67)	18.06 (0.00 to 90.43)	143.68 (62.51 to 240.22)	9.24 (1.51 to 46.79)	507.81 (290.26 to 859.92)	37.16 (21.18 to 79.20)

FRS, fire and rescue service; max., maximum; min., minimum.

a Possible outlier [reported 20 children's centre staff + five FRS staff providing a 'fun day' (cluster 6, usual-care arm)] – when this cluster is removed the mean is reduced to £254.25 with a maximum per cluster of £792.00.

Note

Complete data on costs available for nine clusters per arm. The number of families represents the number of families with complete data within the nine clusters per arm.

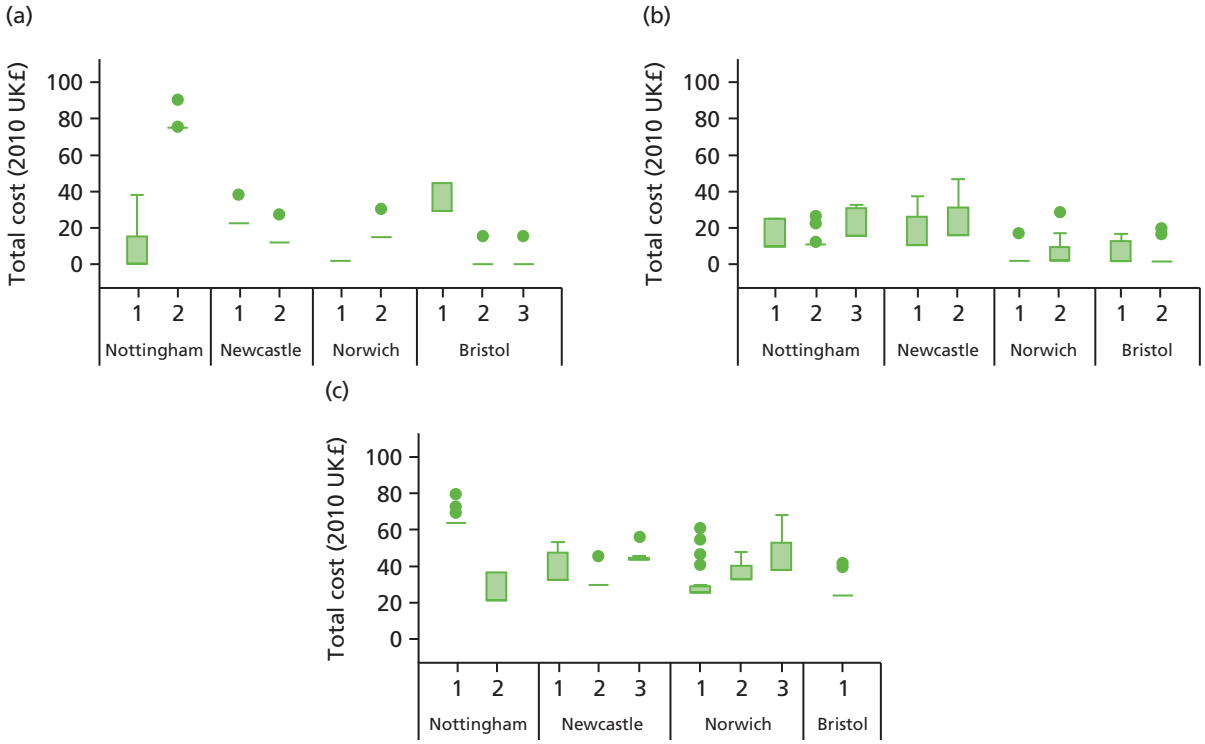


FIGURE 64 Plot of total costs per family (2010 UK£) by cluster (i.e. children's centre): (a) usual care; (b) IPB only; and (c) IPB+. Boxes represent the lower and upper quartiles around the median, lines represent the lower and higher extremes, and dots represent outliers.

TABLE 126 Cost-effectiveness analysis results for the complete-case data set

Description	Trial arm			IPB only vs. usual care	IPB+ vs. usual care
	Usual care	IPB only	IPB+		
Number of families	151	140	123		
Number of children's centres	9	9	9		
'Naive analysis' (ignoring clustering, covariates and correlation between costs and effects)					
Mean cost per family (95% CrI) (£)	18.06 (0.00 to 75.10)	9.24 (1.51 to 29.84)	37.16 (21.18 to 63.87)	–8.82	19.10
Probability of having a fire escape plan	0.46 (r = 69/151)	0.46 (r = 65/140)	0.49 (r = 60/123)	0.007	0.031
ICER (£)				–1260.00	616.13
Analysis incorporating effect of clustering, covariates and correlation between costs and effects					
Mean cost per family (95% CrI) (£)	21.15 (3.95 to 38.31)	12.65 (4.66 to 20.03)	41.41 (31.58 to 52.41)	–8.49	20.26
Probability of having a fire escape plan (95% CrI)	0.48 (0.35 to 0.56)	0.49 (0.38 to 0.58)	0.48 (0.37 to 0.58)	0.03	0.02
ICER (£)				–275.31	1007.96
Sensitivity analysis omitting outlying cluster 6 in the usual-care arm (incorporating effect of clustering and correlation between costs and effects)					
Mean cost per family (95% CrI) (£)	14.99 (6.16 to 24.11)	13.26 (4.52 to 22.24)	39.97 (31.25 to 48.41)	–1.74	24.98
Probability of having a fire escape plan (95% CrI)	0.47 (0.34 to 0.51)	0.50 (0.37 to 0.64)	0.48 (0.34 to 0.62)	0.03	0.01
ICER (£)				–53.01	3778.55

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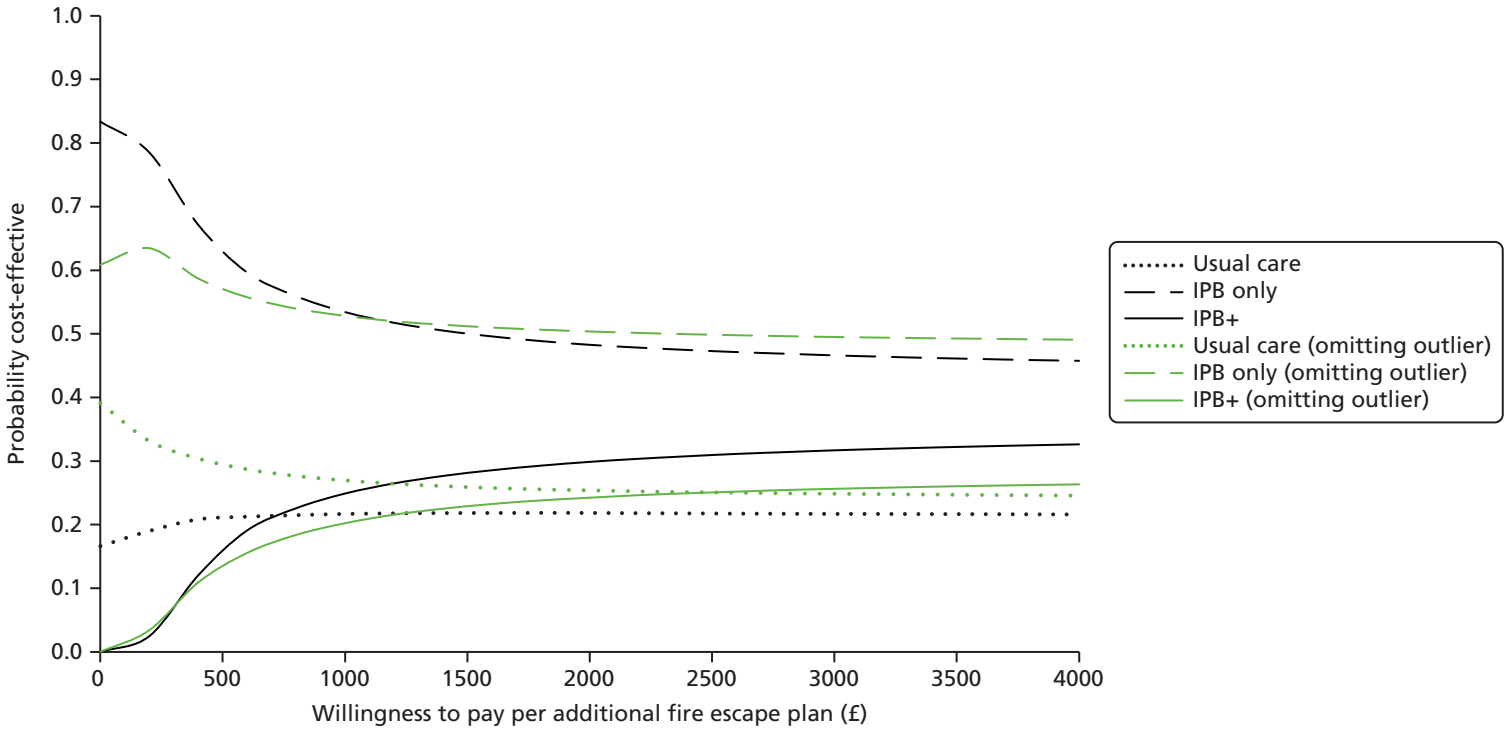


FIGURE 65 Cost-effectiveness acceptability curves: base-case (complete-case) analysis and complete-case analysis omitting the outlier.

TABLE 127 Cost component missing data description

Cost components	Complete (£)	Incomplete (imputed) (£)	Total (£)
Parental costs	563	549	1112
Fire and rescue service costs including HSI	510	602	1112
Children's centre costs including HSI	451	661	1112
Other agency costs including HSI	594	518	1112

HSI, home safety inspection.

TABLE 128 Results of the cost-effectiveness analysis for the imputed data set

Description	Trial arm			IPB only vs. usual care	IPB+ vs. usual care
	Usual care	IPB only	IPB+		
Number of families	370	369	373		
Number of clusters	12	12	12		
Cost per family (95% CI) (£)	19.21 (14.64 to 23.77)	10.80 (6.48 to 14.73)	43.01 (38.71 to 47.33)	–8.60	23.80
Probability of fire escape plan (95% CI)	0.44 (0.37 to 0.52)	0.44 (0.37 to 0.52)	0.58 (0.50 to 0.65)	–0.00	0.13
ICER				6447.53	177.61
Probability cost-effective at a WTP of £1000	0.02	0.02	0.96		
Probability cost-effective at a WTP of £2000	0.01	0.01	0.98		

data set the mean cost difference between the IPB-only arm and the usual-care arm is –£8.60, whereas in the complete-case data set it is –£8.49; similarly, in the imputed data set the mean cost difference between the IPB+ arm and the usual-care arm is £23.80, whereas in the complete-case data set it is £20.26. The probability of a fire escape plan was similar to that in the primary analysis for the usual-care arm, but it decreased from 0.49 to 0.44 for the IPB-only arm and increased from 0.48 to 0.58 for the IPB+ arm. These changes mean that the point estimate for the difference in effectiveness between the IPB-only arm and the usual-care arm is now fractionally negative, which makes the ICER positive. Note that these results should be interpreted with caution because of the large proportion of missing data imputed, ranging from just under 50% for parental costs to nearly 60% for children's centre costs.

Incorporating findings from the trial into the development of a second injury prevention briefing

Four workshops were held with users of the fire prevention IPB and potential users of a future IPB. The numbers that were invited and who attended each workshop are shown in *Table 129*.

The key findings from the workshops were:

- activities need to be designed in ways that help parents think about their situations and possible solutions, rather than just telling them what to do
- activities need to be flexible and adaptable by users of the briefing to accommodate their opportunities and the capabilities of their client groups
- separate information for managers is not needed

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TABLE 129 Numbers of delegates attending IPB workshops by location

Location	Number invited	Number attending
Bristol	10	6
Newcastle	38	15
Nottingham	25	7
Norwich	27	8
Total	100	36

- advice on how to obtain local data is needed
- information on the non-financial consequences of injury and, when known, the cost-effectiveness of interventions should be included
- a short section highlighting the needs of parents and children with disabilities would be helpful
- all injury topics should be covered in one document, with a front section on child development, anticipatory guidance, common risk factors, etc., followed by self-contained activities and, finally, detailed information on each type of injury.

These findings were incorporated into the design of the IPB covering the prevention of fire-related injuries, falls, poisonings and scalds. The IPB is shown in *Appendix 6*, *Injury prevention briefing 2* and is available to download from www.nottingham.ac.uk/research/groups/injuryresearch/projects/kcs/index.aspx (accessed 1 November 2016).

Discussion

Main findings

A complex intervention to change behaviours to improve fire safety in the home was developed using the MRC complex interventions framework.[469] Data from a series of studies undertaken earlier in the KCS programme, interviews with stakeholders and workshops with practitioners were used to develop an IPB for the prevention of fire-related injuries and a training and facilitation package to support its implementation in children's centres. The implementation of the IPB was tested using a RCT (study M) with an economic evaluation and nested qualitative study. A further IPB covering the prevention of fire-related injuries, scalds, falls and poisonings was subsequently developed using data from all component elements of the KCS programme.

The three-arm trial, which compared IPB+, IPB only and usual care, found that families in either intervention arm were not significantly more likely to report having a fire escape plan than usual-care arm families (AOR IPB vs. usual care 0.93, 95% CI 0.58 to 1.49; AOR IPB+ vs. usual care 1.41, 95% CI 0.91 to 2.20). However, families in both intervention arms reported significantly more behaviours that were component elements of fire escape planning (AOR IPB vs. usual care 2.56, 95% CI 1.38 to 4.76; AOR IPB+ vs. usual-care 1.78, 95% CI 1.01 to 3.15). Families in the IPB-only arm reported significantly more bedtime fire safety practices (AOR for a 1-unit increase in the number of bedtime fire safety routines 1.59, 95% CI 1.09 to 2.31) and were significantly less likely to report that their children had been found playing with matches or lighters (AOR 0.27, 95% CI 0.08 to 0.94) than families in the usual-care arm.

Families in the IPB+ arm were significantly more likely than usual-care arm families to report receiving advice on each of the five key safety messages in the IPB, whereas, although the proportion who reported receiving advice was higher in the IPB-only arm than in the usual-care arm for most messages, it was not significantly higher. The proportion receiving advice on the five key messages ranged from 21% in the IPB+ arm, 12% in the IPB-only arm and 10% in the usual-care arm for advice on bedtime safety routines

to 43%, 34% and 24% for advice on smoke alarms, respectively. Families in both intervention arms were significantly more likely to report attending a fire safety session than usual-care arm families; most of these sessions were delivered at children's centres.

All children's centres in the IPB+ arm and 58% of children's centres in the IPB-only arm developed a plan for implementing the IPB. More children's centres in the IPB+ arm provided advice on each of the five key messages and ran sessions on each of the five key messages than IPB-only children's centres, but the numbers were too small to allow for statistical analysis. Data from the qualitative study supported the finding that IPB+ children's centres showed greater implementation of the IPB than IPB-only children's centres and that children's centres found the IPB and the facilitation package relevant and useful.

The economic analysis, which was conducted from a societal perspective including costs incurred by the family, children's centre, fire and rescue service and other agencies that provided home safety inspections, showed that the IPB-only intervention dominates usual care as it is both less costly and marginally more effective, whereas the IPB+ intervention is more costly but only marginally more effective than usual care.

Strengths and limitations

The intervention that we developed was theoretically based and used the MRC complex intervention framework and evidence generated from numerous studies within the KCS programme. Our evaluation included a thorough assessment of the implementation of the intervention, used mixed methods and incorporated an economic evaluation. The treatment arms appeared well balanced at baseline, recruitment exceeded our required sample size, losses to follow-up were as estimated in our sample size calculation and the retention rate was similar across treatment arms. Findings from the multiply imputed data set were very similar to those in the complete-case analysis for the main analysis and the economic analysis.

Although we found evidence of implementation of the IPB, it is clear that the five key safety messages did not reach all families in either intervention arm (67%, 59% and 47% of families did not receive information on any of the messages in the usual-care arm, IPB-only arm and IPB+ arm, respectively). It is possible that greater implementation of the intervention may have achieved greater behavioural change. The qualitative study provided insight into possible explanations for the limited implementation. All children's centres described major current, imminent or recent restructuring, which made it hard to deliver services and implement health promotion messages, including the IPB. Staff changes, budget constraints and staff capacity to take on additional tasks also limited implementation. Some centres found it difficult to prioritise fire safety over other health promotion topics because of a lack of local statistics to demonstrate local need. Centres had difficulty in delivering specific fire safety 'sessions', with poor parental attendance because of competing or more urgent issues or life changes for parents, frequent moves or children's illnesses. Some centres found engaging parents in fire safety education difficult because of a perceived lack of relevance, perceptions that the information was already known, fear of being patronised or peer pressure. However, once parents were 'through the door', staff were frequently surprised by the depth of their engagement. Implementation was more effective when integrated into existing sessions. Trial procedures introduced additional demands for the children's centre staff around data collection.

The finding that a significantly higher proportion of families in both intervention arms than in the usual care arm belonged to the 'more fire escape behaviours' group, without a significant difference in the proportions reporting having a fire escape plan, requires further exploration. The study questionnaire defined a fire escape plan as '. . . a plan of what you would do to escape from the house if a fire broke out or the smoke alarm went off'. As a result of structured parent interviews earlier in the programme we added questions covering some of the elements of a fire escape plan, which the IPB provided advice on (knowing the sound of a smoke alarm, having a torch beside the bed, having door and window keys accessible, having clear exit routes). These were combined into a composite secondary outcome measure categorised as 'more fire escape behaviours' or 'fewer fire escape behaviours'. Our trial findings suggest that it may not be useful to use a single-item question to measure possession of a fire escape plan. Further work will explore responses to open questions about actions that families would take if they could smell

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smoke and/or the smoke alarm was sounding and how these relate to the single-item question on having a fire escape plan. Our primary and most of our secondary outcome measures were self-reported by parents or children's centre staff. Participants (parents or children's centre staff) could not be blinded to treatment arm and hence there was the potential for outcome detection bias.

Our finding that providing the IPB without facilitation cost less than usual care appears counterintuitive. A potential explanation is that session plans provided in the IPB allowed children's centres to deliver more focused sessions that required fewer staff. We found that the intervention arms provided sessions of a similar length using a similar number of staff for delivery, and that both intervention arms provided shorter sessions using fewer staff than the usual-care arm. It is acknowledged that the intervention cost component of the cost-effectiveness analysis is subject to the size of the target population (i.e. the number of children's centres). Although we excluded IPB developmental costs from the cost-effectiveness analysis, we did include printing and distribution costs for the IPB and facilitator training costs. However, we would expect the latter costs to decrease as the target population increased because of economies of scale for printing and training, etc., which would potentially make the IPB+ intervention more cost-effective.

Our trial had three arms and multiple secondary outcome measures, leading to multiple significance testing and the potential for type 1 errors. Many of the effect estimates for the secondary outcome measures, especially at the level of children's centres, were imprecise because of small numbers. We were unable to fit the imputation model without getting error messages if we included cluster as a categorical variable, and so clustering has not been taken into account in the imputation model, although cluster was accounted for in the analysis. There is some evidence that multiple imputation with a classical logistic regression (not accounting for clustering) can provide unbiased estimates of the intervention effect.[494] In addition, our use of multiple imputation assumes that data are missing at random, which may not be the case, in particular for participants who did not respond at 12 months, as discussed in the following paragraph. In addition, there were a large number of missing cost data in the economic analysis and, although the results using multiple imputation were similar to those from the complete-case analysis, caution must be taken in interpreting these findings.

We used strategies to minimise losses to follow-up and retained sufficient participants to meet our sample size requirements, but there was some evidence that families retained in the trial were less disadvantaged than those lost to follow-up. Following up participants was challenging and resource intensive because of household moves, families no longer using the children's centre and changes in mobile phone numbers. The ongoing national evaluation of children's centres has found that most children's centre services were used by families for < 1 year.[495] Under these conditions, it is difficult to achieve high levels of penetration of the intervention, to deliver multiple safety messages or to reinforce the same message and to achieve high follow-up rates. Higher follow-up rates may have been achieved through the use of a repeated outcome measurement, but this has to be weighed against the burden that this places on participants, particularly those from disadvantaged communities. Despite differential loss to follow-up, those retained in our trial still represented a population experiencing substantial disadvantage.

All children's centres were retained in the trial. Most (89%) children's centres participating in the trial were phase 1 centres in the most disadvantaged areas, so our findings should be generalisable to other children's centres in similar areas. Participants (children's centres or parents) may differ from non-participants in terms of interest in fire prevention and this may limit generalisability. Attenders at children's centres are likely to differ from non-attenders and few participants came from a black or ethnic minority group or had English as a second language. Our findings are therefore likely to be generalisable to the predominantly white British, English-speaking population of children's centre attenders.

Comparisons with existing research

We were unable to find any published evaluations of injury prevention interventions delivered by children's centres. Sure Start Local Programmes (SSLPs) were the forerunners to children's centres, aiming to improve health and well-being of families and young children. They provided integrated early education, child care,

health care and family support services in disadvantaged areas. The National Evaluation of Sure Start (NESS)[214] followed up > 9000 families and children in 150 SSLPs, comparing outcomes with those in families and children in the Millennium Cohort Study (MCS) living in similarly disadvantaged areas without SSLPs. At the age of 3 years, children in SSLP areas had a significantly lower accidental injury rate than those in the non-SSLP areas. SSLP area families used more child and family-related services than those in non-SSLP areas. The authors note that differences in injury rates may reflect temporal trends because of non-equivalent data collection periods for SSLP and MCS families. A further evaluation when children reached the age of 5 years included > 7000 randomly selected families (from the 9000 used in the 3-year evaluation) and found no significant difference in the injury rate between families in SSLP areas and MCS families in non-SSLP areas.[496]

Children's centres are currently being evaluated nationally in a multicomponent 6-year study [Evaluation of Children's Centres in England (ECCE)], which has yet to report its main findings. The first strand of the ECCE surveyed children's centre leaders from approximately 500 centres to characterise children's centres and the services that they provide.[212] The proportion of children's centres in the most deprived areas led by local authority staff was similar to that found in our trial (72% vs. 81%, respectively). Findings from the most deprived areas in the ECCE were similar to those from our trial in terms of lone parent families (19% vs. 18%, respectively), families with only one child (47% vs. 51%, respectively) and families living in rented accommodation (48% vs. 54%, respectively). The proportion of white British families in the ECCE was lower than in the trial (70% vs. 95%, respectively). Fewer parents in the ECCE reported having received home safety advice than at baseline in our trial (15% vs. 69%, respectively), but this may reflect differences in the questions asked in the two studies. The proportion of families reporting having a smoke alarm on every floor of their home was similar in the ECCE and in the trial at baseline (79% vs. 74%, respectively), but more ECCE families had tested their smoke alarms in the last 6 months than families in the trial (69% vs. 40%, respectively).[495] Our trial population was therefore broadly similar to families using children's centres in the most disadvantaged areas of the country with the exception of the trial population being more likely to be white British, more likely to have received home safety advice at baseline and possibly displaying fewer fire safety behaviours.

The ECCE survey[212] also found that children's centres were operating in a changing environment, with 40% experiencing recent cuts in services or staffing and many leaders managing two or more centres. This echoes the findings from our interviews with children's centre staff, who frequently reported difficulties with implementing the IPB because of reorganisations, staff changes and loss of staff members. The second strand of the ECCE, a survey of 5700 parents,[495] showed varied patterns of children's centre use by parents. Some families were only limited users of services (19%), some used many children's centre services and activities (38%) and some showed no clear pattern of service use (43%). Our finding that children's centre staff reported low levels of parental attendance at fire safety sessions may reflect the ECCE findings that most parents are not frequent users of children's centre services. In addition, the ECCE found that only 8% of parents had used home safety advice or courses provided by children's centres. This may indicate a lack of prioritisation and provision of injury prevention by children's centres [as found in our national surveys (study D) in work stream 3; see *Chapter 4*], coupled with less parental interest in home safety compared with other children's centre services.[495] Consistent with these findings, children's centres in our trial reported difficulties in prioritising injury prevention and a lack of parental interest in the subject. We found in work stream 4 (study G; see *Chapter 5*) that some parents failed to anticipate injury-producing events or the injuries that they could result in. Previous research suggests that perceived susceptibility to injury is important for safety behaviour change.[479] Although the activities in the IPB were aimed at raising parents' perceptions of susceptibility, this will have required parents to perceive their families as sufficiently susceptible to have participated in fire safety activities provided by children's centres. Future studies and injury prevention programmes may achieve greater changes in safety behaviour if they incorporate activities aimed at enhancing parents' perceived susceptibility to injury prior to commencement of the study or programme, as well as during the programme.

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The challenges of delivering evidence-based programmes within children's centres were explored in questionnaires and interviews with staff in 121 children's centres in the ECCE evaluation. The evaluation found widespread use of evidence-based programmes, particularly parenting programmes, but children's centre staff 'appeared to struggle with the concept of evidence-based practice. Some gave equal weight to research evidence and personal experience' (p. 56).[211] Tension was also reported between maintaining programme fidelity and offering potentially less demanding programmes for families.[211] In addition, only a small number of families were reached by the best-evidenced programmes.[211] These findings share some similarities with those from our trial. Fewer than 50% of families received each of the key safety messages in the IPB and < 20% attended fire safety sessions. Children's centres reported that it was easier to incorporate fire safety messages into existing activities than run specific fire safety sessions. As in the ECCE, this may have resulted in a reduction in intervention fidelity, as activities are likely to have been adapted and shortened. Our implementation fidelity interviews showed that most children's centres, particularly those receiving training and facilitation, undertook a range of activities to implement the IPB. This suggests that children's centres can provide evidence-based injury prevention if provided with the resources and support to do so. However, greater behavioural changes may be achieved if intervention penetration could be increased and if intervention fidelity could be enhanced.

Chapter 8 Patient and public involvement

Patient and public involvement (PPI) underpinned the KCS programme from its inception to its conclusion. The main contributor to PPI was an experienced lay researcher who had worked with members of the KCS programme team on previous child safety projects. In addition, other parents with young children advised the project on the design of some of our data collection tools. This chapter describes the extensive PPI involvement provided by the lay research adviser over the 7 years from when the project was designed to its completion.

Our lay research adviser attended multicentre 3-monthly project management group meetings and 6- to 8-weekly KCS programme meetings with the Nottingham team. Each of these meetings had a specific PPI agenda item to which the lay research adviser spoke. In addition, she contributed to all other discussions at these meetings and provided a lay perspective to the decision-making process. Over time, she contributed increasingly to the evolution of the KCS programme, finding her work enjoyable and a useful learning experience. She feels that she was able to add a personal perspective, looking at processes from a parent's point of view. As one member of the research team commented:

> *She brought a much needed different perspective and voice to the team . . . she was very good at challenging and questioning – this brought greater understanding.*

During the design of the project, the lay research adviser advised on study design, particularly in relation to strategies for participation recruitment and retention. She contributed to drafting the grant proposal, particularly to the sections on PPI involvement and dissemination, but also by commenting on other sections of the application. Early in the KCS programme the PPI input involved commenting on protocols, advising on detailed recruitment and retention strategies and working on invitation letters and information leaflets, questionnaires and a lay summary of the programme for the KCS programme website. She was able to assess the tone, readability, font and content of the documents, making sure that they were written in plain English. This was of great value to the team, as this quotation from one team member illustrates:

> *It was really helpful to have the involvement of someone who was able to translate our jargon into plain language.*

The lay research adviser attended NIHR training on patient information for parents and children, in-house training on research methods and on undertaking home observations for study B and the training for children's centres for using the IPB for the RCT in study M. She also drafted reports on PPI input for interim reports and drafted this section of the final report. She received payment for her time and involvement in the project in line with local and INVOLVE policies on consumer/lay involvement (www.invo.org.uk/posttypepublication/involve-policy-on-payments-and-expenses-for-members-of-the-public-including-involve-group-members-february-2016/).

The lay research adviser made substantial and important contributions to studies A, B, G and M in the KCS programme. She has described her input in the following sections.

Study A (piloting of case–control questionnaires)

> *I visited a local Nottingham children's centre with a researcher for the purpose of piloting questionnaires with parents. I established a good bond with parents and when the questionnaires were returned, they were all from parents that I had spoken to. One of the parents was particularly interested in being involved further with the study. With my support, she went on to provide feedback on a follow-up questionnaire at a later stage in the study. She was able to represent the views of a significant ethnic minority in the area and also had two young children.*

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As the researcher who accompanied her on this occasion commented:

> *She was able to engage participants in the community to take part piloting study tools and had a better response than the researcher present at the same session.*

Study B (validation of tools used to collect data)

> *After some initial study specific training, checking my 'letter of access' with the Human Resources department and of course contributing to and becoming familiar with the questionnaire, I embarked on a series of some 25 joint home visits with a researcher. The roles of leader and recorder were shared over the course of visiting. I was keen to make sure that we had a good sample of parents from ethnic minorities and kept this firmly on the agenda. I was able to share views about what it would be like to have a researcher coming into your home and what was required to help set up visits in a way that would encourage parents to engage openly with the research team.*
>
> *The first contact was very important in order to gain a rapport with the parent – to have a friendly disposition and understand that the parent may be having a bad day. The parent may need to be reassured that it was fine if their child woke up and their attention was diverted. Sometimes participants were nervous about our visit, but I was able to reassure them. Joint visiting diffused the tension, avoiding the intensity of a one-to-one and, as a lay research advisor, I was able to put parents at their ease with friendly remarks and by taking an interest in them. I reassured them that they were not being 'checked up on'. Some parents seemed embarrassed because the house was untidy and I empathised with them about this. If their child had previously had an accident, for example had fallen downstairs, they were understandably sensitive. I was able to empathise without giving direct advice.*
>
> *The data sheet completed, we left the parent after giving them a safety leaflet. We parked some distance from the home and double checked the data (for example on the issue of storing things at adult eye level, which can be difficult with people of different heights, but deciding that the participant's eye level was the correct marker). We documented any additional field material and I received positive feedback on the legibility of my writing!*

The researcher who undertook these home observations with our lay research advisor commented that:

> *She was involved extensively in study B. Her attendance at the home visits was valuable not only for the process of data collection, but also in diffusing the tension around asking participants to show us, for example, where they stored medicines and other potentially harmful substances, and other aspects related to home safety about which they could feel uncomfortable. Having been initially daunted at the thought of conducting such visits I am impressed at how smoothly they went, and our lay research advisor's sensitivity helped in their successful facilitation.*

Study G (interview study of parents to identify barriers to, and facilitators of, injury prevention)

> *I contributed by reading and commenting on transcripts of interviews and themes using experience I had acquired being part of a previous qualitative study. I felt that I was able to add another dimension to the analysis.*

This quotation from one of the research team indicates the lay research advisor's contribution to the analytical process:

> *Her feedback helped to ensure an objective approach was taken to the data analysis.*

Study M (interview study of parents in children's centres about safety practices)

> *I interviewed parents at children's centres in several areas of Nottingham, exploring fire safety practices of the parent/carer of 0–4 year olds. I felt that the parents responded well, and I allowed them time to explain fully about related issues that were on their mind (for example one parent had experience of a fire).*

Her contribution is summarised by one researcher as follows:

> *She was able to make members of the public comfortable so that they felt at ease at asking questions about the study.*

Study M (randomised controlled trial of the injury prevention briefing)

> *I was involved in the development of written material, information and consent forms, recruitment of parents for questionnaires at several children's centres. Further on in the study I supported a parent from a different ethnic background to contribute to the development of a follow-up questionnaire. More recently I made many phone calls and sent extra follow-up questionnaires to parents, noting any changes of address. I felt that this encouraged the favourable response rate achieved.*

Regarding involvement in study M one researcher commented:

> *Our lay research advisor was able to assist with recruitment to the study, making potential study participants feel comfortable by explaining the study in a straightforward and understandable way.*

Our lay research advisor has also played a major role in the dissemination of study findings. She contributed to Child Safety Week activities at the local hospital to raise awareness of the KCS programme to potential participants. She had a poster presented at the 11th World Conference on Injury Prevention and Safety Promotion in October 2012 and at the Society for Academic Primary Care conference in July 2013. The highly visual poster, entitled 'Improving injury prevention research through PPI – towards working in partnership', highlighted the importance of PPI involvement in the KCS programme, with photographs showing her in different roles, for example visiting a children's centre, looking at a medicine cupboard, reading a report and attending a team meeting (*Figure 66*).

In addition, she was a valued member of the Nottingham KCS programme team during Mayfest, an annual free open day for the community and alumni and friends of Nottingham University. She helped to staff the presentation stand, which involved parents and children in 'hands-on' activities promoting the home safety messages arising from the KCS programme. The lay research advisor was pivotal in producing a leaflet to provide participants with feedback on the findings from studies A and G (*Figure 67*). This involved framing the messages that we wanted to put across in a parent-/carer-friendly way to help encourage participants to read and absorb the information. She was also active in producing a dedicated website providing fuller participant result information [available at www.nottingham.ac.uk/go/safe (accessed 2 November 2016)]. Feedback from the research team indicates that:

> *Her involvement is fundamental in disseminating research findings to the public, ensuring that whilst they should be communicated in an accessible way, we should be wary of dumbing down.*

To summarise, PPI has played a major role in the KCS programme and the impact of this can be seen in a number of areas including the recruitment of participants, the achievement of high follow-up rates, the formulation of parent-friendly study material and the dissemination process.

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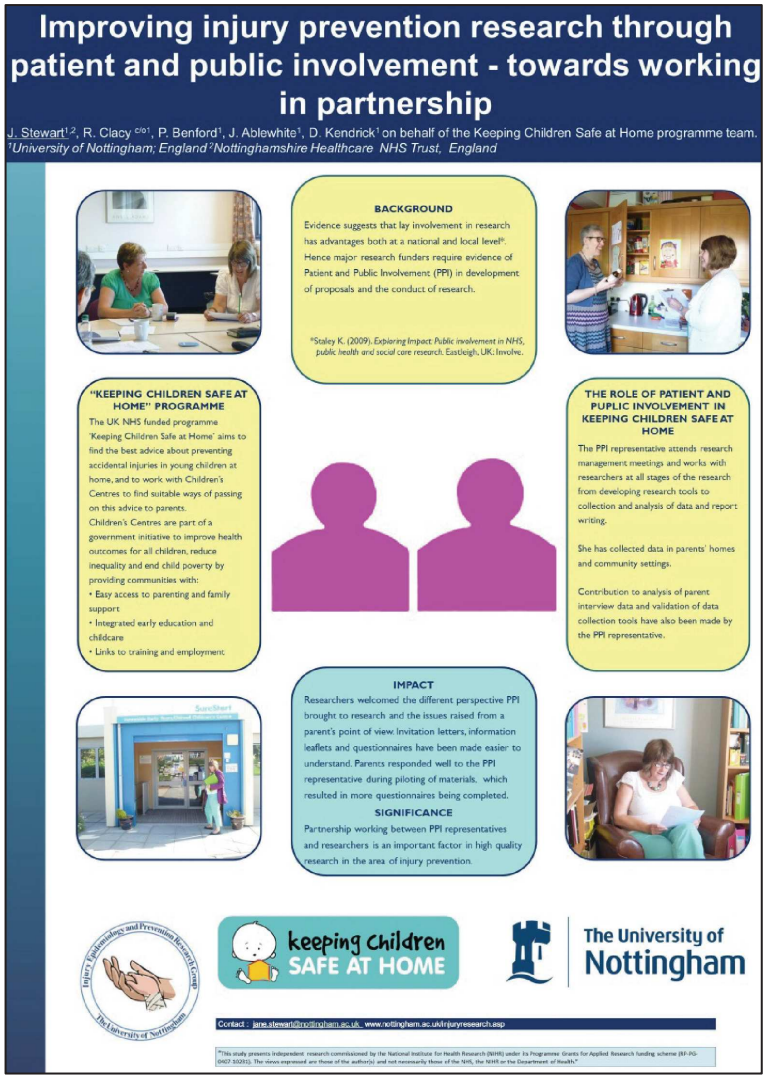


FIGURE 66 Improving injury prevention research through PPI poster.

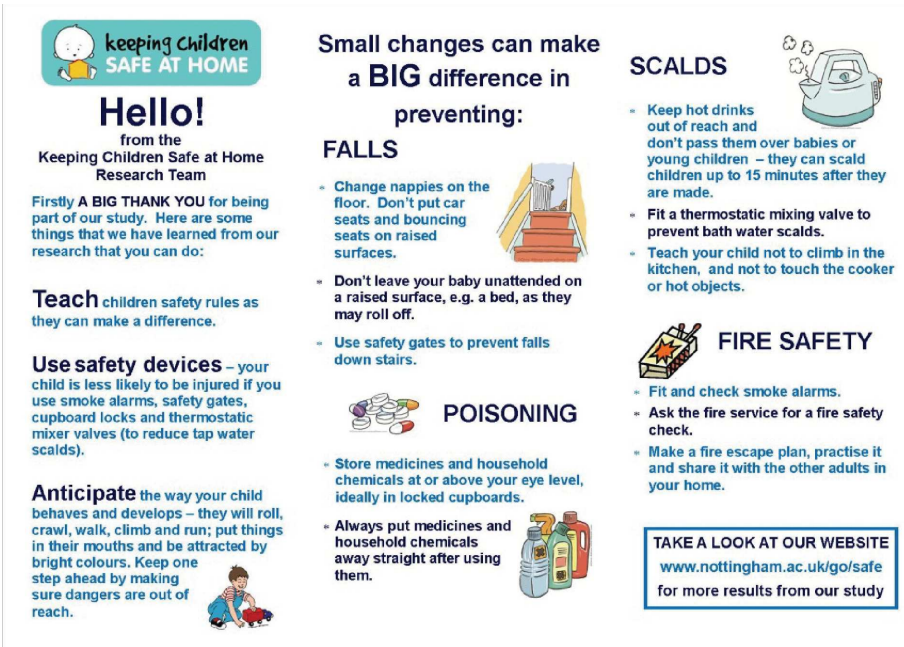


FIGURE 67 Leaflet containing findings from studies A and G.

Chapter 9 Overall conclusion

The KCS programme addressed the issue of childhood injuries occurring in the home through 13 interlinked studies, involving both quantitative and qualitative methods and including the perspectives of families, children's centre staff, health professionals and other stakeholders with an injury prevention role. The studies took place in four sites throughout England, including both urban and rural locations and a diverse range of social areas. PPI has underpinned this research.

The research undertaken within the KCS programme generated new evidence about what works to prevent home injuries in children and the cost of such injuries, explored injury prevention practices by parents and children's centres, reviewed and narratively synthesised and meta-analysed existing data, assessed the cost-effectiveness of a range of interventions and developed and tested an injury prevention intervention (an IPB for the prevention of fire-related injuries and training and support to implement the IPB) using a RCT. Finally, the findings from all work streams were used to develop a further IPB covering the prevention of fire-related injuries, scalds, falls and poisonings.

The KCS programme also advanced methodological approaches in the field of child home injury prevention, which will have applications in evaluating other public health interventions. This included a range of developments to NMA to simultaneously incorporate aggregate and individual participant data, adjust for baseline risk, explore effect modifiers and evaluate evidence on multiple outcomes across different networks. The IPB was developed using innovative methods to bring together evidence of effectiveness with practitioner experience of implementing interventions. The RCT evaluating the IPB incorporated a comprehensive assessment of implementation of the intervention rarely seen in child injury research, adding to our understanding of factors aiding successful implementation.

Patient and public involvement

Throughout the programme, from its design and original funding application to producing the final report and undertaking dissemination activities, we have worked collaboratively with an experienced lay research adviser (see *Chapter 8*). Her role developed over the course of the programme, with increasing involvement in developing and piloting study documentation and tools, undertaking data collection, participation in analysis, presenting her work at conferences, writing for publication, producing written feedback and website information for families who participated in the programme, drafting the lay summary of the final report and participating in dissemination events. We also had additional input from other lay advisers on the development and piloting of study tools.

Synergies

The KCS programme was much more than the sum of its parts. The synergies between the 13 component studies, with all studies informing at least one and often many other studies within the programme, allowed a very large body of work to be produced more quickly than would have been possible with individually funded research projects. It enabled the use of consistent approaches and the sharing of skills, resources and data between component projects. There are many examples of this within the programme and several are given here to illustrate this point. Conducting multiple overviews of reviews and systematic reviews simultaneously (studies E, H and I) allowed, when appropriate, studies identified in one review to be included in other reviews and simultaneous data extraction and risk-of-bias assessment. The collection of individual participant data for PMAs (study I) allowed the development of methods to incorporate individual participant data into NMAs (study J). Conducting five large case–control studies (study A) allowed the sharing of analysis plans and syntax files between studies, enabling consistency of analyses and reducing duplication of work. In addition, the KCS programme used simultaneous identification of

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participants for multiple studies (studies A–C and G), enhancing research efficiency and reducing costs. Importantly, the programme enabled learning from earlier parts to be efficiently incorporated into later parts. For example, the experiences of developing and evaluating the implementation of the IPB for the prevention of fire-related injuries (study M) allowed for the rapid development of a more comprehensive IPB, which also addressed the limitations of the first IPB.

Conclusions

The KCS programme aimed to increase evidence-based NHS thermal injury, falls and poisoning prevention by assessing risk and protective factors for these injuries, evaluating the effectiveness and cost-effectiveness of interventions to prevent these injuries, developing IPBs for effective and cost-effective interventions and evaluating the implementation of one IPB in children's centres.

Work stream 1 found that a range of risk factors were significantly associated with secondary care-attended falls from furniture, falls on stairs or steps, poisonings and scalds in children aged 0–4 years. Only two modifiable risk factors were significantly associated with secondary care-attended falls on one level in children aged 0–4 years.

Work stream 2 found that the PedsQL was a feasible and acceptable measure of HRQL in young children following injury, with adequate internal consistency reliability, the ability to discriminate between varying levels of injury severity and sequelae and evidence of responsiveness to change. Findings in respect of construct validity were equivocal. In terms of the health-care costs of injury, scalds had the highest mean total cost for ED attendances and admissions for observation. Poisonings had the lowest mean total cost for ED attendances and falls on one level had the lowest mean total cost for admissions for observation. The number of admissions requiring at least one overnight stay was too small to reliably estimate health-care costs. In terms of non-health-care costs, informal child care and time off work were the major contributors and could be considerable. Scalds had the highest mean non-health-care costs and falls on one level had the lowest mean non-health-care costs.

Work stream 3 found that most children's centres did not use an evidence-based strategic approach and child injury prevention appeared to be a neglected area within children's centres given the scale of the problem. To ensure effective injury prevention children's centres need support to plan, deliver and evaluate their activities, and centres would welcome such support.

Work stream 4 found a range of barriers to and facilitators of parents preventing child injuries in the home and those delivering injury prevention programmes. Many of these barriers and facilitators are addressable during the design of injury prevention interventions. The effect of addressing these barriers and facilitators on the degree of implementation of injury prevention programmes and on the outcomes of such programmes requires evaluation.

Work stream 5 found that some interventions were effective and some were both effective and cost-effective in promoting home safety and preventing fire-related injuries, scalds, falls and poisonings. More intensive interventions (e.g. those providing education and free or low-cost safety equipment and in some cases fitting equipment and providing home safety inspections) were more likely to be effective than less intensive interventions for promoting functional smoke alarms, having a safe hot water temperature, use of safety gates on stairs and the safe storage of medicines and household products. The most effective interventions were not necessarily the most cost-effective. Decision analyses were conducted from a public sector perspective and included costs incurred by different stakeholders including NHS and non-NHS organisations. However, analyses were limited to HRQL outcomes expressed in terms of QALYs and future studies may want to consider both welfare and quality of life more broadly (e.g. a cost–consequence analysis or a multicriteria decision-making approach), but thresholds would need careful consideration as it

is unclear whether or not a threshold of £30,000 per QALY gained is relevant to different sectors of the economy beyond health care.

Work stream 6 identified factors associated with successful implementation of health promotion interventions and incorporated this evidence, along with that from earlier work streams, into the development of an IPB for the prevention of fire-related injuries and a package of training and support to facilitate its implementation in children's centres. Providing children's centres with the IPB and a training and facilitation package to support its implementation, designed to address barriers to and facilitators of injury prevention, was effective in increasing some safety behaviours. Providing children's centres with the IPB alone was marginally more effective and cost less than usual care, whereas providing the IPB with support (IPB+) was marginally more effective but more costly than usual care. Findings from all work streams were used to develop a more comprehensive IPB for the prevention of fire-related injuries, scalds, falls and poisonings.

Dissemination and impact

The extensive programme of research undertaken within the KCS programme has synthesised existing evidence and generated new evidence about preventing fire-related injuries, scalds, falls and poisonings. It has developed and tested evidence-based resources for preventing child injury. Evidence generated by the KCS programme has already informed the evidence update for the NICE guidelines on strategies to prevent unintentional injuries in children and young people aged < 15 years,[26] Public Health England guidance for local authorities on reducing unintentional injuries in and around the home in children aged < 5 years[1] and the CMO's annual report for 2012.[11] In addition, it has informed local injury prevention strategies[497] and successful bids for home safety equipment schemes.[497,498]

We developed a standard operating procedure for communications and publications and a plan for dissemination of the KCS programme findings. These identified target audiences including:

- child health policy-makers
- child health commissioners
- child health and child care practitioners
- injury prevention practitioners
- voluntary sector, charitable and partner organisations such as the fire and rescue services
- study participants and the wider population of families with young children
- researchers.

We will use a wide range of methods to reach these audiences including:

- targeted audience-specific feedback for strategic bodies (e.g. Department of Health, Department for Education, Public Health England, strategic directors/directors of public health in local authorities, strategic directors in commissioning bodies), professional bodies (e.g. Faculty of Public Health, Royal College of Paediatrics and Child Health, British Association for Community Child Health, British Association for Child and Adolescent Public Health, Community Practitioners and Health Visitors Association) and other organisations (e.g. Local Government Association, Royal Society for Public Health, Association of Directors of Public Health, Association of Public Health Observatories, Injury Observatory for Britain and Ireland)
- articles in practitioner publications targeting local authorities, health commissioners and providers, voluntary organisations and the charity sector
- presentations at conferences for practitioner audiences
- articles for and newsletters to local authorities, health commissioners and providers, injury prevention practitioners and participants

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- peer-reviewed publications in academic journals in the fields of injury epidemiology and prevention, child health, public health, health promotion and research methods
- presentations at academic conferences
- existing distribution networks (Child Accident Prevention Trust, RoSPA, Kid Rapt, *Injury Prevention News*, etc.).

Dissemination activities to date include 37 peer-reviewed papers from the KCS programme, with a further one in press, 42 presentations at national conferences and nine at international conferences. There have been seven press releases about the KCS programme and its publications and 11 newspaper articles. Four dissemination events were held, one in each study centre, for children's centre staff and other groups with a child health or injury prevention role (e.g. health visiting team staff, fire and rescue service staff, local authority public health staff) to provide information on the findings form the KCS programme. A total of 166 people attended these events.

The IPB for the prevention of fire-related injuries, scalds, falls and poisonings is one of the key outputs of the KCS programme. It has been made freely available on the KCS programme website (see www.nottingham.ac.uk/research/groups/injuryresearch/projects/kcs/index.aspx) and will be widely disseminated to relevant audiences electronically. The IPB has also been provided (with training in how to use it) to the children's centres that participated in the RCT in the KCS programme. In addition, the KCS programme team secured external funding to provide the IPB (with training) for up to 180 health and child care staff in Nottinghamshire and 190 health and child care staff, fire and rescue service staff, voluntary sector organisations, early years professionals and health visiting students in Bristol. Furthermore, the Nottingham KCS programme team have secured funding for the injury prevention component of Nottingham CityCare Partnership's successful Big Lottery bid (Small Steps Big Changes programme) (www.nottinghamcitycare.nhs.uk/ssbc/). This project aims to provide systematic evidence-based injury prevention appropriate to the age and stage of development for all families with children aged 0–3 years in the most disadvantaged areas of the city. The IPB will form part of the intervention and will be provided with training to 200 health and child care professionals, voluntary organisations, peer supporters and graduates from the Family Nurse Partnership programme who will deliver the injury prevention programme. The project evaluation will be undertaken by a team of researchers, including some from the KCS programme.

The lay research advisor for the KCS programme has drafted web pages reporting the main findings from the KCS programme for the KCS programme website and leaflets describing the main findings and giving the address for those web pages. Leaflets are being mailed to > 9600 families who participated in the KCS programme. The Nottingham and Bristol KCS programme teams have participated in university open days for the public, providing information on findings from the KCS programme.

A guide for commissioners of child health services on preventing unintentional injuries to the under-fives has been produced in collaboration with the Child Accident Prevention Trust and disseminated to all directors of public health in England. The guide is available online (www.nottingham.ac.uk/research/groups/injuryresearch/documents/kcs-guide-for-commissioners.pdf).

Chapter 10 Implications for practice

This chapter brings together the implications for preventing home injuries in the under-fives arising from each of the work streams.

Work stream 1

If the associations estimated in our case–control studies represent causal relationships, some falls from furniture, falls on stairs or steps, poisonings and scalds may be prevented by incorporating home safety advice based on our findings into child health contacts. Such contacts could include child surveillance programme contacts (i.e. well-child visits in primary care), contacts following injuries in primary, secondary and tertiary care and injury prevention contacts such as home safety assessments or at referral for or fitting of home safety equipment. Similar advice could also be incorporated into personal child health records and other health promotion materials for parents of young children.

Work stream 2

There are no implications for practice from work stream 2.

Work stream 3

Our findings indicate that there is considerable potential for the development of the delivery of injury prevention activities by children's centres. Children's centre managers and staff are interested in preventing injuries and are motivated to deliver injury prevention activities. However, they need further support to develop injury prevention strategies and plan and implement prevention programmes and training and resources to deliver effective injury prevention activities.

Work stream 4

Those implementing injury prevention interventions need to take account of potential barriers and facilitators relevant to their specific context, intervention and population. Implementing interventions without addressing such factors is likely to lead to suboptimal outcomes.

Interventions designed for delivery by children's centre staff need to address children's centre priorities, be adequately resourced, include high-quality training and ongoing support for staff, be delivered by staff with effective communication skills, provide local injury data and encourage sharing of good practice, evaluation and reflective practice. Interventions need to be built on trusting relationships with families. They should be engaging for families, tailored to their needs and their child's stage of development, address socioeconomic barriers and be culturally sensitive. They should be based on models of behaviour change, provide clear and simple messages, limit the number of behaviours that they attempt to change and provide incentives for behaviour change.

Work stream 5

Injury prevention strategies and guidelines, and commissioners and providers of injury prevention services, can be informed by our findings, specifically that providing education plus free/low-cost smoke alarms is cost-effective for reducing house fire-related injuries; that education coupled with fitting free TMVs for

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families with young children living in social housing is cost-effective in reducing scalds; and that providing low-intensity education (e.g. leaflets) is cost-effective in reducing poisonings from medicines.

Work stream 6

Children's centres can effectively deliver injury prevention activities to families with young children living in disadvantaged communities if provided with evidence-based resources for this purpose (an IPB for the prevention of fire-related injuries). Providing children's centres with training and facilitation to implement the IPB can result in greater delivery of injury prevention activities than providing resources without training and facilitation.

Through using the IPB, children's centres can enhance some safety behaviours in families with young children living in disadvantaged communities. An IPB can be effective in increasing fire escape planning behaviours, reducing match play and increasing the number of bedtime fire safety practices. Providing training and facilitation to help implement the IPB can achieve greater implementation, but this approach may be less cost-effective than providing the IPB without facilitation.

The findings from all work streams in the KCS programme are summarised in a further evidence-based IPB for practitioners covering the prevention of fire-related injuries, falls, poisonings and scalds in the under-fives. This provides the evidence on effective interventions to prevent injuries and activities for use with parents addressing the key safety messages. The IPB is freely available from www.nottingham.ac.uk/research/groups/injuryresearch/projects/kcs/index.aspx.

The key messages from the KCS programme for commissioners of injury prevention programmes to consider and for practitioners to deliver to families for the prevention of fire-related injuries, scalds, falls and poisonings are shown in the following sections. These messages could be delivered as part of the Healthy Child Programme and be incorporated into the Personal Child Health Record and health promotion material for parents of young children. They could also be provided by health and child care practitioners during contacts following injuries and during injury prevention contacts such as home safety assessments or at referral for or fitting of home safety equipment.

General safety advice

- Children are less likely to be injured in households that use safety devices such as smoke alarms, safety gates, cupboard locks and TMVs (to reduce tap water scalds).
- Teaching children safety rules can reduce the risk of injury.

Preventing fire-related injury

- Fit and check smoke alarms.
- Home safety checks can help families to make homes safer. Ask the fire service for a fire safety check.
- Make a fire escape plan, practise it and share it with the other adults in the home.

Preventing scalds

- Keep hot drinks out of reach and do not pass them over babies or young children.
- Fit a TMV to prevent bathwater scalds.
- Teach children not to climb in the kitchen and not to touch the cooker or hot objects.

Preventing falls

- Change nappies on the floor and do not put car seats and bouncing seats on raised surfaces.
- Do not leave babies unattended on a raised surface, for example a bed, as they may roll off.
- Use safety gates to prevent falls downstairs and always close them after use.
- Cover stairs with carpet to reduce the risk of falls.
- Teach children rules about not climbing on objects from which they could fall.

Preventing poisoning

- Fit cupboard locks to cupboards where medicines and household chemicals are stored.
- Store medicines and household chemicals in locked cupboards or locked medicines boxes that are at or above adult eye level.
- Always put medicines and household chemicals away straight after using them.

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Chapter 11 Recommendations for research

The KCS programme makes the following recommendations for research.

Important recommendations for research

- Further intervention studies, preferably RCTs, to evaluate the effectiveness and cost-effectiveness of home safety interventions. These need to provide detailed descriptions of intervention and control arm treatments, and measure and report injury outcomes, home safety equipment use and safety behaviours. Studies should explicitly report how they addressed potential barriers and facilitators in the design of their intervention and explore barriers to and facilitators of implementing interventions from a range of perspectives.
- Further intervention studies, preferably RCTs, to explore the effectiveness and cost-effectiveness of delivering other injury prevention interventions within children's centres and of IPBs implemented by different professional groups and in different settings.
- Further meta-analyses, particularly of studies measuring injury outcomes and safety behaviours, as the number of primary studies increases.
- Pairwise meta-analyses and NMAs incorporating covariate information to evaluate whether or not targeting interventions at specific population groups is more effective than providing non-targeted interventions.
- Further economic evaluations to enhance the evidence base for the prevention of fire-related injuries, scalds, falls and poisonings in childhood. Economic evaluations should measure the NHS, family and societal costs of a wide range of injuries, using large representative samples of injured children. Studies measuring utility decrements for a wide range of childhood injuries requiring different levels of health-care resource use would be particularly useful. Economic evaluations are needed that evaluate within a single analytical model complex multicomponent interventions such as home safety schemes providing education and safety equipment to prevent a range of injuries. Future studies may want to consider both welfare and quality of life more broadly (e.g. a cost–consequence analysis or a multicriteria decision-making approach), but thresholds would need careful consideration as it is unclear whether or not a threshold of £30,000 per QALY gained is relevant to different sectors of the economy beyond health care.

Recommendations for research of interest but of lesser importance

- UK studies that explore the effect on the estimation of costs of using parent-reported data compared with health-care resource use data obtained from medical records.
- Studies to explore why retrospectively reported pre-injury HRQL scores tend to be higher than those for the general population from whom the injured sample is drawn.
- Further investigation of the psychometric properties of the PedsQL in a large sample of healthy UK toddlers (a general population sample) using modern psychometric methods such as item response theory.
- Further surveys of injury prevention activity to assess the extent to which children's centres are fulfilling their remit to deliver injury prevention activities as they continue to develop and evolve.
- Qualitative and quantitative studies to evaluate the use of 'real-life' injury experiences as learning opportunities for parents within injury prevention interventions.

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Acknowledgements

Nottinghamshire County Teaching PCT hosted the programme until March 2012. Nottinghamshire Healthcare NHS Trust hosted the programme from April 2012.

Contributions of others

We would like to thank the following people for their invaluable help with undertaking components of this programme of work.

Work stream 1

Dr Asiya Maula (University of Nottingham) who assisted with recruitment and data analysis; Dr Paula Sealey (University of Nottingham) who assisted with recruitment; Clare Ferns (Norfolk and Norwich University Hospitals NHS Foundation Trust), Nathalie Horncastle (Norfolk and Norwich University Hospitals NHS Foundation Trust), Pilar Muñoz (University of the West of England), Benita Laird-Hopkins (University of the West of England), Emma Davison (Newcastle upon Tyne Hospitals NHS Foundation Trust) and Laura Simms (Newcastle upon Tyne Hospitals NHS Foundation Trust) who assisted with data entry and data management; study participants who completed questionnaires and allowed us to visit them in their homes; liaison health visitors, research nurses and staff from EDs, MIUs and inpatient wards who assisted with recruitment from Nottingham University Hospitals NHS Trust, Derby Teaching Hospitals NHS Foundation Trust, Norfolk and Norwich University Hospitals NHS Foundation Trust, United Lincolnshire Hospitals NHS Trust, James Paget University Hospitals NHS Foundation Trust, University Hospitals Bristol NHS Foundation Trust, North Bristol Healthcare Trust, Newcastle Upon Tyne Hospitals NHS Foundation Trust, Gateshead NHS Foundation Trust and Northumbria Healthcare NHS Foundation Trust; Primary Care Research Networks for East Midlands and South Yorkshire, Leicestershire, Northamptonshire and Rutland, East of England, Northern and Yorkshire and South West who assisted with recruitment and Trent, Norfolk and Suffolk, Northumberland Tyne and Wear and Western Comprehensive Local Research Networks who provided support for recruitment.

Work stream 2

Study participants who completed questionnaires.

Work stream 3

Children's centre managers who participated in the surveys.

Work stream 4

Dr Jenny C Ingram (University of Bristol) and Gail Errington (University of Nottingham) who assisted with the review of barriers to and facilitators of injury prevention; Dr Paula Sealey (University of Nottingham) who assisted with interviews of children's centre staff; and parents and children's centre staff who participated in the interviews.

Work stream 5

Professor Andrea Manca (University of York) who provided PhD supervision (during a NIHR Career Development Fellowship) and advised on decision modelling and Mr Ken Dunn (University Hospital of South Manchester) who advised on model structure and supplied data to inform the model parameters for assessing the cost-effectiveness of smoke alarms and the promotion of safe hot water temperatures; Dr Sofia Dias and Guobing Lu (University of Bristol) and Stephen JC Rice (University of York) who advised

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on methods for adjusting NMAs for baseline risk; Dr Sylwia Bujkiewicz (University of Leicester) who advised on NMA with multiple outcomes; Professor David Jones (University of Leicester) who provided PhD supervision in relation to undertaking NMAs and decision modelling for poisoning and falls outcomes; Paula Dhiman (University of Leicester) who assisted with the NMA for smoke alarms; Dr Ilyas Nohaid, Dr Zhimin He, Dr Elodie Le Cozannet, Jayne Simpson and Jacqueline Mhizha-Murira (University of Nottingham) who assisted with systematic reviewing; and Professor Jon Nicholl (University of Sheffield) for providing data from the HALO study.

Work stream 6

Dr Paula Sealey (University of Nottingham) who assisted with data collection; Benita Laird-Hopkins (University of the West of England) who assisted with data collection and data management; families and children's centre staff who participated in work stream 6; and Trial Steering Committee members: Professor Alison Kemp (chairperson; Cardiff University), Mrs Sally Kerry (Queen Mary University of London), Dr Phil Edwards (London School of Hygiene and Tropical Medicine), Ian Evans (Child Accident Prevention Trust), Sally Jaeckle (Strategic Lead for Early Childhood Services, Bristol City Council), Liz Jenkins (St Werburgh's Park Nursery School and Children's Centre, Bristol), Andy Townsend (Lifeskills Safety Centre, Bristol) and Sue Webster (Children's Centre Leaders' Network).

Contributions of authors

Denise Kendrick (Professor of Primary Care Research) was Chief Investigator for the study. She was a lead applicant and Principal Investigator for the Nottingham study centre, was responsible for oversight of the programme, study co-ordination and management of staff and contributed to study design, study implementation, analysis and interpretation (all work streams) and to writing the manuscript.

Joanne Ablewhite (Research Fellow) contributed to study co-ordination, participant recruitment and data collection (work streams 1, 2, 4 and 6), qualitative analysis and interpretation (work stream 4) and to writing the manuscript.

Felix Achana (PhD Student) undertook the evidence synthesis and economic analysis for poisoning outcomes and interpretation of the results (work stream 5) and contributed to writing the manuscript.

Penny Benford (Research Fellow) contributed to participant recruitment and data collection (work streams 1, 2 and 6), analysis (work stream 1) and to writing the manuscript.

Rose Clacy (Lay Consumer Adviser) was the PPI representative for this study and contributed to study design, development of data collection tools, participant recruitment and data collection (work streams 1 and 6) and to writing the manuscript.

Frank Coffey (Associate Professor and Consultant in Emergency Medicine) was a co-applicant and emergency medicine lead for the study. He contributed to the study design, participant recruitment, data collection (work stream 1) and writing the manuscript.

Nicola Cooper (Professor of Healthcare Evaluation Research) was a co-applicant, led the economic evaluation (work streams 2, 5 and 6) and co-led the evidence synthesis components of the programme (work stream 5) and contributed to study design, analysis and interpretation and to writing the manuscript.

Carol Coupland (Associate Professor and Reader in Medical Statistics) was a co-applicant, contributed to the study design, provided statistical and data analytical guidance and contributed to the interpretation and analysis of data (work streams 1, 3 and 6) and to writing the manuscript.

Toity Deave (Associate Professor for Family and Child Health) was a researcher on the KCS programme of work and became Principal Investigator for the Bristol centre in November 2011. She co-ordinated the RCT (work stream 6) and contributed to participant recruitment and data collection (work streams 1, 2, 4 and 6), analysis (work streams 4 and 6) and literature reviewing (work stream 5) and to writing the manuscript.

Trudy Goodenough (Research Fellow) contributed to participant recruitment and data collection (work streams 1, 2, 4 and 6) and analysis (work streams 4 and 6) and to writing of the manuscript.

Adrian Hawkins (Clinical Trials Officer) contributed to participant recruitment and data collection (work streams 1, 2, 4 and 6), analysis and interpretation (work streams 4 and 6) and literature reviewing (work stream 5) and to writing the manuscript.

Mike Hayes (Principal Consultant) was a co-applicant, contributed to study design, designed and led the training used in the RCT, co-authored the IPB that was used in the RCT and the later edition that was a practitioner-focused output from the project (work stream 6), provided expert input to the economic analysis (work stream 2) and contributed to writing the manuscript.

Paul Hindmarch (Clinical Trials Officer) contributed to participant recruitment and data collection (work streams 1, 2, 4 and 6), analysis and interpretation (work stream 6) and literature reviewing (work stream 5) and to writing the manuscript.

Stephanie Hubbard (Lecturer in Medical Statistics) undertook the evidence synthesis and economic analysis for the falls outcomes and interpretation of the results (work stream 5) and contributed to writing the manuscript.

Bryony Kay (Research Nurse) contributed to participant recruitment and data collection (work streams 1, 2 and 6), analysis (work stream 4) and literature reviewing (work stream 5) and to writing the manuscript.

Arun Kumar (Research Fellow, University of Nottingham) contributed to data analysis (work stream 6) and to writing the manuscript.

Gosia Majsak-Newman (Research Fellow) contributed to data collection and analysis (work streams 1, 2, 4 and 6) and literature reviewing (work stream 5) and to writing the manuscript.

Elaine McColl (Professor of Health Services Research and Director of Newcastle Clinical Trials Unit) was a co-applicant and Principal Investigator for the Newcastle centre and contributed to study design, study implementation, analysis and interpretation of the data, particularly validation of the PedsQL (work stream 2), and to writing the manuscript.

Lisa McDaid (Research Associate) contributed to data collection (work streams 1, 2, 4 and 6) and analysis (work streams 4 and 6) and to writing the manuscript.

Phil Miller (Senior Research Nurse) contributed to participant recruitment and data collection (work streams 1 and 2) and reviewing the literature (work stream 5) and to writing the manuscript.

Caroline Mulvaney (Senior Research Fellow) contributed to data analysis and interpretation of the findings (work stream 3) and to writing the manuscript.

Isabel Peel (Research Nurse) contributed to participant recruitment and data collection (work streams 1 and 2) and data analysis (work stream 4) and to writing the manuscript.

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Emma Pitchforth [RAND (Europe)] was the independent research consultant for this study and contributed to the development of qualitative data collection tools and qualitative data analysis (work stream 4) and to writing the manuscript.

Richard Reading (Consultant Community Paediatrician) was a co-applicant and Principal Investigator for the Norwich study centre and contributed to study design, study implementation (work streams 1, 2 and 4–6) and analysis and to writing the manuscript.

Pedro Saramago (Research Fellow) undertook the evidence synthesis and economic analysis for fire-related outcomes and the interpretation of results (work stream 5) and contributed to writing the manuscript.

Jane Stewart (Senior Research Fellow) contributed to the research programme and study co-ordination, data collection (work streams 1, 2, 4 and 6), analysis and interpretation (work streams 1, 3, 4 and 6) and to writing the manuscript.

Alex Sutton (Professor of Medical Statistics) was a co-applicant, co-led the evidence synthesis components of the programme (work stream 5) and contributed to study design, analysis and interpretation (work streams 5 and 6) and to writing the manuscript.

Clare Timblin (Research Assistant) led the data management (all work streams) and contributed to data collection (work stream 3) and analysis (work stream 1) and to writing the manuscript.

Elizabeth Towner (Emeritus Professor of Child Health) was a co-applicant and Principal Investigator for the Bristol centre until 2011. She contributed to the study design, co-authored the IPB that was used in the RCT (work stream 6) and contributed to analysis and literature reviewing (work stream 4) and to writing the manuscript.

Michael C Watson (Associate Professor in Public Health) was a co-applicant, contributed to the study design, led work stream 3 and contributed to data interpretation and to writing the manuscript.

Persephone Wynn (Research Fellow) contributed to participant recruitment and data collection (work stream 1), analysis (work streams 1 and 6) and literature reviewing (work stream 5) and to writing the manuscript.

Ben Young (Research Assistant) contributed to literature reviewing (work stream 5), data collection (work stream 2) and analysis (work streams 1 and 6) and to writing the manuscript.

Kun Zou (Research Assistant) contributed to literature reviewing (work stream 5) and analysis (work stream 1) and to writing the manuscript.

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Data sharing statement

Study participants were recruited prior to the period when data sharing became common practice. Participants were therefore not asked on consent forms to provide consent to data sharing; hence, only the data within the report and appendices are available.

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Appendix 1 Case–control questionnaires, home observation checklist for study B and summary of analyses using hospital controls for study A

Summary tables of analyses using hospital controls for study A

TABLE 130 Sociodemographic characteristics of cases, community controls and hospital controls participating in the falls from furniture study

Characteristic	Cases ($n = 672$)	Community controls ($n = 2648$)	Hospital controls ($n = 1334$)
Study centre			
Nottingham	246 (36.6)	966 (36.5)	468 (35.1)
Bristol	215 (32.0)	832 (31.4)	441 (33.1)
Norwich	146 (21.7)	644 (24.3)	289 (21.7)
Newcastle	65 (9.7)	206 (7.8)	136 (10.2)
Age (years), median (IQR)[a]	1.74 (0.84–2.86)	1.91 (1.00–3.01)	1.98 (1.29–2.95)
Age group (months)			
0–12	223 (33.2)	741 (28.0)	211 (15.8)
13–36	296 (44.0)	1270 (48.0)	815 (61.1)
37–62	153 (22.8)	637 (24.1)	308 (23.1)
Male	365 (54.3)	1478 (55.8)	723 (54.2)
Ethnic origin: white	583 (88.9) [16]	2403 (92.2) [41]	1164 (89.3) [30]
Children aged 0–4 years in family	[6]	[40]	[27]
0	9 (1.4)	20 (0.8)	15 (1.1)
1	391 (58.7)	1563 (59.9)	771 (59.0)
2	231 (34.7)	927 (35.5)	460 (35.2)
≥ 3	35 (5.3)	98 (3.8)	61 (4.7)
First child	285 (45.4) [44]	1093 (44.9) [212]	540 (43.8) [102]
Maternal age ≤ 19 years at birth of first child[b]	77 (12.5) [4]	219 (9.0) [19]	214 (18.0) [15]
Single adult household	95 (14.5) [15]	263 (10.2) [61]	189 (14.6) [36]
Weekly out-of-home child care (hours), median (IQR)	7.5 (0–18.0) [46]	12.0 (1.0–22.0) [179]	10.0 (0–20.0) [113]
Adults out of work	[16]	[45]	[34]
0	319 (48.6)	1481 (56.9)	590 (45.4)
1	221 (33.7)	795 (30.5)	480 (36.9)
2	116 (17.7)	327 (12.6)	230 (17.7)

continued

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TABLE 130 Sociodemographic characteristics of cases, community controls and hospital controls participating in the falls from furniture study (*continued*)

Characteristic	Cases ($n = 672$)	Community controls ($n = 2648$)	Hospital controls ($n = 1334$)
Receives state benefits	280 (43.0) [21]	928 (35.9) [65]	592 (45.8) [42]
Overcrowding (more than one person per room)	56 (8.8) [32]	173 (6.9) [146]	135 (10.9) [98]
Non-owner occupier	262 (39.5) [9]	838 (32.2) [49]	560 (43.1) [34]
Household has no car	95 (14.4) [10]	288 (11.0) [40]	184 (14.1) [27]
IMD score, median (IQR)[c]	16.8 (10.0–31.9)	14.9 (9.0–6.8) [28]	18.0 (9.7–32.6) [1]
Distance (km) from hospital, median (IQR)	3.4 (1.9–5.4)	3.9 (2.4–7.4) [29]	3.5 (2.2–5.5) [1]
CBQ score, mean (SD)[c]	4.68 (0.92) [45]	4.67 (0.88) [234]	4.68 (0.97) [96]
Long-term health condition	60 (9.0) [5]	185 (7.0) [14]	117 (8.9) [24]
Child health VAS score (range 0–10), median (IQR)[c]	9.9 (9.3–10.0) [6]	9.7 (8.5–10.0) [22]	10.0 (9.0–10.0) [17]
HRQL (PedsQL), median (IQR)[c,d]	$n = 287$, 93.1 (86.9–97.6) [4]	$n = 1270$, 90.0 (82.9–94.4) [21]	$n = 658$, 92.9 (84.5–97.6) [22]
Parental assessment of child's ability to climb	[18]	[57]	[39]
All scenarios 'not likely'	166 (25.4)	536 (20.7)	120 (9.3)
One or more scenario 'quite likely' and none 'very likely'	85 (13.0)	235 (9.1)	179 (13.8)
One or more scenario 'very likely'	403 (61.6)	1820 (70.2)	996 (76.9)
PDH tasks subscale score, median (IQR)[c,e]	13 (10–17) [65]	14 (11–18) [168]	14 (10–17) [144]
HADS score, mean (SD)[c,e]	10.7 (6.0) [8]	10.8 (6.0) [39]	10.7 (6.2) [37]

a Age when questionnaire completed.
b Only applicable when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values.

TABLE 131 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the falls from furniture study

Exposure	Cases ($n = 672$)	Community controls ($n = 2648$)	Hospital controls ($n = 1334$)	Community controls, unadjusted OR (95% CI)	Hospital controls, unadjusted OR (95% CI)
Did not use any safety gates[a]	227 (36.9) [56]	688 (27.7) [160]	293 (23.3) [77]	1.68 (1.36 to 2.07)	1.92 (1.56 to 2.37)
Used high chair without harness at least some days[b,c]	118 (26.3) [11] ((213))	522 (29.6) [34] ((853))	235 (24.8) [32] ((356))	0.82 (0.65 to 1.05)	1.08 (0.84 to 1.40)
Had things child could climb on to reach high surfaces[a]	248 (37.6) [12]	1075 (40.9) [22]	503 (38.1) [13]	0.85 (0.70 to 1.04)	0.98 (0.81 to 1.19)
Left child on a raised surface at least some days[b,c]	357 (57.7) [13] ((40))	1221 (49.0) [33] ((121))	478 (38.5) [31] ((60))	1.56 (1.29 to 1.88)	2.18 (1.79 to 2.65)
Changed nappy on raised surface at least some days[b,c]	297 (56.0) [10] ((132))	1106 (53.9) [30] ((565))	493 (46.2) [27] ((239))	1.09 (0.89 to 1.33)	1.49 (1.21 to 1.83)
Put child in car/bouncing seat on raised surface at least some days[b,c]	59 (11.4) [11] ((142))	176 (8.8) [30] ((626))	52 (5.0) [34] ((251))	1.33 (0.95 to 1.87)	2.46 (1.67 to 3.63)
Child climbed or played on furniture at least some days[b,c]	472 (78.1) [7] ((61))	1909 (77.9) [27] ((169))	1016 (80.2) [26] ((41))	0.95 (0.73 to 1.26)	0.88 (0.70 to 1.12)
Child climbed or played on garden furniture at least some days[b,c]	181 (34.4) [10] ((136))	816 (39.1) [28] ((532))	441 (40.2) [30] ((206))	0.78 (0.62 to 0.98)	0.78 (0.63 to 0.97)
Had not taught child rules about climbing in kitchen	282 (44.5) [39]	1026 (40.0) [82]	427 (33.8) [71]	1.52 (1.15 to 2.00)	1.57 (1.29 to 1.91)
Had not taught child rules about jumping on bed/ furniture	283 (44.5) [36]	1079 (42.0) [80]	434 (34.5) [75]	1.30 (0.97 to 1.73)	1.52 (1.25 to 1.85)
Exposures measured only in children aged 0–36 months	**Cases (n = 519)**	**Community controls (n = 2011)**	**Hospital controls (n = 1026)**	**Community controls, unadjusted OR (95% CI)**	**Hospital controls, unadjusted OR (95% CI)**
Did not use baby walker[a]	372 (73.5) [13]	1359 (68.8) [36]	713 (71.3) [26]	1.27 (1.01 to 1.60)	1.12 (0.88 to 1.42)
Did not use playpen or travel cot[a]	411 (81.9) [17]	1628 (82.6) [41]	827 (83.0) [30]	0.95 (0.73 to 1.23)	0.92 (0.70 to 1.22)
Did not use stationary activity centre[a]	375 (74.6) [16]	1469 (74.5) [39]	805 (80.7) [29]	0.98 (0.78 to 1.24)	0.70 (0.54 to 0.90)

a In the last 24 hours.
b In the last week.
c Excludes 'not applicable' responses.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.

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TABLE 132 Adjusted ORs comparing cases with community and hospital controls participating in the falls from furniture study

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Did not use any safety gates[b]	1.65 (1.29 to 2.12)	1.78 (1.38 to 2.30)	PDH score, HADS score, hours of out-of-home care, ability to climb, first child
Used high chair without harness at least some days[c]	0.77 (0.57 to 1.03)	1.06 (0.80 to 1.41)	CBQ score, hours of out-of-home care
Had things child could climb on to reach high surfaces[b]	0.96 (0.75 to 1.24)	1.21 (0.94 to 1.57)	Hours of out-of-home care, ability to climb, first child, uses safety gate, safety rules on climbing in kitchen and jumping on furniture
Left child on a raised surface at least some days[c]	1.66 (1.34 to 2.06)	2.38 (1.91 to 2.97)	CBQ score, hours out-of-home care
Changed nappy on raised surface at least some days[c]	1.10 (0.87 to 1.40)	1.19 (0.93 to 1.51)	CBQ score, hours of out-of-home care
Put child in car/bouncing seat on raised surface at least some days[c]	1.35 (0.91 to 2.01)	1.79 (1.16 to 2.78)	CBQ score, hours of out-of-home care
Child climbed or played on furniture at least some days[c]	1.03 (0.73 to 1.44)	1.48 (1.06 to 2.07)	CBQ score, hours of out-of-home care, things child could climb on to reach high surfaces
Child climbed or played on garden furniture at least some days[c]	0.74 (0.56 to 0.97)	0.90 (0.69 to 1.17)	CBQ score, hours of out-of-home care, things child could climb on to reach high surfaces
Had not taught child rules about climbing in kitchen	1.58 (1.16 to 2.15)	1.16 (0.87 to 1.55)	HADS score, PDH score, first child, things child could climb on to reach high surfaces
Had not taught child rules about jumping on bed/furniture	1.21 (0.87 to 1.68)	0.94 (0.69 to 1.27)	HADS score, PDH score, first child, things child could climb on to reach high surfaces
Did not use baby walker[b]	1.22 (0.90 to 1.65)	1.30 (0.94 to 1.78)	HADS score, PDH score, hours of out-of-home care, ability to climb, first child, uses safety gate, uses playpen/travel cot, uses activity centre
Did not use playpen or travel cot[b]	1.01 (0.71 to 1.46)	0.83 (0.57 to 1.08)	HADS score, PDH score, hours of out-of-home care, ability to climb, first child, uses baby walker, uses safety gate, uses activity centre
Did not use stationary activity centre[b]	0.94 (0.69 to 1.27)	0.78 (0.56 to 1.08)	HADS score, PDH score, hours of out-of-home care, ability to climb, first child, uses baby walker, uses playpen/travel cot, uses safety gate

a All matched analyses adjusted for deprivation (IMD) and distance from hospital plus confounders in the table. All unmatched analyses adjusted for age, sex, deprivation (IMD) and distance from hospital plus confounders in the table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c In the last week.

TABLE 133 Sociodemographic characteristics of cases and community controls and hospital controls participating in the falls on one level study

Characteristic	Cases ($n = 582$)	Community controls ($n = 2460$)	Hospital controls ($n = 1525$)
Study centre			
Nottingham	192 (33.0)	765 (31.1)	556 (36.5)
Bristol	180 (30.9)	817 (33.2)	515 (33.8)
Norwich	137 (23.5)	614 (25.0)	307 (20.1)
Newcastle	73 (12.5)	264 (10.7)	147 (9.6)
Age (years), median (IQR)[a]	2.08 (1.42–3.13)	2.16 (1.53–3.22)	1.81 (1.08–2.84)
Age group (months)			
0–12	73 (12.5)	206 (8.4)	384 (25.2)
13–36	355 (61.0)	1591 (64.7)	819 (53.7)
37–62	154 (26.5)	663 (27.0)	322 (21.1)
Male	355 (61.0)	1507 (61.3)	779 (51.0)
Ethnic origin: white	512 (89.8) [12]	2232 (91.9) [32]	1324 (88.7) [33]
Number of children aged 0–4 years in family	[11]	[34]	[23]
0	2 (0.4)	20 (0.8)	23 (1.5)
1	365 (63.9)	1438 (59.3)	858 (57.1)
2	180 (31.5)	867 (35.7)	543 (36.2)
≥ 3	24 (4.2)	101 (4.2)	78 (5.2)
First child	244 (44.5) [34]	959 (42.5) [206]	620 (44.1) [119]
Maternal age ≤ 19 years at birth of first child[b]	86 (16.5) [9]	244 (10.8) [15]	215 (15.8) [24]
Single adult household	80 (14.0) [12]	263 (10.9) [49]	215 (14.5) [40]
Weekly out of home child care (hours), median (IQR)	10 (0–20.0) [45]	15 (2.5–24.0) [132]	8 (0–20.0) [119]
Adults in paid work	[12]	[33]	[39]
≥ 2	263 (46.1)	1381 (56.9)	684 (46.0)
1	198 (34.7)	745 (30.7)	554 (37.3)
0	109 (19.1)	301 (12.4)	248 (16.7)
Receives state benefits	252 (44.3) [13]	893 (37.0) [48]	663 (44.9) [50]
Overcrowding (more than one person per room)	51 (9.3) [32]	173 (7.4) [127]	151 (10.6) [103]
Non-owner occupier	242 (42.5) [13]	792 (32.7) [38]	618 (41.3) [30]
Household has no car	71 (12.3) [7]	252 (10.4) [29]	223 (14.9) [30]
IMD score, median (IQR)[c]	17.1 (8.8–31.8)	15.1 (9.3–26.8) [26]	17.6 (10.1–33.1)
Distance (km) from hospital, median (IQR)	3.3 (2.0–5.0)	3.7 (2.4–6.4) [25]	3.5 (2.1–5.6)
CBQ score, mean (SD)[c]	4.66 (0.98) [40]	4.60 (0.87) [213]	4.68 (0.93) [109]
Long-term health condition	55 (9.7) [13]	187 (7.6) [14]	130 (8.6) [15]
Child health VAS score (range 0–10), median (IQR)[c]	10 (9.3–10) [5]	9.6 (8.5–10) [23]	9.9 (9.0–10) [18]

continued

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TABLE 133 Sociodemographic characteristics of cases and community controls and hospital controls participating in the falls on one level study (*continued*)

Characteristic	Cases ($n = 582$)	Community controls ($n = 2460$)	Hospital controls ($n = 1525$)
HRQL (PedsQL), median (IQR)[c,d]	$n = 308$, 93.1 (86.1–97.6) [12]	$n = 1413$, 89.3 (82.1–94.0) [29]	$n = 678$, 92.9 (85.7–97.6) [13]
PDH tasks subscale score, median (IQR)[c,e]	13.0 (9.0–16.0) [63]	13.7 (10.0–17.1) [132]	13.0 (9.0–17.0) [139]
HADS score, mean (SD)[c,e]	10.7 (6.3) [14]	11.0 (6.2) [35]	10.7 (6.1) [33]

a Age when questionnaire completed.
b Applicable only when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values.

TABLE 134 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the falls on one level study

Exposure	Cases ($n = 582$)	Community controls ($n = 2460$)	Hospital controls ($n = 1525$)	Community controls, unadjusted OR (95% CI)	Hospital controls, unadjusted OR (95% CI)
Did not use any safety gates[a]	134 (24.5) [36]	524 (22.8) [157]	416 (29.3) [105]	1.10 (0.87 to 1.40)	0.78 (0.63 to 0.98)
No use of furniture corner covers[a]	443 (76.6) [4]	1982 (81.2) [20]	1203 (79.9) [20]	0.76 (0.61 to 0.95)	0.82 (0.65 to 1.04)
Rugs/carpets not firmly fixed to the floor[a]	151 (26.4) [11]	808 (33.1) [18]	415 (27.9) [38]	0.72 (0.59 to 0.89)	0.93 (O.75 to 1.15)
Electric wires or cables trailing across the floor at least some days[b,c]	86 (15.6) [14] ((18))	475 (19.9) [16] ((63))	249 (17.2) [19] ((62))	0.72 (0.56 to 0.93)	0.89 (0.68 to 1.16)
Things on floor that could be tripped over at least some days[b,c]	371 (66.8) [14] ((13))	1698 (70.1) [16] ((21))	1012 (69.3) [29] ((36))	0.88 (0.72 to 1.07)	0.89 (0.72 to 1.10)
Not locking back doors to prevent access to the garden at least some days[b,c]	193 (38.8) [17] ((68))	851 (41.8) [23] ((259))	485 (37.9) [27] ((218))	0.98 (0.79 to 1.22)	1.04 (0.84 to 1.29)
Not using safety gate to prevent access to the garden at least some days[b,c]	364 (89.7) [16] ((160))	1631 (93.6) [36] ((682))	899 (91.3) [38] ((502))	0.58 (0.38 to 0.88)	0.83 (0.56 to 1.22)
Unsupervised playing in the garden at least some days[b,c]	154 (29.6) [13] ((48))	770 (34.6) [27] ((207))	327 (24.9) [27] ((186))	0.76 (0.61 to 0.96)	1.26 (1.01 to 1.58)
Not taught child rules about slippery floors	218 (39.4) [28]	910 (38.0) [66]	745 (51.1) [67]	1.07 (0.85 to 1.36)	0.62 (0.51 to 0.76)
Not taught child rules about running in the house	198 (36.0) [32]	939 (39.2) [67]	703 (48.3) [71]	0.77 (0.60 to 0.98)	0.60 (0.49 to 0.74)

TABLE 134 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the falls on one level study (*continued*)

Exposure	Cases (*n* = 582)	Community controls (*n* = 2460)	Hospital controls (*n* = 1525)	Community controls, unadjusted OR (95% CI)	Hospital controls, unadjusted OR (95% CI)
Exposures measured only in children aged 0–36 months					
	n = *428*	**n = *1797***	**n = *1203***		
Used baby walker[a]	117 (27.7) [5]	530 (29.9) [24]	319 (27.4) [40]	0.90 (0.71 to 1.15)	1.01 (0.79 to 1.30)
Did not use playpen or travel cot[a]	345 (82.1) [8]	1521 (85.8) [24]	963 (83.2) [45]	0.76 (0.57 to 1.02)	0.93 (0.69 to 1.25)
Did not use stationary activity centre[a]	350 (83.1) [7]	1391 (78.5) [25]	893 (77.0) [44]	1.40 (1.05 to 1.86)	1.47 (1.10 to 1.96)

a In the last 24 hours.
b In the last week.
c Excludes 'not applicable' responses.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.

TABLE 135 Adjusted ORs comparing cases with community and hospital controls participating in the falls on one level study

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Did not use any safety gates[b]	1.12 (0.83 to 1.49)	0.80 (0.61 to 1.05)	HADS score, hours of out-of-home child care, PDH score, first child
Did not use furniture corner covers[b]	0.72 (0.54 to 0.94)	0.81 (0.61 to 1.06)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Rugs/carpets not firmly fixed to the floor[b]	0.77 (0.59 to 0.99)	0.97 (0.75 to 1.25)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Electric wires or cables trailing across the floor[c]	0.75 (0.55 to 1.02)	1.00 (0.73 to 1.36)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Things on floor that could be tripped over[c]	1.07 (0.82 to 1.38)	0.97 (0.74 to 1.26)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Did not lock back doors to prevent access to the garden[c]	0.97 (0.75 to 1.27)	1.14 (0.89 to 1.46)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Did not use safety gate to prevent access to the garden[c]	1.01 (0.58 to 1.74)	1.00 (0.61 to 1.64)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Unsupervised playing in the garden[c]	0.89 (0.68 to 1.17)	1.24 (0.93 to 1.64)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate
Had not taught child rules about slippery floors	1.13 (0.83 to 1.52)	0.80 (0.61 to 1.05)	HADS score, PDH score, first child, uses safety gate
Had not taught child rules about running in the house	0.73 (0.54 to 1.00)	0.78 (0.58 to 1.03)	HADS score, PDH score, first child, uses safety gate

continued

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TABLE 135 Adjusted ORs comparing cases with community and hospital controls participating in the falls on one level study (*continued*)

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Used baby walker[a]	0.83 (0.59 to 1.16)	0.97 (0.70 to 1.34)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate, uses playpen/travel cot, uses activity centre
Did not use playpen or travel cot[a]	0.90 (0.61 to 1.33)	0.92 (0.63 to 1.36)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate, uses baby walker, uses activity centre
Did not use stationary activity centre[a]	1.37 (0.95 to 1.97)	1.36 (0.95 to 1.96)	HADS score, hours of out-of-home child care, PDH score, first child, uses safety gate, uses baby walker, uses playpen/travel cot

a All matched analyses adjusted for deprivation (quintiles of IMD: ≤ 7.77, 7.78–12.50,12.51–19.84, 19.85–31.92, > 31.92 and distance from hospital plus confounders in the table. All unmatched analyses adjusted for age, sex, deprivation (IMD) and distance from hospital plus confounders in the table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c In the last week.

TABLE 136 Sociodemographic characteristics of cases, community controls and hospital controls participating in the stair falls study

Characteristic	Cases ($n = 610$)	Community controls ($n = 2658$)	Hospital controls ($n = 2087$)
Study centre			
Nottingham	252 (41.3)	1055 (39.7)	740 (35.5)
Bristol	178 (29.2)	796 (29.9)	666 (31.9)
Norwich	97 (15.9)	457 (17.2)	424 (20.3)
Newcastle	83 (13.6)	350 (13.2)	257 (12.3)
Age (years), median (IQR)[a]	2.0 (1.2–2.9)	2.0 (1.3–3.1)	1.9 (1.2–2.9)
Age group (months)			
0–12	113 (18.5)	315 (11.9)	443 (21.2)
13–36	362 (59.3)	1694 (63.7)	1188 (56.9)
37–62	135 (22.1)	649 (24.4)	456 (21.8)
Male	299 (49.0)	1320 (49.7)	1140 (54.6)
Ethnic origin: white	547 (91.5) [12]	2371 (91.0) [52]	1811 (88.7) [46]
Children aged < 5 years in family	[8]	[44]	[35]
0	7 (1.2)	28 (1.1)	24 (1.2)
1	358 (59.5)	1566 (59.9)	1232 (60.0)
2	212 (35.2)	911 (34.9)	702 (34.2)
≥ 3	25 (4.2)	109 (4.2)	94 (4.6)
First child	242 (43.3) [51]	1067 (44.5) [260]	858 (44.5) [158]

TABLE 136 Sociodemographic characteristics of cases, community controls and hospital controls participating in the stair falls study (*continued*)

Characteristic	Cases ($n = 610$)	Community controls ($n = 2658$)	Hospital controls ($n = 2087$)
Maternal age ≤ 19 years at birth of first child[b]	100 (18.5) [7]	219 (9.1) [15]	286 (15.3) [25]
Single adult household	87 (14.6) [15]	272 (10.5) [76]	305 (15.0) [47]
Weekly out-of-home child care (hours), median (IQR)	13.5 (1.0–22.5) [43]	15 (3.0–24.0) [165]	8.0 (0.0–20.0) [154]
Adults in the family in paid work	[16]	[56]	[45]
> 1	297 (50.0)	1534 (59.0)	946 (46.3)
1	209 (35.2)	784 (30.1)	719 (35.2)
0	88 (14.8)	284 (10.9)	377 (18.5)
Receives state benefits	241 (40.9) [21]	838 (32.4) [68]	900 (44.4) [62]
Overcrowding (more than one person per room)	52 (9.1) [40]	187 (7.5) [152]	205 (10.5) [131]
Non-owner occupier	241 (40.4) [14]	836 (32.2) [65]	886 (43.3) [40]
Household has no car	88 (14.7) [12]	254 (9.7) [50]	308 (15.0) [33]
IMD score, median (IQR)[c]	18.7 (10.1–32.7)	15.2 (9.0–27.1) [35]	18.0 (10.0–33.0)
Distance (km) from hospital, median (IQR)	3.4 (2.2–5.4)	3.9 (2.4–7.6) [34]	3.5 (2.2–5.5) [1]
CBQ score, mean (SD)[c]	4.7 (0.9) [43]	4.6 (0.9) [293]	4.7 (1.0) [137]
Long-term health condition	63 (10.4) [6]	202 (7.7) [19]	185 (9.0) [29]
Child health VAS score (range 0–10), median (IQR)[c]	9.9 (9.0–10.0) [9]	9.7 (8.4–10.0) [19]	9.9 (9.2–10.0) [19]
HRQL (PedsQL), median (IQR)[c,d]	$n = 303$, 91.7 (83.3, 97.6) [6]	$n = 1342$, 89.3 (82.1, 94.0) [18]	$n = 961$, 92.9 (86.9, 97.6) [24]
Parental assessment of child's ability to open safety gate	[19]	[97]	[55]
Not likely	423 (73.1)	1808 (76.0)	1356 (76.0)
Very or quite likely	156 (26.9)	571 (24.0)	429 (24.0)
PDH tasks subscale score, median (IQR)[c,e]	14.0 (10.0–18.0) [61]	14.0 (11.0–18.0) [152]	13.7 (10.0–17.0) [214]
HADS score, mean (SD)[c,e]	10.4 (6.2) [14]	10.7 (5.9) [36]	10.7 (6.1) [48]

a Age when questionnaire completed.
b Applicable only when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes
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TABLE 137 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the stair falls study

Exposure	Cases (*n* = 610)	Community controls (*n* = 2658)	Hospital controls (*n* = 2087)	Community controls, unadjusted OR (95% CI)	Hospital controls. unadjusted OR (95% CI)
Did not use any safety gates[a]	142 (23.7) [12]	521 (20.6) [124]	540 (28.0) [159]	1.22 (0.97 to 1.53)	0.80 (0.65 to 0.99)
Exposures measured only for households with stairs					
	n = *598*	**n = *2476***	**n = *1840***		
Gate closed	174 (29.7)	1245 (51.1)	975 (54.3)	1	1
Gate open	210 (35.9)	555 (22.8)	159 (8.9)	2.93 (2.32 to 3.72)	7.40 (5.70 to 9.61)
No gate[a]	201 (34.4) [13]	636 (26.1) [40]	662 (36.9) [44]	2.52 (1.97 to 3.22)	1.70 (1.36 to 2.13)
Did not have carpeted stairs[a]	83 (14.1) [8]	200 (8.2) [28]	162 (9.0) [36]	1.91 (1.44 to 2.53)	1.66 (1.25 to 2.20)
Did not have landing part-way up stairs[a]	413 (69.6) [5]	1556 (63.6) [28]	1152 (63.7) [32]	1.35 (1.11 to 1.65)	1.31 (1.07 to 1.60)
Had spiral or winding stairs[a]	96 (16.2) [7]	402 (16.4) [30]	308 (17.1) [39]	1.04 (0.81 to 1.33)	0.94 (0.73 to 1.21)
Had tripping hazards on stairs[b,c]	183 (31.6) [4] ((14))	932 (38.4) [16] ((35))	584 (34.0) [68] ((54))	0.73 (0.60 to 0.89)	0.94 (0.77 to 1.15)
Stairs too steep[a]	218 (37.6) [18]	743 (31.0) [80]	571 (32.5) [82]	1.35 (1.11 to 1.64)	1.25 (1.03 to 1.52)
Stairs too narrow[a]	154 (26.8) [23]	484 (20.4) [98]	417 (23.9) [94]	1.45 (1.17 to 1.80)	1.17 (0.94 to 1.45)
Stairs poorly lit[a]	103 (18.0) [26]	329 (13.8) [94]	261 (15.0) [99]	1.37 (1.07 to 1.76)	1.25 (0.97 to 1.60)
Steps in need of repair[a]	67 (11.7) [25]	147 (6.2) [96]	133 (7.6) [97]	1.97 (1.45 to 2.70)	1.60 (1.18 to 2.19)
Banister/handrail on stairs in need of repair[a]	68 (12.0) [32]	203 (8.5) [98]	188 (10.8) [99]	1.46 (1.09 to 1.97)	1.13 (0.84 to 1.52)
Stair covering in need of repair[a]	71 (12.4) [26]	175 (7.4) [96]	157 (9.0) [98]	1.74 (1.28 to 2.36)	1.43 (1.06 to 1.93)
Stairs not safe to use[a]	101 (17.2) [10]	271 (11.1) [25]	217 (12.1) [41]	1.71 (1.33 to 2.21)	1.51 (1.17 to 1.96)
Did not have handrails on all stairs[a]	215 (36.0) [1]	1063 (43.3) [20]	670 (37.0) [30]	0.72 (0.60 to 0.88)	0.96 (0.79 to 1.16)
Did not have banisters or railings on all stairs[a]	152 (26.4) [22]	486 (20.1) [60]	394 (22.2) [67]	1.44 (1.17 to 1.79)	1.25 (1.01 to 1.58)
Had not taught child rules about going downstairs	173 (29.9) [20]	624 (25.9) [70]	584 (33.3) [86]	1.60 (1.19 to 2.17)	0.86 (0.70 to 1.05)
Had not taught child rules about carrying big/heavy things while going downstairs	291 (50.3) [20]	1134 (47.1) [68]	921 (52.5) [86]	1.33 (1.01 to 1.74)	0.92 (0.76 to 1.11)
Had not taught child rules about leaving things on stairs	320 (55.6) [22]	1339 (55.5) [64]	1031 (58.6) [80]	1.00 (0.77 to 1.30)	0.88 (0.73 to 1.07)
Exposure measured only for households with banisters					
	n = *424*	**n = *1930***	**n = *1379***		
Banister width (inches), median (IQR)[a,d]	3 (2–4) [190]	3 (2–4) [803]	3 (2–4) [673]		
Up to ≤ 2.5	94 (40.2)	400 (35.5)	290 (41.1)	1	1

TABLE 137 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the stair falls study (*continued*)

Exposure	Cases ($n = 610$)	Community controls ($n = 2658$)	Hospital controls ($n = 2087$)	Community controls, unadjusted OR (95% CI)	Hospital controls. unadjusted OR (95% CI)
> 2.5 to ≤ 3.75	67 (28.6)	363 (32.2)	204 (28.9)	0.88 (0.59 to 1.32)	1.01 (0.71 to 1.45)
> 3.75	73 (31.2)	364 (32.3)	212 (30.3)	0.84 (0.55 to 1.26)	1.06 (0.75 to 1.51)
Exposures measured only in children aged 0–36 months					
	n = *475*	**n = *2009***	**n = *1631***		
Used baby walker[a]	135 (29.3) [14]	675 (34.1) [32]	418 (26.4) [47]	0.80 (0.63 to 1.00)	1.16 (0.92 to 1.45)
Did not use playpen or travel cot[a]	384 (83.3) [14]	1645 (83.1) [30]	1319 (83.7) [55]	1.03 (0.78 to 1.36)	0.97 (0.74 to 1.28)
Did not use stationary activity centre[a]	348 (75.8) [16]	1486 (75.2) [33]	1263 (80.0) [52]	1.01 (0.79 to 1.29)	0.78 (0.61 to 1.00)

a In the last 24 hours.
b In the last week.
c Excludes 'not applicable' responses.
d Divided into three quantiles, the boundaries and associated frequencies and ORs of which are defined for the matched analysis in black and the unmatched analysis in red.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.

TABLE 138 Adjusted ORs comparing cases with community and hospital controls participating in the stair falls study

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Did not use any safety gates[b]	1.22 (0.92 to 1.62)	0.77 (0.59 to 1.00)	HADS score, PDH score, first child, stair safety, hours of out-of-home child care
Gate closed	1	1	Child's ability to open safety gate, taught child rules about going down the stairs, carrying things down the stairs, leaving things on the stairs, stair safety
Gate open	3.09 (2.39 to 4.00)	7.60 (5.60 to 10.32)	
No gate	2.50 (1.90 to 3.29)	1.91 (1.45 to 2.52)	
Did not have carpeted stairs[b]	1.52 (1.09 to 2.10)	1.46 (1.07 to 2.00)	HADS score, PDH score, stair safety
Did not have landing part-way up stairs[b]	1.34 (1.08 to 1.65)	1.29 (1.05 to 1.59)	Stair safety
Had spiral or winding stairs[b]	0.97 (0.75 to 1.27)	0.92 (0.71 to 1.19)	Stair safety
Had tripping hazards on stairs[c]	0.77 (0.62 to 0.97)	0.90 (0.72 to 1.12)	HADS score, PDH score, stair safety
Stairs too steep[b,d]	1.21 (0.94 to 1.56)	1.34 (1.03 to 1.74)	Stair safety
Stairs too narrow[b,d]	1.28 (0.96 to 1.70)	1.09 (0.82 to 1.44)	Stair safety
Stairs poorly lit[b,d]	1.32 (0.97 to 1.79)	1.23 (0.91 to 1.07)	HADS score, PDH score, stair safety
Steps in need of repair[b,d]	1.71 (1.16 to 2.50)	1.45 (1.00 to 2.11)	HADS score, PDH score, stair safety

continued

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TABLE 138 Adjusted ORs comparing cases with community and hospital controls participating in the stair falls study (*continued*)

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Banister/handrail on stairs in need of repair[b,d]	1.32 (0.92 to 1.88)	1.10 (0.78 to 1.54)	HADS score, PDH score, stair safety
Stair covering in need of repair[b,d]	1.41 (0.99 to 2.03)	1.38 (0.97 to 1.97)	HADS score, PDH score, stair safety
Stairs not safe to use[b,d]	1.46 (1.07 to 1.99)	1.40 (1.04 to 1.90)	HADS score, PDH score, stair safety
Did not have handrails on all stairs[b,d]	0.69 (0.56 to 0.86)	0.94 (0.76 to 1.16)	HADS score, PDH score, stair safety
Did not have banisters or railings on all stairs[b,d]	1.27 (0.99 to 1.63)	1.17 (0.92 to 1.50)	HADS score, PDH score, stair safety
Had not taught child rules about going downstairs	1.36 (0.92 to 2.02)	0.82 (0.58 to 1.17)	HADS score, PDH score, first child, child's ability to open safety gate, safety gate, stair safety
Had not taught child rules about carrying big/heavy things while going downstairs	1.21 (0.83 to 1.75)	0.84 (0.63 to 1.13)	HADS score, PDH score, first child, child's ability to open safety gate, safety gate, stair safety
Had not taught child rules about leaving things on stairs	0.85 (0.60 to 1.22)	0.80 (0.60 to 1.08)	HADS score, PDH score, first child, child's ability to open safety gate, safety gate, stair safety
Banister width (inches)[b]			Stair safety
Up to ≤ 2.5	1	1	
> 2.5 to ≤ 3.75	0.83 (0.53 to 1.29)	1.03 (0.71 to 1.49)	
> 3.75	0.75 (0.48 to 1.18)	1.05 (0.72 to 1.52)	
Used baby walker[b]	0.83 (0.63 to 1.10)	1.25 (0.96 to 1.63)	HADS score, PDH score, first child, hours of out-of-home child care
Did not use playpen or travel cot[b]	1.07 (0.75 to 1.53)	1.13 (0.80 to 1.61)	HADS score, PDH score, uses baby walker, first child, hours of out-of-home child care
Did not use stationary activity centre[b]	1.08 (0.80 to 1.46)	0.91 (0.67 to 1.22)	HADS score, PDH score, uses baby walker, first child, hours of out-of-home child care

a All matched analyses adjusted for deprivation (IMD) and distance from hospital (quintiles in km: ≤ 2.0, 2.1–3.2, 3.3–4.7, 4.8–8.8, > 8.8) plus confounders in the table. All unmatched analyses adjusted for age, sex, deprivation (IMD) and distance from hospital (quintiles in km: ≤ 2.0, 2.1–3.0, 3.1–4.0, 4.1–7.0, > 7.0) plus confounders listed. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c In the last week.
d Stair safety is a composite variable combining responses to these questions, which are grouped as all 'safe' responses, some 'safe' responses and no 'safe' responses. When the exposure variable is a measure of stair safety this variable is excluded from the composite stair safety measure used as a confounder in adjusted analyses.

Note
HADS – for matched analysis quintiles: ≤ 5, 5.1–8.0, 8.1–11.0, 11.1–16.0, > 16.0).

TABLE 139 Sociodemographic characteristics of cases, community controls and hospital controls participating in the poisoning study

Characteristic	Cases ($n = 567$)	Community controls ($n = 2320$)	Hospital controls ($n = 2253$)
Study centre			
Nottingham	193 (34.0)	738 (31.8)	842 (37.4)
Bristol	179 (31.6)	794 (34.2)	699 (31.0)
Norwich	106 (18.7)	467 (20.1)	435 (19.3)
Newcastle	89 (15.7)	321 (13.8)	277 (12.3)
Age (years), median (IQR)[a]	2.18 (1.49–2.92)	2.24 (1.54–3.02)	1.82 (1.15–2.85)
Age group (months)			
0–12	65 (11.5)	204 (8.8)	517 (22.9)
13–36	378 (66.7)	1575 (67.9)	1253 (55.6)
37–62	124 (21.9)	541 (23.3)	483 (21.4)
Male	280 (49.4)	1210 (52.2)	1240 (55.0)
Ethnic origin: white	514 (92.1) [9]	2115 (92.6) [36]	1954 (88.7) [50]
Children aged 0–4 years in family	[11]	[29]	[32]
0	6 (1.1)	16 (0.7)	25 (1.1)
1	299 (53.8)	1379 (60.2)	1362 (61.3)
2	229 (41.2)	810 (35.4)	735 (33.1)
≥ 3	22 (4.0)	86 (3.8)	99 (4.5)
First child	210 (41.7) [64]	895 (42.7) [222]	934 (44.6) [158]
Maternal age ≤ 19 years at birth of first child[b]	84 (16.5) [8]	208 (9.7) [14]	312 (15.5) [24]
Single adult household	92 (16.6) [13]	262 (11.5) [43]	318 (14.4) [52]
Weekly out-of-home child care (hours), median (IQR)	12 (0.5–22.0) [31]	15 (2.5–24.0) [112]	9 (0–20) [170]
Adults in paid work	[11]	[35]	[51]
≥ 2	263 (47.3)	1281 (56.1)	1047 (47.4)
1	184 (33.1)	742 (32.5)	781 (35.5)
0	109 (19.6)	262 (11.5)	374 (17.0)
Receives state benefits	228 (41.7) [20]	795 (35.1) [54]	951 (43.5) [65]
Overcrowding (more than one person per room)	46 (8.8) [42]	163 (7.4) [128]	213 (10.1) [137]
Non-owner occupier	241 (43.5) [13]	771 (33.8) [41]	928 (42.0) [44]
Household has no car	81 (14.6) [11]	219 (9.6) [28]	319 (14.4) [34]
IMD score, median (IQR)[c]	17.5 (10.3–31.7)	15.1 (9.3–26.5) [24]	18.2 (9.9–33.3) [1]
Distance (km) from hospital, median (IQR)	3.5 (2.2–5.9)	4.0 (2.4–7.6) [24]	3.4 (2.0–5.6)
CBQ score, mean (SD)[c]	4.75 (0.91) [24]	4.61 (0.86) [186]	4.6 (0.95) [149]
Long-term health condition	53 (9.4) [5]	187 (8.1) [21]	204 (9.2) [32]
Child health VAS score (range 0–10), median (IQR)[c]	9.8 (8.8–10) [2]	9.6 (8.4–10) [14]	9.9 (9.2–10) [26]
HRQL (PedsQL), median (IQR)[c,d]	$n = 326$, 91.7 (85.7–97.2) [3]	$n = 1354$, 89.3 (82.1–95.2) [24]	$n = 995$, 92.9 (86.1–97.6) [26]

continued

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TABLE 139 Sociodemographic characteristics of cases, community controls and hospital controls participating in the poisoning study (*continued*)

Characteristic	Cases ($n = 567$)	Community controls ($n = 2320$)	Hospital controls ($n = 2253$)
Parental assessment of child's ability to access poisons	[21]	[96]	[111]
All scenarios 'not likely'	22 (4.0)	112 (5.0)	253 (11.8)
One or more scenarios 'quite likely' and none 'very likely'	100 (18.3)	513 (23.1)	552 (25.8)
One or more scenarios 'very likely'	424 (77.7)	1599 (71.9)	1337 (62.4)
PDH tasks subscale score, median (IQR)[c,e]	14.0 (10.3–18.0) [50]	14.0 (11.0–18.0) [113]	13 (10.0–17.0) [233]
HADS score, mean (SD)[c,e]	10.9 (6.1) [15]	10.8 (6.2) [25]	10.6 (6.1) [49]

a Age when questionnaire completed.
b Applicable only when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values.

TABLE 140 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the poisoning study

Exposure	Cases ($n = 567$)	Community controls ($n = 2320$)	Hospital controls ($n = 2253$)	Community controls, unadjusted OR (95% CI)	Hospital controls, unadjusted OR (95% CI)
Did not have CRCs or blister packs for all medicines[a]	102 (18.2) [6]	321 (13.9) [8]	207 (9.3) [26]	1.39 (1.09 to 1.78)	2.17 (1.68 to 2.81)
Did not have all medicines in locked medicines box[a]	447 (79.5) [5]	1914 (82.8) [9]	1561 (70.2) [30]	0.84 (0.66 to 1.06)	1.65 (1.32 to 2.06)
Not all medicines were locked away[a,b]	454 (83.6) [24] ((0))	1897 (85.4) [92] ((6))	1582 (76.3) [164] ((15))	0.87 (0.67 to 1.14)	1.59 (1.24 to 2.03)
Not all medicines were stored at adult eye level or above[a,b]	189 (40.7) [101] ((2))	612 (30.8) [324] ((10))	478 (25.7) [372] ((22))	1.68 (1.35 to 2.09)	1.99 (1.61 to 2.46)
Not all medicines were stored safely[a]	165 (34.4) [87]	506 (24.9) [287]	360 (18.6) [315]	1.73 (1.38 to 2.17)	2.30 (1.84 to 2.86)
Any medicines transferred into a different container[a]	28 (5.0) [6]	104 (4.5) [10]	93 (4.2) [26]	1.15 (0.74 to 1.77)	1.21 (0.78 to 1.86)
Did not put all medicines away immediately after use[b,c]	213 (41.7) [16] ((40))	522 (26.2) [57] ((274))	455 (24.4) [96] ((289))	2.00 (1.62 to 2.45)	2.22 (1.81 to 2.73)

TABLE 140 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the poisoning study (*continued*)

Exposure	Cases (*n* = 567)	Community controls (*n* = 2320)	Hospital controls (*n* = 2253)	Community controls, unadjusted OR (95% CI)	Hospital controls, unadjusted OR (95% CI)
Did not have CRCs for all cleaning products[a]	154 (27.5) [8]	686 (29.7) [14]	465 (20.9) [26]	0.90 (0.73 to 1.11)	1.44 (1.17 to 1.78)
Not all household/ cleaning products were locked away[a,b]	353 (69.4) [54] ((4))	1590 (72.1) [106] ((10))	1425 (68.7) [160] ((19))	0.85 (0.68 to 1.05)	1.03 (0.84 to 1.27)
Not all household/ cleaning products were stored at adult eye level or above[a,b]	409 (83.5) [73] ((4))	1823 (86.0) [191] ((10))	1507 (78.0) [303] ((19))	0.84 (0.64 to 1.12)	1.42 (1.09 to 1.85)
Not all household/ cleaning products were stored safely[a]	239 (49.9) [88]	1138 (54.6) [234]	891 (46.0) [317]	0.82 (0.67 to 1.01)	1.17 (0.96 to 1.43)
Any cleaning products transferred into a different container[a]	17 (3.0) [5]	38 (1.6) [10]	40 (1.8) [27]	1.74 (0.97 to 3.12)	1.70 (0.96 to 3.03)
Did not use safety gate to stop child accessing kitchen[a]	411 (73.3) [6]	1735 (75.1) [10]	1597 (71.9) [33]	0.91 (0.73 to 1.13)	1.07 (0.87 to 1.32)
Had things child could climb on to reach high surfaces[a]	281 (50.0) [5]	1056 (45.7) [8]	796 (35.8) [29]	1.18 (0.96 to 1.44)	1.79 (1.49 to 2.16)
Did not put all household/cleaning products away immediately after use[b,c]	131 (25.0) [30] ((14))	378 (17.1) [74] ((34))	372 (18.5) [159] ((87))	1.62 (1.28 to 2.05)	1.47 (1.17 to 1.84)
Had not taught child rules about what to do or not do when sees cleaning products	194 (36.1) [30]	899 (40.0) [72]	1082 (50.3) [100]	0.88 (0.70 to 1.10)	0.56 (0.46 to 0.68)
Had not taught child rules about what to do or not do if medicine on worktop	239 (44.0) [24]	1138 (50.7) [74]	1246 (58.1) [110]	0. 73 (0.58 to 0.93)	0.57 (0.47 to 0.68)
Exposures measured only in children aged 0–36 months					
	n = *443*	**n = *1779***	**n = *1770***		
Used baby walker[a]	103 (24.3) [19]	539 (30.6) [15]	472 (27.3) [43]	0.76 (0.59 to 0.98)	0.85 (0.67 to 1.09)

a In the last 24 hours.
b Excludes 'not applicable' responses.
c In the last week.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.

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TABLE 141 Adjusted ORs comparing cases with community and hospital controls participating in the poisoning study

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Did not have CRCs or blister packs on all medicines[b]	1.25 (0.95 to 1.65)	2.31 (1.74 to 3.07)	First child, ability to access poisons
Did not have all medicines in locked medicines box[b]	0.82 (0.47 to 1.43)	1.30 (0.83 to 2.04)	CRCs, HADS score, PDH score, ability to access poisons, hours of out-of-home care, first child, medicines locked, medicines put away immediately after use, uses kitchen safety gate, medicines stored high, things child could climb on to reach high surfaces
Not all medicines were locked away[b]	0.91 (0.64 to 1.31)	1.43 (1.04 to 1.98)	CRCs, HADS score, PDH score, uses kitchen safety gate, medicines stored high, things child could climb on to reach high surfaces, hours of out-of-home care
Not all medicines were stored at adult level or above[b]	1.59 (1.21 to 2.09)	1.95 (1.51 to 2.51)	CRCs, HADS score, PDH score, ability to access poisons, uses kitchen safety gate, first child, things child could climb on to reach high surfaces, hours of out-of-home care
Not all medicines stored safely	1.83 (1.38 to 2.42)	2.28 (1.75 to 2.97)	CRCs, HADS score, PDH score, able to access poisons, first child, uses kitchen safety gate, things child could climb on to reach high surfaces, hours of out-of-home care
Any medicines transferred into a different container[b]	0.96 (0.52 to 1.76)	0.96 (0.54 to 1.73)	CRCs, HADS score, PDH score, locked medicines box, medicines locked away, medicines stored high
Did not put all medicines away immediately after use[c]	2.11 (1.54 to 2.90)	2.22 (1.68 to 2.93)	HADS score, PDH score, ability to access poisons, first child, medicines locked, medicines stored high, things child could climb on to reach high surfaces
Did not have CRCs for all cleaning products[b]	0.87 (0.69 to 1.10)	1.44 (1.14 to 1.81)	First child, ability to access poisons
Not all household/cleaning products were locked away[b]	0.90 (0.69 to 1.17)	1.07 (0.83 to 1.37)	CRCs, HADS score, PDH score, uses kitchen safety gate, products stored high, things child could climb on to reach high surfaces, hours of out-of-home care
Not all household/cleaning products were stored at adult level or above[b]	0.95 (0.67 to 1.35)	1.34 (0.97 to 1.85)	CRCs, HADS score, PDH score, ability to access poisons, uses kitchen safety gate, things child could climb on to reach high surfaces, hours of out-of-home care
Not all household/cleaning products stored safely[b]	0.77 (0.59 to 0.99)	1.16 (0.92 to 1.48)	CRCs, HADS score, PDH score, ability to access poisons, first child, uses kitchen safety gate, things child could climb on to reach high surfaces, hours of out-of-home care
Any cleaning products transferred into a different container[b]	1.20 (0.54 to 2.65)	1.82 (0.84 to 3.93)	CRCs, HADS score, PDH score, products locked, products stored high
Did not use safety gate to stop child access the kitchen[b]	1.05 (0.80 to 1.37)	1.08 (0.84 to 1.39)	HADS score, PDH score, first child, hours of out-of-home care

TABLE 141 Adjusted ORs comparing cases with community and hospital controls participating in the poisoning study (*continued*)

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Had things child could climb on to reach high surfaces[b]	1.20 (0.93 to 1.54)	1.47 (1.16 to 1.87)	CRCs, HADS score, PDH score, ability to access poisons, first child
Did not put all household/ cleaning products away immediately after use[c]	1.79 (1.29 to 2.48)	1.56 (1.16 to 2.09)	HADS score, PDH score, ability to access poisons, first child, products locked, products stored high, things child could climb on to reach high surfaces
Had not taught child rules about what to do or not do when see cleaning products	0.81 (0.59 to 1.12)	0.63 (0.47 to 0.83)	CRCs, HADS score, PDH score, ability to access poisons, first child, products locked, products put away immediately after use, uses kitchen safety gate, products stored high, products transferred to different container
Had not taught child rules about what to do or not do if medicine on worktop	0.66 (0.45 to 0.96)	0.54 (0.40 to 0.73)	CRCs, HADS score, PDH score, ability to access poisons, first child, locked medicines box, medicines locked away, medicines put away immediately after use, uses kitchen safety gate, medicines stored high, medicines transferred to different container
Used baby walker[b]	0.82 (0.61 to 1.10)	0.98 (0.74 to 1.30)	HADS score, PDH score, first child, hours of out-of-home care

a All matched analyses adjusted for deprivation (IMD) and distance from hospital plus confounders in the table. All unmatched analyses adjusted for age, sex, deprivation (IMD) and distance from hospital plus confounders in the table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c In the last week.

TABLE 142 Sociodemographic characteristics of cases, community controls and hospital controls participating in the scalds study

Characteristic	Cases ($n = 338$)	Community controls ($n = 1438$)	Hospital controls ($n = 2490$)
Study centre			
Nottingham	123 (36.4)	521 (36.2)	917 (36.8)
Bristol	112 (33.1)	490 (34.1)	768 (30.8)
Norwich	54 (16.0)	235 (16.3)	488 (19.6)
Newcastle	49 (14.5)	192 (13.4)	317 (12.7)
Age (years), median (IQR)[a]	1.47 (1.03–1.96)	1.56 (1.15–2.07)	2.00 (1.24–2.96)
Age group (months)			
0–12	91 (26.9)	316 (22.0)	491 (19.7)
13–36	216 (63.9)	984 (68.4)	1419 (57.0)
37–62	31 (9.2)	138 (9.6)	580 (23.3)
Male	183 (54.1)	808 (56.2)	1324 (53.2)
Ethnic origin: white	269 (81.8) [9]	1295 (91.3) [19]	2206 (90.4) [51]

continued

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TABLE 142 Sociodemographic characteristics of cases, community controls and hospital controls participating in the scalds study (*continued*)

Characteristic	Cases ($n = 338$)	Community controls ($n = 1438$)	Hospital controls ($n = 2490$)
Number of children aged 0–4 years in family	[6]	[21]	[37]
1	224 (67.5)	883 (62.3)	1473 (60.0)
2	95 (28.6)	476 (33.6)	871 (35.5)
≥ 3	13 (3.9)	58 (4.1)	109 (4.4)
First child	140 (44.4) [23]	581 (43.8) [111]	1008 (44.0) [200]
Maternal age ≤ 19 years at birth of first child[b]	43 (14.6) [3]	156 (11.8) [9]	354 (15.8) [29]
Single adult household	52 (15.9) [10]	171 (12.2) [34]	360 (14.8) [56]
Weekly out of home child care (hours), median (IQR)	5.5 (0–18) [32]	12 (0–24) [77]	10.0 (0–20) [170]
Adults in paid work	[6]	[19]	[57]
≥ 2	150 (45.2)	802 (56.5)	1165 (47.9)
1	129 (38.9)	433 (30.5)	835 (34.3)
0	53 (16.0)	184 (13.0)	433 (17.8)
Receives state benefits	151 (46.0) [10]	491 (35.0) [35]	1386 (57.4) [76]
Overcrowding (more than one person per room)	47 (15.2) [28]	116 (8.6) [83]	213 (9.1) [151]
Non-owner occupier	164 (49.5) [7]	521 (37.1) [33]	1010 (41.4) [51]
Household has no car	55 (16.5) [5]	174 (12.3) [18]	350 (14.3) [41]
IMD score, median (IQR)[c]	20.6 (10.1–35.6)	15.7 (9.5–28.8) [18]	17.8 (9.9–32.1)
Distance (km) from hospital, median (IQR)	3.9 (2.1–8.1)	4.6 (2.6–10.3) [16]	3.4 (2.1–5.4)
CBQ score, mean (IQR)[c]	4.7 (4.0–5.3) [18]	4.6 (4.1–5.2) [155]	4.7 (4.0–5.3) [168]
Long-term health condition	22 (6.6) [7]	77 (5.4) [13]	236 (9.6) [30]
Child health VAS (range 0–10), median (IQR)[c]	9.9 (9.2–10) [4]	9.6 (8.3–10) [4]	9.9 (9.1–10) [24]
HRQL (PedsQL), median (IQR)[c,d]	$n = 79$, 94.8 (88.2–98.8) [3]	$n = 40$, 89.3 (88.1–94.1) [3]	$n = 124$, 92.9 (85.7–97.6) [26]
Parental assessment of child's ability to climb	[6]	[12]	[43]
All scenarios 'not likely'	24 (7.2)	80 (5.6)	130 (5.3)
One or more scenarios 'quite likely' and none 'very likely'	47 (14.2)	165 (11.6)	314 (12.8)
One or more scenarios 'very likely'	261 (78.6)	1181 (82.8)	2003 (81.9)
PDH tasks subscale, median (IQR)[c,e]	13 (10.0–16.0) [34]	14 (11.0–18.0) [99]	13.7 (10.0–17.0) [248]
HADS score, mean (IQR)[c,e]	9 (6.0–13.0) [11]	10 (6.0–14.0) [20]	10 (6.0–14.0) [54]

a Age when questionnaire completed.
b Applicable only when mothers completed the questionnaire.
c IMD: higher scores indicate greater deprivation; CBQ: higher scores indicate more active and more intense behaviour; child health VAS: higher scores indicate better health; PedsQL: higher scores indicate better quality of life; PDH scale: higher scores indicate more hassle; HADS: higher scores indicate greater symptoms of anxiety/depression.
d Missing values refer to those with ≥ 50% items on any scale missing.
e Missing values refer to those with more than one item missing.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values.

TABLE 143 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the scalds study

Exposure	Cases ($n = 338$)	Community controls ($n = 1438$)	Hospital controls ($n = 2490$)	Community controls, unadjusted OR (95% CI)	Hospital controls, unadjusted OR (95% CI)
Did not use any safety gates[a]	82 (26.3) [26]	242 (17.6) [65]	626 (26.7) [149]	1.79 (1.29 to 2.48)	0.98 (0.75 to 1.28)
Had things child could climb on to reach high surfaces[a]	115 (34.7) [7]	475 (33.2) [6]	966 (39.2) [28]	1.07 (0.81 to 1.42)	0.82 (0.65 to 1.05)
Does not have curly flex or cordless kettle[a]	96 (29.3) [10]	417 (29.5) [25]	761 (31.3) [62]	1.00 (0.76 to 1.31)	0.91 (0.70 to 1.17)
Kettle not at back of worktop/table or back ring of cooker[a]	41 (12.6) [12]	135 (9.5) [17]	234 (9.6) [54]	1.46 (1.00 to 2.14)	1.35 (0.95 to 1.93)
Hot tap water too hot[a]	270 (82.8) [12]	1249 (88.0) [18]	1940 (80.0) [64]	0.67 (0.48 to 0.94)	1.21 (0.89 to 1.64)
Temperature of hot tap water not known or known to be > 54 °C[a]	289 (88.7) [12]	1212 (85.5) [21]	2058 (84.6) [56]	1.29 (0.88 to 1.87)	1.43 (1.00 to 2.04)
Child climbed or played on furniture at least some days[b,c]	233 (74.4) [7] ((18))	1098 (80.6) [6] ((70))	1890 (81.3) [41] ((125))	0.54 (0.37 to 0.77)	0.67 (0.51 to 0.88)
Child held by someone holding a hot drink at least some days[b,c]	89 (28.2) [7] ((15))	395 (28.6) [6] ((50))	420 (18.3) [47] ((148))	0.95 (0.72 to 1.26)	1.75 (1.34 to 2.29)
Child held by someone while using a cooker at least some days[b,c]	77 (24.1) [7] ((11))	357 (25.7) [6] ((44))	445 (19.2) [42] ((132))	0.91 (0.68 to 1.21)	1.33 (1.01 to 1.76)
Hot drinks passed over child's head at least some days[b,c]	42 (12.9) [6] ((7))	147 (10.5) [9] ((28))	184 (7.8) [44] ((99))	1.24 (0.85 to 1.80)	1.74 (1.22 to 2.49)
Hot drinks left within reach of child at least some days[b,c]	171 (53.9) [12] ((9))	534 (38.0) [12] ((21))	899 (37.9) [37] ((80))	1.99 (1.54 to 2.57)	1.92 (1.52 to 2.43)
Hot drinks or hot liquids put on a table with a tablecloth at least some days[b,c]	57 (17.8) [8] ((10))	178 (12.9) [9] ((47))	303 (13.1) [46] ((126))	1.47 (1.05 to 2.05)	1.44 (1.06 to 1.97)
The front rings of the cooker used at least some days[b,c]	236 (75.2) [13] ((11))	1152 (82.2) [18] ((19))	1870 (79.4) [43] ((93))	0.67 (0.49 to 0.90)	0.78 (0.59 to 1.03)
Pan handles never turned towards the back of the cooker while cooking[b,c]	104 (32.2) [9] ((6))	380 (27.2) [16] ((23))	649 (27.5) [57] ((75))	1.26 (0.96 to 1.65)	1.25 (0.97 to 1.61)
Child left in bathroom, without adult, even for a moment at least some days[b,c]	55 (17.0) [6] ((8))	384 (27.2) [11] ((17))	600 (25.1) [40] ((63))	0.53 (0.39 to 0.74)	0.61 (0.45 to 0.83)
Child left in bath, without adult, even for a moment at least some days[b,c]	40 (12.5) [9] ((8))	314 (22.2) [12] ((13))	512 (21.5) [44] ((63))	0.47 (0.32 to 0.68)	0.52 (0.37 to 0.73)

continued

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TABLE 143 Frequency of exposures and unadjusted ORs comparing cases with community and hospital controls participating in the scalds study (*continued*)

Exposure	Cases (*n* = 338)	Community controls (*n* = 1438)	Hospital controls (*n* = 2490)	Community controls, unadjusted OR (95% CI)	Hospital controls, unadjusted OR (95% CI)
Bath run for child by an older child at least some days[b,c]	15 (5.6) [11] ((60))	65 (5.6) [19] ((252))	111 (5.5) [54] ((421))	1.13 (0.61 to 2.11)	1.02 (0.59 to 1.78)
Older child looked after child in the bath at least some days[b,c]	29 (11.0) [10] ((64))	164 (14.2) [10] ((273))	265 (13.4) [54] ((463))	0.82 (0.53 to 1.27)	0.80 (0.53 to 1.19)
Bath never run using cold water first[b,c]	246 (78.8) [8] ((18))	1125 (82.7) [22] ((56))	1760 (77.5) [65] ((155))	0.83 (0.61 to 1.13)	1.08 (0.81 to 1.44)
Temperature of bathwater never checked using thermometer or other gadget[b,c]	228 (74.5) [10] ((22))	1045 (75.5) [9] ((45))	1688 (73.7) [60] ((141))	0.95 (0.71 to 1.29)	1.04 (0.79 to 1.37)
Temperature of bathwater never checked using hand or elbow[b,c]	90 (27.6) [7] ((5))	327 (23.4) [10] ((30))	561 (23.9) [48] ((91))	1.23 (0.94 to 1.62)	1.21 (0.94 to 1.58)
Child not taught rules about things not to climb on in the kitchen	160 (49.8) [17]	609 (43.3) [32]	824 (34.9) [129]	1.52 (1.11 to 2.07)	1.85 (1.47 to 2.34)
Child not taught rules about what to do or not do when parents are cooking using the top of the cooker	175 (53.2) [9]	636 (45.1) [27]	873 (36.6) [107]	1.78 (1.29 to 2.44)	1.97 (1.56 to 2.48)
Child not taught rules about hot things in the kitchen	181 (55.9) [14]	655 (46.6) [32]	920 (38.6) [105]	1.79 (1.31 to 2.43)	2.02 (1.59 to 2.55)
Child not taught rules about what to do or not do when in the bathtub	141 (44.2) [19]	471 (33.7) [39]	653 (27.6) [123]	2.16 (1.56 to 2.98)	2.08 (1.64 to 2.64)
Exposures measured only in children aged 0–36 months					
	n = *307*	**n = *1300***	**n = *1910***		
Used baby walker[a]	81 (27.0) [7]	446 (34.7) [15]	494 (26.6) [56]	0.71 (0.53 to 0.94)	1.01 (0.77 to 1.34)
Did not use playpen or travel cot[a]	252 (84.3) [8]	1060 (82.6) [16]	1543 (83.5) [61]	1.16 (0.82 to 1.65)	1.06 (0.76 to 1.48)
Did not use stationary activity centre[a]	246 (82.0) [7]	951 (74.0) [15]	1458 (78.9) [63]	1.62 (1.17 to 2.25)	1.22 (0.89 to 1.67)

a In the last 24 hours.
b In the last week.
c Excludes 'not applicable' responses.

Notes
Values are number (%) unless stated otherwise. Percentages may add up to > 100 because of rounding. Numbers in square brackets represent missing values. Numbers in double parentheses represent responses that are not applicable.

TABLE 144 Adjusted ORs comparing cases with community and hospital controls participating in the scalds study

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Did not use any safety gates[b]	1.46 (0.98 to 2.16)	1.15 (0.83 to 1.61)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care
Had things child could climb on to reach high surfaces[b]	1.24 (0.89 to 1.72)	0.99 (0.73 to 1.34)	HADS score, PDH score, ability to climb, uses safety gate
Does not have curly flex or cordless kettle[b]	0.93 (0.65 to 1.33)	0.82 (0.59 to 1.12)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Kettle not at back of worktop/table or back ring of cooker[b]	1.20 (0.67 to 2.15)	1.11 (0.69 to 1.79)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Hot tap water too hot[b]	0.96 (0.57 to 1.64)	1.24 (0.81 to 1.89)	HADS score, PDH score, ability to climb, first child, bath access
Temperature of hot tap water not known or known to be > 54 °C[b]	0.99 (0.57 to 1.70)	1.50 (0.93 to 2.40)	HADS score, PDH score, ability to climb, first child, bath access
Child climbed or played on furniture at least some days[c]	0.62 (0.40 to 0.96)	0.74 (0.50 to 1.08)	HADS score, PDH score, ability to climb, safety gate
Child held by someone holding a hot drink at least some days[c]	0.83 (0.57 to 1.21)	1.51 (1.05 to 2.15)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Child held by someone while using a cooker at least some days[c]	0.97 (0.67 to 1.41)	1.39 (0.99 to 1.96)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Hot drinks passed over child's head at least some days[c]	1.18 (0.71 to 1.98)	1.70 (1.06 to 2.73)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Hot drinks left within reach of child at least some days[c]	2.33 (1.63 to 3.31)	2.76 (2.00 to 3.80)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Hot drinks or hot liquids put on a table with a tablecloth at least some days[c]	1.33 (0.85 to 2.08)	1.45 (0.97 to 2.17)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
The front rings of the cooker used at least some days[c]	0.70 (0.46 to 1.05)	0.95 (0.66 to 1.36)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen
Pan handles never turned towards the back of the cooker while cooking[c]	0.91 (0.63 to 1.32)	1.01 (0.73 to 1.40)	HADS score, PDH score, ability to climb, first child, uses safety gate, climbable objects, playing/climbing on furniture, safety rules about climbing in kitchen

continued

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TABLE 144 Adjusted ORs comparing cases with community and hospital controls participating in the scalds study (*continued*)

Exposure	Community controls, AOR (95% CI)	Hospital controls, AOR (95% CI)	Confounders adjusted for[a]
Child left in bathroom, without adult, even for a moment at least some days[c]	0.70 (0.48 to 1.01)	0.88 (0.62 to 1.24)	HADS score, PDH score, ability to climb, first child, number of adults living with child, overcrowding
Child left in bath, without adult, even for a moment at least some days[c]	0.47 (0.30 to 0.75)	0.65 (0.43 to 0.98)	HADS score, PDH score, ability to climb, first child, number of adults living with child, overcrowding
Bath run for child by an older child at least some days[c]	0.74 (0.31 to 1.82)	0.89 (0.41 to 1.90)	HADS score, PDH score, ability to climb, first child, number of adults living with child, overcrowding
Older child looked after child in the bath at least some days[c]	1.10 (0.63 to 1.93)	0.95 (0.58 to 1.55)	HADS score, PDH score, ability to climb, first child, number of adults living with child, overcrowding
Bath never run using cold water first[c]	0.85 (0.60 to 1.22)	1.04 (0.75 to 1.44)	HADS score, PDH score, ability to climb, first child, hot water temperature
Temperature of bathwater never checked using thermometer or other gadget[c]	1.00 (0.70 to 1.43)	1.26 (0.90 to 1.75)	HADS score, PDH score, ability to climb, first child, hot water temperature
Temperature of bathwater never checked using hand or elbow[c]	1.19 (0.86 to 1.64)	1.15 (0.85 to 1.56)	HADS score, PDH score, ability to climb, first child, hot water temperature
Child not taught rules about things not to climb on in the kitchen	1.66 (1.12 to 2.47)	1.68 (1.20 to 2.35)	HADS score, PDH score, ability to climb, first child, uses safety gate
Child not taught rules about what to do or not do when parents are cooking using the top of the cooker	1.95 (1.33 to 2.85)	1.76 (1.27 to 2.45)	HADS score, PDH score, ability to climb, first child, uses safety gate
Child not taught rules about hot things in the kitchen	1.89 (1.30 to 2.75)	1.65 (1.19 to 2.29)	HADS score, PDH score, ability to climb, first child, uses safety gate
Child not taught rules about what to do or not do when in the bathtub	1.42 (0.85 to 2.37)	1.57 (1.03 to 2.40)	HADS score, PDH score, ability to climb, first child, uses safety gate, bath access, hot water temperature, bath run with cold first, bath temperature checked
Used baby walker[b]	0.74 (0.52 to 1.03)	1.16 (0.85 to 1.60)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care
Did not use playpen or travel cot[b]	1.33 (0.86 to 2.06)	1.14 (0.75 to 1.73)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care, baby walker
Did not use stationary activity centre[b]	1.22 (0.83 to 1.79)	1.09 (0.76 to 1.58)	HADS score, PDH score, ability to climb, first child, hours of out-of-home care, baby walker

a All matched analyses adjusted for deprivation (IMD) and distance from hospital plus confounders in the table. All unmatched analyses adjusted for age, sex, deprivation (IMD) and distance from hospital plus confounders in the table. The confounders in the table are those identified as the minimum adjustment set from DAGs.
b In the last 24 hours.
c In the last week.

Note
PDH scale – for matched analysis in quintiles: ≤ 10, 10.1–12, 12.1–15, 15.1–19, > 19.

Case–control questionnaires

Case 0–12 months questionnaire

Keeping Children Safe From Accidents

keeping children SAFE AT HOME

Please complete this questionnaire for your child born on .....

Your answers really are important to us.

Thank you for taking the time to help us with this study.

cc study CASE ques Age group 1 V2.2 10.02.2011



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Part 1. About Your Child

1.1 Is your child ☐ Male ☐ Female

1.2 When was your child born? Date of Birth: ...../...../.....

1.3 The postcode where my child lives is: .....

Please tell us a little about your child's recent visit to the Accident and Emergency Department, Minor Injuries Unit or Walk-In Centre

1.4 Did your child visit the A&E department, Minor Injuries Unit or Walk-In Centre because of *(Please ✓ one box)*

- ☐ A slip, trip, fall or tumble on stairs or steps
- ☐ A slip, trip, fall or tumble on the same level
- ☐ A slip, trip, fall or tumble from furniture
- ☐ Swallowing medicine or pills
- ☐ Swallowing cleaning products or garden chemicals
- ☐ A scald from hot water, other hot liquid or steam
- ☐ Other accident (*Please describe*)

.....

1.5 Where did your child's accident happen?

- ☐ In the house or garden where they live *(i.e. where they are registered with a GP)*
- ☐ In another house or garden *(Please say where e.g. grandparents)* .....
- ☐ Somewhere else e.g. road, park, nursery etc *(Please say where)* .....

1.6 What sort of accident was it? *(Please ✓ all that apply)*

- ☐ Loss of consciousness
- ☐ Bang on the head
- ☐ Broken bone
- ☐ Burn or scald
- ☐ Swallowed household cleaner/other poison/pills
- ☐ Cut needing stitches
- ☐ Cut or graze not needing stitches
- ☐ Other accident

1.7 What happened when your child went to the A&E department, Minor Injuries Unit or Walk-In Centre? *(Please ✓ all that apply)*

- ☐ My child was seen and examined but didn't need any treatment
- ☐ My child was given some treatment e.g. medicine, stitches, plaster cast, sling etc

  (Please tell us what).....
- ☐ My child was admitted to hospital
- ☐ My child was discharged from A&E, Minor Injuries Unit or Walk-In Centre but has to be seen in the outpatient department
- ☐ My child was discharged from A&E, Minor Injuries Unit or Walk-In Centre but has to be seen by the GP or practice nurse

1.8 Please tell us the date you completed this questionnaire .....

If your child's accident did not happen in the house or garden where they live, please do not answer any more questions. Please return the questionnaire in the FREEPOST envelope.

Part 2. About your child's development, health and behaviour

All children develop at their own rate so we would like to ask you what your child can do. There are no right or wrong answers.

2.1 Please tell us whether your child does each thing often, has only done it once or twice or has not started to do it yet.

Please ✓ one box on each line

	Often	Once or twice	Not yet
Crawling			
Shuffling along the floor on his/her bottom			
Walking			

2.2 At the moment, how likely do you think it is that your child could:
(If your child is too young to be able to do some of these things, put a tick in the "not likely" box)

Please ✓ one box on each line

	Very likely	Quite likely	Not likely	Don't know
Reach, or climb on to a worktop				
Reach, or climb on to something to reach a cupboard at adult eye level				
Open cupboards, drawers or medicine cabinets with locks or safety catches on them				
Open a fridge with a lock or safety catch on it				
Open a container with a child resistant cap				
Open a lockable medicine box				
Get medicines out of blister packs				
Touch things that you have told him/her not to				
Open a stair gate or safety gate				
Reach, or climb on to something to reach a pan on the cooker				
Reach, or climb on to something to reach a hot water tap				
Reach to pull a table cloth hanging over the side of a table				
Turn a hot water tap on by him/herself				
Climb into the bath by him/herself				
Climb onto furniture e.g. sofa, chair, bed				
Climb out of a cot				
Roll off a bed or high surface				
Climb up to a top bunk bed				

2.3 Does your child have any long-term conditions (e.g. problems with hearing, eye sight, development, fits etc) that have been diagnosed by a health professional?
Long-term means anything that your child has had for at least 3 months or is expected to continue for at least the next 3 months.

☐ Yes ☐ No

If YES, please tell us what conditions your child has:

.....

2.4 How was your child's health **IN THE 24 HOURS BEFORE THEIR ACCIDENT**? Please put an "x" on the line below to indicate how good or how bad your child's health was:



Worst possible health

Perfect health



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2.5 Have you taught your child any rules or instructions about keeping safe at home? If your child is too young to teach some of these rules to, put a tick in the "No" box next to each rule.

	Have you taught your child these rules? *(Please ✓ one box for each question)*		**If YES**, how often does your child follow these rules? *(Please ✓ one box for each question)*				
	Yes	No	Always	Most times	Sometimes	Occasionally	Never
What to do or not do when parents are cooking using the top of the cooker							
What to do or not do with hot things in the kitchen e.g. kettle							
What to do or not do when he/she is in the bathtub							
About things in the kitchen that he/she is not supposed to climb on							
What to do or not do when he/she sees cleaning products							
What to do or not do if there is medicine on the work top							
What to do or not do if the floor is slippery							
About running in the house							
About jumping on the bed or furniture							
What to do or how he/she is supposed to behave when going down the stairs							
About carrying big things or lots of things while going down stairs							
About leaving things on the stairs							

2.6 Please tell us how often your child did the things described below during the **LAST WEEK** by ticking one of the boxes. You may not be able to answer some of the questions because you may not have seen your child in that situation, e.g. if the question is about playing peekaboo and your child has not played this in the last week, then tick the "Not Applicable" box.

Please ✓ one box on each line

	Never	Very rarely	Less than half the time	About half the time	More than half the time	Almost always	Always	Not applicable
Enjoy being tickled by you or someone else in your family?								
During feeding how often did your baby lie or sit quietly?								
During feeding how often did your baby squirm or kick?								
During feeding how often did your baby wave his/her arms?								
When being dressed or undressed during the last week how often did your baby squirm and/or try and roll away?								
When tossed around playfully how often did your baby smile?								
When tossed around playfully how often did your baby laugh?								
During a peekaboo game, how often did your baby smile?								
During a peekaboo game, how often did your baby laugh?								
How often did your baby enjoy bouncing up and down while on your lap?								
How often did your baby enjoy bouncing up and down on an object such as a bed, bouncing chair or toy?								
When placed in an infant seat or car seat how often did your baby wave his/her arms and kick?								
When placed in an infant seat or car seat how often did your baby squirm and turn his/her body?								
When placed on his/her back how often did your baby squirm and/or turn his/her body?								

Part 3. About your home

Every home has things that may not seem very safe for children. We want to find out which things really are safe or not. Please answer the questions below as honestly as possible.

Please think about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.1 Please tell us where your medicines and cleaning products were **IN THE 24 HOURS BEFORE YOUR CHILD'S ACCIDENT.**

	Did you have this in your home? *(Please ✓ one box)*		**IF YES** At what level was it? *(Please ✓ all that apply)*		**IF YES** Where was it? *(Please ✓ all that apply)*		
	Yes	No	At adult eye level or above	Below adult eye level	Cupboard, medicine cabinet, drawer or fridge with lock or safety catch	Cupboard, medicine cabinet, drawer or fridge without lock or safety catch	Other place without lock e.g. shelf, handbag, work surface
Painkillers e.g. Calpol							
Iron or vitamins							
Cough mixture							
Antidepressants or sleeping tablets							
Any other medicines in the kitchen							
Any other medicines in the bathroom							
Any other medicines anywhere else in the house							
Bleach							
Dishwasher products							
Oven cleaner							
Toilet cleaner							
White spirit/ turpentine							
Rat or ant killer							
Garden chemicals e.g. weed killer							
Any other household products							

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Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.2 Did all your medicines have child resistant caps or blister packs? ☐ Yes ☐ No

3.3 Had any medicines been put in a container different from the one they came in? ☐ Yes ☐ No

3.4 Were all medicines kept in a locked medicine box? ☐ Yes ☐ No

3.5 Were any medicines kept in the fridge? ☐ Yes ☐ No

If YES, was the fridge closed with a lock or safety catch? ☐ Yes ☐ No





3.6 Did all your cleaning products have child resistant caps? ☐ Yes ☐ No

3.7 Had any cleaning products been put in a container different from the one they came in? ☐ Yes ☐ No



3.8 Did you use a safety gate to stop your child/children getting in to the kitchen? ☐ Yes ☐ No

3.9 Was there anything your child could climb on to reach work tops, shelves, cupboards etc, in any of your rooms? ☐ Yes ☐ No



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Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.10 Did you use protective corner covers on any of your furniture? ☐ Yes ☐ No

3.11 Did your child use a baby walker? ☐ Yes ☐ No

3.12 Did your child use a stationary play centre (like a baby walker without wheels) ☐ Yes ☐ No

3.13 Did your child use a playpen? ☐ Yes ☐ No

3.14 Did your child use a travel cot instead of a playpen? ☐ Yes ☐ No

3.15 Did you have a kettle with a curly flex or a cordless kettle? ☐ Yes ☐ No

3.16. Where was your kettle? *(Please ✓ one box)*

☐ At the front of the work top or table ☐ Between the front and back of the work top or table

☐ At the back of the worktop or table ☐ On the front ring of the cooker

☐ On the back ring of the cooker ☐ Other (*please describe*).....

3.17 How hot was your hot tap water? *(Please ✓ one box)*

☐ Very hot – you couldn't have a bath without adding a lot of cold water

☐ Hot – you would need to add some cold water to the bath

☐ Warm enough– you don't need to add any cold water to the bath

☐ Not very warm – not warm enough to have a bath in



3.18 Do you know the temperature of your hot tap water? *(Please ✓ one box)*

☐ Lower than 54°C ☐ 54°C or higher ☐ Don't know

3.19 Were all carpets or rugs in your home firmly fixed to the floor? ☐ Yes ☐ No

3.20 Do you have any stairs in your home? ☐ Yes ☐ No (if no, go to question 3.29)

3.21 Did you use any stair gates or safety gates in your home? ☐ Yes ☐ No

If YES, where did you use them? *(Please ✓ all that apply)*

☐ Bottom of stairs ☐ Top of stairs

☐ Other (*please tell us where*).....

Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.22 Were any of your stair gates on the stairs left open? ☐ Yes ☐ No

3.23 Which of the following describe how your stairs look? *(Please ✓ all that apply)*

☐ Carpeted ☐ Exposed wood ☐ Exposed metal or concrete

☐ Lino/vinyl covered ☐ Don't know ☐ Other *(please describe)*.....

3.24 Please put a tick in the box that best describes your agreement with each of the following:

Please ✓ one box on each line

	Agree	Neither agree nor disagree	Disagree
The stairs are too steep			
The stairs are too narrow			
The stairs are poorly lit			
The steps are in need of repair			
The banister/handrail is in need of repair			
The stair covering is in need of repair			
The stairs are safe to use			

3.25 Are there any handrails on the wall next to your stairs? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

3.26 Is there a banister/railings at the side of your stairs to stop people from falling through? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

If YES, how wide are the biggest gaps between the railings? .....*(please write in number of inches)*

3.27 Do any of your stairs have a landing part way up? ☐ Yes ☐ No

3.28 Are any of your stairs spiral or winding stair cases? ☐ Yes ☐ No



Please think about the WEEK BEFORE YOUR CHILD'S ACCIDENT:

3.29 How often did these things happen in the **WEEK** before your child's accident? If you did not have the things the question is asking about e.g. high chair, tick the "does not apply" box. For questions that ask about older children, if you do not have older children, tick the "does not apply" box.

Please ✓ one box on each line

	Does not apply	Every day	Most days	Some days	Never
Your child was held, even for a moment, by some one holding a hot drink?					
Your child was held, even for a moment, by some one using the cooker?					
Hot drinks were passed over your child's head?					
Hot drinks were left within the reach of your child e.g. coffee table, work top, other low surface?					
Hot drinks or hot liquids were put on a table with a table cloth?					
The front rings of the cooker were used?					
Pan handles were turned towards the back of the cooker whilst cooking?					
Your child was left in the bathroom, without an adult whilst the bath was running, even for a moment e.g. to collect clothes, nappies or answer the phone?					
Your child was left in the bath without an adult, even for a moment e.g. to collect clothes, nappies or answer the phone?					
A bath was run for your child by an older child?					
An older child looked after your child in the bath?					
The bath was run using cold water first?					
The temperature of your child's bath water was checked using a thermometer or other gadget?					
The temperature of your child's bath water was checked using a hand or elbow?					
There were things on your floors that could be tripped over?					
Your child was left on a raised surface e.g. table, sofa, adult bed, even for a moment?					
Your child's nappy was changed on a raised surface e.g. bed, changing table, work top?					
Your child was put in a car seat or bouncing seat on a raised surface e.g. table, work top, even for a moment?					
There were wires or cables trailing across the floor?					
Your child climbed onto or played on furniture e.g. bed, chair, sofa?					

Please continue on page 14



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	Does not apply	Every day	Most days	Some days	Never
Your child climbed onto or played on garden furniture?					
There were things on your stairs that could be tripped over?					
Your child used a high chair without being strapped in with the harness/straps?					
Your child played in the garden without an adult in the garden?					
A safety gate was used to stop your child getting into the garden?					
The back door was locked to stop your child getting into the garden?					

3.30 Please tell us how often these things happened in the **WEEK** before your child's accident. If you did not have or did not use some of these medicines or cleaning products please tick the "does not apply" box.

Please ✓ one box on each line

The following were put away IMMEDIATELY after use:	Does not apply	Every time	Most times	Some times	Never
Painkillers (e.g. Calpol)					
Iron or vitamins					
Cough mixtures					
Antidepressant or sleeping tablets					
Other medicines					
Bleach					
Dishwasher products					
Oven cleaner					
Toilet cleaner					
White spirit/turpentine					
Rat or ant killer					
Garden chemicals e.g. weed killers					
Any other household products					

Part 4. About the worries of family life

4.1 The statements below describe things that often happen in families with young children. These things sometimes make life difficult. Please read each statement and tick how often it happens to you and then tick how much of a "hassle" you feel it has been for you in the **PAST 6 MONTHS**. **Please answer these questions thinking about all of your children.**

	How often it happens				Hassle (low to high)				
	Rarely	Sometimes	A lot	Constantly	1 low	2	3	4	5 high
Continually cleaning up messes of food or toys									
The children's schedules (like pre-school or other activities) interfere with your own household needs									
The children are constantly underfoot, interfering with other chores									
Having to change your plans because of unexpected child needs									
The children get dirty several times a day needing changes of clothing									
Difficulties in getting children ready for outings and leaving on time									
Having to run extra errands to meet the children's needs									
Fights with brothers or sisters require a referee (if you only have one child, please write "only one child")									

4.2 Please read each statement and tick the box next to each one which comes closest to how you have been feeling in the **PAST WEEK**. Don't take too long over your replies: your first reaction to each item will probably be better than thinking about it for too long.

I feel tense or 'wound up':		**I feel as if I am slowed down:**	
Most of the time		Nearly all of the time	
A lot of the time		Very often	
Time to time, occasionally		Sometimes	
Not at all		Not at all	

I still enjoy the things I used to enjoy:		**I get a sort of frightened feeling like 'butterflies in the stomach':**	
Definitely as much		Not at all	
Not quite so much		Occasionally	
Only a little		Quite often	
Not at all		Very often	
I get a sort of frightened feeling like something awful is about to happen:		**I have lost interest in my appearance:**	
Very definitely and quite badly		Definitely	
Yes, but not too badly		I don't take as much care as I should	
A little, but it doesn't worry me		I may not take quite as much care	
Not at all		I take just as much care as ever	
I can laugh and see the funny side of things:		**I feel restless as if I have to be on the move:**	
As much as I always could		Very much indeed	
Not quite so much now		Quite a lot	
Definitely not so much now		Not very much	
Not at all		Not at all	
Worrying thoughts go through my mind:		**I look forward with enjoyment to things:**	
A great deal of the time		As much as I ever did	
A lot of the time		Rather less than I used to	
From time to time but not too often		Definitely less than I used to	
Only occasionally		Hardly at all	
I feel cheerful:		**I get sudden feelings of panic:**	
Not at all		Very often indeed	
Not often		Quite often	
Sometimes		Not very often	
Most of the time		Not at all	
I can sit at ease and feel relaxed:		**I can enjoy a good book or radio or TV programme:**	
Definitely		Often	
Usually		Sometimes	
Not often		Not often	
Not at all		Very seldom	

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5. About your family

5.1 How many children, including step-children, (under 5) do you have living with you? ..... *(Please give number)*

5.2 How many children, including step-children, (aged 5-16) do you have living with you? ..... *(Please give number)*

5.3 The total number of adults and children living in our home is: ..... *(Please give number)*

5.4. I am the child(ren's) *(Please ✓ one box)*

☐ Mother ☐ Father ☐ Grandparent ☐ Other *(Please say what)* .....

5.5 How many brothers and sisters (including step-brothers/step-sisters) does your child have?

..... older brothers and sisters ..... younger brothers and sisters *(Please give number)*

5.6 Does your child live? *(Please ✓ one box)*

☐ In one house only

☐ In a residential home

☐ Part time in one house and part time in another house [please answer the remaining questions about the house where they spend most of their time]

5.7 How many adults, over the age of 16, live in the house with your child? *(Please ✓ one box)*

☐ One parent ☐ Both parents ☐ One parent and other adults

☐ Both parents and other adults ☐ Other (Please describe) .....

5.8 How many adults living in the house with your child work in a paid job? *(Please ✓ one box)*

☐ None ☐ One ☐ Two ☐ More than two

5.9 What kind of house does your child live in? *(Please ✓ one box)*

☐ Rented house ☐ House owned by, or being bought by family

☐ Other *(Please say what)*.....

5.10 My family usually has the use of a car ☐ Yes ☐ No

5.11 My family receives one or more state benefits as well as child benefit ☐ Yes ☐ No

If you are the mother of the child in this survey, please answer the next question. Otherwise please go to question 5.13

5.12 When my first child was born my age was: .....years

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5.13 I am (*Please ✓ one box)*

☐ White (e.g. White British, Irish, other white background) ☐ Black (e.g. Caribbean, African)

☐ Asian (e.g. Indian, Pakistani, Bangladeshi, Chinese)

☐ Other *(Please say what)*.....

5.14 The total number of rooms in our home is: ..... *(Please give number)*
(***do not count bathrooms or toilets or rooms that can only be used for storage such as cupboards***)

5.15 Who else looks after your child? *(Please ✓ all that apply)*

☐ Day Nursery ☐ Preschool ☐ Playgroup ☐ School

☐ Childminder ☐ Family/grandparents ☐ Friends ☐ N/A

☐ Other *(Please say who)*.....

5.16 In a typical week how many hours is your child cared for by somebody else away from the family home (please include all those ticked in 5.15)?

..... hours *(please give number)*

5.17 Is there anything else you would like to tell us about your child, their accident or the things that you do at home to keep your child/children safe?

.....

.....

.....

.....

.....

.....

Thank you very much for filling in this questionnaire. Your answers are very important in helping us stop children's accidents.

Please send this back to us in the FREEPOST ENVELOPE

We will need your name and address so that we can send you your gift voucher. Please fill in the pink form and send it back with your questionnaire

keeping Children SAFE AT HOME

Thank you very much for filling in this questionnaire. Your answers are very important in helping us stop children's accidents.

Please send this back to us in the FREEPOST ENVELOPE

We will need your name and address so that we can send you your gift voucher.

Please fill in the pink form and send it back with your questionnaire



☐☐ ☐☐☐☐☐ ☐☐

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Case 13–36 months questionnaire

Keeping Children Safe From Accidents

keeping children SAFE AT HOME

Please complete this questionnaire for your child born on .....

Your answers really are important to us.

Thank you for taking the time to help us with this study.

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Part 1. About Your Child

1.1 Is your child ☐ Male ☐ Female

1.2 When was your child born? Date of Birth ...../...../.....

1.3 The postcode where my child lives is:.....

Please tell us a little about your child's recent visit to the Accident and Emergency Department, Minor Injuries Unit or Walk-In Centre

1.4 Did your child visit the A&E department, Minor Injuries Unit or Walk-In Centre because of *(Please ✓ one box)*

- ☐ A slip, trip, fall or tumble on stairs or steps
- ☐ A slip, trip, fall or tumble on the same level
- ☐ A slip, trip, fall or tumble from furniture
- ☐ Swallowing medicine or pills
- ☐ Swallowing cleaning products or garden chemicals
- ☐ A scald from hot water, other hot liquid or steam
- ☐ Other accident (*Please describe*).....

1.5 Where did your child's accident happen?

- ☐ In the house or garden where they live *(i.e. where they are registered with a GP)*
- ☐ In another house or garden *(Please say where e.g. grandparents)* .....
- ☐ Somewhere else e.g. road, park, nursery etc *(Please say where)* .....

1.6 What sort of accident was it? *(Please ✓ all that apply)*

- ☐ Loss of consciousness ☐ Bang on the head ☐ Broken bone
- ☐ Burn or scald ☐ Swallowed household cleaner/other poison/pills
- ☐ Cut needing stitches ☐ Cut or graze not needing stitches ☐ Other accident

1.7 What happened when your child went to the A&E department, Minor Injuries Unit or Walk-In Centre? *(Please ✓ all that apply)*

- ☐ My child was seen and examined but didn't need any treatment
- ☐ My child was given some treatment e.g. medicine, stitches, plaster cast, sling etc

  (Please tell us what).....
- ☐ My child was admitted to hospital
- ☐ My child was discharged from A&E, Minor Injuries Unit or Walk-In Centre but has to be seen in the outpatient department
- ☐ My child was discharged from A&E, Minor Injuries Unit or Walk-In Centre but has to be seen by the GP or practice nurse

1.8 Please tell us the date you completed this questionnaire .....

If your child's accident did not happen in the house or garden where they live, please do not answer any more questions. Please return the questionnaire in the FREEPOST envelope.

Part 2. About your child's development, health and behaviour

All children develop at their own rate so we would like to ask you what your child can do. There are no right or wrong answers.

2.1 Please tell us whether your child does each thing often, has only done it once or twice or has not started to do it yet.

Please ✓ one box on each line

	Often	Once or twice	Not yet
Crawling			
Shuffling along the floor on his/her bottom			
Walking			

2.2 At the moment, how likely do you think it is that your child could:
(If your child is too young to be able to do some of these things, put a tick in the "not likely" box)

Please ✓ one box on each line

	Very likely	Quite likely	Not likely	Don't Know
Reach, or climb on to a worktop				
Reach, or climb on to something to reach a cupboard at adult eye level				
Open cupboards, drawers or medicine cabinets with locks or safety catches on them				
Open a fridge with a lock or safety catch on it				
Open a container with a child resistant cap				
Open a lockable medicine box				
Get medicines out of blister packs				
Touch things that you have told him/her not to				
Open a stair gate or safety gate				
Reach, or climb on to something to reach a pan on the cooker				
Reach, or climb on to something to reach a hot water tap				
Reach to pull a table cloth hanging over the side of a table				
Turn a hot water tap on by him/herself				
Climb into the bath by him/herself				
Climb onto furniture e.g. sofa, chair, bed				
Climb out of a cot				
Roll off a bed or high surface				
Climb up to a top bunk bed				

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2.3 Does your child have any long-term conditions (e.g. problems with hearing, eye sight, development, fits etc) that have been diagnosed by a health professional?
Long-term means anything that your child has had for at least 3 months or is expected to continue for at least the next 3 months.

☐ Yes ☐ No

If YES, please tell us what conditions your child has:

.....

2.4 How was your child's health **IN THE 24 HOURS BEFORE THEIR ACCIDENT**? Please put an "x" on the line below to indicate how good or how bad your child's health was:



Worst possible health ——————————— Perfect health



PLEASE COMPLETE 2.5 IF YOUR CHILD IS AGED 2 YEARS OR OVER
FOR CHILDREN AGED UNDER 2 YEARS – please go to 2.7

2.5 Below is a list of things that might be a problem for your child. Please tell us how much of a problem each one has been for your child during the **TWO WEEKS BEFORE THEIR ACCIDENT** by circling:

0 if it is never a problem
1 if it is almost never a problem
2 if it is sometimes a problem
3 if it is often a problem
4 if it is almost always a problem

There are no right or wrong answers.

In the **TWO WEEKS BEFORE YOUR CHILD'S ACCIDENT**, how much of a problem has your child had with:

Physical Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

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Emotional Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

2.6 Does your child attend school or day care? *(please ✓ one box)*

☐ Yes - Please complete the next 3 questions

☐ No - Please go to 2.7

School Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/daycare because of not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the doctor or hospital	0	1	2	3	4

2.7 Have you taught your child any rules or instructions about keeping safe at home? If your child is too young to teach some of these rules to, put a tick in the "No" box next to each rule.

	Have you taught your child these rules? *Please ✓ one box for each question*		**If YES**, how often does your child follow these rules? *(Please ✓ one box for each question)*				
	Yes	No	Always	Most times	Some times	Occasionally	Never
What to do or not do when parents are cooking using the top of the cooker							
What to do or not do with hot things in the kitchen e.g. kettle							
What to do or not do when he/she is in the bathtub							
About things in the kitchen that he/she is not supposed to climb on							
What to do or not do when he/she sees cleaning products							
What to do or not do if there is medicine on the work top							
What to do or not do if the floor is slippery							
About running in the house							
About jumping on the bed or furniture							
What to do or how he/she is supposed to behave when going down the stairs							
About carrying big things or lots of things while going down stairs							
About leaving things on the stairs							

2.8 Please tell us how often your child did the things described below during the **LAST TWO WEEKS** by ticking one of the boxes. You may not be able to answer some of the questions because you may not have seen your child in that situation, e.g. if the question is about going down a slide and your child did not do this in the last 2 weeks then tick the "Not Applicable" box

Please ✓ one box on each line

	Never	Very rarely	Less than half the time	About half the time	More than half the time	Almost always	Always	Not applicable
While bathing, how often did your child sit quietly?								
While bathing, how often did your child splash, kick or try to jump?								
While participating in daily activities, how often did your child move quickly from one place to another?								
While participating in daily activities, how often did your child seem full of energy, even in the evening?								
During sleep how often did your child toss about in the bed?								
During sleep how often did your child sleep in one position only?								
When playing outdoors with other children, how often did your child seem to be one of the most active children?								
When playing outdoors with other children, how often did your child sit quietly and watch?								
When being dressed or undressed, how often did your child squirm and try to get away?								
When being dressed or undressed, how often did your child stay still?								
When playing indoors, how often did your child run through the house?								
When playing indoors, how often did your child climb over furniture?								
While playing outdoors, how often did your child:								
Like making lots of noise?								
Want to climb to high places (e.g. up a tree or on a climbing frame)?								
Choose to take chances for the fun and excitement of it?								
Not like going down high slides at the play ground?								
Want to jump from heights?								
Want to go down the slide in unusual ways (e.g. head first)?								

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	Never	Very rarely	Less than half the time	About half the time	More than half the time	Almost always	Always	Not applicable
While playing indoors, how often did your child:								
Like rough and rowdy games?								
Enjoy playing boisterous games like chase?								
Enjoy vigorously jumping on the bed or settee?								
Not like rough or rowdy games?								
Enjoy activities such as being spun etc?								

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Part 3. About your home

Every home has things that may not seem very safe for children. We want to find out which things really are safe or not. Please answer the questions below as honestly as possible.

Please think about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.1 Please tell us where your medicines and cleaning products were **IN THE 24 HOURS BEFORE YOUR CHILD'S ACCIDENT.**

	Did you have this in your home? *(Please ✓ one box)*		**IF YES** At what level was it? *(Please ✓ all that apply)*		**IF YES** Where was it? *(Please ✓ all that apply)*		
	Yes	No	At adult eye level or above	Below adult eye level	Cupboard, medicine cabinet, drawer or fridge with lock or safety catch	Cupboard, medicine cabinet, drawer or fridge without lock or safety catch	Other place without lock e.g. shelf, handbag, work surface
Painkillers e.g. Calpol							
Iron or vitamins							
Cough mixture							
Antidepressants or sleeping tablets							
Any other medicines in the kitchen							
Any other medicines in the bathroom							
Any other medicines anywhere else in the house							
Bleach							
Dishwasher products							
Oven cleaner							
Toilet cleaner							
White spirit/ turpentine							
Rat or ant killer							
Garden chemicals e.g. weed killer							
Any other household products							

Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.2 Did all your medicines have child resistant caps or blister packs? ☐ Yes ☐ No

3.3 Had any medicines been put in a container different from the one they came in? ☐ Yes ☐ No

3.4 Were all medicines kept in a locked medicine box? ☐ Yes ☐ No

3.5 Were any medicines kept in the fridge? ☐ Yes ☐ No

If YES, was the fridge closed with a lock or safety catch? ☐ Yes ☐ No





3.6 Did all your cleaning products have child resistant caps? ☐ Yes ☐ No

3.7 Had any cleaning products been put in a container different from the one they came in? ☐ Yes ☐ No



3.8 Did you use a safety gate to stop your child/children getting in to the kitchen? ☐ Yes ☐ No

3.9 Was there anything your child could climb on to reach work tops, shelves, cupboards etc, in any of your rooms? ☐ Yes ☐ No

3.10 Did you use protective corner covers on any of your furniture? ☐ Yes ☐ No

3.11 Did your child use a baby walker? ☐ Yes ☐ No

3.12 Did your child use a stationary play centre (like a baby walker without wheels) ☐ Yes ☐ No

3.13 Did your child use a playpen? ☐ Yes ☐ No

Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.14 Did your child use a travel cot instead of a playpen? ☐ Yes ☐ No

3.15 Did you have a kettle with a curly flex or a cordless kettle? ☐ Yes ☐ No



3.16. Where was your kettle? *(Please ✓ one box)*

☐ At the front of the work top or table ☐ Between the front and back of the work top or table

☐ At the back of the worktop or table ☐ On the front ring of the cooker

☐ On the back ring of the cooker ☐ Other (*please describe*).....

3.17 How hot was your hot tap water? *(Please ✓ one box)*

☐ Very hot – you couldn't have a bath without adding a lot of cold water

☐ Hot – you would need to add some cold water to the bath

☐ Warm enough– you don't need to add any cold water to the bath

☐ Not very warm – not warm enough to have a bath in



3.18 Do you know the temperature of your hot tap water? *(Please ✓ one box)*

☐ Lower than 54°C ☐ 54°C or higher ☐ Don't know

3.19 Were all carpets or rugs in your home firmly fixed to the floor? ☐ Yes ☐ No

3.20 Do you have any stairs in your home? ☐ Yes ☐ No (if no, go to question 3.29)

3.21 Did you use any stair gates or safety gates in your home? ☐ Yes ☐ No

If YES, where did you use them? *(Please ✓ all that apply)*

☐ Bottom of stairs ☐ Top of stairs

☐ Other (*please tell us where*).....

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Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.22 Were any of your stair gates on the stairs left open? ☐ Yes ☐ No

3.23 Which of the following describe how your stairs look? *(Please ✓ all that apply)*

☐ Carpeted ☐ Exposed wood ☐ Exposed metal or concrete

☐ Lino/vinyl covered ☐ Don't know ☐ Other *(please describe)*.....

3.24 Please put a tick in the box that best describes your agreement with each of the following:

Please ✓ one box on each line

	Agree	Neither agree nor disagree	Disagree
The stairs are too steep			
The stairs are too narrow			
The stairs are poorly lit			
The steps are in need of repair			
The banister/handrail is in need of repair			
The stair covering is in need of repair			
The stairs are safe to use			

3.25 Are there any handrails on the wall next to your stairs? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

3.26 Is there a banister/railings at the side of your stairs to stop people from falling through? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

If YES, how wide are the biggest gaps between the railings? .....*(please write in number of inches)*

3.27 Do any of your stairs have a landing part way up? ☐ Yes ☐ No

3.28 Are any of your stairs spiral or winding stair cases? ☐ Yes ☐ No



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Please think about the WEEK BEFORE YOUR CHILD'S ACCIDENT:

3.29 How often did these things happen in the **WEEK** before your child's accident. If you did not have the things the question is asking about e.g. high chair, tick the "does not apply" box. For questions that ask about older children, if you do not have older children, tick the "does not apply" box.

Please ✓ one box on each line

	Does not apply	Every day	Most days	Some days	Never
Your child was held, even for a moment, by someone holding a hot drink?					
Your child was held, even for a moment, by someone using the cooker?					
Hot drinks were passed over your child's head?					
Hot drinks were left within the reach of your child e.g. coffee table, work top, other low surface?					
Hot drinks or hot liquids were put on a table with a table cloth?					
The front rings of the cooker were used?					
Pan handles were turned towards the back of the cooker whilst cooking?					
Your child was left in the bathroom, without an adult whilst the bath was running, even for a moment e.g. to collect clothes, nappies or answer the phone?					
Your child was left in the bath without an adult, even for a moment e.g. to collect clothes, nappies or answer the phone?					
A bath was run for your child by an older child?					
An older child looked after your child in the bath?					
The bath was run using cold water first?					
The temperature of your child's bath water was checked using a thermometer or other gadget?					
The temperature of your child's bath water was checked using a hand or elbow?					
There were things on your floors that could be tripped over?					
Your child was left on a raised surface e.g. table, sofa, adult bed, even for a moment?					
Your child's nappy was changed on a raised surface e.g. bed, changing table, work top?					
Your child was put in a car seat or bouncing seat on a raised surface e.g. table, work top, even for a moment?					
There were wires or cables trailing across the floor?					
Your child climbed onto or played on furniture e.g. bed, chair, sofa?					

	Does not apply	Every day	Most days	Some days	Never
Your child climbed onto or played on garden furniture?					
There were things on your stairs that could be tripped over?					
Your child used a high chair without being strapped in with the harness/straps?					
Your child played in the garden without an adult in the garden?					
A safety gate was used to stop your child getting into the garden?					
The back door was locked to stop your child getting into the garden?					

3.30 Please tell us how often these things happened in the **WEEK** before your child's accident. If you did not have or did not use some of these medicines or cleaning products please tick the "does not apply" box.

Please ✓ one box on each line

The following were put away IMMEDIATELY after use:	Does not apply	Every time	Most times	Some times	Never
Painkillers (e.g. Calpol)					
Iron or vitamins					
Cough mixtures					
Antidepressant or sleeping tablets					
Other medicines					
Bleach					
Dishwasher products					
Oven cleaner					
Toilet cleaner					
White spirit/turpentine					
Rat or ant killer					
Garden chemicals e.g. weed killers					
Any other household products					

Part 4. About the worries of family life

4.1 The statements below describe things that often happen in families with young children. These things sometimes make life difficult. Please read each statement and tick how often it happens to you and then tick how much of a "hassle" you feel it has been for you in the **PAST 6 MONTHS**. **Please answer these questions thinking about all of your children.**

	How often it happens				Hassle (low to high)				
	Rarely	Sometimes	A lot	Constantly	1 low	2	3	4	5 high
Continually cleaning up messes of food or toys									
The children's schedules (like pre-school or other activities) interfere with your own household needs									
The children are constantly underfoot, interfering with other chores									
Having to change your plans because of unexpected child needs									
The children get dirty several times a day needing changes of clothing									
Difficulties in getting children ready for outings and leaving on time									
Having to run extra errands to meet the children's needs									
Fights with brothers or sisters require a referee (if you only have one child, please write "only one child")									

4.2 Please read each statement and tick the box next to each one which comes closest to how you have been feeling in the **PAST WEEK**. Don't take too long over your replies: your first reaction to each item will probably be better than thinking about it for too long.

I feel tense or 'wound up':		**I feel as if I am slowed down:**	
Most of the time		Nearly all of the time	
A lot of the time		Very often	
Time to time, occasionally		Sometimes	
Not at all		Not at all	

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I still enjoy the things I used to enjoy:		**I get a sort of frightened feeling like 'butterflies in the stomach':**	
Definitely as much		Not at all	
Not quite so much		Occasionally	
Only a little		Quite often	
Not at all		Very often	
I get a sort of frightened feeling like something awful is about to happen:		**I have lost interest in my appearance:**	
Very definitely and quite badly		Definitely	
Yes, but not too badly		I don't take as much care as I should	
A little, but it doesn't worry me		I may not take quite as much care	
Not at all		I take just as much care as ever	
I can laugh and see the funny side of things:		**I feel restless as if I have to be on the move:**	
As much as I always could		Very much indeed	
Not quite so much now		Quite a lot	
Definitely not so much now		Not very much	
Not at all		Not at all	
Worrying thoughts go through my mind:		**I look forward with enjoyment to things:**	
A great deal of the time		As much as I ever did	
A lot of the time		Rather less than I used to	
From time to time but not too often		Definitely less than I used to	
Only occasionally		Hardly at all	
I feel cheerful:		**I get sudden feelings of panic:**	
Not at all		Very often indeed	
Not often		Quite often	
Sometimes		Not very often	
Most of the time		Not at all	
I can sit at ease and feel relaxed:		**I can enjoy a good book or radio or TV programme:**	
Definitely		Often	
Usually		Sometimes	
Not often		Not often	
Not at all		Very seldom	

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5. About your family

5.1 How many children, including step-children, (under 5) do you have living with you? ..... *(Please give number)*

5.2 How many children, including step-children, (aged 5-16) do you have living with you? ..... *(Please give number)*

5.3 The total number of adults and children living in our home is: ..... *(Please give number)*

5.4. I am the child(ren's) *(Please ✓ one box)*

☐ Mother ☐ Father ☐ Grandparent ☐ Other *(Please say what)* .....

5.5 How many brothers and sisters (including step-brothers/step-sisters) does your child have?

..... older brothers and sisters ..... younger brothers and sisters *(Please give number)*

5.6 Does your child live? *(Please ✓ one box)*

☐ In one house only

☐ In a residential home

☐ Part time in one house and part time in another house [please answer the remaining questions about the house where they spend most of their time]

5.7 How many adults, over the age of 16, live in the house with your child? *(Please ✓ one box)*

☐ One parent ☐ Both parents ☐ One parent and other adults

☐ Both parents and other adults ☐ Other (Please describe) .....

5.8 How many adults living in the house with your child work in a paid job? *(Please ✓ one box)*

☐ None ☐ One ☐ Two ☐ More than two

5.9 What kind of house does your child live in? *(Please ✓ one box)*

☐ Rented house ☐ House owned by, or being bought by family

☐ Other *(Please say what)*.....

5.10 My family usually has the use of a car ☐ Yes ☐ No

5.11 My family receives one or more state benefits as well as child benefit ☐ Yes ☐ No

If you are the mother of the child in this survey, please answer the next question. Otherwise please go to question 5.13

5.12 When my first child was born my age was: .....years

5.13 I am *(Please ✓ one box)*

☐ White (e.g. White British, Irish, other white background) ☐ Black (e.g. Caribbean, African)

☐ Asian (e.g. Indian, Pakistani, Bangladeshi, Chinese)

☐ Other *(Please say what)*.....

5.14 The total number of rooms in our home is: ..... *(Please give number)*
(***do not count bathrooms or toilets or rooms that can only be used for storage such as cupboards***)

5.15 Who else looks after your child? *(Please ✓ all that apply)*

☐ Day Nursery ☐ Preschool ☐ Playgroup ☐ School

☐ Childminder ☐ Family/grandparents ☐ Friends ☐ N/A

☐ Other *(Please say who)*.....

5.16 In a typical week how many hours is your child cared for by somebody else away from the family home (please include all those ticked in 5.15)?

..... hours *(please give number)*

5.17 Is there anything else you would like to tell us about your child, their accident or the things that you do at home to keep your child/children safe?

.....

.....

.....

.....

.....

Thank you very much for filling in this questionnaire. Your answers are very important in helping us stop children's accidents.

Please send this back to us in the FREEPOST ENVELOPE

We will need your name and address so that we can send you your gift voucher. Please fill in the pink form and send it back with your questionnaire.

keeping Children SAFE AT HOME

☐☐ ☐☐☐☐☐ ☐☐

Case 37–59 months questionnaire

Keeping Children Safe From Accidents

keeping children SAFE AT HOME

Please complete this questionnaire for your child born on .....

Your answers really are important to us.

Thank you for taking the time to help us with this study.

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Part 1. About Your Child

1.1 Is your child ☐ Male ☐ Female

1.2 When was your child born? Date of Birth ...../...../.....

1.3 The postcode where my child lives is:.....

Please tell us a little about your child's recent visit to the Accident and Emergency Department, Minor Injuries Unit or Walk-In Centre

1.4 Did your child visit the A&E department, Minor Injuries Unit or Walk-In Centre because of *(Please ✓ one box)*

☐ A slip, trip, fall or tumble on stairs or steps

☐ A slip, trip, fall or tumble on the same level

☐ A slip, trip, fall or tumble from furniture

☐ Swallowing medicine or pills

☐ Swallowing cleaning products or garden chemicals

☐ A scald from hot water, other hot liquid or steam

☐ Other accident (*Please describe*).....

1.5 Where did your child's accident happen?

☐ In the house or garden where they live *(i.e. where they are registered with a GP)*

☐ In another house or garden *(Please say where e.g. grandparents)* .....

☐ Somewhere else e.g. road, park, nursery etc *(Please say where)* .....

1.6 What sort of accident was it? *(Please ✓ all that apply)*

☐ Loss of consciousness ☐ Bang on the head ☐ Broken bone

☐ Burn or scald ☐ Swallowed household cleaner/other poison/pills

☐ Cut needing stitches ☐ Cut or graze not needing stitches ☐ Other accident

1.7 What happened when your child went to the A&E department, Minor Injuries Unit or Walk-In Centre? *(Please ✓ all that apply)*

☐ My child was seen and examined but didn't need any treatment

☐ My child was given some treatment e.g. medicine, stitches, plaster cast, sling etc

(Please tell us what).....

☐ My child was admitted to hospital

☐ My child was discharged from A&E, Minor Injuries Unit or Walk-In Centre but has to be seen in the outpatient department

☐ My child was discharged from A&E, Minor Injuries Unit or Walk-In Centre but has to be seen by the GP or practice nurse

1.8 Please tell us the date you completed this questionnaire .....

If your child's accident did not happen in the house or garden where they live, please do not answer any more questions. Please return the questionnaire in the FREEPOST envelope.

Part 2. About your child's development, health and behaviour

All children develop at their own rate so we would like to ask you what your child can do. There are no right or wrong answers.

2.1 Please tell us whether your child does each thing often, has only done it once or twice or has not started to do it yet.

Please ✓ one box on each line

	Often	Once or twice	Not yet
Walking			
Walking on the level without difficulties			
Walking up steps like an adult, one foot on each step			

2.2 At the moment, how likely do you think it is that your child could:
(If your child is too young to be able to do some of these things, put a tick in the "not likely" box)

Please ✓ one box on each line

	Very likely	Quite likely	Not likely	Don't know
Reach, or climb on to a worktop				
Reach, or climb on to something to reach a cupboard at adult eye level				
Open cupboards, drawers or medicine cabinets with locks or safety catches on them				
Open a fridge with a lock or safety catch on it				
Open a container with a child resistant cap				
Open a lockable medicine box				
Get medicines out of blister packs				
Touch things that you have told him/her not to				
Open a stair gate or safety gate				
Reach, or climb on to something to reach a pan on the cooker				
Reach, or climb on to something to reach a hot water tap				
Reach to pull a table cloth hanging over the side of a table				
Turn a hot water tap on by him/herself				
Climb into the bath by him/herself				
Climb onto furniture e.g. sofa, chair, bed				
Climb out of a cot				
Roll off a bed or high surface				
Climb up to a top bunk bed				

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2.3 Does your child have any long-term conditions (e.g. problems with hearing, eye sight, development, fits etc) that have been diagnosed by a health professional?
Long-term means anything that your child has had for at least 3 months or is expected to continue for at least the next 3 months.

☐ Yes ☐ No

If YES, please tell us what conditions your child has:

.....

2.4 How was your child's health **IN THE 24 HOURS BEFORE THEIR ACCIDENT**? Please put an "x" on the line below to indicate how good or how bad your child's health was:



Worst possible health _____ Perfect health



2.5 Below is a list of things that might be a problem for your child. Please tell us how much of a problem each one has been for your child during the **TWO WEEKS BEFORE THEIR ACCIDENT** by circling:

0 if it is never a problem
1 if it is almost never a problem
2 if it is sometimes a problem
3 if it is often a problem
4 if it is almost always a problem

There are no right or wrong answers.

In the **TWO WEEKS BEFORE YOUR CHILD'S ACCIDENT**, how much of a problem has your child had with

Physical Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

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Emotional Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

2.6 Does your child attend school or day care? *(please ✓ one box)*

☐ Yes - Please complete the next 3 questions

☐ No - Please go to 2.7

School Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/daycare because of not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the doctor or hospital	0	1	2	3	4

2.7 Have you taught your child any rules or instructions about keeping safe at home? If your child is too young to teach some of these rules to, put a tick in the "No" box next to each rule.

	Have you taught your child these rules? *Please ✓ one box for each question*		**If YES**, how often does your child follow these rules? *(Please ✓ one box for each question)*				
	Yes	No	Always	Most times	Some times	Occasionally	Never
What to do or not do when parents are cooking using the top of the cooker							
What to do or not do with hot things in the kitchen e.g. kettle							
What to do or not do when he/she is in the bathtub							
About things in the kitchen that he/she is not supposed to climb on							
What to do or not do when he/she sees cleaning products							
What to do or not do if there is medicine on the work top							
What to do or not do if the floor is slippery							
About running in the house							
About jumping on the bed or furniture							
What to do or how he/she is supposed to behave when going down the stairs							
About carrying big things or lots of things while going down stairs							
About leaving things on the stairs							

2.8 These statements describe children's reactions to a number of situations. We would like you to tell us what your child's reaction is likely to be in those situations. Please read each statement and decide whether it is a "true" or "untrue" description of your child's reaction **WITHIN THE LAST SIX MONTHS**. You may not be able to answer some of the questions because you may not have seen your child in that situation, e.g. if the question is about going down a slide and your child did not do this in the last 6 months, then tick the "Not Applicable" box.

Please ✓ one box on each line

My child:	extremely untrue	quite untrue	slightly untrue	neither true nor false	slightly true	quite true	Extremely true	Not applicable
Seems always in a big hurry to get from one place to another								
Tends to run, rather than walk, from room to room								
When outside, often sits quietly								
Moves about actively (runs, climbs, jumps) when playing in the house								
Prefers quiet activities to active games								
Is full of energy, even in the evening								
Likes to sit quietly and watch people do things								
Likes going down high slides or other adventurous activities								
Likes to play so wild and recklessly that he or she might get hurt								
Enjoys activities such as being chased, spun around by the arms etc								
Likes to go high and fast when pushed on a swing								
Dislikes rough and rowdy games								
Enjoys riding a tricycle or bicycle fast and recklessly								

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Part 3. About your home

Every home has things that may not seem very safe for children. We want to find out which things really are safe or not. Please answer the questions below as honestly as possible.

Please think about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.1 Please tell us where your medicines and cleaning products were **IN THE 24 HOURS BEFORE YOUR CHILD'S ACCIDENT.**

	Did you have this in your home? *(Please ✓ one box)*		**IF YES** At what level was it? *(Please ✓ all that apply)*		**IF YES** Where was it? *(Please ✓ all that apply)*		
	Yes	No	At adult eye level or above	Below adult eye level	Cupboard, medicine cabinet, drawer or fridge with lock or safety catch	Cupboard, medicine cabinet, drawer or fridge without lock or safety catch	Other place without lock e.g. shelf, handbag, work surface
Painkillers e.g. Calpol							
Iron or vitamins							
Cough mixture							
Antidepressants or sleeping tablets							
Any other medicines in the kitchen							
Any other medicines in the bathroom							
Any other medicines anywhere in the house							
Bleach							
Dishwasher products							
Oven cleaner							
Toilet cleaner							
White spirit/ turpentine							
Rat or ant killer							
Garden chemicals e.g. weed killer							
Any other household products							

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Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.2 Did all your medicines have child resistant caps or blister packs? ☐ Yes ☐ No

3.3 Had any medicines been put in a container different from the one they came in? ☐ Yes ☐ No

3.4 Were all medicines kept in a locked medicine box? ☐ Yes ☐ No

3.5 Were any medicines kept in the fridge? ☐ Yes ☐ No

If YES, was the fridge closed with a lock or safety catch? ☐ Yes ☐ No





3.6 Did all your cleaning products have child resistant caps? ☐ Yes ☐ No

3.7 Had any cleaning products been put in a container different from the one they came in? ☐ Yes ☐ No



3.8 Did you use a safety gate to stop your child/children getting in to the kitchen? ☐ Yes ☐ No

3.9 Was there anything your child could climb on to reach work tops, shelves, cupboards etc, in any of your rooms? ☐ Yes ☐ No

3.10 Did you use protective corner covers on any of your furniture? ☐ Yes ☐ No

3.11 Did you have a kettle with a curly flex or a cordless kettle? ☐ Yes ☐ No



Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.12. Where was your kettle? *(Please ✓ one box)*

☐ At the front of the work top or table ☐ Between the front and back of the work top or table

☐ At the back of the worktop or table ☐ On the front ring of the cooker

☐ On the back ring of the cooker ☐ Other (*please describe*).....

3.13 How hot was your hot tap water? *(Please ✓ one box)*

☐ Very hot – you couldn't have a bath without adding a lot of cold water

☐ Hot – you would need to add some cold water to the bath

☐ Warm enough– you don't need to add any cold water to the bath

☐ Not very warm – not warm enough to have a bath in



3.14 Do you know the temperature of your hot tap water? *(Please ✓ one box)*

☐ Lower than 54^{0}C ☐ 54^{0}C or higher ☐ Don't know

3.15 Were all carpets or rugs in your home firmly fixed to the floor? ☐ Yes ☐ No

3.16 Do you have any stairs in your home? ☐ Yes ☐ No (if no, go to question 3.25)

3.17 Did you use any stair gates or safety gates in your home? ☐ Yes ☐ No

If YES, where do you use them? *(Please ✓ all that apply)*

☐ Bottom of stairs ☐ Top of stairs

☐ Other (*please tell us where*).....

3.18 Were any of your stair gates on the stairs left open? ☐ Yes ☐ No

3.19 Which of the following describe how your stairs look? *(Please ✓ all that apply)*

☐ Carpeted ☐ Exposed wood ☐ Exposed metal or concrete

☐ Lino/vinyl covered ☐ Don't know ☐ Other *(please describe)*.....

Still thinking about the 24 HOURS BEFORE YOUR CHILD'S ACCIDENT:

3.20 Please put a tick in the box that best describes your agreement with each of the following:

Please ✓ one box on each line

	Agree	Neither agree nor disagree	Disagree
The stairs are too steep			
The stairs are too narrow			
The stairs are poorly lit			
The steps are in need of repair			
The banister/handrail is in need of repair			
The stair covering is in need of repair			
The stairs are safe to use			

3.21 Are there any handrails on the wall next to your stairs? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

3.22 Is there a banister/railings at the side of your stairs to stop people from falling through? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

If YES, how wide are the biggest gaps between the railings? ……*(please write in number of inches)*

3.23 Do any of your stairs have a landing part way up? ☐ Yes ☐ No

3.24 Are any of your stairs spiral or winding stair cases? ☐ Yes ☐ No



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Please think about the WEEK BEFORE YOUR CHILD'S ACCIDENT:

3.25 How often did these things happen in the **WEEK** before your child's accident. If you did not have the things the question is asking about e.g. high chair, tick the "does not apply" box. For questions that ask about older children, if you do not have older children, tick the "does not apply" box.

Please ✓ one box on each line

	Does not apply	Every day	Most days	Some days	Never
Your child was held, even for a moment, by someone holding a hot drink?					
Your child was held, even for a moment, by someone using the cooker?					
Hot drinks were passed over your child's head?					
Hot drinks were left within the reach of your child e.g. coffee table, work top, other low surface?					
Hot drinks or hot liquids were put on a table with a table cloth?					
The front rings of the cooker were used?					
Pan handles were turned towards the back of the cooker whilst cooking?					
Your child was left in the bathroom, without an adult whilst the bath was running, even for a moment e.g. to collect clothes, nappies or answer the phone?					
Your child was left in the bath without an adult, even for a moment e.g. to collect clothes, nappies or answer the phone?					
A bath was run for your child by an older child?					
An older child looked after your child in the bath?					
The bath was run using cold water first?					
The temperature of your child's bath water was checked using a thermometer or other gadget?					
The temperature of your child's bath water was checked using a hand or elbow?					
There were things on your floors that could be tripped over?					
Your child was left on a raised surface e.g. table, sofa, adult bed, even for a moment?					
Your child's nappy was changed on a raised surface e.g. bed, changing table, work top?					
Your child was put in a car seat or bouncing seat on a raised surface e.g. table, work top, even for a moment?					
There were wires or cables trailing across the floor?					
Your child climbed onto or played on furniture e.g. bed, chair, sofa?					

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	Does not apply	Every day	Most days	Some days	Never
Your child climbed onto or played on garden furniture?					
There were things on your stairs that could be tripped over?					
Your child used a high chair without being strapped in with the harness/straps?					
Your child played in the garden without an adult in the garden?					
A safety gate was used to stop your child getting into the garden?					
The back door was locked to stop your child getting into the garden?					

3.26 Please tell us how often these things happened in the **WEEK** before your child's accident. If you did not have or did not use some of these medicines or cleaning products please tick the "does not apply" box.

Please ✓ one box on each line

The following were put away IMMEDIATELY after use:	Does not apply	Every time	Most times	Some times	Never
Painkillers (e.g. Calpol)					
Iron or vitamins					
Cough mixtures					
Antidepressant or sleeping tablets					
Other medicines					
Bleach					
Dishwasher products					
Oven cleaner					
Toilet cleaner					
White spirit/turpentine					
Rat or ant killer					
Garden chemicals e.g. weed killers					
Any other household products					

Part 4. About the worries of family life

4.1 The statements below describe things that often happen in families with young children. These things sometimes make life difficult. Please read each statement and tick how often it happens to you and then tick how much of a "hassle" you feel it has been for you in the **PAST 6 MONTHS**. **Please answer these questions thinking about all of your children.**

	How often it happens				**Hassle (low to high)**				
	Rarely	Sometimes	A lot	Constantly	1 low	2	3	4	5 high
Continually cleaning up messes of food or toys									
The children's schedules (like pre-school or other activities) interfere with your own household needs									
The children are constantly underfoot, interfering with other chores									
Having to change your plans because of unexpected child needs									
The children get dirty several times a day needing changes of clothing									
Difficulties in getting children ready for outings and leaving on time									
Having to run extra errands to meet the children's needs									
Fights with brothers or sisters require a referee (if you only have one child, please write "only one child")									

4.2 Please read each statement and tick the box next to each one which comes closest to how you have been feeling in the **PAST WEEK**. Don't take too long over your replies: your first reaction to each item will probably be better than thinking about it for too long.

I feel tense or 'wound up':		**I feel as if I am slowed down:**	
Most of the time		Nearly all of the time	
A lot of the time		Very often	
Time to time, occasionally		Sometimes	
Not at all		Not at all	

I still enjoy the things I used to enjoy:		**I get a sort of frightened feeling like 'butterflies in the stomach':**	
Definitely as much		Not at all	
Not quite so much		Occasionally	
Only a little		Quite often	
Not at all		Very often	
I get a sort of frightened feeling like something awful is about to happen:		**I have lost interest in my appearance:**	
Very definitely and quite badly		Definitely	
Yes, but not too badly		I don't take as much care as I should	
A little, but it doesn't worry me		I may not take quite as much care	
Not at all		I take just as much care as ever	
I can laugh and see the funny side of things:		**I feel restless as if I have to be on the move:**	
As much as I always could		Very much indeed	
Not quite so much now		Quite a lot	
Definitely not so much now		Not very much	
Not at all		Not at all	
Worrying thoughts go through my mind:		**I look forward with enjoyment to things:**	
A great deal of the time		As much as I ever did	
A lot of the time		Rather less than I used to	
From time to time but not too often		Definitely less than I used to	
Only occasionally		Hardly at all	
I feel cheerful:		**I get sudden feelings of panic:**	
Not at all		Very often indeed	
Not often		Quite often	
Sometimes		Not very often	
Most of the time		Not at all	
I can sit at ease and feel relaxed:		**I can enjoy a good book or radio or TV programme:**	
Definitely		Often	
Usually		Sometimes	
Not often		Not often	
Not at all		Very seldom	

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5. About your family

5.1 How many children, including step-children, (under 5) do you have living with you? ..... *(Please give number)*

5.2 How many children, including step-children, (aged 5-16) do you have living with you? ..... *(Please give number)*

5.3 The total number of adults and children living in our home is: ..... *(Please give number)*

5.4. I am the child(ren's) *(Please ✓ one box)*

☐ Mother ☐ Father ☐ Grandparent ☐ Other *(Please say what)* .....

5.5 How many brothers and sisters (including step-brothers/step-sisters) does your child have?

..... older brothers and sisters ..... younger brothers and sisters *(Please give number)*

5.6 Does your child live? *(Please ✓ one box)*

☐ In one house only

☐ In a residential home

☐ Part time in one house and part time in another house [please answer the remaining questions about the house where they spend most of their time]

5.7 How many adults, over the age of 16, live in the house with your child? *(Please ✓ one box)*

☐ One parent ☐ Both parents ☐ One parent and other adults

☐ Both parents and other adults ☐ Other (Please describe) .....

5.8 How many adults living in the house with your child work in a paid job? *(Please ✓ one box)*

☐ None ☐ One ☐ Two ☐ More than two

5.9 What kind of house does your child live in? *(Please ✓ one box)*

☐ Rented house ☐ House owned by, or being bought by family

☐ Other *(Please say what)*.....

5.10 My family usually has the use of a car ☐ Yes ☐ No

5.11 My family receives one or more state benefits as well as child benefit ☐ Yes ☐ No

If you are the mother of the child in this survey, please answer the next question. Otherwise please go to question 5.13

5.12 When my first child was born my age was: .....years

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5.13 I am (*Please ✓ one box)*

☐ White (e.g. White British, Irish, other white background) ☐ Black (e.g. Caribbean, African)

☐ Asian (e.g. Indian, Pakistani, Bangladeshi, Chinese) ☐ Other *(Please say what……)*

5.14 The total number of rooms in our home is: …… *(Please give number)*
(do not count bathrooms or toilets or rooms that can only be used for storage such as cupboards)

5.15 Who else looks after your child? *(Please ✓ all that apply)*

☐ Day Nursery ☐ Preschool ☐ Playgroup ☐ School

☐ Childminder ☐ Family/grandparents ☐ Friends ☐ N/A

☐ Other *(Please say who)* ……

5.16 In a typical week how many hours is your child cared for by somebody else away from the family home (please include all those ticked in 5.15)?

…….. hours *(please give number)*

5.17 Is there anything else you would like to tell us about your child, their accident or the things that you do at home to keep your child/children safe?

……

……

……

……

……

……

Thank you very much for filling in this questionnaire. Your answers are very important in helping us stop children's accidents.

Please send this back to us in the FREEPOST ENVELOPE

We will need your name and address so that we can send you your gift voucher. Please fill in the pink form and send it back with your questionnaire



Thank you very much for filling in this questionnaire. Your answers are very important in helping us stop children's accidents.

Please send this back to us in the FREEPOST ENVELOPE

We will need your name and address so that we can send you your gift voucher.

Please fill in the pink form and send it back with your questionnaire



☐☐ ☐☐☐☐☐ ☐☐

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Control 0–12 months questionnaire

Keeping Children Safe From Accidents

keeping children SAFE AT HOME

Please complete this questionnaire for your child born on .....

Is your child ☐ Male ☐ Female

Please tell us the date you completed this questionnaire .....

Your answers really are important to us. Thank you for taking the time to help us with this study.

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Part 1. About your child's development, health and behaviour

All children develop at their own rate so we would like to ask you what your child can do. There are no right or wrong answers.

1.1 Please tell us whether your child does each thing often, has only done it once or twice or has not started to do it yet.

Please ✓ one box on each line

	Often	Once or twice	Not yet
Crawling			
Shuffling along the floor on his/her bottom			
Walking			

1.2 At the moment, how likely do you think it is that your child could:
(If your child is too young to be able to do some of these things, put a tick in the "not likely" box)

Please ✓ one box on each line

	Very likely	Quite likely	Not likely	Don't Know
Reach, or climb on to a worktop				
Reach, or climb on to something to reach a cupboard at adult eye level				
Open cupboards, drawers or medicine cabinets with locks or safety catches on them				
Open a fridge with a lock or safety catch on it				
Open a container with a child resistant cap				
Open a lockable medicine box				
Get medicines out of blister packs				
Touch things that you have told him/her not to				
Open a stair gate or safety gate				
Reach, or climb on to something to reach a pan on the cooker				
Reach, or climb on to something to reach a hot water tap				
Reach to pull a table cloth hanging over the side of a table				
Turn a hot water tap on by him/herself				
Climb into the bath by him/herself				
Climb onto furniture e.g. sofa, chair, bed				
Climb out of a cot				
Roll off a bed or high surface				
Climb up to a top bunk bed				

1.3 Does your child have any long-term conditions (e.g. problems with hearing, eye sight, development, fits etc) that have been diagnosed by a health professional?
Long-term means anything that your child has had for at least 3 months or is expected to continue for at least the next 3 months.

☐ Yes ☐ No

If YES, please tell us what conditions your child has:

.....

1.4 How was your child's health **IN THE LAST 24 HOURS**? Please put an "x" on the line below to indicate how good or how bad your child's health was:



Worst possible health _____ Perfect health



1.5 Have you taught your child any rules or instructions about keeping safe at home? If your child is too young to teach some of these rules to, put a tick in the "No" box next to each rule.

	Have you taught your child these rules? *(Please ✓ one box for each question)*		**If YES**, how often does your child follow these rules? *(Please ✓ one box for each question)*				
	Yes	No	Always	Most times	Sometimes	Occasionally	Never
What to do or not do when parents are cooking using the top of the cooker							
What to do or not do with hot things in the kitchen e.g. kettle							
What to do or not do when he/she is in the bathtub							
About things in the kitchen that he/she is not supposed to climb on							
What to do or not do when he/she sees cleaning products							
What to do or not do if there is medicine on the work top							
What to do or not do if the floor is slippery							
About running in the house							
About jumping on the bed or furniture							
What to do or how he/she is supposed to behave when going down the stairs							
About carrying big things or lots of things while going down stairs							
About leaving things on the stairs							

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1.6 Please tell us how often your child did each of the things described below during the **LAST WEEK** by ticking one of the boxes. You may not be able to answer some of the questions because you may not have seen your child in that situation, e.g. if the question is about playing peekaboo and your child has not played this in the last week, then tick the Not Applicable box.

Please ✓ one box on each line

	Never	Very rarely	Less than half the time	About half the time	More than half the time	Almost always	Always	Not applicable
Enjoy being tickled by you or someone else in your family?								
During feeding how often did your baby lie or sit quietly?								
During feeding how often did your baby squirm or kick?								
During feeding how often did your baby wave his/her arms?								
When being dressed or undressed during the last week how often did your baby squirm and/or try and roll away?								
When tossed around playfully how often did your baby smile?								
When tossed around playfully how often did your baby laugh?								
During a peek-a-boo game, how often did your baby smile?								
During a peek-a-boo game, how often did your baby laugh?								
How often did your baby enjoy bouncing up and down while on your lap?								
How often did your baby enjoy bouncing up and down on an object such as a bed, bouncing chair or toy?								
When placed in an infant seat or car seat how often did your baby wave his/her arms and kick?								
When placed in an infant seat or car seat how often did your baby squirm and turn his/her body?								
When placed on his/her back how often did your baby squirm and/or turn his/her body?								

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Part 2. About your home

Every home has things that may not seem very safe for children. We want to find out which things really are safe or not. Please answer the questions below as honestly as possible.

Please think about THE LAST 24 HOURS:

2.1 Please tell us where your medicines and cleaning products were IN THE LAST 24 HOURS.

	Did you have this in your home? *(Please ✓ one box)*		**IF YES** At what level was it? *(Please ✓ all that apply)*		**IF YES** Where was it? *(Please ✓ all that apply)*		
	Yes	No	At adult eye level or above	Below adult eye level	Cupboard, medicine cabinet, drawer or fridge with lock or safety catch	Cupboard, medicine cabinet, drawer or fridge without lock or safety catch	Other place without lock e.g. shelf, handbag, work surface
Painkillers e.g. Calpol							
Iron or vitamins							
Cough mixture							
Antidepressants or sleeping tablets							
Any other medicines in the kitchen							
Any other medicines in the bathroom							
Any other medicines anywhere else in the house							
Bleach							
Dishwasher products							
Oven cleaner							
Toilet cleaner							
White spirit/ turpentine							
Rat or ant killer							
Garden chemicals e.g. weed killer							
Any other household products							

Still thinking about THE LAST 24 HOURS:

2.2 Did all your medicines have child resistant caps or blister packs? ☐ Yes ☐ No

2.3 Had any medicines been put in a container different from the one they came in? ☐ Yes ☐ No

2.4 Were all medicines kept in a locked medicine box? ☐ Yes ☐ No

2.5 Were any medicines kept in the fridge? ☐ Yes ☐ No

If YES, was the fridge closed with a lock or safety catch? ☐ Yes ☐ No





2.6 Did all your cleaning products have child resistant caps? ☐ Yes ☐ No

2.7 Had any cleaning products been put in a container different from the one they came in? ☐ Yes ☐ No



2.8 Did you use a safety gate to stop your child/children getting in to the kitchen? ☐ Yes ☐ No

2.9 Was there anything your child could climb on to reach work tops, shelves, cupboards etc in any of your rooms? ☐ Yes ☐ No



2.10 Did you use protective corner covers on any of your furniture? ☐ Yes ☐ No

Still thinking about THE LAST 24 HOURS:

2.11 Did your child use a baby walker? ☐ Yes ☐ No

2.12 Did your child use a stationary play centre (like a baby walker without wheels) ☐ Yes ☐ No

2.13 Did your child use a playpen? ☐ Yes ☐ No

2.14 Did your child use a travel cot instead of a playpen? ☐ Yes ☐ No

2.15 Did you have a kettle with a curly flex or a cordless kettle? ☐ Yes ☐ No

2.16 Where was your kettle? *(Please ✓ one box)*

☐ At the front of the work top or table ☐ Between the front and back of the work top or table

☐ At the back of the worktop or table ☐ On the front ring of the cooker

☐ On the back ring of the cooker ☐ Other (*please describe*).....

2.17 How hot was your hot tap water? *(Please ✓ one box)*

☐ Very hot – you couldn't have a bath without adding a lot of cold water

☐ Hot – you would need to add some cold water to the bath

☐ Warm enough– you don't need to add any cold water to the bath

☐ Not very warm – not warm enough to have a bath in



2.18 Do you know the temperature of your hot tap water? *(Please ✓ one box)*

☐ Lower than 54^{0}C ☐ 54^{0}C or higher ☐ Don't know

2.19 Were all carpets or rugs in your home firmly fixed to the floor? ☐ Yes ☐ No

2.20 Do you have any stairs in your home? ☐ Yes ☐ No (if no, go to Question 2.29)

2.21 Did you use any stair gates or safety gates in your home? ☐ Yes ☐ No

If YES, where did you use them? *(Please ✓ all that apply)*

☐ Bottom of stairs ☐ Top of stairs

☐ Other (*please tell us where*).....

2.22 Were any of your stair gates on the stairs left open? ☐ Yes ☐ No

Still thinking about THE LAST 24 HOURS:

2.23 Which of the following describe how your stairs look? *(Please ✓ all that apply)*

☐ Carpeted ☐ Exposed wood ☐ Exposed metal or concrete

☐ Lino/vinyl covered ☐ Don't know ☐ Other *(please describe)*.....

2.24 Please put a tick in the box that best describes your agreement with each of the following:

Please ✓ one box on each line

	Agree	Neither agree nor disagree	Disagree
The stairs are too steep			
The stairs are too narrow			
The stairs are poorly lit			
The steps are in need of repair			
The banister/handrail is in need of repair			
The stair covering is in need of repair			
The stairs are safe to use			

2.25 Are there any handrails on the wall next to your stairs? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

2.26 Is there a banister/railings at the side of your stairs to stop people from falling through? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

If YES, how wide are the biggest gaps between the railings? ..... *(please write in number of inches)*

2.27 Do any of your stairs have a landing part way up? ☐ Yes ☐ No

2.28 Are any of your stairs spiral or winding stair cases? ☐ Yes ☐ No



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Thinking about the LAST WEEK:

2.29 How often did these things happen in the **LAST WEEK**? If you did not have the things the question is asking about e.g. high chair, tick the "does not apply" box. For questions that ask about older children, if you do not have older children, tick the "does not apply" box.

Please ✓ one box on each line

	Does not apply	Every day	Most days	Some days	Never
Your child was held, even for a moment, by someone holding a hot drink?					
Your child was held, even for a moment, by someone using the cooker?					
Hot drinks were passed over your child's head?					
Hot drinks were left within the reach of your child e.g. coffee table, work top, other low surface?					
Hot drinks or hot liquids were put on a table with a table cloth?					
The front rings of the cooker were used?					
Pan handles were turned towards the back of the cooker whilst cooking?					
Your child was left in the bathroom, without an adult whilst the bath was running, even for a moment e.g. to collect clothes, nappies or answer the phone?					
Your child was left in the bath without an adult, even for a moment e.g. to collect clothes, nappies or answer the phone?					
A bath was run for your child by an older child?					
An older child looked after your child in the bath?					
The bath was run using cold water first?					
The temperature of your child's bath water was checked using a thermometer or other gadget?					
The temperature of your child's bath water was checked using a hand or elbow?					
There were things on your floors that could be tripped over?					
Your child was left on a raised surface e.g. table, sofa, adult bed, even for a moment?					
Your child's nappy was changed on a raised surface e.g. bed, changing table, work top?					
Your child was put in a car seat or bouncing seat on a raised surface e.g. table, work top, even for a moment?					
There were wires or cables trailing across the floor?					
Your child climbed onto or played on furniture e.g. bed, chair, sofa?					

	Does not apply	Every day	Most days	Some days	Never
Your child climbed onto or played on garden furniture?					
There were things on your stairs that could be tripped over?					
Your child used a high chair without being strapped in with the harness/straps?					
Your child played in the garden without an adult in the garden?					
A safety gate was used to stop your child getting into the garden?					
The back door was locked to stop your child getting into the garden?					

2.30 Please tell us how often these things happened in the **LAST WEEK**? If you did not have or did not use some of these medicines or cleaning products please tick the "does not apply" box.

Please ✓ one box on each line

The following were put away IMMEDIATELY after use:	Does not apply	Every time	Most times	Some times	Never
Painkillers (e.g. Calpol)					
Iron or vitamins					
Cough mixtures					
Antidepressant or sleeping tablets					
Other medicines					
Bleach					
Dishwasher products					
Oven cleaner					
Toilet cleaner					
White spirit/turpentine					
Rat or ant killer					
Garden chemicals e.g. weed killers					
Any other household products					

Part 3. About the worries of family life

3.1 The statements below describe things that often happen in families with young children. These things sometimes make life difficult. Please read each statement and tick how often it happens to you and then tick how much of a "hassle" you feel it has been for you in the **PAST 6 MONTHS**. **Please answer these questions thinking about all of your children.**

	How often it happens				Hassle (low to high)				
	Rarely	Sometimes	A lot	Constantly	1 low	2	3	4	5 high
Continually cleaning up messes of food or toys									
The children's schedules (like pre-school or other activities) interfere with your own household needs									
The children are constantly underfoot, interfering with other chores									
Having to change your plans because of unexpected child needs									
The children get dirty several times a day needing changes of clothing									
Difficulties in getting children ready for outings and leaving on time									
Having to run extra errands to meet the children's needs									
Fights with brothers or sisters require a referee (if you only have one child, please write "only one child")									

3.2 Please read each statement and tick the box next to each one which comes closest to how you have been feeling in the **PAST WEEK**. Don't take too long over your replies: your first reaction to each item will probably be better than thinking about it for too long.

I feel tense or 'wound up':		**I feel as if I am slowed down:**	
Most of the time		Nearly all of the time	
A lot of the time		Very often	
Time to time, occasionally		Sometimes	
Not at all		Not at all	

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I still enjoy the things I used to enjoy:		**I get a sort of frightened feeling like 'butterflies in the stomach':**	
Definitely as much		Not at all	
Not quite so much		Occasionally	
Only a little		Quite often	
Not at all		Very often	
I get a sort of frightened feeling like something awful is about to happen:		**I have lost interest in my appearance:**	
Very definitely and quite badly		Definitely	
Yes, but not too badly		I don't take as much care as I should	
A little, but it doesn't worry me		I may not take quite as much care	
Not at all		I take just as much care as ever	
I can laugh and see the funny side of things:		**I feel restless as if I have to be on the move:**	
As much as I always could		Very much indeed	
Not quite so much now		Quite a lot	
Definitely not so much now		Not very much	
Not at all		Not at all	
Worrying thoughts go through my mind:		**I look forward with enjoyment to things:**	
A great deal of the time		As much as I ever did	
A lot of the time		Rather less than I used to	
From time to time but not too often		Definitely less than I used to	
Only occasionally		Hardly at all	
I feel cheerful:		**I get sudden feelings of panic:**	
Not at all		Very often indeed	
Not often		Quite often	
Sometimes		Not very often	
Most of the time		Not at all	
I can sit at ease and feel relaxed:		**I can enjoy a good book or radio or TV programme:**	
Definitely		Often	
Usually		Sometimes	
Not often		Not often	
Not at all		Very seldom	

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4. About your family

4.1 How many children, including step-children, (under 5) do you have living with you? ..... *(Please give number)*

4.2 How many children, including step-children, (aged 5-16) do you have living with you? ..... *(Please give number)*

4.3 The total number of adults and children living in our home is: ..... *(Please give number)*

4.4. I am the child(ren's) *(Please ✓ one box)*

☐ Mother ☐ Father ☐ Grandparent ☐ Other *(Please say what)* .....

4.5 How many brothers and sisters (including step-brothers/step-sisters) does your child have?

..... older brothers and sisters ..... younger brothers and sisters *(Please give number)*

4.6 Does your child live? *(Please ✓ one box)*

☐ In one house only

☐ In a residential home

☐ Part time in one house and part time in another house [please answer the remaining questions about the house where they spend most of their time]

4.7 How many adults, over the age of 16, live in the house with your child? *(Please ✓ one box)*

☐ One parent ☐ Both parents ☐ One parent and other adults

☐ Both parents and other adults ☐ Other (Please describe) .....

4.8 How many adults living in the house with your child work in a paid job? *(Please ✓ one box)*

☐ None ☐ One ☐ Two ☐ More than two

4.9 What kind of house does your child live in? *(Please ✓ one box)*

☐ Rented house ☐ House owned by, or being bought by family

☐ Other *(Please say what)*.....

4.10 My family usually has the use of a car ☐ Yes ☐ No

4.11 My family receives one or more state benefits as well as child benefit ☐ Yes ☐ No

4.12 The postcode where my child lives is:.....

If you are the mother of the child in this survey, please answer the next question. Otherwise please go to question 4.14

4.13 When my first child was born my age was: .....years

4.14 I am (*Please ✓ one box*)

☐ White (e.g. White British, Irish, other white background) ☐ Black (e.g. Caribbean, African)

☐ Asian (e.g. Indian, Pakistani, Bangladeshi, Chinese) ☐ Other *(Please say what .....)*

4.15 The total number of rooms in our home is: ..... *(Please give number)*
(***do not count bathrooms or toilets or rooms that can only be used for storage such as cupboards***)

4.16 Who else looks after your child? *(Please ✓ all that apply)*

☐ Day Nursery ☐ Preschool ☐ Playgroup ☐ School

☐ Childminder ☐ Family/grandparents ☐ Friends ☐ N/A

☐ Other *(Please say who .....)*

4.17 In a typical week how many hours is your child cared for by somebody else away from the family home (please include all those ticked in 4.16)?

..... hours *(please give number)*

4.18 Is there anything else you would like to tell us about the things that you do at home to keep your child/children safe?

.....

.....

.....

.....

.....

Thank you very much for filling in this questionnaire. Your answers are very important in helping us stop children's accidents.

Please send this back to us in the FREEPOST ENVELOPE

We will need your name and address so that we can send you your gift voucher. Please fill in the pink form and send it back with your questionnaire



☐☐ ☐☐☐☐☐ ☐☐ ☐☐

Control 13–36 months questionnaire

Keeping Children Safe From Accidents

keeping children SAFE AT HOME

Please complete this questionnaire for your child born on .....

Is your child ☐ Male ☐ Female

Please tell us the date you completed this questionnaire .....

Your answers really are important to us. Thank you for taking the time to help us with this study.

cc study CONTROL ques Age group 2 V2.2 11.02.2011



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Part 1. About your child's development, health and behaviour

All children develop at their own rate so we would like to ask you what your child can do. There are no right or wrong answers.

1.1 Please tell us whether your child does each thing often, has only done it once or twice or has not started to do it yet.

Please ✓ one box on each line

	Often	Once or twice	Not yet
Crawling			
Shuffling along the floor on his/her bottom			
Walking			

1.2 At the moment, how likely do you think it is that your child could:
(If your child is too young to be able to do some of these things, put a tick in the "not likely" box)

Please ✓ one box on each line

	Very likely	Quite likely	Not likely	Don't Know
Reach, or climb on to a worktop				
Reach, or climb on to something to reach a cupboard at adult eye level				
Open cupboards, drawers or medicine cabinets with locks or safety catches on them				
Open a fridge with a lock or safety catch on it				
Open a container with a child resistant cap				
Open a lockable medicine box				
Get medicines out of blister packs				
Touch things that you have told him/her not to				
Open a stair gate or safety gate				
Reach, or climb on to something to reach a pan on the cooker				
Reach, or climb on to something to reach a hot water tap				
Reach to pull a table cloth hanging over the side of a table				
Turn a hot water tap on by him/herself				
Climb into the bath by him/herself				
Climb onto furniture e.g. sofa, chair, bed				
Climb out of a cot				
Roll off a bed or high surface				
Climb up to a top bunk bed				

1.3 Does your child have any long-term conditions (e.g. problems with hearing, eye sight, development, fits etc) that have been diagnosed by a health professional?
Long-term means anything that your child has had for at least 3 months or is expected to continue for at least the next 3 months.

☐ Yes ☐ No

If YES, please tell us what conditions your child has:

.....

1.4 How was your child's health **IN THE LAST 24 HOURS**? Please put an "x" on the line below to indicate how good or how bad your child's health was:



Worst possible health _____ Perfect health



PLEASE COMPLETE 1.5 IF YOUR CHILD IS AGED 2 YEARS OR OVER
FOR CHILDREN AGED UNDER 2 YEARS – please go to 1.7

1.5 Below is a list of things that might be a problem for your child. Please tell us how much of a problem each one has been for your child during the **LAST TWO WEEKS** by circling:

0 if it is never a problem
1 if it is almost never a problem
2 if it is sometimes a problem
3 if it is often a problem
4 if it is almost always a problem

There are no right or wrong answers.

In the **LAST TWO WEEKS**, how much of a problem has your child had with….

Physical Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

Emotional Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

1.6 Does your child attend school or day care? *(please ✓ one box)*

☐ Yes - Please complete the next 3 questions

☐ No - Please go to 1.7

School Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/daycare because of Not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the Doctor or hospital	0	1	2	3	4

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1.7 Have you taught your child any rules or instructions about keeping safe at home? If your child is too young to teach some of these rules to, put a tick in the "No" box next to each rule.

	Have you taught your child these rules? *Please ✓ one box for each question*		**If YES**, how often does your child follow these rules? *(Please ✓ one box for each question)*				
	Yes	No	Always	Most times	Some times	Occasionally	Never
What to do or not do when parents are cooking using the top of the cooker							
What to do or not do with hot things in the kitchen e.g. kettle							
What to do or not do when he/she is in the bathtub							
About things in the kitchen that he/she is not supposed to climb on							
What to do or not do when he/she sees cleaning products							
What to do or not do if there is medicine on the work top							
What to do or not do if the floor is slippery							
About running in the house							
About jumping on the bed or furniture							
What to do or how he/she is supposed to behave when going down the stairs							
About carrying big things or lots of things while going down stairs							
About leaving things on the stairs							

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1.8 Please tell us how often your child did each of the things described below during the **LAST TWO WEEKS** by ticking one of the boxes. You may not be able to answer some of the questions because you may not have seen your child in that situation, e.g. if the question is about going down a slide and your child did not do this in the last 2 weeks, then tick the "Not Applicable" box.

Please ✓ one box on each line

	Never	Very rarely	Less than half the time	About half the time	More than half the time	Almost always	Always	Not applicable
While bathing, how often did your child sit quietly?								
While bathing, how often did your child splash, kick or try to jump?								
While participating in daily activities, how often did your child move quickly from one place to another?								
While participating in daily activities, how often did your child seem full of energy, even in the evening?								
During sleep how often did your child toss about in the bed?								
During sleep how often did your child sleep in one position only?								
When playing outdoors with other children, how often did your child seem to be one of the most active children?								
When playing outdoors with other children, how often did your child sit quietly and watch?								
When being dressed or undressed, how often did your child squirm and try to get away?								
When being dressed or undressed, how often did your child stay still?								
When playing indoors, how often did your child run through the house?								
When playing indoors, how often did your child climb over furniture?								
While playing outdoors, how often did your child:								
Like making lots of noise?								
Want to climb to high places (e.g. up a tree or on a climbing frame)?								
Choose to take chances for the fun and excitement of it?								
Not like going down high slides at the play ground?								
Want to jump from heights?								
Want to go down the slide in unusual ways (e.g. head first)?								

	Never	Very rarely	Less than half the time	About half the time	More than half the time	Almost always	Always	Not applicable
While playing indoors, how often did your child:								
Like rough and rowdy games?								
Enjoy playing boisterous games like chase?								
Enjoy vigorously jumping on the bed or settee?								
Not like rough or rowdy games?								
Enjoy activities such as being spun etc?								

Part 2. About your home

Every home has things that may not seem very safe for children. We want to find out which things really are safe or not. Please answer the questions below as honestly as possible.

Please think about THE LAST 24 HOURS:

2.1 Please tell us where your medicines and cleaning products were IN THE LAST 24 HOURS.

	Did you have this in your home? *(Please ✓ one box)*		**IF YES** At what level was it? *(Please ✓ all that apply)*		**IF YES** Where was it? *(Please ✓ all that apply)*		
	Yes	No	At adult eye level or above	Below adult eye level	Cupboard, medicine cabinet, drawer or fridge with lock or safety catch	Cupboard, medicine cabinet, drawer or fridge without lock or safety catch	Other place without lock e.g. shelf, handbag, work surface
Painkillers e.g. Calpol							
Iron or vitamins							
Cough mixture							
Antidepressants or sleeping tablets							
Any other medicines in the kitchen							
Any other medicines in the bathroom							
Any other medicines anywhere else in the house							
Bleach							
Dishwasher products							
Oven cleaner							
Toilet cleaner							
White spirit/ turpentine							
Rat or ant killer							
Garden chemicals e.g. weed killer							
Any other household products							

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Still thinking about THE LAST 24 HOURS:

2.2 Did all your medicines have child resistant caps or blister packs? ☐ Yes ☐ No

2.3 Had any medicines been put in a container different from the one they came in? ☐ Yes ☐ No

2.4 Were all medicines kept in a locked medicine box? ☐ Yes ☐ No

2.5 Were any medicines kept in the fridge? ☐ Yes ☐ No

If YES, was the fridge closed with a lock or safety catch? ☐ Yes ☐ No





2.6 Did all your cleaning products have child resistant caps? ☐ Yes ☐ No

2.7 Had any cleaning products been put in a container different from the one they came in? ☐ Yes ☐ No



2.8 Did you use a safety gate to stop your child/children getting in to the kitchen? ☐ Yes ☐ No

2.9 Was there anything your child could climb on to reach work tops, shelves, cupboards etc, in any of your rooms? ☐ Yes ☐ No

2.10 Did you use protective corner covers on any of your furniture? ☐ Yes ☐ No

2.11 Did your child use a baby walker? ☐ Yes ☐ No

2.12 Did your child use a stationary play centre (like a baby walker without wheels) ☐ Yes ☐ No

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Still thinking about THE LAST 24 HOURS:

2.13 Did your child use a playpen? ☐ Yes ☐ No

2.14 Did your child use a travel cot instead of a playpen? ☐ Yes ☐ No

2.15 Did you have a kettle with a curly flex or a cordless kettle? ☐ Yes ☐ No



2.16. Where was your kettle? *(Please ✓ one box)*

☐ At the front of the work top or table ☐ Between the front and back of the work top or table

☐ At the back of the worktop or table ☐ On the front ring of the cooker

☐ On the back ring of the cooker ☐ Other (*please describe*).....

2.17 How hot was your hot tap water? *(Please ✓ one box)*

☐ Very hot – you couldn't have a bath without adding a lot of cold water

☐ Hot – you would need to add some cold water to the bath

☐ Warm enough– you don't need to add any cold water to the bath

☐ Not very warm – not warm enough to have a bath in



2.18 Do you know the temperature of your hot tap water? *(Please ✓ one box)*

☐ Lower than 54^{0}C ☐ 54^{0}C or higher ☐ Don't know

2.19 Were all carpets or rugs in your home firmly fixed to the floor? ☐ Yes ☐ No

2.20 Do you have any stairs in your home? ☐ Yes ☐ No (if no, go to question 2.29)

2.21 Did you use any stair gates or safety gates in your home? ☐ Yes ☐ No

If YES, where did you use them? *(Please ✓ all that apply)*

☐ Bottom of stairs ☐ Top of stairs

☐ Other (*please tell us where*).....

Still thinking about THE LAST 24 HOURS:

2.22 Were any of your stair gates on the stairs left open? ☐ Yes ☐ No

2.23 Which of the following describe how your stairs look? *(Please ✓ all that apply)*

☐ Carpeted ☐ Exposed wood ☐ Exposed metal or concrete

☐ Lino/vinyl covered ☐ Don't know ☐ Other *(please describe)*.....

2.24 Please put a tick in the box that best describes your agreement with each of the following:

Please ✓ one box on each line

	Agree	Neither agree nor disagree	Disagree
The stairs are too steep			
The stairs are too narrow			
The stairs are poorly lit			
The steps are in need of repair			
The banister/handrail is in need of repair			
The stair covering is in need of repair			
The stairs are safe to use			

2.25 Are there any handrails on the wall next to your stairs? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

2.26 Is there a banister/railings at the side of your stairs to stop people from falling through? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

If YES, how wide are the biggest gaps between the railings? .....*(please write in number of inches)*

2.27 Do any of your stairs have a landing part way up? ☐ Yes ☐ No

2.28 Are any of your stairs spiral or winding stair cases? ☐ Yes ☐ No



Thinking about the LAST WEEK:

2.29 How often did these things happen in the **LAST WEEK**? If you did not have the things the question is asking about e.g. high chair, tick the "does not apply" box. For questions that ask about older children, if you do not have older children, tick the "does not apply" box.

Please ✓ one box on each line

	Does not apply	Every day	Most days	Some days	Never
Your child was held, even for a moment, by someone holding a hot drink?					
Your child was held, even for a moment, by someone using the cooker?					
Hot drinks were passed over your child's head?					
Hot drinks were left within the reach of your child e.g. coffee table, work top, other low surface?					
Hot drinks or hot liquids were put on a table with a table cloth?					
The front rings of the cooker were used?					
Pan handles were turned towards the back of the cooker whilst cooking?					
Your child was left in the bathroom, without an adult whilst the bath was running, even for a moment e.g. to collect clothes, nappies or answer the phone?					
Your child was left in the bath without an adult, even for a moment e.g. to collect clothes, nappies or answer the phone?					
A bath was run for your child by an older child?					
An older child looked after your child in the bath?					
The bath was run using cold water first?					
The temperature of your child's bath water was checked using a thermometer or other gadget?					
The temperature of your child's bath water was checked using a hand or elbow?					
There were things on your floors that could be tripped over?					
Your child was left on a raised surface e.g. table, sofa, adult bed, even for a moment?					
Your child's nappy was changed on a raised surface e.g. bed, changing table, work top?					
Your child was put in a car seat or bouncing seat on a raised surface e.g. table, work top, even for a moment?					
There were wires or cables trailing across the floor?					
Your child climbed onto or played on furniture e.g. bed, chair, sofa?					

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	Does not apply	Every day	Most days	Some days	Never
Your child climbed onto or played on garden furniture?					
There were things on your stairs that could be tripped over?					
Your child used a high chair without being strapped in with the harness/straps?					
Your child played in the garden without an adult in the garden?					
A safety gate was used to stop your child getting into the garden?					
The back door was locked to stop your child getting into the garden?					

2.30 Please tell us how often these things happened in the **LAST WEEK**. If you did not have or did not use some of these medicines or cleaning products please tick the "does not apply" box.

Please ✓ one box on each line

The following were put away IMMEDIATELY after use:	Does not apply	Every time	Most times	Some times	Never
Painkillers (e.g. Calpol)					
Iron or vitamins					
Cough mixtures					
Antidepressant or sleeping tablets					
Other medicines					
Bleach					
Dishwasher products					
Oven cleaner					
Toilet cleaner					
White spirit/turpentine					
Rat or ant killer					
Garden chemicals e.g. weed killers					
Any other household products					

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Part 3. About the worries of family life

3.1 The statements below describe things that often happen in families with young children. These things sometimes make life difficult. Please read each statement and tick how often it happens to you and then tick how much of a "hassle" you feel it has been for you in the **PAST 6 MONTHS**. **Please answer these questions thinking about all of your children.**

	How often it happens				**Hassle (low to high)**				
	Rarely	Sometimes	A lot	Constantly	1 low	2	3	4	5 high
Continually cleaning up messes of food or toys									
The children's schedules (like pre-school or other activities) interfere with your own household needs									
The children are constantly underfoot, interfering with other chores									
Having to change your plans because of unexpected child needs									
The children get dirty several times a day needing changes of clothing									
Difficulties in getting children ready for outings and leaving on time									
Having to run extra errands to meet the children's needs									
Fights with brothers or sisters require a referee (if you only have one child, please write "only one child")									

3.2 Please read each statement and tick the box next to each one which comes closest to how you have been feeling in the **PAST WEEK**. Don't take too long over your replies: your first reaction to each item will probably be better than thinking about it for too long.

I feel tense or 'wound up':		**I feel as if I am slowed down:**	
Most of the time		Nearly all of the time	
A lot of the time		Very often	
Time to time, occasionally		Sometimes	
Not at all		Not at all	
I still enjoy the things I used to enjoy:		**I get a sort of frightened feeling like 'butterflies in the stomach':**	
Definitely as much		Not at all	
Not quite so much		Occasionally	
Only a little		Quite often	
Not at all		Very often	
I get a sort of frightened feeling like something awful is about to happen:		**I have lost interest in my appearance:**	
Very definitely and quite badly		Definitely	
Yes, but not too badly		I don't take as much care as I should	
A little, but it doesn't worry me		I may not take quite as much care	
Not at all		I take just as much care as ever	
I can laugh and see the funny side of things:		**I feel restless as if I have to be on the move:**	
As much as I always could		Very much indeed	
Not quite so much now		Quite a lot	
Definitely not so much now		Not very much	
Not at all		Not at all	
Worrying thoughts go through my mind:		**I look forward with enjoyment to things:**	
A great deal of the time		As much as I ever did	
A lot of the time		Rather less than I used to	
From time to time but not too often		Definitely less than I used to	
Only occasionally		Hardly at all	

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I feel cheerful:		**I get sudden feelings of panic:**	
Not at all		Very often indeed	
Not often		Quite often	
Sometimes		Not very often	
Most of the time		Not at all	
I can sit at ease and feel relaxed:		**I can enjoy a good book or radio or TV programme:**	
Definitely		Often	
Usually		Sometimes	
Not often		Not often	
Not at all		Very seldom	

4. About your family

4.1 How many children, including step-children, (under 5) do you have living with you? ..... *(Please give number)*

4.2 How many children, including step-children, (aged 5-16) do you have living with you? ..... *(Please give number)*

4.3 The total number of adults and children living in our home is: ..... *(Please give number)*

4.4. I am the child(ren's) *(Please ✓ one box)*

☐ Mother ☐ Father ☐ Grandparent ☐ Other *(Please say what)* .....

4.5 How many brothers and sisters (including step-brothers/step-sisters) does your child have?

..... older brothers and sisters ..... younger brothers and sisters *(Please give number)*

4.6 Does your child live? *(Please ✓ one box)*

☐ In one house only

☐ In a residential home

☐ Part time in one house and part time in another house [please answer the remaining questions about the house where they spend most of their time]

4.7 How many adults, over the age of 16, live in the house with your child? *(Please ✓ one box)*

☐ One parent ☐ Both parents ☐ One parent and other adults

☐ Both parents and other adults ☐ Other (Please describe) .....

4.8 How many adults living in the house with your child work in a paid job? *(Please ✓ one box)*

☐ None ☐ One ☐ Two ☐ More than two

4.9 What kind of house does your child live in? *(Please ✓ one box)*

☐ Rented house ☐ House owned by, or being bought by family

☐ Other *(Please say what)*.....

4.10 My family usually has the use of a car ☐ Yes ☐ No

4.11 My family receives one or more state benefits as well as child benefit ☐ Yes ☐ No

4.12 The postcode where my child lives is:.....

If you are the mother of the child in this survey, please answer the next question. Otherwise please go to question 4.14

4.13 When my first child was born my age was: .....years

4.14 I am (*Please ✓ one box)*

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☐ White (e.g. White British, Irish, other white background) ☐ Black (e.g. Caribbean, African)

☐ Asian (e.g. Indian, Pakistani, Bangladeshi, Chinese) ☐ Other *(Please say what.....)*

4.15 The total number of rooms in our home is: ..... *(Please give number)*
(do not count bathrooms or toilets or rooms that can only be used for storage such as cupboards)

4.16 Who else looks after your child? *(Please ✓ all that apply)*

☐ Day Nursery ☐ Preschool ☐ Playgroup ☐ School

☐ Childminder ☐ Family/grandparents ☐ Friends ☐ N/A

☐ Other *(Please say who)* .....

4.17 In a typical week how many hours is your child cared for by somebody else away from the family home (please include all those ticked in 4.16)?

..... hours *(please give number)*

4.18 Is there anything else you would like to tell us about the things that you do at home to keep your child/children safe?

.....

.....

.....

.....

.....

Thank you very much for filling in this questionnaire. Your answers are very important in helping us stop children's accidents.

Please send this back to us in the FREEPOST ENVELOPE

We will need your name and address so that we can send you your gift voucher. Please fill in the pink form and send it back with your questionnaire



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☐☐ ☐☐☐☐☐☐ ☐☐ ☐☐

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Control 37–59 months questionnaire

Keeping Children Safe From Accidents

keeping children SAFE AT HOME

Please complete this questionnaire for your child born on .....

Is your child ☐ Male ☐ Female

Please tell us the date you completed this questionnaire .....

Your answers really are important to us. Thank you for taking the time to help us with this study.

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Part 1. About your child's development, health and behaviour

All children develop at their own rate so we would like to ask you what your child can do. There are no right or wrong answers.

1.1 Please tell us whether your child does each thing often, has only done it once or twice or has not started to do it yet.

Please ✓ one box on each line

	Often	Once or twice	Not yet
Walking			
Walking on the level without difficulties			
Walking up steps like an adult, one foot on each step			

1.2 At the moment, how likely do you think it is that your child could:
(If your child is too young to be able to do some of these things, put a tick in the "not likely" box)

Please ✓ one box on each line

	Very likely	Quite likely	Not likely	Don't know
Reach, or climb on to a worktop				
Reach, or climb on to something to reach a cupboard at adult eye level				
Open cupboards, drawers or medicine cabinets with locks or safety catches on them				
Open a fridge with a lock or safety catch on it				
Open a container with a child resistant cap				
Open a lockable medicine box				
Get medicines out of blister packs				
Touch things that you have told him/her not to				
Open a stair gate or safety gate				
Reach, or climb on to something to reach a pan on the cooker				
Reach, or climb on to something to reach a hot water tap				
Reach to pull a table cloth hanging over the side of a table				
Turn a hot water tap on by him/herself				
Climb into the bath by him/herself				
Climb onto furniture e.g. sofa, chair, bed				
Climb out of a cot				
Roll off a bed or high surface				
Climb up to a top bunk bed				

1.3 Does your child have any long-term conditions (e.g. problems with hearing, eye sight, development, fits etc) that have been diagnosed by a health professional?
Long-term means anything that your child has had for at least 3 months or is expected to continue for at least the next 3 months.

☐ Yes ☐ No

If YES, please tell us what conditions your child has:

.....

1.4 How was your child's health **IN THE LAST 24 HOURS**? Please put an "x" on the line below to indicate how good or how bad your child's health was:



Worst possible health ——————————— Perfect health



1.5 Below is a list of things that might be a problem for your child. Please tell us how much of a problem each one has been for your child during the **LAST TWO WEEKS** by circling:

0 if it is never a problem
1 if it is almost never a problem
2 if it is sometimes a problem
3 if it is often a problem
4 if it is almost always a problem

There are no right or wrong answers.

In the **LAST TWO WEEKS**, how much of a problem has your child had with...

Physical Functioning (problems with...)	Never	Almost Never	Some times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

Emotional Functioning (problems with…)	Never	Almost Never	Some times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

1.6 Does your child attend school or day care? *(please ✓ one box)*

☐ Yes - Please complete the next 3 questions

☐ No - Please go to 1.7

School Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/daycare because of Not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the Doctor or hospital	0	1	2	3	4

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1.7 Have you taught your child any rules or instructions about keeping safe at home? If your child is too young to teach some of these rules to, put a tick in the "No" box next to each rule.

	Have you taught your child these rules? *Please ✓ one box for each question*		**If YES**, how often does your child follow these rules? *(Please ✓ one box for each question)*				
	Yes	No	Always	Most times	Some times	Occasionally	Never
What to do or not do when parents are cooking using the top of the cooker							
What to do or not do with hot things in the kitchen e.g. kettle							
What to do or not do when he/she is in the bathtub							
About things in the kitchen that he/she is not supposed to climb on							
What to do or not do when he/she sees cleaning products							
What to do or not do if there is medicine on the work top							
What to do or not do if the floor is slippery							
About running in the house							
About jumping on the bed or furniture							
What to do or how he/she is supposed to behave when going down the stairs							
About carrying big things or lots of things while going down stairs							
About leaving things on the stairs							

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1.8 These statements describe children's reactions to a number of situations. We would like you to tell us what your child's reaction is likely to be in those situations. Please read each statement and decide whether it is a "true" or "untrue" description of your child's reaction **WITHIN THE LAST SIX MONTHS**. You may not be able to answer some of the questions because you may not have seen your child in that situation, e.g. if the question is about going down a slide and your child did not do this in the last 6 months, then tick the "Not Applicable" box.

Please ✓ one box on each line

My child:	extremely untrue	quite untrue	slightly untrue	neither true nor false	slightly true	quite true	Extremely true	Not applicable
Seems always in a big hurry to get from one place to another								
Tends to run, rather than walk, from room to room								
When outside, often sits quietly								
Moves about actively (runs, climbs, jumps) when playing in the house								
Prefers quiet activities to active games								
Is full of energy, even in the evening								
Likes to sit quietly and watch people do things								
Likes going down high slides or other adventurous activities								
Likes to play so wild and recklessly that he or she might get hurt								
Enjoys activities such as being chased, spun around by the arms etc								
Likes to go high and fast when pushed on a swing								
Dislikes rough and rowdy games								
Enjoys riding a tricycle or bicycle fast and recklessly								

Part 2. About your home

Every home has things that may not seem very safe for children. We want to find out which things really are safe or not. Please answer the questions below as honestly as possible.

Please think about THE LAST 24 HOURS:

2.1 Please tell us where your medicines and cleaning products were IN THE LAST 24 HOURS.

	Did you have this in your home? *(Please ✓ one box)*		**IF YES** At what level was it? *(Please ✓ all that apply)*		**IF YES** Where was it? *(Please ✓ all that apply)*		
	Yes	No	At adult eye level or above	Below adult eye level	Cupboard, medicine cabinet, drawer or fridge with lock or safety catch	Cupboard, medicine cabinet, drawer or fridge without lock or safety catch	Other place without lock e.g. shelf, handbag, work surface
Painkillers e.g. Calpol							
Iron or vitamins							
Cough mixture							
Antidepressants or sleeping tablets							
Any other medicines in the kitchen							
Any other medicines in the bathroom							
Any other medicines anywhere else in the house							
Bleach							
Dishwasher products							
Oven cleaner							
Toilet cleaner							
White spirit/ turpentine							
Rat or ant killer							
Garden chemicals e.g. weed killer							
Any other household products							

Still thinking about THE LAST 24 HOURS:

2.2 Did all your medicines have child resistant caps or blister packs? ☐ Yes ☐ No

2.3 Had any medicines been put in a container different from the one they came in? ☐ Yes ☐ No

2.4 Were all medicines kept in a locked medicine box? ☐ Yes ☐ No

2.5 Were any medicines kept in the fridge? ☐ Yes ☐ No

If YES, was the fridge closed with a lock or safety catch? ☐ Yes ☐ No





2.6 Did all your cleaning products have child resistant caps? ☐ Yes ☐ No

2.7 Had any cleaning products been put in a container different from the one they came in? ☐ Yes ☐ No



2.8 Did you use a safety gate to stop your child/children getting in to the kitchen? ☐ Yes ☐ No

2.9 Was there anything your child could climb on to reach work tops, shelves, cupboards etc, in any of your rooms? ☐ Yes ☐ No

2.10 Did you use protective corner covers on any of your furniture? ☐ Yes ☐ No

2.11 Did you have a kettle with a curly flex or a cordless kettle? ☐ Yes ☐ No



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Still thinking about THE LAST 24 HOURS:

2.12. Where was your kettle? *(Please ✓ one box)*

☐ At the front of the work top or table ☐ Between the front and back of the work top or table

☐ At the back of the worktop or table ☐ On the front ring of the cooker

☐ On the back ring of the cooker ☐ Other (*please describe*).....

2.13 How hot was your hot tap water? *(Please ✓ one box)*

☐ Very hot – you couldn't have a bath without adding a lot of cold water

☐ Hot – you would need to add some cold water to the bath

☐ Warm enough– you don't need to add any cold water to the bath

☐ Not very warm – not warm enough to have a bath in



2.14 Do you know the temperature of your hot tap water? *(Please ✓ one box)*

☐ Lower than 54^{0}C ☐ 54^{0}C or higher ☐ Don't know

2.15 Were all carpets or rugs in your home firmly fixed to the floor? ☐ Yes ☐ No

2.16 Do you have any stairs in your home? ☐ Yes ☐ No (if no, go to question 2.25)

2.17 Did you use any stair gates or safety gates in your home? ☐ Yes ☐ No

If YES, where do you use them? *(Please ✓ all that apply)*

☐ Bottom of stairs ☐ Top of stairs

☐ Other (*please tell us where)*.....

2.18 Were any of your stair gates on the stairs left open? ☐ Yes ☐ No

2.19 Which of the following describe how your stairs look? *(Please ✓ all that apply)*

☐ Carpeted ☐ Exposed wood ☐ Exposed metal or concrete

☐ Lino/vinyl covered ☐ Don't know ☐ Other *(please describe)*.....

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Still thinking about THE LAST 24 HOURS:

2.20 Please put a tick in the box that best describes your agreement with each of the following:

Please ✓ one box on each line

	Agree	Neither agree nor disagree	Disagree
The stairs are too steep			
The stairs are too narrow			
The stairs are poorly lit			
The steps are in need of repair			
The banister/handrail is in need of repair			
The stair covering is in need of repair			
The stairs are safe to use			

2.21 Are there any handrails on the wall next to your stairs? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

2.22 Is there a banister/railings at the side of your stairs to stop people from falling through? *(Please ✓ one box)*

☐ Yes on all stairs ☐ Yes on some stairs ☐ No

If YES, how wide are the biggest gaps between the railings? ……..……*(please write in number of inches)*

2.23 Do any of your stairs have a landing part way up? ☐ Yes ☐ No

2.24 Are any of your stairs spiral or winding stair cases? ☐ Yes ☐ No



Thinking about the LAST WEEK:

2.25 How often did these things happen in the **LAST WEEK**? If you did not have the things the question is asking about e.g. high chair, tick the "does not apply" box. For questions that ask about older children, if you do not have older children, tick the "does not apply" box.

Please ✓ one box on each line

	Does not apply	Every day	Most days	Some days	Never
Your child was held, even for a moment, by someone holding a hot drink?					
Your child was held, even for a moment, by someone using the cooker?					
Hot drinks were passed over your child's head?					
Hot drinks were left within the reach of your child e.g. coffee table, work top, other low surface?					
Hot drinks or hot liquids were put on a table with a table cloth?					
The front rings of the cooker were used?					
Pan handles were turned towards the back of the cooker whilst cooking?					
Your child was left in the bathroom, without an adult whilst the bath was running, even for a moment e.g. to collect clothes, nappies or answer the phone?					
Your child was left in the bath without an adult, even for a moment e.g. to collect clothes, nappies or answer the phone?					
A bath was run for your child by an older child?					
An older child looked after your child in the bath?					
The bath was run using cold water first?					
The temperature of your child's bath water was checked using a thermometer or other gadget?					
The temperature of your child's bath water was checked using a hand or elbow?					
There were things on your floors that could be tripped over?					
Your child was left on a raised surface e.g. table, sofa, adult bed, even for a moment?					
Your child's nappy was changed on a raised surface e.g. bed, changing table, work top?					
Your child was put in a car seat or bouncing seat on a raised surface e.g. table, work top, even for a moment?					
There were wires or cables trailing across the floor?					
Your child climbed onto or played on furniture e.g. bed, chair, sofa?					

	Does not apply	Every day	Most days	Some days	Never
Your child climbed onto or played on garden furniture?					
There were things on your stairs that could be tripped over?					
Your child used a high chair without being strapped in with the harness/straps?					
Your child played in the garden without an adult in the garden?					
A safety gate was used to stop your child getting into the garden?					
The back door was locked to stop your child getting into the garden?					

2.26 Please tell us how often these things happened in the **LAST WEEK**. If you did not have or did not use some of these medicines or cleaning products please tick the "does not apply" box.

Please ✓ one box on each line

The following were put away IMMEDIATELY after use:	Does not apply	Every time	Most times	Some times	Never
Painkillers (e.g. Calpol)					
Iron or vitamins					
Cough mixtures					
Antidepressant or sleeping tablets					
Other medicines					
Bleach					
Dishwasher products					
Oven cleaner					
Toilet cleaner					
White spirit/turpentine					
Rat or ant killer					
Garden chemicals e.g. weed killers					
Any other household products					

Please continue on page 15



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Part 3. About the worries of family life

3.1 The statements below describe things that often happen in families with young children. These things sometimes make life difficult. Please read each statement and tick how often it happens to you and then tick how much of a "hassle" you feel it has been for you in the **PAST 6 MONTHS**. **Please answer these questions thinking about all of your children.**

	How often it happens				**Hassle (low to high)**				
	Rarely	Sometimes	A lot	Constantly	1 low	2	3	4	5 high
Continually cleaning up messes of food or toys									
The children's schedules (like pre-school or other activities) interfere with your own household needs									
The children are constantly underfoot, interfering with other chores									
Having to change your plans because of unexpected child needs									
The children get dirty several times a day needing changes of clothing									
Difficulties in getting children ready for outings and leaving on time									
Having to run extra errands to meet the children's needs									
Fights with brothers or sisters require a referee (if you only have one child, please write "only one child")									

3.2 Please read each statement and tick the box next to each one which comes closest to how you have been feeling in the **PAST WEEK**. Don't take too long over your replies: your first reaction to each item will probably be better than thinking about it for too long.

I feel tense or 'wound up':		**I feel as if I am slowed down:**	
Most of the time		Nearly all of the time	
A lot of the time		Very often	
Time to time, occasionally		Sometimes	
Not at all		Not at all	
I still enjoy the things I used to enjoy:		**I get a sort of frightened feeling like 'butterflies in the stomach':**	
Definitely as much		Not at all	
Not quite so much		Occasionally	
Only a little		Quite often	
Not at all		Very often	
I get a sort of frightened feeling like something awful is about to happen:		**I have lost interest in my appearance:**	
Very definitely and quite badly		Definitely	
Yes, but not too badly		I don't take as much care as I should	
A little, but it doesn't worry me		I may not take quite as much care	
Not at all		I take just as much care as ever	
I can laugh and see the funny side of things:		**I feel restless as if I have to be on the move:**	
As much as I always could		Very much indeed	
Not quite so much now		Quite a lot	
Definitely not so much now		Not very much	
Not at all		Not at all	
Worrying thoughts go through my mind:		**I look forward with enjoyment to things:**	
A great deal of the time		As much as I ever did	
A lot of the time		Rather less than I used to	
From time to time but not too often		Definitely less than I used to	
Only occasionally		Hardly at all	

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I feel cheerful:		I get sudden feelings of panic:	
Not at all		Very often indeed	
Not often		Quite often	
Sometimes		Not very often	
Most of the time		Not at all	
I can sit at ease and feel relaxed:		**I can enjoy a good book or radio or TV programme:**	
Definitely		Often	
Usually		Sometimes	
Not often		Not often	
Not at all		Very seldom	

4. About your family

4.1 How many children, including step-children, (under 5) do you have living with you? ..... *(Please give number)*

4.2 How many children, including step-children, (aged 5-16) do you have living with you? ..... *(Please give number)*

4.3 The total number of adults and children living in our home is: ..... *(Please give number)*

4.4. I am the child(ren's) *(Please ✓ one box)*

☐ Mother ☐ Father ☐ Grandparent ☐ Other *(Please say what)* .....

4.5 How many brothers and sisters (including step-brothers/step-sisters) does your child have?

..... older brothers and sisters ..... younger brothers and sisters *(Please give number)*

4.6 Does your child live? *(Please ✓ one box)*

☐ In one house only

☐ In a residential home

☐ Part time in one house and part time in another house [please answer the remaining questions about the house where they spend most of their time]

4.7 How many adults, over the age of 16, live in the house with your child? *(Please ✓ one box)*

☐ One parent ☐ Both parents ☐ One parent and other adults

☐ Both parents and other adults ☐ Other (Please describe) .....

4.8 How many adults living in the house with your child work in a paid job? *(Please ✓ one box)*

☐ None ☐ One ☐ Two ☐ More than two

4.9 What kind of house does your child live in? *(Please ✓ one box)*

☐ Rented house ☐ House owned by, or being bought by family

☐ Other *(Please say what)*.....

4.10 My family usually has the use of a car ☐ Yes ☐ No

4.11 My family receives one or more state benefits as well as child benefit ☐ Yes ☐ No

4.12 The postcode where my child lives is:.....

If you are the mother of the child in this survey, please answer the next question. Otherwise please go to question 4.14

4.13 When my first child was born my age was: .....years

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4.14 I am (*Please ✓ one box)*

☐ White (e.g. White British, Irish, other white background) ☐ Black (e.g. Caribbean, African)

☐ Asian (e.g. Indian, Pakistani, Bangladeshi, Chinese) ☐ Other *(Please say what……)*

4.15 The total number of rooms in our home is: …… *(Please give number)*
(***do not count bathrooms or toilets or rooms that can only be used for storage such as cupboards***)

4.16 Who else looks after your child? *(Please ✓ all that apply)*

☐ Day Nursery ☐ Preschool ☐ Playgroup ☐ School

☐ Childminder ☐ Family/grandparents ☐ Friends ☐ N/A

☐ Other *(Please say who)* …….

4.17 In a typical week how many hours is your child cared for by somebody else away from the family home (please include all those ticked in 4.16)?

…….. hours *(please give number)*

4.18 Is there anything else you would like to tell us about the things that you do at home to keep your child/children safe?

……

……

……

……

……

Thank you very much for filling in this questionnaire. Your answers are very important in helping us stop children's accidents.

Please send this back to us in the FREEPOST ENVELOPE

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Home observation checklist for study B

The University of Nottingham

keeping children SAFE AT HOME

PI logo

Study B research checklist

Study B ID No. _____ **Date:** _____

Visit conducted by **1. (Leader)** _____

2. (Recorder) _____

1	**Postcode**	
2.	**Number of children under five**	
	Details of children under five	Age (DOB) _____ M/F Age(DOB) _____ M/F Age (DOB) _____ M/F Age(DOB) _____ M/F Age (DOB) _____ M/F Age(DOB) _____ M/F
3	**Main living area**	• Corner covers on **any** furniture Yes ☐ No ☐ • Changes last 3 months? Yes ☐ No ☐ If so, when /where?

Study B Validation checklist v4 15/4/2011

4. Stairs and hall

4.1	Stairs	Yes ☐ No ☐
4.2	Stairs - type	• Landing part way up? Yes ☐ No ☐ • Spiral/winding? Yes ☐ No ☐ • Changes last 3 months? Yes ☐ No ☐ If so, when /where?
4.3	Stairs – covering **(tick all that apply)**	Carpeted ☐ Exposed wood ☐ Lino/vinyl covered ☐ Exposed metal or concrete ☐ Other ☐ • Changes last 3 months? Yes ☐ No ☐ If so, when /where?
4.4	Stairs - **measure**	• **Height** _____ cm **Depth** _____ cm **Width** _____ cm • Changes last 3 months? Yes ☐ No ☐ If so, when /where?
4.5	Handrails on wall	• All stairs ☐ Some stairs ☐ None ☐ • Changes last 3 months? Yes ☐ No ☐ If so, when /where?
4.6	Banister/railings	• All stairs ☐ Some stairs ☐ None ☐ • Changes last 3 months? Yes ☐ No ☐ If so, when /where?
4.7		• Measure biggest gap _____ inches *(if banister has no gap insert 0)* • Changes last 3 months? Yes ☐ No ☐ If so, when /where?
4.8	Stair gates - on stairs	• Top Yes ☐ No ☐ • Bottom Yes ☐ No ☐ • Changes last 3 months? Yes ☐ No ☐ If so, when /where?
4.9	Stair gates - other	• Yes ☐ No ☐ • Where? _____ • Changes last 3 months? Yes ☐ No ☐ If so, when /where?

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5. Medicines

- Which of the following **medicines** do you have in your home today?
- Is this where you normally store them (prompt last 3 months)?
- Have you got anymore anywhere else?

		Yes No or DK	Place (**NOT** FOR INPUT TO DATABASE)	**Level now** (Please ✓ all that apply)		**Where is it now?** (Please ✓ all that apply)			**Changes last 3 months?** Yes/No If so, when /where?
				Adult eye level or above	Below adult eye level	Cupboard, medicine cabinet, drawer or fridge with **lock or safety catch**	Cupboard, medicine cabinet, drawer or fridge **without** lock or safety catch	**Other place without lock** e.g. shelf, handbag, work surface	
5.1	Painkillers e.g. Calpol								
5.2	Iron or vitamins								
5.3	Cough mixture								
5.4	Antidepressants or sleeping tablets								
5.5	Any other medicines								

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6. Medicines - general

6.1	All medicines have child resistant caps or blister packs?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
6.2	Any medicines been put in a container different from the one they came in?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
6.3	All medicines kept in a locked medicine box?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?

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7. Household products

- Which of the following **household products** do you have in your home today (and what level do you store them)?
- Is this where you normally store them (prompt last 3 months)?
- Have you got anymore anywhere else?

		Yes **No** or **DK**	Place (***NOT*** *FOR INPUT TO DATABASE)*	**Level now** *(Please ✓ all that apply)*		**Where is it now?** *(Please ✓ all that apply)*			**Changes last 3 months?** Yes/No If so, when /where?
				Adult eye level or above	Below adult eye level	Cupboard, medicine cabinet, drawer or fridge with **lock or safety catch**	Cupboard, medicine cabinet, drawer or fridge **without** lock or safety catch	**Other place without lock** e.g. shelf, handbag, work surface	
7.1	Bleach								
7.2	Dishwasher products								
7.3	Oven cleaner								
7.4	Toilet cleaner								
7.5	White spirit/turpentine								
7.6	Rat or ant killer								
7.7	Garden chemicals e.g. weed killer								
7.8	Any other household products								

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8. Household products - general

8.1	All household products have child resistant caps?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
8.2	Any household products put in container different from the one they came in?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?

9. Kitchen

9.1	Safety gate?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
9.2	Kettle cord - Cordless **or** curly flex?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
9.3	Kettle position	☐ Front worktop/table ☐ Between front and back worktop/table ☐ Back worktop/table ☐ Back ring cooker ☐ Front ring cooker ☐ Other Please specify other: _____ Changes last 3 months? Yes ☐ No ☐ If so, when /where?	
9.4	Fridge - medicines?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
9.5	Fridge - lock or safety catch?	Yes ☐ No ☐	Changes last 3 months? Yes ☐ No ☐ If so, when /where?

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10. Infant equipment

Does your child use...

If so please can you show it to us?

10.1	A baby walker?	Yes ☐ No ☐	Age(s) of child(ren) who uses it	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
10.2	A stationary play centre (like a baby walker without wheels)?	Yes ☐ No ☐	Age(s) of child(ren) who uses it	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
10.3	A play pen?	Yes ☐ No ☐	Age(s) of child(ren) who uses it	Changes last 3 months? Yes ☐ No ☐ If so, when /where?
10.4	A travel cot instead of a playpen?	Yes ☐ No ☐	Age(s) of child(ren) who uses it	Changes last 3 months? Yes ☐ No ☐ If so, when /where?

Fieldnotes/Observations

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Appendix 2 Follow-up questionnaires and mini questionnaire, medical record data extraction form and unit cost tables for study C

Follow-up questionnaires

☐☐☐☐☐☐☐☐ ☐

Keeping Children Safe: Measuring the cost of children's accidents



These questions ask about how much your child's accident cost you, your family and the NHS in the FIRST TWO WEEKS after the accident and whether your child is getting better.

Part 1. About your child's recent visit to the Accident and Emergency (A&E) Department, Minor Injuries Unit or Walk In Centre

These questions are about your child's visit to the A&E Department, Minor Injuries Unit or Walk-In Centre after an accident, on __/__/____

1.1 **Please tell us which hospital/unit/centre you went to:** *(please ✓ all that apply)*

- ☐ Queen's Medical Centre, Nottingham
- ☐ Norfolk and Norwich University Hospital, Norwich
- ☐ Frenchay Hospital, Bristol
- ☐ Bristol Royal Hospital for Children
- ☐ Royal Victoria Infirmary, Newcastle
- ☐ Queen Elizabeth Hospital, Gateshead
- ☐ North Tyneside Hospital, North Shields
- ☐ Wansbeck Hospital, Ashington
- ☐ NHS Walk-In Centre (*please give name)* _____
- ☐ Minor Injuries Unit (*please give name)* _____
- ☐ Other (*please describe)* _____

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1.2 **Did your child stay in hospital for ONE OR MORE NIGHTS because of their accident?**

(Please ✓ one box)

☐ Yes ☐ No

If **YES**, please tell us the date when they first stayed in hospital (admission date) and the date when they left hospital (discharge date).

Admission date ..... Day..... Month..... Year

Discharge date ..... Day..... Month..... Year

1.3 **Did your child have any of these tests in the A&E Department, Minor Injuries Unit, Walk-In Centre or on the ward?** (*Please ✓ one box for each line)*

	Yes	No	Don't Know
Blood test			
Urine test			
X-ray			
Scan (ultrasound, MRI or CT scan)			
Other(s) (please describe)			

1.4 Did your child have any of these treatments in the A&E Department, Minor Injuries Unit, Walk-In Centre or on the ward?

(*Please ✓ one box for each line)*

	Yes	No	Don't know
Observation (kept in A&E, Minor Injuries Unit or on ward so child can be checked to make sure there are no problems)			
Advice			
Medicine given by mouth			
Medicine given by injection			
Cream put on their skin			
Medicine given to take home			
Dressing for wound or burn			
Stitches			
Paper stitches (steri-strips) or wound glue			
Bandage, sling or support			
Splint (equipment to stop injured part of body moving)			

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Manipulation of broken or fractured bone (putting bone back in line)			
Manipulation of dislocated joint (putting joint back in place)			
Operation to fix broken or fractured bone using metal plate, pins or wires			
Cast to hold broken or fractured bone in place (e.g. plaster, resin, fibre-glass cast)			
Physiotherapy			
Stomach wash out			
General anaesthetic (being put to sleep for an operation)			
Local anaesthetic (injection to numb part of body)			
Tetanus injection			
Drip			
Blood transfusion			
Chest drain			
Oxygen through mask or tube to help breathing			
Tube in throat for child who cannot breathe for themselves			
Resuscitation (to restart breathing or heart)			
Other(s) *(please describe)*			

1.5 **Do you think your child is now completely better and their accident is not affecting them anymore?** *(Please ✓ one box)*

☐ Yes ☐ No

Part 2. Visits to your GP for your child's accident

2.1 **In the FIRST TWO WEEKS after the accident, how many times has your child visited any of these health professionals at your GP's surgery because of their accident?** *(Please put '0' if none)*

	Number of visits
GP	.....
Practice nurse	.....
Other (please say who) _____	.....

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Part 3. Visits to other health professionals for your child's accident

3.1 **In the FIRST TWO WEEKS after the accident, how many times has your child visited, or been visited at home by, one of these health professionals because of their accident?** *(Please put '0' if none)*

	Number of visits	Treatment site (e.g. home, clinic, name of hospital)	Did you pay for this visit?	
			Yes	No
Doctor / Consultant				
Health visitor				
Physiotherapist				
Nurse (Don't include GP visits here)				
Other (please say who)(Don't include visits to Practice Nurse here)				

Part 4. Stays in hospital AND visits to the Day Case Unit for your child's accident

4.1 **In the FIRST TWO WEEKS after the accident, has your child had to stay in hospital overnight or visit a day case unit because of their accident?** *(Please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 5

	Admission Date	Discharge Date	Name of the hospital	Name of consultant *(if known)*	Name of ward *(if known)*
Stay 1					
Stay 2					
Stay 3					
Stay 4					
Stay 5					

Part 5. Medicine and medical supplies for your child's accident

5.1 **In the FIRST TWO WEEKS after the accident, has your child taken any PRESCRIBED medicines because of their accident?** *(Please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 5.2

Please list all medicines prescribed by a doctor or nurse because of your child's accident.

Name of medicine	About HOW OFTEN and HOW LONG did your child take this medicine?
e.g. paracetamol, calpol, nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

5.2 **In the FIRST TWO WEEKS after the accident, has your child taken any medicines that were BOUGHT WITHOUT A PRESCRIPTION because of their accident?** *(Please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 5.3

Please list all the medicines bought without a prescription because of your child's accident?

Name of medication	About HOW OFTEN and HOW LONG did your child take this medicine?
e.g. paracetamol, calpol, nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

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5.3 **In the FIRST TWO WEEKS after the accident, have you GOT ANY AIDS OR MADE ANY CHANGES to help your child in the home or garden because of their accident?** *(Please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 6

Type of Aid/Changes made *(e.g. Wheel chair)*	**Cost of item (if known)**	**Who bought this or gave you this?** *(e.g. (yourself, family, NHS, social services, other)*
1.		
2.		
3.		
4.		
5.		

Part 6. Childcare and other costs

6.1 **When you took your child who had the accident to see a health professional, did you need to get someone to look after your other children and/or other people you care for?** (*Please ✓ one box)*

☐ Yes ☐ No ☐ Not applicable

If YES,

a) Who looked after your children or the other people you care for? *(please ✓ all that apply)*

☐ Relative

☐ Friend

☐ Professional carer *(e.g. childminder)*

b) In total, how long did they look after your children and/or the other people you care for?
..... Days ..... Hours

6.2 **In the FIRST TWO WEEKS after the accident, has your child who had the accident needed extra care that you paid for because of their accident?** *(Please ✓ one box)*

☐ Yes ☐ No

If YES,

How many days care did your child have? ..... Days

How many hours care per day? ..... Hours

Part 7. Work and your child's accident

The next questions ask about time off work or usual activities of the people (including yourself) who have cared for your child in the FIRST TWO WEEKS after their accident. Please only include care they have provided because of the accident, not care they would usually provide. [Please include your first visit to the A&E Department, Minor Injuries Unit or Walk-In Centre.]

Please think about the 2 people who do most of the caring for your child. Call these people carer 1 and carer 2. One of these people may be you. Please fill in the box below:

The 2 people who care most for your child	**Carer 1**	**Carer 2**
What is the relationship of this person to your child?	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*
Total number of days taken off work or usual activities, in the FIRST TWO WEEKS after the accident, by this person to care for your child. Only include care provided because of the accident. e.g. if you took 3 days off work in the first week after the accident, and grandmother took 1 day off work in the first week and 1 day off work in the second week to look after your child, you would write "3" in the carer 1 box and "2" in the carer 2 box.	..... Days	..... Days
Did this person lose any money from work because they were caring for your child?	☐ Yes ☐ No	☐ Yes ☐ No
Sex of this person	☐ Male ☐ Female	☐ Male ☐ Female

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Age of this person	☐ Less than 21yrs ☐ 21-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs	☐ Less than 21yrs ☐ 21-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs
What best describes this person's usual activities? Please ✓ ONE BOX only	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)

Part 8. Travel

8.1 **In the FIRST TWO WEEKS after the accident, did you spend any money on travelling to the A&E department, Minor Injuries Unit or Walk-In Centre because of your child's accident?** [Please include your first visit] *(Please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) .....

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8.2 **In the FIRST TWO WEEKS after the accident, did you spend any money on travelling to the hospital (other than to the A&E department, Minor Injuries Unit or Walk-In Centre) because of your child's accident?** *(Please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking ……...

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

8.3 **In the FIRST TWO WEEKS after the accident, did you spend any money on travelling to the GP's surgery because of your child's accident?** *(Please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking ……...

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

8.4 **In the FIRST TWO WEEKS after the accident, did you spend any money travelling anywhere else because of your child's accident?** *(Please ✓ one box)*

☐ Yes ☐ No

If YES, please tell us where you travelled to and give details below.

Travelled to _____

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking ……...

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

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Part 9. Other accidents

Most children have accidents at some time. How well they get better may be affected by having other accidents afterwards. This is why we are asking you about any other accidents your child has had recently.

9.1 **Has your child visited the A&E department, Minor Injuries Unit or Walk-In Centre because of an accident since __/__/____.**

☐ Yes ☐ No

If YES, please tick why they went to A&E, Minor Injuries Unit or Walk-In Centre *(Please ✓ all that apply)*

☐ A slip, trip, fall or tumble on stairs or steps

☐ A slip, trip, fall or tumble on the same level

☐ A slip, trip, fall or tumble from furniture

☐ Swallowing medicine or pills

☐ Swallowing cleaning products or garden chemicals

☐ A scald from hot water, other hot liquid or steam

☐ Other accident (*Please describe*)……

What sort of accident was it? *(Please ✓ all that apply)*

☐ Loss of consciousness

☐ Bang on the head

☐ Broken bone

☐ Burn or scald

☐ Swallowed household cleaner/other poison/pills

☐ Cut needing stitches

☐ Cut or graze

☐ Other accident

Part 10. General Health

How is your child's health TODAY? Please put an "X" on the line below to indicate how good or how bad your child's health is:

Worst possible health — Perfect health





Part 11. Quality of life (PedsQL™)

PLEASE COMPLETE PART 11 IF YOUR CHILD IS AGED 2 YEARS OR OVER

FOR CHILDREN AGED UNDER 2 YEARS – PLEASE GO TO PART 12

Directions

On the following page is a list of things that might be a problem for your child.
Please tell us how much of a problem each one has been for your child during the FIRST TWO WEEKS after the accident by circling:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.

In the FIRST TWO WEEKS after the accident, how much of a problem has your child had with…

Physical Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

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Emotional Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

11.1 **Does your child attend school or day care?** *(Please ✓ one box)*

☐ Yes ☐ No

If YES *Please complete the next 3 questions*
If No *Please go to Part 12*

In the FIRST TWO WEEKS after the accident, how much of a problem has your child had with……

School Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/day care because of not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the Doctor or hospital	0	1	2	3	4

Part 12. Any Other Comments

12.1 Please tell us the date you filled in this questionnaire: ...../...../.....

12.2 Are there any other costs that you have had to pay because of your child's accident and you have not been asked about them in this questionnaire? If YES, please tell us about them below:

12.3 Is there anything else you would like to tell us about your child's accident? If YES, please tell us below:

Thank you for taking the time to fill in this questionnaire. Please send it back in the FREEPOST envelope.

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Keeping Children Safe: Measuring the cost of children's accidents



These questions ask about how much your child's accident cost you, your family and the NHS in the THIRD and FOURTH WEEKS after the accident and whether your child is getting better.

Part 1. Visits to your GP for your child's accident

1.1 **In the THIRD and FOURTH WEEKS after the accident, how many times has your child visited any of these health professionals at your GP's surgery because of their accident?** *(please put '0' if none)*

	Number of visits
GP	.....
Practice nurse	.....
Other (please say who) _____	.....

Part 2. Visits to other health professionals for your child's accident

2.1 **In the THIRD and FOURTH WEEKS after the accident, how many times has your child visited, or been visited at home by, one of these health professionals because of their accident?** *(please put '0' if none)*

	Number of visits	Treatment site (e.g. home, clinic, name of hospital	Did you pay for this visit?	
			Yes	No
Doctor / Consultant				
Health visitor				
Physiotherapist				
Nurse (Don't include GP visits here)				
Other (please say who)(Don't include visits to Practice Nurse here)				

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Part 3. Stays in hospital AND visits to the Day Case Unit for your child's accident

3.1 **In the THIRD and FOURTH WEEKS after the accident, has your child had to stay in hospital overnight or visit a day case unit because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 4

	Admission Date	Discharge Date	Name of the hospital	Name of consultant *(if known)*	Name of ward *(if known)*
Stay 1					
Stay 2					
Stay 3					
Stay 4					
Stay 5					

Part 4. Medicine and medical supplies for your child's accident

4.1 **In the THIRD and FOURTH WEEKS after the accident, has your child taken any PRESCRIBED medicines because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 4.2

Please list all medicines prescribed by a doctor or nurse because of your child's accident.

Name of medicine	**About HOW OFTEN and HOW LONG did your child take this medicine?**
e.g. Paracetamol, Calpol, Nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

4.2 **In the THIRD and FOURTH WEEKS after the accident, has your child taken any medicines that were BOUGHT WITHOUT A PRESCRIPTION because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 4.3

Please list all the medicines bought without a prescription because of your child's accident.

Name of medication	**About HOW OFTEN and HOW LONG did your child take this medicine?**
e.g. Paracetamol, Calpol, Nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

4.3 **In the THIRD and FOURTH WEEKS after the accident, have you GOT ANY AIDS OR MADE ANY CHANGES to help your child in the home or garden because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 5

Type of Aid/Changes made *(e.g. Wheel chair)*	**Cost of item (if known)**	**Who bought this or gave you this?** *(e.g. (yourself, family, NHS, social services, other)*
1.		
2.		
3.		
4.		
5.		

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Part 5. Childcare and other costs

5.1 **In the THIRD and FOURTH WEEKS after the accident, when you took your child who had the accident to see a health professional, did you need to get someone to look after your other children and/or other people you care for? Please only include care they have provided because of the accident, not care they would normally provide.** (*please ✓ one box)*

☐ Yes ☐ No ☐ Not applicable

If YES,

a) Who looked after your children or the other people you care for? *(please ✓ all that apply)*

☐ Relative

☐ Friend

☐ Professional carer *(e.g. childminder)*

b) In total, how long did they look after your children and/or the other people you care for?
..... Days ..... Hours

5.2 **In the THIRD and FOURTH WEEKS after the accident, has your child who had the accident needed extra care that you paid for because of their accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES,

How many days care did your child have? ..... Days

How many hours care per day? ..... Hours

Part 6. Work and your child's accident

The next questions ask about time off work or usual activities of the people (including yourself) who have cared for your child. Please only include care they have provided because of the accident, not care they would normally provide.

During the THIRD and FOURTH WEEKS after the accident, please think about the 2 people who do most of the caring for your child. Call these people carer 1 and carer 2. One of these people may be you. Please fill in the box below:

The 2 people who care most for your child	**Carer 1**	**Carer 2**
What is the relationship of this person to your child?	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*
Total number of days taken off work or usual activities by this person to care for your child in the **THIRD and FOURTH WEEKS** after the accident. Only include care provided because of the accident. E.g. if you took 4 days off in week THREE and grandmother took 3 days off in week FOUR you would write "4" in the carer 1 box and "3" in the carer 2 box.	..... Days	..... Days
Did this person lose any money from work because they were caring for your child?	☐ Yes ☐ No	☐ Yes ☐ No
Sex of this person	☐ Male ☐ Female	☐ Male ☐ Female
Age of this person	☐ Less than 21yrs ☐ 22-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs	☐ Less than 21yrs ☐ 22-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs

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What best describes this person's usual activities? Please ✓ ONE BOX only	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)

Part 7. Travel

7.1 **In the THIRD and FOURTH WEEKS after the accident, did you spend any money on travelling to the A&E department or Minor Injuries Unit or Walk-In Centre because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) .....

7.2 **In the THIRD and FOURTH WEEKS after the accident, did you spend any money on travelling to the hospital (other than to the A&E department or Minor Injuries Unit or Walk-In Centre) because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

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7.3 **In the THIRD and FOURTH WEEKS after the accident, did you spend any money on travelling to the GP's surgery because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

7.4 **In the THIRD and FOURTH WEEKS after the accident, did you spend any money travelling anywhere else because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please tell us where you travelled to and give details below.

Travelled to _____

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

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Part 8. Other accidents

Most children have accidents at some time. How well they get better may be affected by having other accidents afterwards. This is why we are asking you about any other accidents your child has had recently.

8.1 **Has your child visited the A&E department or Minor Injuries Unit or Walk-In Centre because of an accident in the THIRD and FOURTH WEEKS after the accident?**

☐ Yes ☐ No

If **YES,** please tick why they went to A&E or Minor Injuries Unit or Walk-In Centre
(Please ✓ all that apply)

☐ A slip, trip, fall or tumble on stairs or steps

☐ A slip, trip, fall or tumble on the same level

☐ A slip, trip, fall or tumble from furniture

☐ Swallowing medicine or pills

☐ Swallowing cleaning products or garden chemicals

☐ A scald from hot water, other hot liquid or steam

☐ Other accident (*Please describe*).....

What sort of accident was it? *(Please ✓ all that apply)*

☐ Loss of consciousness

☐ Bang on the head

☐ Broken bone

☐ Burn or scald

☐ Swallowed household cleaner/other poison/pills

☐ Cut needing stitches

☐ Cut or graze

☐ Other accident

Part 9. General Health

How is your child's health TODAY? Please put an "X" on the line below to indicate how good or how bad your child's health is:

Worst possible health — Perfect health





Part 10. Quality of life (PedsQL™)

PLEASE COMPLETE PART 10 IF YOUR CHILD IS AGED 2 YEARS OR OVER

FOR CHILDREN AGED UNDER 2 YEARS – PLEASE GO TO PART 11

Directions

On the following page is a list of things that might be a problem for your child.
Please tell us how much of a problem each one has been for your child during the **THIRD and FOURTH WEEKS** after the accident:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.

In the THIRD and FOURTH WEEKS after the accident, how much of a problem has your child had with…

Physical Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

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Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4
Emotional Functioning (problems with…)	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

10.1 **Does your child attend school or day care?** *(please ✓ one box)*

☐ Yes ☐ No

If **YES** *Please complete the next 3 questions*
If **No** *Please go to Part 11*

In the THIRD and FOURTH WEEKS after the accident, how much of a problem has your child had with…

School Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/day care because of not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the Doctor or hospital	0	1	2	3	4

Part 11. Your Child

11.1 **Do you think your child is now completely better and their accident is not affecting them anymore?** *(Please ✓ one box)*

☐ Yes ☐ No

Part 12. Any Other Comments

12.1 Please tell us the date you filled in this questionnaire: ...../...../.....

12.2 Are there any other costs that you have had to pay because of your child's accident and you have not been asked about them in this questionnaire? If YES, please tell us about them below:

12.3 Is there anything else you would like to tell us about your child's accident? If YES, please tell us below:

Thank you for taking the time to fill in this questionnaire. Please send it back in the FREEPOST envelope.

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Keeping Children Safe: Measuring the cost of children's accidents



These questions ask about how much your child's accident cost you, your family and the NHS in the 3 MONTHS after the accident and whether your child is getting better.

Part 1. Visits to your GP for your child's accident

1.1 **In the 3 MONTHS after the accident, how many times has your child visited any of these health professionals at your GP's surgery because of their accident?** *(please put '0' if none)*

	Number of visits
GP	.....
Practice nurse	.....
Other (please say who) _____	.....

Part 2. Visits to other health professionals for your child's accident

2.1 **In the 3 MONTHS after the accident, how many times has your child visited, or been visited at home by, one of these health professionals because of their accident?** *(please put '0' if none)*

	Number of visits	Treatment site (e.g. home, clinic, name of hospital	Did you pay for this visit?	
			Yes	No
Doctor / Consultant				
Health visitor				
Physiotherapist				
Nurse (Don't include GP visits here)				
Other (please say who)(Don't include visits to Practice Nurse here)				

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Part 3. Stays in hospital AND visits to the Day Case Unit for your child's accident

3.1 **In the 3 MONTHS after the accident, has your child had to stay in hospital overnight or visit a day case unit because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 4

	Admission Date	Discharge Date	Name of the hospital	Name of consultant *(if known)*	Name of ward *(if known)*
Stay 1					
Stay 2					
Stay 3					
Stay 4					
Stay 5					

Part 4. Medicine and medical supplies for your child's accident

4.1 **In the 3 MONTHS after the accident, has your child taken any PRESCRIBED medicines because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 4.2

Please list all medicines prescribed by a doctor or nurse because of your child's accident.

Name of medicine	**About HOW OFTEN and HOW LONG did your child take this medicine?**
e.g. Paracetamol, Calpol, Nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

4.2 **In the 3 MONTHS after the accident, has your child taken any medicines that were BOUGHT WITHOUT A PRESCRIPTION because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 4.3

Please list all the medicines bought without a prescription because of your child's accident.

Name of medication	**About HOW OFTEN and HOW LONG did your child take this medicine?**
e.g. Paracetamol, Calpol, Nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

4.3 **In the 3 MONTHS after the accident, have you GOT ANY AIDS OR MADE ANY CHANGES to help your child in the home or garden because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 5

Type of Aid/Changes made *(e.g. Wheel chair)*	**Cost of item (if known)**	**Who bought this or gave you this?** *(e.g. (yourself, family, NHS, social services, other)*
1.		
2.		
3.		
4.		
5.		

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Part 5. Childcare and other costs

5.1 **In the 3 MONTHS after the accident, when you took your child who had the accident to see a health professional, did you need to get someone to look after your other children and/or other people you care for? Please only include care they have provided because of the accident, not care they would normally provide.** (*please ✓ one box)*

☐ Yes ☐ No ☐ Not applicable

If YES,

a) Who looked after your children or the other people you care for? *(please ✓ all that apply)*

☐ Relative

☐ Friend

☐ Professional carer *(e.g. childminder)*

b) In total, how long did they look after your children and/or the other people you care for?
..... Days ..... Hours

5.2 **In the 3 MONTHS after the accident, has your child who had the accident needed extra care that you paid for because of their accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES,

How many days care did your child have? ..... Days

How many hours care per day? ..... Hours

Part 6. Work and your child's accident

The next questions ask about time off work or usual activities of the people (including yourself) who have cared for your child. Please only include care they have provided because of the accident, not care they would normally provide.

During the 3 MONTHS after the accident, please think about the 2 people who do most of the caring for your child. Call these people carer 1 and carer 2. One of these people may be you. Please fill in the box below:

The 2 people who care most for your child	**Carer 1**	**Carer 2**
What is the relationship of this person to your child?	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*
Total number of days taken off work or usual activities by this person to care for your child in the 3 MONTHS weeks after the accident. Only include care provided because of the accident. E.g. if you took 4 days off in week THREE and grandmother took 3 days off in week FOUR you would write "4" in the carer 1 box and "3" in the carer 2 box.	..... Days	..... Days
Did this person lose any money from work because they were caring for your child?	☐ Yes ☐ No	☐ Yes ☐ No
Sex of this person	☐ Male ☐ Female	☐ Male ☐ Female
Age of this person	☐ Less than 21yrs ☐ 22-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs	☐ Less than 21yrs ☐ 22-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs

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What best describes this person's usual activities? Please ✓ ONE BOX only	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)

Part 7. Travel

7.1 **In the 3 MONTHS after the accident, did you spend any money on travelling to the A&E department or Minor Injuries Unit or Walk-In Centre because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) .....

7.2 **In the 3 MONTHS after the accident, did you spend any money on travelling to the hospital (other than to the A&E department or Minor Injuries Unit or Walk-In Centre) because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

7.3 **In the 3 MONTHS after the accident, did you spend any money on travelling to the GP's surgery because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

7.4 **In the 3 MONTHS after the accident, did you spend any money travelling anywhere else because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please tell us where you travelled to and give details below.

Travelled to _____

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

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Part 8. Other accidents

Most children have accidents at some time. How well they get better may be affected by having other accidents afterwards. This is why we are asking you about any other accidents your child has had recently.

8.1 **Has your child visited the A&E department or Minor Injuries Unit or Walk-In Centre because of an accident in the 3 MONTHS after the accident?**

☐ Yes ☐ No

If **YES,** please tick why they went to A&E or Minor Injuries Unit or Walk-In Centre
(Please ✓ all that apply)

☐ A slip, trip, fall or tumble on stairs or steps

☐ A slip, trip, fall or tumble on the same level

☐ A slip, trip, fall or tumble from furniture

☐ Swallowing medicine or pills

☐ Swallowing cleaning products or garden chemicals

☐ A scald from hot water, other hot liquid or steam

☐ Other accident (*Please describe*).....

What sort of accident was it? *(Please ✓ all that apply)*

☐ Loss of consciousness

☐ Bang on the head

☐ Broken bone

☐ Burn or scald

☐ Swallowed household cleaner/other poison/pills

☐ Cut needing stitches

☐ Cut or graze

☐ Other accident

Part 9. General Health

How is your child's health TODAY? Please put an "X" on the line below to indicate how good or how bad your child's health is:

Worst possible health — Perfect health





Part 10. Quality of life (PedsQL™)

PLEASE COMPLETE PART 10 IF YOUR CHILD IS AGED 2 YEARS OR OVER

FOR CHILDREN AGED UNDER 2 YEARS – PLEASE GO TO PART 11

Directions

On the following page is a list of things that might be a problem for your child.
Please tell us how much of a problem each one has been for your child during the 3 MONTHS after the accident:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.

In the 3 MONTHS after the accident, how much of a problem has your child had with…

Physical Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

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Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4
Emotional Functioning (problems with…)	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

10.1 **Does your child attend school or day care?** *(please ✓ one box)*

☐ Yes ☐ No

If **YES** *Please complete the next 3 questions*
If **No** *Please go to Part 11*

In the 3 MONTHS after the accident, how much of a problem has your child had with…

School Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/day care because of not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the Doctor or hospital	0	1	2	3	4

Part 11. Your Child

11.1 **Do you think your child is now completely better and their accident is not affecting them anymore?** *(Please ✓ one box)*

☐ Yes ☐ No

Part 12. Any Other Comments

12.1 Please tell us the date you filled in this questionnaire: ...../...../.....

12.2 Are there any other costs that you have had to pay because of your child's accident and you have not been asked about them in this questionnaire? If YES, please tell us about them below:

12.3 Is there anything else you would like to tell us about your child's accident? If YES, please tell us below:

Thank you for taking the time to fill in this questionnaire. Please send it back in the FREEPOST envelope.

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Keeping Children Safe: Measuring the cost of children's accidents



These questions ask about how much your child's accident cost you, your family and the NHS in the 6 MONTHS after the accident and whether your child is getting better.

Part 1. Visits to your GP for your child's accident

1.1 **In the 6 MONTHS after the accident, how many times has your child visited any of these health professionals at your GP's surgery because of their accident?** *(please put '0' if none)*

	Number of visits
GP	.....
Practice nurse	.....
Other (please say who) _____	.....

Part 2. Visits to other health professionals for your child's accident

2.1 **In the 6 MONTHS after the accident, how many times has your child visited, or been visited at home by, one of these health professionals because of their accident?** *(please put '0' if none)*

	Number of visits	Treatment site (e.g. home, clinic, name of hospital	Did you pay for this visit?	
			Yes	No
Doctor / Consultant				
Health visitor				
Physiotherapist				
Nurse (Don't include GP visits here)				
Other (please say who)(Don't include visits to Practice Nurse here)				

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Part 3. Stays in hospital AND visits to the Day Case Unit for your child's accident

3.1 **In the 6 MONTHS after the accident, has your child had to stay in hospital overnight or visit a day case unit because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 4

	Admission Date	Discharge Date	Name of the hospital	Name of consultant *(if known)*	Name of ward *(if known)*
Stay 1					
Stay 2					
Stay 3					
Stay 4					
Stay 5					

Part 4. Medicine and medical supplies for your child's accident

4.1 **In the 6 MONTHS after the accident, has your child taken any PRESCRIBED medicines because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 4.2

Please list all medicines prescribed by a doctor or nurse because of your child's accident.

Name of medicine	**About HOW OFTEN and HOW LONG did your child take this medicine?**
e.g. Paracetamol, Calpol, Nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

4.2 **In the 6 MONTHS after the accident, has your child taken any medicines that were BOUGHT WITHOUT A PRESCRIPTION because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 4.3

Please list all the medicines bought without a prescription because of your child's accident.

Name of medication	**About HOW OFTEN and HOW LONG did your child take this medicine?**
e.g. Paracetamol, Calpol, Nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

4.3 **In the 6 MONTHS after the accident, have you GOT ANY AIDS OR MADE ANY CHANGES to help your child in the home or garden because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 5

Type of Aid/Changes made *(e.g. Wheel chair)*	**Cost of item (if known)**	**Who bought this or gave you this?** *(e.g. (yourself, family, NHS, social services, other)*
1.		
2.		
3.		
4.		
5.		

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Part 5. Childcare and other costs

5.1 **In the 6 MONTHS after the accident, when you took your child who had the accident to see a health professional, did you need to get someone to look after your other children and/or other people you care for? Please only include care they have provided because of the accident, not care they would normally provide.** (*please ✓ one box)*

☐ Yes ☐ No ☐ Not applicable

If YES,

a) Who looked after your children or the other people you care for? *(please ✓ all that apply)*

☐ Relative

☐ Friend

☐ Professional carer *(e.g. childminder)*

b) In total, how long did they look after your children and/or the other people you care for?
..... Days ..... Hours

5.2 **In the 6 MONTHS after the accident, has your child who had the accident needed extra care that you paid for because of their accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES,

How many days care did your child have? ..... Days

How many hours care per day? ..... Hours

Part 6. Work and your child's accident

The next questions ask about time off work or usual activities of the people (including yourself) who have cared for your child. Please only include care they have provided because of the accident, not care they would normally provide.

During the 6 MONTHS after the accident, please think about the 2 people who do most of the caring for your child. Call these people carer 1 and carer 2. One of these people may be you. Please fill in the box below:

The 2 people who care most for your child	**Carer 1**	**Carer 2**
What is the relationship of this person to your child?	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*
Total number of days taken off work or usual activities by this person to care for your child in the 6 MONTHS weeks after the accident. Only include care provided because of the accident. E.g. if you took 4 days off in week THREE and grandmother took 3 days off in week FOUR you would write "4" in the carer 1 box and "3" in the carer 2 box.	..... Days	..... Days
Did this person lose any money from work because they were caring for your child?	☐ Yes ☐ No	☐ Yes ☐ No
Sex of this person	☐ Male ☐ Female	☐ Male ☐ Female
Age of this person	☐ Less than 21yrs ☐ 22-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs	☐ Less than 21yrs ☐ 22-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs

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What best describes this person's usual activities? Please ✓ ONE BOX only	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)

Part 7. Travel

7.1 **In the 6 MONTHS after the accident, did you spend any money on travelling to the A&E department or Minor Injuries Unit or Walk-In Centre because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) .....

7.2 **In the 6 MONTHS after the accident, did you spend any money on travelling to the hospital (other than to the A&E department or Minor Injuries Unit or Walk-In Centre) because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

7.3 **In the 6 MONTHS after the accident, did you spend any money on travelling to the GP's surgery because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

7.4 **In the 6 MONTHS after the accident, did you spend any money travelling anywhere else because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please tell us where you travelled to and give details below.

Travelled to _____

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

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Part 8. Other accidents

Most children have accidents at some time. How well they get better may be affected by having other accidents afterwards. This is why we are asking you about any other accidents your child has had recently.

8.1 **Has your child visited the A&E department or Minor Injuries Unit or Walk-In Centre because of an accident in the 6 MONTHS after the accident?**

☐ Yes ☐ No

If **YES,** please tick why they went to A&E or Minor Injuries Unit or Walk-In Centre
(Please ✓ all that apply)

☐ A slip, trip, fall or tumble on stairs or steps

☐ A slip, trip, fall or tumble on the same level

☐ A slip, trip, fall or tumble from furniture

☐ Swallowing medicine or pills

☐ Swallowing cleaning products or garden chemicals

☐ A scald from hot water, other hot liquid or steam

☐ Other accident (*Please describe*).....

What sort of accident was it? *(Please ✓ all that apply)*

☐ Loss of consciousness

☐ Bang on the head

☐ Broken bone

☐ Burn or scald

☐ Swallowed household cleaner/other poison/pills

☐ Cut needing stitches

☐ Cut or graze

☐ Other accident

Part 9. General Health

How is your child's health TODAY? Please put an "X" on the line below to indicate how good or how bad your child's health is:

Worst possible health — Perfect health





Part 10. Quality of life (PedsQL™)

PLEASE COMPLETE PART 10 IF YOUR CHILD IS AGED 2 YEARS OR OVER

FOR CHILDREN AGED UNDER 2 YEARS – PLEASE GO TO PART 11

Directions

On the following page is a list of things that might be a problem for your child.
Please tell us how much of a problem each one has been for your child during the 6 MONTHS after the accident:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.

In the 6 MONTHS after the accident, how much of a problem has your child had with…

Physical Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

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Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4
Emotional Functioning (problems with…)	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

10.1 **Does your child attend school or day care?** *(please ✓ one box)*

☐ Yes ☐ No

If **YES** *Please complete the next 3 questions*
If **No** *Please go to Part 11*

In the 6 MONTHS after the accident, how much of a problem has your child had with…

School Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/day care because of not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the Doctor or hospital	0	1	2	3	4

Part 11. Your Child

11.1 **Do you think your child is now completely better and their accident is not affecting them anymore?** *(Please ✓ one box)*

☐ Yes ☐ No

Part 12. Any Other Comments

12.1 Please tell us the date you filled in this questionnaire: ...../...../.....

12.2 Are there any other costs that you have had to pay because of your child's accident and you have not been asked about them in this questionnaire? If YES, please tell us about them below:

12.3 Is there anything else you would like to tell us about your child's accident? If YES, please tell us below:

Thank you for taking the time to fill in this questionnaire. Please send it back in the FREEPOST envelope.

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Keeping Children Safe: Measuring the cost of children's accidents



These questions ask about how much your child's accident cost you, your family and the NHS in the 12 MONTHS after the accident and whether your child is getting better.

Part 1. Visits to your GP for your child's accident

1.1 **In the 12 MONTHS after the accident, how many times has your child visited any of these health professionals at your GP's surgery because of their accident?** *(please put '0' if none)*

	Number of visits
GP	.....
Practice nurse	.....
Other (please say who) _____	.....

Part 2. Visits to other health professionals for your child's accident

2.1 **In the 12 MONTHS after the accident, how many times has your child visited, or been visited at home by, one of these health professionals because of their accident?** *(please put '0' if none)*

	Number of visits	Treatment site (e.g. home, clinic, name of hospital	Did you pay for this visit?	
			Yes	No
Doctor / Consultant				
Health visitor				
Physiotherapist				
Nurse (Don't include GP visits here)				
Other (please say who)(Don't include visits to Practice Nurse here)				

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Part 3. Stays in hospital AND visits to the Day Case Unit for your child's accident

3.1 **In the 12 MONTHS after the accident, has your child had to stay in hospital overnight or visit a day case unit because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 4

	Admission Date	Discharge Date	Name of the hospital	Name of consultant *(if known)*	Name of ward *(if known)*
Stay 1					
Stay 2					
Stay 3					
Stay 4					
Stay 5					

Part 4. Medicine and medical supplies for your child's accident

4.1 **In the 12 MONTHS after the accident, has your child taken any PRESCRIBED medicines because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 4.2

Please list all medicines prescribed by a doctor or nurse because of your child's accident.

Name of medicine	**About HOW OFTEN and HOW LONG did your child take this medicine?**
e.g. Paracetamol, Calpol, Nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

4.2 **In the 12 MONTHS after the accident, has your child taken any medicines that were BOUGHT WITHOUT A PRESCRIPTION because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No - please go to Section 4.3

Please list all the medicines bought without a prescription because of your child's accident.

Name of medication	**About HOW OFTEN and HOW LONG did your child take this medicine?**
e.g. Paracetamol, Calpol, Nurofen	e.g. four times a day for 2 weeks
1.	
2.	
3.	
4.	
5.	

4.3 **In the 12 MONTHS after the accident, have you GOT ANY AIDS OR MADE ANY CHANGES to help your child in the home or garden because of their accident?** *(please ✓ one box)*

☐ Yes – please fill in the table below

☐ No – please go to Section 5

Type of Aid/Changes made *(e.g. Wheel chair)*	**Cost of item (if known)**	**Who bought this or gave you this?** *(e.g. (yourself, family, NHS, social services, other)*
1.		
2.		
3.		
4.		
5.		

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Part 5. Childcare and other costs

5.1 **In the 12 MONTHS after the accident, when you took your child who had the accident to see a health professional, did you need to get someone to look after your other children and/or other people you care for? Please only include care they have provided because of the accident, not care they would normally provide.** (*please ✓ one box)*

☐ Yes ☐ No ☐ Not applicable

If YES,

a) Who looked after your children or the other people you care for? *(please ✓ all that apply)*

☐ Relative

☐ Friend

☐ Professional carer *(e.g. childminder)*

b) In total, how long did they look after your children and/or the other people you care for?
..... Days ..... Hours

5.2 **In the 12 MONTHS after the accident, has your child who had the accident needed extra care that you paid for because of their accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES,

How many days care did your child have? ..... Days

How many hours care per day? ..... Hours

Part 6. Work and your child's accident

The next questions ask about time off work or usual activities of the people (including yourself) who have cared for your child. Please only include care they have provided because of the accident, not care they would normally provide.

During the 12 MONTHS after the accident, please think about the 2 people who do most of the caring for your child. Call these people carer 1 and carer 2. One of these people may be you. Please fill in the box below:

The 2 people who care most for your child	**Carer 1**	**Carer 2**
What is the relationship of this person to your child?	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*	☐ Parent ☐ Relative (not parent) ☐ Friend ☐ Other *(please describe)*
Total number of days taken off work or usual activities by this person to care for your child in the **12 MONTHS** weeks after the accident. Only include care provided because of the accident. E.g. if you took 4 days off in week THREE and grandmother took 3 days off in week FOUR you would write "4" in the carer 1 box and "3" in the carer 2 box.	..... Days	..... Days
Did this person lose any money from work because they were caring for your child?	☐ Yes ☐ No	☐ Yes ☐ No
Sex of this person	☐ Male ☐ Female	☐ Male ☐ Female
Age of this person	☐ Less than 21yrs ☐ 22-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs	☐ Less than 21yrs ☐ 22-29yrs ☐ 30-39yrs ☐ 40-49yrs ☐ 50-59yrs ☐ 60+yrs

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What best describes this person's usual activities? Please ✓ ONE BOX only	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)	☐ Works full-time ☐ Works part-time ☐ Unemployed ☐ Retired ☐ Student ☐ Housewife/husband ☐ Other (please describe)

Part 7. Travel

7.1 **In the 12 MONTHS after the accident, did you spend any money on travelling to the A&E department or Minor Injuries Unit or Walk-In Centre because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) .....

7.2 **In the 12 MONTHS after the accident, did you spend any money on travelling to the hospital (other than to the A&E department or Minor Injuries Unit or Walk-In Centre) because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

7.3 **In the 12 MONTHS after the accident, did you spend any money on travelling to the GP's surgery because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please give details below.

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

7.4 **In the 12 MONTHS after the accident, did you spend any money travelling anywhere else because of your child's accident?** *(please ✓ one box)*

☐ Yes ☐ No

If YES, please tell us where you travelled to and give details below.

Travelled to _____

USED PRIVATE CAR

☐ Yes Number of miles for round trip ..... miles Cost of Parking .....

USED PUBLIC TRANSPORT/TAXI

☐ Yes Return fare (£) **.....**

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Part 8. Other accidents

Most children have accidents at some time. How well they get better may be affected by having other accidents afterwards. This is why we are asking you about any other accidents your child has had recently.

8.1 **Has your child visited the A&E department or Minor Injuries Unit or Walk-In Centre because of an accident in the 12 MONTHS after the accident?**

☐ Yes ☐ No

If **YES,** please tick why they went to A&E or Minor Injuries Unit or Walk-In Centre
(Please ✓ all that apply)

☐ A slip, trip, fall or tumble on stairs or steps

☐ A slip, trip, fall or tumble on the same level

☐ A slip, trip, fall or tumble from furniture

☐ Swallowing medicine or pills

☐ Swallowing cleaning products or garden chemicals

☐ A scald from hot water, other hot liquid or steam

☐ Other accident (*Please describe*).....

What sort of accident was it? *(Please ✓ all that apply)*

☐ Loss of consciousness

☐ Bang on the head

☐ Broken bone

☐ Burn or scald

☐ Swallowed household cleaner/other poison/pills

☐ Cut needing stitches

☐ Cut or graze

☐ Other accident

Part 9. General Health

How is your child's health TODAY? Please put an "X" on the line below to indicate how good or how bad your child's health is:

Worst possible health — Perfect health





Part 10. Quality of life (PedsQL™)

PLEASE COMPLETE PART 10 IF YOUR CHILD IS AGED 2 YEARS OR OVER

FOR CHILDREN AGED UNDER 2 YEARS – PLEASE GO TO PART 11

Directions

On the following page is a list of things that might be a problem for your child.
Please tell us how much of a problem each one has been for your child during the **12 MONTHS** after the accident:

0 if it is **never** a problem
1 if it is **almost never** a problem
2 if it is **sometimes** a problem
3 if it is **often** a problem
4 if it is **almost always** a problem

There are no right or wrong answers.

In the 12 MONTHS after the accident, how much of a problem has your child had with…

Physical Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Walking	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in active play or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Bathing	0	1	2	3	4
6. Helping to pick up his or her toys	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

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Social Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Playing with other children	0	1	2	3	4
2. Other kids not wanting to play with him or her	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4
Emotional Functioning (problems with…)	**Never**	**Almost Never**	**Some-times**	**Often**	**Almost Always**
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying	0	1	2	3	4

10.1 **Does your child attend school or day care?** *(please ✓ one box)*

☐ Yes ☐ No

If **YES** *Please complete the next 3 questions*
If **No** *Please go to Part 11*

In the 12 MONTHS after the accident, how much of a problem has your child had with…

School Functioning (problems with…)	Never	Almost Never	Some-times	Often	Almost Always
1. Doing the same school activities as peers	0	1	2	3	4
2. Missing school/day care because of not feeling well	0	1	2	3	4
3. Missing school/daycare to go to the Doctor or hospital	0	1	2	3	4

Part 11. Your Child

11.1 **Do you think your child is now completely better and their accident is not affecting them anymore?** *(Please ✓ one box)*

☐ Yes ☐ No

Part 12. Any Other Comments

12.1 Please tell us the date you filled in this questionnaire: ...../...../.....

12.2 Are there any other costs that you have had to pay because of your child's accident and you have not been asked about them in this questionnaire? If YES, please tell us about them below:

12.3 Is there anything else you would like to tell us about your child's accident? If YES, please tell us below:

Thank you for taking the time to fill in this questionnaire. Please send it back in the FREEPOST envelope.

Study C Resource 12 MONTHS questionnaire v3 10 02 11

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Study C Resource 12 MONTHS questionnaire v3 10 02 11

Mini questionnaire

☐☐ ☐☐☐☐☐ ☐☐ ☐

Keeping Children Safe: Measuring the cost of children's accidents



These questions ask about how your child is after their accident on …./…./….

1. Do you think your child is now completely better and their accident is not affecting them anymore? *(Please ✓ one box)*

☐ Yes (please go to question 2) ☐ No (please go to question 3)

2. If your child is completely better, how long did it take for your child to stop being affected by the accident? *(Please ✓ one box)*

☐ less than 1 month after the accident

☐ 1 to 3 months after the accident

☐ 4 to 6 months after the accident

☐ 7 to 12 months after the accident

☐ more than 12 months after the accident

3. If your child is still affected by the accident, would you be willing to fill in a postal questionnaire about how it is affecting your child? *(Please ✓ one box)*

☐ Yes ☐ No

4. Please tell us the date you filled in this questionnaire: ……./……./…….

5. Is there anything else you would like to tell us about your child's accident? If YES, please tell us below:

Thank you for taking the time to fill in this questionnaire. Please send it back in the FREEPOST envelope

Study C Mini-Questionnaire v1: 24 01 11

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Unit cost tables

TABLE 145 Unit costs (£) of emergency medicine treatments and investigations in the ED, MIU and walk-in centre: national average unit costs (IQR)[31]

HRG code	Description[a,b]	ED: not leading to admitted	ED: leading to admitted[c]	MIU: not leading to admitted	MIU: leading to admitted[c]	Walk-in centre: not leading to admitted	Walk-in centre: leading to admitted[c]
VB01Z	Emergency Medicine, Any Investigation with Category 5 Treatment	264 (132–319)	359 (241–502)	63 (29–29)	175 (113–130)	58 (58–58)	
VB02Z	Emergency Medicine, Category 3 Investigation with Category 4 Treatment	257 (173–328)	319 (267–375)	167 (57–248)	123 (105–107)	49 (49–49)	
VB03Z	Emergency Medicine, Category 3 Investigation with Category 1–3 Treatment	220 (184–245)	245 (185–276)	149 (67–177)	111 (78–123)	85 (45–74)	
VB04Z	Emergency Medicine, Category 2 Investigation with Category 4 Treatment	191 (147–203)	210 (181–227)	86 (55–94)	136 (77–151)	66 (45–58)	
VB05Z	Emergency Medicine, Category 2 Investigation with Category 3 Treatment	164 (140–187)	183 (157–206)	88 (44–128)	103 (71–90)	63 (45–48)	
VB06Z	Emergency Medicine, Category 1 Investigation with Category 3–4 Treatment	114 (95–131)	137 (114–149)	84 (57–106)	69 (43–107)	40 (39–39)	36 (36–36)
VB07Z	Emergency Medicine, Category 2 Investigation with Category 2 Treatment	143 (123–157)	162 (139–179)	76 (50–96)	83 (55–92)	40 (39–39)	
VB08Z	Emergency Medicine, Category 2 Investigation with Category 1 Treatment	131 (113–146)	155 (130–175)	94 (56–130)	106 (50–139)	58 (51–51)	
VB09Z	Emergency Medicine, Category 1 Investigation with Category 1–2 Treatment	91 (78–103)	114 (101–119)	58 (42–63)	46 (36–42)	58 (46–79)	35 (35–35)
VB10Z	Emergency Medicine, Dental Care	68 (78–103)	152 (151–157)	95 (26–126)	89 (47–110)	43 (24–62)	

TABLE 145 Unit costs (£) of emergency medicine treatments and investigations in the ED, MIU and walk-in centre: national average unit costs (IQR)[31] (*continued*)

HRG code	Description[a,b]	ED: not leading to admitted	ED: leading to admitted[c]	MIU: not leading to admitted	MIU: leading to admitted[c]	Walk-in centre: not leading to admitted	Walk-in centre: leading to admitted[c]
VB11Z	Emergency Medicine, No Investigation with No Significant Treatment	71 (59–82)	94 (151–98)	51 (43–58)	49 (21–92)	38 (32–41)	42 (38–42)

HRG, Healthcare Resource Group.
a Examples of investigations: category 1 = urine test; category 2 = blood test, radiography; category 3 = scan.
b Examples of treatments: category 1 = observation, advice, cream to put on the skin, medicine to take home, bandage, sling or support; category 2 = medicine given by mouth, dressing for wound or burn, paper stitches or wound glue, splint, cast to hold broken or fractured bone in place, physiotherapy, stomach washout, local anaesthetic, tetanus injection, drip; category 3 = medicine given by injection, stitches, oxygen through mask or tube to help breathing; category 4 = manipulation of broken or fractured bone or dislocated joint, general anaesthetic, blood transfusion, chest drain, tube in throat for child who cannot breathe for him- or herself; category 5 = resuscitation.
c 'Admitted' includes children observed in the ED or on the ward or who stayed in hospital overnight.
Reproduced with permission from Cooper NJ, Kendrick D, Timblin C, Hayes M, Majsak-Newman G, Meteyard K, Hawkins A, Kay B. The short-term cost of falls, poisonings and scalds occurring at home in children under 5 years old in England: multicentre longitudinal study. *Injury Prevention* 2016; [published online first 29 January 2016] http://dx.doi.org/10.1136/injuryprev-2015-041808.200 Copyright © 2015 by the BMJ Publishing Group Ltd. All rights reserved.

TABLE 146 Unit costs (£) of health-care and non-health-care resources

Resource	Unit cost (IQR) (£)	Source
Health-care resources		
Long inpatient stay ≥ 2 days (average cost per episode)	2461.00 (1771–2865)	Curtis[30]
Short inpatient stay 0–1 day (average cost per episode)	586.00 (386–688)	Curtis[30]
Day case	680.00 (460–837)	Curtis[30]
GP visit (average length of visit 11.7 minutes)	36.00	Curtis[30]
GP-based nurse visit (average length of visit 15.5 minutes)	11.63	Curtis[30]
Health visitor – home visit (average length of visit 20 minutes[a])	21.00	Curtis[30]
Health visitor – telephone (average length of call 7.1 minutes[b])	5.08	Curtis[30]
Consultant outpatient visit	139.00	Curtis[30]
Hospital-based nurse visit	22.00	Curtis[30]
Physiotherapist	17.00	Curtis[30]
Subsequent visit to ED	155.87	Department of Health[31]
Prescribed medication		
Fucidin cream	3.64	BNF[499]
Paracetamol	0.72	
Ibuprofen	1.51	
Eye drops	1.75	
Penicillin	1.90	
Flucloxacillin	13.12	
Yellow paraffin cream	3.28	
Aqueous cream	1.72	

continued

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TABLE 146 Unit costs (£) of health-care and non-health-care resources (*continued*)

Resource	Unit cost (IQR) (£)	Source
Oilatum	4.65	
Hydrocortisone	1.71	
Siligel	19.00	
Pressure garment	2.86	
Silicon patch	7.50	
Non-health-care resources		
Over-the-counter medication		
Paracetamol	4.89	Chemist Direct [www.chemistdirect.co.uk/ (accessed 2 November 2016)]
Ibuprofen	3.99	
Sensodyne toothpaste	3.89	
Sudocrem	3.49	
Bio-Oil	20.37	
Professional child care (per hour)	4.05	Family and Childcare Trust[500]
Time off paid work (per day)		
16–17 years	32.00	Office for National Statistics[501]
18–21 years	55.90	
22–29 years	82.40	
30–39 years	111.40	
40–49 years	114.50	
50–59 years	107.20	
60+ years	95.60	
Time off other activities, i.e. non-work (per day)	45.70	Department for Transport[493]
Travel (per km assuming average speed of 56 km/h)	0.11	Department for Transport[493]

BNF, *British National Formulary*.
a Conservative assumption.
b Based on average length of GP's telephone call.
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Medical record data extraction form

Unique identity code:

Q1.1 Was child admitted to hospital for their original injury?

Q1.2 Number of nights?

Q1.3 Tests carried out in ED/ward.

- Blood tests.
- Urine tests.
- Radiography.
- Scan (computerised tomography, ultrasound, magnetic resonance imaging).
- Other.

Q1.4 Treatments carried out in ED/ward

- Observations.
- Advice.
- Medications by mouth.
- Medications by injection.
- Cream on skin.
- Medications to take home.
- Dressing to wound/burn.
- Stitches.
- Wound closure strips or glue.
- Bandage/sling/support.
- Splint.
- Manipulation of fractured bone.
- Dislocated joint.
- Operation to fix fracture.
- Cast/plaster of Paris.
- Physiotherapy.
- Stomach washout.
- General anaesthetic.
- Local anaesthetic.
- Tetanus injection.
- Drip.
- Blood transfusion.
- Chest drain.
- Oxygen therapy.
- Intubation.
- Resuscitation.
- Other.

Q1.5 Admissions since accident.

- Number of overnight admissions.
- Number of day-case admissions.

Q1.6 Other health professional contacts.

- Doctor/consultant outpatients.
- Nurse-led clinic.
- Physiotherapist.
- Other.

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Appendix 3 The 2010 and 2012 questionnaires for study D

The 2010 questionnaire for study D

NHS keeping Children SAFE AT HOME capt child accident prevention trust The University of Nottingham

NATIONAL CHILDREN'S CENTRE SURVEY

1. Your Children's Centre

Please would you tell us the following:

1.1 Name of Children's Centre.....

1.2 Lead Agency for Children's Centre.....

1.3 When was your Centre established? *Please tick 1 box*

2004-06 (Phase 1) ☐ 2006-08 (Phase 2) ☐ 2008-10 (Phase 3) ☐

1.4 Your job title? .....

1.5 Your employer? .....

1.6 What professional group are you from?

Administration ☐ Health Promotion ☐ Nursing ☐ Social care services ☐ Other ☐

Other - *Please specify*.....

1.7 What do you consider to be the **3 main** priority areas for children's Health for your Centre?

I.....

II.....

III.....

1.8 If *Accident Prevention is not included in your top three, please add a comment about how important accident prevention is in relation to your priorities:*

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2. Key documents

2.1 Has Child Accident Prevention been included in:

	Yes	No	Don't know
• Local Area Agreement	☐	☐	☐
• Children and Young People's Plan	☐	☐	☐

2.2 Do the following have a written **child accident prevention strategy?**
(or a broader strategy of which child accident prevention is a part?)

	Yes	No	Don't know
• Your Children's Centre	☐	☐	☐
• Your PCT or Local Authority	☐	☐	☐

2.3 Since your Children's Centre was established do you recall receiving any:
policy documents/guidance/training relating to accident prevention? Yes ☐ No ☐

If YES, please list the documents/training below:

.....

.....

3. Activities

Please answer the following questions by ticking the relevant box:

Activities: *(Please tick 1 box per row)*	**Yes**	**No**	**Don't know**
The Children's Centre is involved in accident prevention			
Posters on child safety have been displayed in the Centre			
The Centre takes part in Child Safety Week			
The Centre has had media coverage about accident prevention			
First aid kits are given to parents			
Staff lobby or campaign on local safety issue(s)			
The Centre has collected data on children's accidents			
Outside speakers are invited in to talk to parents on accident prevention			

If outside speakers talk about accident prevention what topics do they cover?

.....

.....

4. Home safety equipment scheme

4.1 Is there a home safety equipment scheme in your area?

Yes ☐ No ☐ Don't Know ☐

*If **No** go to section 5 below.*

4.2 If yes, please name the Lead Agency for the scheme.....

4.3 If yes, approximately how many years has it been in operation.....

4.4 If yes, is the scheme run from your Children's Centre.....

4.5 *Please describe the scheme in your area by ticking 1 box per line*

*Equipment is: Free ☐ Low cost ☐ On loan ☐ Don't Know ☐

*Equipment is delivered to homes? Yes ☐ No ☐ Don't Know ☐

*Equipment is fitted in homes? Yes ☐ No ☐ Don't Know ☐

4.6 What items of equipment are covered by the scheme?

Please list all

1..... 5.....
2..... 6.....
3..... 7.....
4..... 8.....

4.7 Is your Local Scheme part of the "Safe at Home – The National Home Safety Equipment Scheme". (run by RoSPA)?

Yes ☐ No ☐ Don't Know ☐

5. Fire and scalds

5.1 Does your Children's Centre provide advice and/or leaflets on any of the following topics?

(Please tick at least 1 box per row)	No Advice	One to one advice	Advice in groups	Leaflets	Don't Know
General fire prevention					
Handling hot drinks					
Using cigarettes, lighters and matches					
Bonfire and firework safety					
Barbecue safety					
Cooking safety					
Using candles safely					
Electrical safety					
Handling hot irons safely					
How to make a fire escape plan					
Smoking cessation					

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5.2 Does your Children's Centre staff carry out any of these activities?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
Fire home safety risk assessments			
Provide smoke alarms			
Fit smoke alarms			
Exchange chip pans for deep fat fryers			
Provide fire guards			
Provide cooker guards			
Provide fire extinguishers/fire blankets			
Provide electric blanket checking/exchange service			

5.3 Does your Children's Centre staff refer families to other agencies?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
To ***Fire and Rescue Service (FRS)*** for fire home safety risk assesments			
To ***FRS*** for smoke alarms			
To ***FRS*** for exchange of chip pans for deep fat fryers			
To ***FRS*** for fire extinguishers/fire blankets			
To ***FRS*** for electric blanket checking/exchange service			
To ***Safety Equipment Scheme*** for smoke alarms			
To ***Safety Equipment Scheme*** for fire guards			
To ***Safety Equipment Scheme*** for cooker guards			
To ***Safety Equipment Scheme*** for fire blankets/ extinguishers			
To ***an agency*** for devices to control water temperature			
To ***NHS smoking cessation services***			
"Other"			

Please specify **"Other"**.....

6. Joint working

6.1 Is there an organised group/alliance specifically for child accident prevention in your area? Yes ☐ No ☐ Don't Know ☐

6.2 If YES, *please list* the name of this group/alliance and any others that specifically deal with accident prevention.

.....
.....

6.3 Is your Children's Centre working with any of the following organisations on child accident prevention?

- Accident & Emergency Dept. ☐
- Community Nursing Services e.g. Health Visitors, School Nurses ☐
- Fire and Rescue Service ☐
- Local Authorities ☐
- Road Safety ☐
- Voluntary organisations ☐
- Others ☐

Please specify "Others".....
.....

7. Your views

7.1 How effective do you think the following are in preventing injuries to children (aged under 5)?

Activity *(Please tick 1 box per row)*	**Very effective**	**Effective**	**Not very effective**	**Ineffective**	**Not sure**
One to one home safety advice from Centre staff					
Group home safety advice from Centre staff					
Providing leaflets (without additional advice)					
Media campaigns on home safety					
Providing home safety equipment					

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7.2 Which single type of home accident, do you think, causes the most **deaths** in children (under 5)?

.....

7.3 Which single type of home accident, do you think, causes the most **injuries** in children (under 5)?

.....

7.4 Please indicate your personal views on each statement: -

Statement *(Please tick at least 1 box per row)*	**Strongly agree**	**Agree**	**Disagree**	**Strongly disagree**	**Not sure**
Accident prevention is predominantly the responsibility of the parent/carer					
Most child accidents are preventable					
Children's Centres can be effective in preventing accidents					
Other agencies have a greater responsibility for Accident prevention than Children's Centres					
National and regional agencies are better placed than local ones to educate the public about preventing accidents					
Children's Centres should be involved in lobbying or campaigning on local safety issues					
It is important for our Centre to collect data on accidents					

7.5 What do you see as the main barriers / enabling factors **to accident prevention work** for your Centre?
(*Please give a brief description.*)

BARRIERS **ENABLING FACTORS**

8. Materials, resources and staffing

8.1 Have you or your colleagues in your Centre produced material about accident prevention that would be of use to others?

(*e.g. resources/evaluations/reports/articles…*) Yes ☐ No ☐ Don't know ☐

8.2 If YES, *please tell us about them –titles, topics, for whom, etc.*

8.3 What are your views on the level of resources for accident prevention in your area? (e.g. Financial / human / material)

---

9. Support

In the future we are planning to support Children's Centres with their Child Accident Prevention work. Which of the following would be helpful to your Centre:
(please tick one box per row)

	Yes	No	Don't Know
Training	☐	☐	☐
Examples of Good Practice	☐	☐	☐
Planning accident prevention	☐	☐	☐
Help with evaluation	☐	☐	☐
Provision of educational materials	☐	☐	☐
Working with communities	☐	☐	☐
Working with partners	☐	☐	☐
Other	☐	☐	☐

Please specify "Others"……

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Additional comments

If you have any additional comments about accident prevention that you would like to make, please use the space below:

*Thank you for completing this questionnaire.

*If you would like me to send you a summary of the results of this survey, *please tick*..... ☐

Your name..... Your email.....
(please print)

***Please return this completed questionnaire in the FREEPOST envelope to:**

Clare Bryan, Research Secretary,
NHS Nottinghamshire County,
Birch House, Southwell Road West,
Mansfield, NG21 0HJ.

The 2012 questionnaire for study D

Michael.Watson@nottingham.ac.uk

Dear Children's Centre Manager,

National Accident Prevention Survey

We are carrying out research into accident prevention for children under 5, and as part of this work we are contacting Children's Centres in England. This research will:

1. investigate how Children's Centres across the country are involved in accident prevention,
2. find out what help Children's Centres need for their accident prevention work, and
3. help us to produce a range of support materials for Children's Centres.

We would be very grateful if you would help with our research by completing the attached short questionnaire. The questionnaire **only takes a short time to complete** and the replies of individual Children's Centres will be treated confidentially. Your answers are very important to us and will help us to produce relevant support materials.

If we do not hear from you in the next few weeks we may send you another reminder. If you do not wish to take part in this study please simply draw a line on the front cover of the questionnaire (to indicate that you do not want to take part) and return the questionnaire in the freepost envelope supplied.

Yours sincerely,

[redacted]

Dr Michael Watson (University of Nottingham)

[redacted]

Dr Mike Hayes (CAPT)

Enclosures: FREEPOST reply envelope.

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NATIONAL CHILDREN'S CENTRE SURVEY

1. Your children's centre

Please would you tell us the following:

1.1 Name of children's centre.....

1.2 Lead agency for children's centre.....

1.3 When was your centre established? *Please tick 1 box*

2004-06 (Phase 1) ☐
2006-08 (Phase 2) ☐
2008-10 (Phase 3) ☐

1.4 Your job title? .....

1.5 What professional group are you from?

Administration ☐ Education ☐ Health Promotion ☐
Social care services ☐ Nursing/health visiting ☐ Other ☐

Other - *Please specify*.....

1.6 What do you consider to be the **3 main** priority areas for children's health for your centre?

I. .....

II. .....

III. .....

1.7 If accident prevention is not included in your top three, *please add a comment about how important accident prevention is in relation to your priorities:*

.....

.....

.....

2. Activities

Please answer the following by ticking one box in each row:

Activities:	Yes	No	Don't know
The children's centre is involved in accident prevention	☐	☐	☐
Posters on child safety have been displayed in the centre	☐	☐	☐
The centre takes part in Child Safety Week	☐	☐	☐
The centre has had media coverage about accident prevention	☐	☐	☐
The centre does home safety checks	☐	☐	☐
Centre staff lobby or campaign on local safety issue(s)	☐	☐	☐
The centre has collected data on children's accidents in the local area	☐	☐	☐
Outside speakers are invited in to talk to parents on accident prevention	☐	☐	☐
The centre teaches parents first aid	☐	☐	☐

3. Preventing falls

Does your children's centre provide advice and/or leaflets on any of the following topics?

(Please tick at least 1 box in each row)	No advice	One to one advice	Advice in groups	Leaflets	Don't know
General falls prevention	☐	☐	☐	☐	☐
Baby walker safety	☐	☐	☐	☐	☐
Climbing hazards	☐	☐	☐	☐	☐
High chair and push chair safety	☐	☐	☐	☐	☐
Non-slip bath mats	☐	☐	☐	☐	☐
Not leaving children on high surfaces	☐	☐	☐	☐	☐
Stair safety	☐	☐	☐	☐	☐
Tripping hazards	☐	☐	☐	☐	☐
Window locks	☐	☐	☐	☐	☐
What to do if a child has a head injury	☐	☐	☐	☐	☐

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4. Scalds

Does your children's centre provide advice and/or leaflets on any of the following topics?

(Please tick at least 1 box in each row)	No advice	One to one advice	Advice in groups	Leaflets	Don't know
General scald prevention	☐	☐	☐	☐	☐
Bathroom scald prevention	☐	☐	☐	☐	☐
Cooking safety (cookers/microwaves)	☐	☐	☐	☐	☐
Handling hot drinks	☐	☐	☐	☐	☐
Kettle safety	☐	☐	☐	☐	☐
Thermostatic mixing valves (TMVs)	☐	☐	☐	☐	☐

5. Preventing poisoning

Does your children's centre provide advice and/or leaflets on any of the following topics?

(Please tick at least 1 box in each row)	No advice	One to one advice	Advice in groups	Leaflets	Don't know
General poisoning prevention	☐	☐	☐	☐	☐
Child-resistant containers	☐	☐	☐	☐	☐
Disposal of unwanted medicines	☐	☐	☐	☐	☐
Poisonous plants	☐	☐	☐	☐	☐
Safe storage of hazardous substances (e.g medicines, household chemicals)	☐	☐	☐	☐	☐

6. Home safety equipment

6.1 Is there a home safety equipment scheme in your area operated by your children's centre or other agencies?

Yes ☐ No ☐ Don't know ☐

If No or Don't know *go to section 7 below.*

6.2 Please name the lead agency for the scheme.....

6.3 Approximately how many years the scheme been in operation? .....

6.4 *Please describe the scheme in your area by ticking 1 box per row*

- Equipment is: Free ☐ At low cost ☐ On loan ☐ Don't know ☐
- Equipment is delivered to homes? Yes ☐ No ☐ Don't know ☐
- Equipment is fitted in homes? Yes ☐ No ☐ Don't know ☐

6.5 Is the scheme organised from your children's centre? Yes ☐ No ☐

If No, *go to section 7 below.*

6.6 Does your centre provide any of the following:

(Please tick 1 box in each row)	**Yes**	**No**	**Don't know**
Corner covers	☐	☐	☐
Devices to measure bath water temperature	☐	☐	☐
First aid kits	☐	☐	☐
Fridge locks	☐	☐	☐
Lockable medicine cabinets	☐	☐	☐
Safety catches for cupboards and drawers	☐	☐	☐
Safety gates	☐	☐	☐
Thermostatic mixing valves (TMVs)	☐	☐	☐
Window locks	☐	☐	☐

7. Joint working

7.1 Is there an organised group/alliance for child accident prevention in your area?

Yes ☐ No ☐ Don't know ☐

7.2 If YES, *please state* the name of this group/alliance

.....

7.3 Does your children's centre refer families to other agencies?

(Please tick 1 box in each row)	**Yes**	**No**	**Don't know**
To ***safety equipment scheme*** (e.g. for safety catches, safety gates)	☐	☐	☐
To ***pharmacists*** for the safe disposal of unwanted medicines	☐	☐	☐
To an ***oganisation*** for thermostatic mixing valves (TMVs)	☐	☐	☐
To an ***oganisation*** for home safety checks	☐	☐	☐

7.4 If you have answered YES for TMVs or home safety checks, please state **which organisations**:

TMVs .....

Home safety checks .....

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8. Strategy

Do the following have a written **child accident prevention strategy?**
(or a broader strategy of which child accident prevention is a part?)

	Yes	No	Don't know
• Your children's centre	☐	☐	☐
• Your PCT	☐	☐	☐
• Local authority	☐	☐	☐

9 Your views

9.1 Which single type of home accident, do you think, causes the most **deaths** in children under 5? .....

9.2 Which single type of home accident, do you think, causes the most **injuries** in children under 5? .....

9.3 Please indicate your personal views on each statement: -

Statement *(Please tick 1 box in each row)*	**Strongly agree**	**Agree**	**Disagree**	**Strongly disagree**	**Not sure**
Accident prevention is predominantly the responsibility of the parent/carer	☐	☐	☐	☐	☐
Most child accidents are preventable	☐	☐	☐	☐	☐
Children's centres can be effective in preventing accidents	☐	☐	☐	☐	☐
Other agencies have a greater responsibility for accident prevention than children's centres	☐	☐	☐	☐	☐

9.4 What do you see as the main barriers/enabling factors **to accident prevention work** for your centre?

(*Please give a brief description.*)

Barriers | **Enabling factors**

10. Materials, resources and staffing

What are your views on the level of resources for accident prevention in your area?

(e.g. Financial/human/material)

Additional comments

If you have any additional comments about accident prevention that you would like to make, please use the space below:

*****Thank you for completing this questionnaire*****

If you would like me to send you a summary of the results of this survey, *please tick*.....☐

Your name ..... Your email.....
(please print)

Please return this completed questionnaire in the **FREEPOST** envelope to:

Clare Bryan, Research Secretary,
Keeping Children Safe At Home,
Nottinghamshire Healthcare NHS Trust,
Institute of Mental Health,
2nd Floor, Duncan Macmillan House,
Porchester Road,
Mapperley
Nottingham
NG3 6AA

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Appendix 4 Search strategy for study E and interview guides for studies F and G

Search strategy for identification of qualitative studies for the systematic review of barriers to, and facilitators of, injury prevention (study E)

The following search strategy was used to search MEDLINE. The search strategy was adapted as necessary for other databases.

1. comparative stud$.mp.
2. intervention stud$.mp.
3. evaluation stud$.mp.
4. feasibility.mp
5. qualitative.mp
6. 1 or 2 or 3 or 4 or 5
7. human.sh.
8. exp CHILD/
9. exp INFANT/
10. MINORS/
11. (child$ or infan$ or young$ or minor$ or toddl$ or bab$).mp.
12. 6 or 7 or 8 or 9 or 10 or 11
13. "EARLY INTERVENTION (EDUCATION)"/
14. exp EDUCATION/
15. exp PATIENT EDUCATION/ or exp HEALTH EDUCATION/ or exp EDUCATION/
16. exp Public Health/ed
17. exp PARENTING/
18. exp COUNSELING/
19. training.mp.
20. (educat$ or train$ or teach$ or parent$ or counsel$).mp. [mp=title, original title,
21. abstract, name of substance, mesh subject heading]
22. 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20
23. exp Accident Prevention/
24. SAFETY/
25. exp Safety Management/
26. safety practice$.mp.
27. exp Drug storage/
28. Hazardous Substances/ae, po [Adverse Effects, Poisoning]
29. 22 or 23 or 24 or 25 or 26 or 27
30. safety equipment.mp. or Equipment Safety/
31. exp Infant Equipment/
32. protective devices.mp. or exp Protective Devices/
33. (fire-guard$ or fireguard$).mp.
34. (stair$ adj3 gate$).mp.
35. (protect$ adj3 device$).mp.
36. (kettle$ adj3 (flex$ or cable$ or wire$)).mp.
37. (cook$ adj3 guard$).mp.
38. (smok$ adj3 alarm$ or smok$ adj3 detect$).mp.
39. 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37
40. 21 or 38

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41. exp ACCIDENTS/ or exp ACCIDENTS, HOME/
42. exp EYE BURNS/ or exp BURNS, CHEMICAL/ or exp BURNS, INHALATION/ or exp
43. BURNS/ or exp BURNS, ELECTRIC/
44. SMOKE INHALATION INJURY/ or SMOKE/
45. exp POISONING/
46. CARBON MONOXIDE POISONING/ or exp POISONING/
47. exp "Wounds and Injuries"/
48. (accident$ or burn$ or scald$ or asphyx$ or chok$ or cut$ or suffocat$ or poison$ or
49. fracture$ or wound$ or injur$).mp.
50. exp FRACTURES/
51. suffocation.mp. or Asphyxia/
52. exp IPECAC/
53. NEAR DROWNING/ or exp DROWNING/ or drowning.mp.
54. 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50
55. barrier$.mp
56. facilitator$.mp
57. lever$.mp
58. motivator$.mp
59. implementation.mp
60. (process adj3 measure$).mp
61. 52 or 53 or 54 or 55 or 56 or 57
62. (focus adj3 group$).mp
63. interview$.mp
64. 59 or 60
65. (6 and 7 and 11) and (20 or 28 or 39) and 51
66. 7 and 11 and (20 or 28 or 39) and 51
67. (6 and 7 and 11) and (20 or 28 or 39) and 51 and 61

Interview guide for interviews with children's centre managers and staff (study G)

To help us in the development of an injury prevention programme to be tested in Children's Centres, we would like to ask about your experiences related to the delivery of health promotion/healthy lifestyles programmes at Children's Centres, current child safety work and training/ and the way professionals at your Centre are helped to build their knowledge and skills to deliver programmes of work to parents (e.g. healthy eating, healthy routines, child development and behaviour, preventing accidents and injuries etc).

1. Health promotion programmes

- 1A. Can you tell me about any health promotion programmes for the parents of pre-school children that the Children's Centre was involved in over the last 12 months, that you feel were particularly successful?
- 1B. Why do you feel that these programmes were particularly successful, compared with other programmes?
- 1C. Can you tell me about any health promotion programmes for the parents of pre-school children that the Children's Centre was involved in over the last 12 months, that you feel were less successful than they could have been?
- 1D. Why do you feel that these programmes were less successful, compared with other programmes?.
- 1E. How do you feel that such barriers could be overcome?
- 1F. If you were going to design a new health promotion programme, in an ideal world, how would you go about it, what particular factors would you bear in mind?

2. Current child safety work

- 2A. Can you tell me about any local partnerships/ forums which address unintentional child injury? Is the Children's Centre represented on these?

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- 2B. Can you tell me about any organisations or agencies that the Children's Centre has worked with on child injury prevention over the last 12 months?

- 2C. Do you know whether any policies (local or national) inform the work of the Children's Centre on childhood injury prevention? How have these been used in practice? How could they be made more effective?

- 2D. How does the Children's Centre assess local needs and identify priorities in relation to child safety?

- 2E. Does the Children's Centre operate or participate in a home safety equipment scheme? How does this work – what role does the Centre and its staff play?

- 2F. Are there any local community groups with which the Children's Centre works in relation to child safety? Are there any local champions for child safety?

3. Training/ helping professionals build their knowledge and skills to deliver programmes of work

- 3A. Can you tell me about any staff training/ ways of building knowledge and skills to deliver programmes of work that the Children's Centre was involved in over the last 12 months that you feel were particularly successful?

- 3B. Why do you feel that these initiatives were particularly successful, compared with other training? What factors do you think helped to make them a success?

- 3C. Can you tell me about any staff training/ ways of building knowledge and skills to deliver programmes of work that the Children's Centre was involved in over the last 12 months that you feel were less successful?

- 3D. Why do you feel that these initiatives were less successful, compared with other training? What factors do you think helped to make them less successful?

- 3E. How do you feel that such barriers could be overcome?
- 3F. If you were going to design a new training/ ways of building knowledge and skills to deliver programmes of work related to injury prevention for staff, in an ideal world, how would you go about it, what particular factors would you bear in mind?

4. Other Information

- 4A. Is there anything else relevant to child injury prevention work at the Children's Centre that we have not asked you about that you think is important?
- 4B. Is there anything that you feel makes this Children's Centre more unusual?
- 4C. Are there any groups of parents with pre-school children that the Children's Centre finds particularly 'difficult to reach'? Why is this?
- 4D. Do you have any questions you would like to ask us about this study or the 'Keeping Children Safe' project?

5. Background Information about the Participant and Children's Centre

- 5A. How long have you worked at the Centre?
- 5B. What is your specific role in the Centre?
- 5C. Characteristics of the Children's Centre
    - how long has it been in operation?
    - does it have a primarily health focus or an education focus?
    - what is the size of the Children's Centre?
    - what is the catchment population for the Children's Centre?

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Interview guide for interviews with parents of injured children (study F)

You have filled in the questionnaire for us which gave us lots of information about what you do and think about to help keep your children safe. I'd like to talk to you in a bit more detail about this.

There are no right or wrong answers; we just want to find out what parents think help to keep children safe from accidents and what makes it hard to do this.

1. Can I just check I have got the right information about you from the questionnaire?

- 1A. There are x number of children living here and it was xx that had the accident?
- 1B. The accident happened --- give date, so that's xx long ago now?
- 1C. If it's Ok with you I would like to ask you a bit more about the accident, but first could we talk more generally about what you think about child safety?

2. Can you start by telling me what kind of things you do around the home to help keep your child/children safe from having accidents?

Prompt: Separate out answers for different children if more than one child in the family. Prompt parents with regard to different areas in the house that they don't mention e.g. kitchen, bathroom, stairs

3. What do you find are the main things that make it difficult to keep your children safe around the home?

4. How do you find out about child safety?

Prompts if necessary:

- Talk to other people? Who?
- Telly? Children's programmes?
- Leaflets, books etc? Where from?

5. From your experience what has been the most useful advice or information you have received and/or seen? Why?

6. In the questionnaire we asked about lots of different things that parents do to help keep their children safe at home. For you and xx, what is/are the most important thing/s?

Prompt: If parent can't think straight away prompt with what we asked about in questionnaire

- Safety equipment, such as stair gates or ways to store medicines
- Teaching children not to touch or other safety rules
- Things about your home/garden/where you live
- Things about your child - age/gender/personality
- Things about being able to keep an eye on your child
- Things about your life and how you feel

7. Can you tell me why this is more important?

Prompt: If parent can't think straight away prompt with what we asked about in questionnaire and mention other strategies parent did not

- Safety equipment, such as stair gates or ways to store medicines
- Teaching children not to touch or other safety rules
- Things about your home/garden/where you live
- Things about your child - age/gender/personality
- Things about being able to keep an eye on your child
- Things about your life and how you feel
- Draw out differences/similarities between siblings

8. Is there anything that makes it difficult for you to be able to keep xx safe in the way you think is most important?

9. Is it Ok if we talk a bit more about xx accident now? You said that xx had xx kind of accident – were you surprised that this happened?

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- 9A. Why is that?
- 9B. Had anything like this happened before?

Prompt: [If parent has not described] prompt for more detail about the accident

- eg if it was a slip trip or fall downstairs ask if it was all the way downstairs etc)
- What else was happening at the time, was something different to usual routine happening?
- What would have stopped it happening?
- How is xx doing now?
- And how about you?

- 9C. Have your thoughts about child safety changed since the accident? If yes, in what ways?

Prompt: if parent has not said they do things differently prompt with, do you do anything different now since the accident?

10. Do you think what you do to keep xx safe is similar to other parents with children the same age? In what kind of ways is it the same or different?

11. [For parents that have other children]

- 11A. Is what you do to keep xx safe different to what you have done/will do with your other children?

- 11B. Have you changed anything you have done compared with your older children?

- 11C. Do you think you would do anything differently with your younger children?

12. Do you think there is anything anybody could do to help stop xx (and other children if applicable) having accidents generally?

13. By talking to lots of parents we would like to build up a picture of what might help parents to stop children having accidents, can you think of anything that might help you?

- 13A. If no, why?
- 13B. If yes, who and what would this be?
- 13C. Some people think it is good for children to learn by taking risks and some don't – what do you think about this?
- 13D. Some parents try to prevent the accidents that they think might be more serious but don't try to prevent accidents that they think are less serious. Where would your views on how to keep children safe fit in with this?

14. Is there anything else you would like to tell us about in relation to child safety?

Thank you very much for talking to me. I have some information leaflets about child safety with me if you would be interested in having any?

Tell parent what happens now with the information.

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Interview guide for interviews with parents with uninjured children (study G)

You have filled in the questionnaire for us which gave us lots of information about what you do and think to help keep your children safe. I'd like to talk to you in a bit more detail about this. We are talking to parents whose children have had an accident and to parents like you whose children haven't had an accident, so we can try to work out how to stop accidents happening.

There are no right or wrong answers; we just want to find out what parents think help to keep children safe from accidents and what makes it hard to do this

1. Can I just check I have got the right information about you from the questionnaire?

- 1A. There are x number of children living here
- 1B. It was xx that you told us about in the questionnaire?

2. Can you start by telling me what kind of things you do around the home to help keep your child/children safe from having accidents?

Prompt: Separate out answers for different children if more than one child in the family. Prompt parents with regard to different areas in the house that they don't mention e.g. kitchen, bathroom, stairs

3. What do you find are the main things that make it difficult to keep your children safe around the home?

4. How do you find out about child safety?

Prompts if necessary

- Talk to other people? Who?
- Telly? Children's programmes
- Leaflets, books etc? Where from

5. From your experience what has been the most useful advice or information you have received and/or seen? Why?

6. In the questionnaire we asked about lots of different things that parents do to help keep their children safe at home.

- 6A. For you and xx, what is/are the most important thing/s?

Prompt: If parent can't think straight away prompt with what we asked about in questionnaire

- Safety equipment, such as stair gates or ways to store medicines
- Teaching children not to touch or other safety rules
- Things about your home/garden/where you live
- Things about your child - age/gender/personality
- Things about being able to keep an eye on your child
- Things about your life and how you feel

7. Can you tell me why this is more important?

Prompt: If parent can't think straight away prompt with what we asked about in questionnaire and mention other strategies parent did not

- Safety equipment, such as stair gates or ways to store medicines
- Teaching children not to touch or other safety rules
- Things about your home/garden/where you live
- Things about your child - age/gender/personality
- Things about being able to keep an eye on your child
- Things about your life and how you feel
- Draw out differences/similarities between siblings

8. Is there anything that makes it difficult for you to be able to keep xx safe in the way you think is most important?

9. Children have lots of bumps, and knocks as they grow.

- 9A. Can you tell me about any near misses x has had – things that you have thought 'that was lucky – that could have been quite a nasty accident?'

- 9B. What do you think it was that saved it from turning out badly?

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10. Do you think what you do to keep xx safe is similar to other parents with children the same age? In what kind of ways is it the same or different?

11. [For parents that have other children]

- 11A. Is what you do to keep xx safe different to what you have done/will do with your other children?
- 11B. Have you changed anything you have done compared to your older children?
- 11C. Do you think you would do anything differently with your younger children?

12. Do you think there is anything anybody could do to more help stop xx (and other children if applicable) having accidents generally?

- 12A. If no, why not
- 12B. If yes, who and what would this be

13. By talking to lots of parents, we would like to build up a picture of what might help parents to stop children having accidents, can you think of anything that might help you?

- 13A. If no, why
- 13B. If yes, who and what would this be
- 13C. Some people think it is good for children to learn by taking risks and some don't – what do you think about this?
- 13D. Some parents try to prevent the accidents that they think might be more serious but don't try to prevent accidents that they think are less serious. Where would your views on how to keep children safe fit in with this?

14. Is there anything else you would like to tell us about in relation to child safety?

Thank you very much for talking to me. I have some information leaflets about child safety with me if you would be interested in having any?

Tell parent what happens now with the information.

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Appendix 5 Search terms and strategies for studies H and I and base-case model inputs for the decision analyses for study K

Search terms for the overviews of reviews and primary studies for study H

Reproduced from Cooper NJ, Kendrick D, Achana F, Dhiman P, He Z, Wynn P, Le Cozannet E, Saramago P, Sutton A. Network meta-analysis to evaluate the effectiveness of interventions to increase the uptake of smoke alarms. *Epidemiologic Reviews* 2012;**34**:32–45, by permission of Oxford University Press; *Accident Analysis & Prevention* 2013;**60**:158–171. Young B, Wynn PM, He Z, Kendrick D. Preventing childhood falls within the home: overview of systematic reviews and a systematic review of primary studies.[48] Copyright 2013, with permission from Elsevier; Wynn P, Zou K, Young B, Majsak-Newman G, Hawkins A, Kay B, Mhizha-Murira J, Kendrick D. Prevention of childhood poisoning in the home: overview of systematic reviews and a systematic review of primary studies. *International Journal of Injury Control and Safety Promotion* 2016;**23**:2–28;[390] and Achana FA, Sutton AJ, Kendrick D, Wynn P, Young B, Jones DR, *et al.* (2015) The effectiveness of different interventions to promote poison prevention behaviours in households with children: a network meta-analysis. *PLOS ONE* 10(4): e0121122.[449] http://dx.doi.org/10.1371/journal.pone.0121122.

Fire-related injuries

The following search strategy was used to search MEDLINE for overviews of reviews, systematic reviews and meta-analyses. The search strategy was adapted as necessary for the other databases.

1. review.m_titl.
2. systematic.m_titl.
3. meta-analysis.m_titl.
4. review.pt.
5. meta-analysis.pt.
6. 1 or 2 or 3 or 4 or 5
7. limit 6 to humans
8. exp CHILD/
9. exp INFANT/
10. 1exp ADOLESCENT/
11. MINORS/
12. (child$ or adolesc$ or infan$ or young$ or minor$ or toddl$ or bab$).tw.
13. 8 or 9 or 10 or 11 or 12
14. exp "early intervention (education)"/
15. exp EDUCATION/
16. exp Public Health/ed
17. exp PARENTING/
18. exp COUNSELING/
19. training.tw.
20. (educat$ or train$ or teach$ or parent$ or counsel$).tw.
21. 14 or 15 or 16 or 17 or 18 or 19 or 20
22. exp Accident Prevention/ or injury prevention.tw.
23. SAFETY/
24. exp safety Management/
25. safety practice$.tw.

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26. (firework or bonfire or barbecue).tw.
27. exp Cookery/
28. exp "Cooking and Eating Utensils"/
29. microwave.tw.
30. exp electricity/ or exp electric wiring/
31. (electrical appliance or electric blanket).tw.
32. candle.tw.
33. exp fire Extinguishing Systems/ or fire extinguisher.tw.
34. fire escape.tw.
35. exp firesetting Behavior/
36. thermostat$.tw.
37. hot iron.tw.
38. exp Heating/
39. 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38
40. safety equipment.tw. or exp Equipment Safety/
41. exp Infant Equipment/
42. exp protective devices/ or (protect$ adj3 device$).tw.
43. exp "interior design and furnishings"/
44. (fire-guard$ or fireguard$).tw.
45. (cook$ adj3 guard$).tw.
46. (((smok$ adj3 alarm$) or smok$) adj3 detect$).tw.
47. exp consumer product safety/
48. 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47
49. exp Smoking Cessation/
50. exp smoking/pc [prevention and control]
51. 49 or 50
52. exp ACCIDENTS/ or exp ACCIDENTS, HOME/
53. exp burns/ or exp fires/
54. exp SMOKE INHALATION INJURY/ or SMOKE.tw.
55. exp "Wounds and Injuries"/
56. (accident$ or burn$ or wound$ or injur$).tw.
57. 52 or 53 or 54 or 55 or 56
58. exp first aid/
59. (first adj3 aid).tw.
60. 58 or 59
61. (7 and 13 and (21 or 39 or 48 or 51) and 57) or (7 and 60)

The above search was adapted to find primary studies published since the most comprehensive systematic review,[352] substituting the terms below for study design terms in lines 1–6.

For experimental study designs

1. randomi?ed controlled trial.pt.
2. randomi?ed controlled trials.sh.
3. randomi?ed controlled trial$.mp. or Randomi?ed Controlled Trials/
4. random allocation.sh.
5. double blind method.sh.
6. single blind method.sh.
7. Random Allocation/
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. Clinical Trials/ or Placebos/
10. CONTROLLED CLINICAL TRIAL.pt.
11. comparative stud$.mp.

12. intervention stud$.mp.
13. control group$.mp. or Control Groups/
14. placebo$.mp. or PLACEBOS/
15. evaluation stud$.mp.
16. 9 or 10 or 11 or 12 or 13 or 14 or 15

For case–control and cohort studies

1. exp Case-Control Studies/
2. exp Cohort Studies/
3. 1 or 2

First aid

The following search strategy was used to search MEDLINE for overviews of reviews, systematic reviews and meta-analyses. The search strategy was adapted as necessary for the other databases.

1. review.m_titl.
2. systematic.m_titl.
3. meta-analysis.m_titl.
4. review.pt.
5. meta-analysis.pt.
6. 1 or 2 or 3 or 4 or 5
7. limit 6 to humans
8. (lay people or lay-people or laypeople or layperson$ or lay-person$ or lay person$).mp. [mp=title, abstract, heading word, table of contents, key concepts]
9. (bystander or by-stander).mp. [mp=title, abstract, heading word, table of contents, key concepts]
10. parents/ or fathers/ or mothers/ or single parent/ or persons/
11. middle-aged.mp. [mp=title, abstract, heading word, table of contents, key concepts]
12. persons/ or legal guardians/
13. adolescen$.mp. [mp=title, abstract, heading word, table of contents, key concepts]
14. adult$.mp. [mp=title, abstract, heading word, table of contents, key concepts]
15. Child$.mp. [mp=title, abstract, heading word, table of contents, key concepts]
16. (caregiver$ or care giver$ or care-giver$).mp. [mp=title, abstract, heading word, table of contents, key concepts]
17. (child minder$ or childminder$ or child-minder$ or childminding or child minding).mp. [mp=title, abstract, heading word, table of contents, key concepts]
18. Population/
19. 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18
20. child health services/ or "early intervention (education)"/ or preventive health services/
21. child welfare.mp. [mp=title, abstract, heading word, table of contents, key concepts]
22. Learning/ed [Education]
23. educational measurement.mp. [mp=title, abstract, heading word, table of contents, key concepts]
24. exp public health/ed
25. train*.tw.
26. learn*.tw.
27. teach*.tw.
28. instruct*.tw.
29. counsel*.tw.
30. question$.mp. [mp=title, abstract, heading word, table of contents, key concepts]
31. (educat$ or train$ or teach$ or Parent$ or counsel$).tw.
32. 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31
33. accident$.mp. [mp=title, abstract, heading word, table of contents, key concepts]
34. emergencies.mp. [mp=title, abstract, heading word, table of contents, key concepts]

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35. first aid/mt
36. ("pediatric first aid" or "paediatric first aid").mp. [mp=title, abstract, heading word, table of contents, key concepts]
37. health education/st
38. ("first aid" or "first-aid" or First Aid or First-aid).mp. [mp=title, abstract, heading word, table of contents, key concepts]
39. basic life support.mp. [mp=title, abstract, heading word, table of contents, key concepts]
40. emergency treatment/ or first aid/ or resuscitation/
41. (emergency medicine or emergency nursing).mp. [mp=title, abstract, heading word, table of contents, key concepts]
42. first aid.tw.
43. first response.tw.
44. prehospital care.mp. or pre-hospital care.tw. [mp=title, abstract, heading word, table of contents, key concepts]
45. prehospital management.mp. or pre-hospital management.tw. [mp=title, abstract, heading word, table of contents, key concepts]
46. Life support*.tw.
47. bystander cardiopulmonary resuscitation.mp. [mp=title, abstract, heading word, table of contents, key concepts]
48. ("layperson CPR" or "lay-person CPR" or "layperson cardiopulmonary resuscication" or "lay-person cardiopulmonary resuscitation").mp. [mp=title, abstract, heading word, table of contents, key concepts]
49. lifesupport*.tw.
50. lifesaving.tw.
51. first response/
52. life support/
53. life saving/
54. life-saving/
55. ("CPR" or "Cardio Pulmonary Resuscitation").mp. or "Cardiopulmonary Resuscitation"/ [mp=title, abstract, heading word, table of contents, key concepts]
56. Cardio-Pulmonary Resuscitation/
57. 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56
58. (First Aid cours$ or first-aid cours$).mp. [mp=title, abstract, heading word, table of contents, key concepts]
59. (First Aid Skill$ or first-aid skill$).mp. [mp=title, abstract, heading word, table of contents, key concepts]
60. (First Aid Training or First-Aid Training).mp. [mp=title, abstract, heading word, table of contents, key concepts]
61. Survival skill$.mp.
62. (life support cours$ or life-support cours$).mp. [mp=title, abstract, heading word, table of contents, key concepts]
63. 58 or 59 or 60 or 61 or 62
64. 7 and 19 and 32 and 57 and 63

The above search was adapted to find primary studies published since the most comprehensive systematic review,[352] substituting the terms below for study design terms in lines 1–6.

For experimental study designs

1. randomi?ed controlled trial.pt.
2. randomi?ed controlled trials.sh.
3. randomi?ed controlled trial$.mp. or Randomi?ed Controlled Trials/
4. random allocation.sh.
5. double blind method.sh.

6. single blind method.sh.
7. Random allocation/
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. clinical trials/ or Placebos/
10. CONTROLLED CLINICAL TRIAL.pt.
11. Comparative stud$.mp.
12. intervention stud$.mp. [mp=title, original title, abstract, name of substance word, subject heading word, unique identifier]
13. control group$.mp. or Control Groups/
14. placebo$.mp. or PLACEBOS/ [mp=title, original title, abstract, name of substance word, subject heading word, unique identifier]
15. evaluation stud$.mp.
16. 9 or 10 or 11 or 12 or 13 or 14 or 15

For case–control and cohort studies

1. exp Case-Control Studies/
2. exp Cohort Studies/
3. 1 or 2

Falls

The following search strategy was used to search MEDLINE for studies with experimental or observational designs, and adapted as necessary for the other databases.

1. exp Case-Control Studies/
2. exp Cohort Studies/
3. 1 or 2
4. randomized controlled trial.pt.
5. randomized controlled trials.sh.
6. randomized controlled trial$.mp. or Randomized Controlled Trials/
7. random allocation.sh.
8. double blind method.sh.
9. single blind method.sh.
10. Random Allocation/
11. 4 or 5 or 6 or 7 or 8 or 9 or 10
12. Clinical Trials/ or Placebos/
13. controlled clinical trial.pt.
14. comparative stud$.mp.
15. intervention stud$.mp.
16. control group$.mp. or Control Groups/
17. placebo$.mp. or Placebos/
18. evaluation stud$.mp.
19. 12 or 13 or 14 or 15 or 16 or 17 or 18
20. exp child/
21. exp infant/
22. exp adolescent/
23. exp minors/
24. (child$ or adolesc$ or infan$ or young$ or toddl$ or bab$).tw.
25. 20 or 21 or 22 or 23 or 24
26. exp "early intervention (education)"/
27. exp education/
28. exp public health/ed
29. exp parenting/

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30. exp counseling/
31. (educat$ or train$ or teach$ or parent$ or counsel$ or supervis$).tw.
32. 26 or 27 or 28 or 29 or 30 or 31
33. exp accident prevention/ or injury prevention.tw.
34. exp safety/
35. exp safety management/
36. safety practice$.tw.
37. 33 or 34 or 35 or 36
38. safety equipment.tw. or exp equipment safety/
39. exp infant equipment/
40. exp protective devices/ or (protect$ adj3 device$).tw.
41. exp "interior design and furnishings"/
42. ((stair$ or safety) adj3 gate$).tw.
43. ((bab$ adj3 walk$) or (infant$ adj3 walk$)).tw.
44. ((bab$ adj3 exercis$) or (bab$ adj3 bouncer$)).tw.
45. (playpen$ or activity cent$ or play cent$).tw.
46. (play$ adj3 equipment).tw.
47. (cot$ or crib$).tw.
48. (furniture adj3 corner adj3 cover$).tw.
49. (trip adj3 (flex$ or cable$ or wire$ or lead$)).tw.
50. ((high adj3 chair$) or highchair or (changing adj3 table$) or cradle$).tw.
51. (pushchair$ or pram$ or stroller$).tw.
52. ((child adj3 safety adj3 restraint$) or (safety adj3 harness$)).tw.
53. ((((high or raised) and surface$) or bed$) adj3 (fall$ or drop$ or push$ or roll$)).tw.
54. (window$ adj3 (safety or lock$ or guard$ or bar$ or catch$ or screen$ or restrict$ or limit$ or opening$)).tw.
55. (child-proof or child proof or childproof).tw.
56. (glass adj3 (safety or film)).tw.
57. (garden$ adj3 (lock$ or restrict$ or access$)).tw.
58. ((roof$ or rooves) adj3 (lock$ or restrict or access$)).tw.
59. (bath$ adj3 (mat$ or decal$ or $slip$)).tw.
60. (wet adj3 floor).tw.
61. ((trip$ adj3 hazard$) or stumble$ or (lose adj3 balance)).tw.
62. ((carpet$ or rug$) adj3 (fix$ or loose or trip$)).tw.
63. ((floor$ or stair$ or step$) and $repair$).tw.
64. (stair$ adj3 (light$ or safe$ or play$ or climb$ or trip$ or fall$)).tw.
65. (banister$ or handrail$ or stair$ or railing$).tw.
66. (furniture adj3 (climb$ or jump$ or play$ or fall$ or layout)).tw.
67. (balcon$ adj3 fall$).tw.
68. exp consumer product safety/
69. or/38-68
70. exp accidents/ or exp accidents, home/
71. exp accidental falls/
72. exp "wounds and injuries"/
73. (accident$ or cut or cuts or bruis$ or fracture$ or wound$ or laceration$ or injur$).tw.
74. or/70-73
75. (3 or 11 or 19) and 25 and (32 or 37 or 69) and 74

Search terms for systematic reviews and meta-analyses were as above but with terms 1–19 replaced with:

1. review.m_titl.
2. systematic.m_titl.
3. meta-analysis.m_titl.

4. review.pt.
5. meta-analysis.pt.
6. 1 or 2 or 3 or 4 or 5

Poisoning

The following search strategy was used to search MEDLINE for overviews of reviews, systematic reviews and meta-analyses. The search strategy was adapted as necessary for the other databases.

1. review.m_titl.
2. systematic.m_titl.
3. meta-analysis.m_titl.
4. review.pt.
5. meta-analysis.pt.
6. 1 or 2 or 3 or 4 or 5
7. limit 6 to humans
8. exp child/
9. exp infant/
10. exp adolescent/
11. exp minors/
12. (child$ or adolesc$ or infan$ or young$ or toddl$ or bab$).tw.
13. or/8-12
14. exp "early intervention (education)"/
15. exp education/
16. exp public health/ed
17. exp parenting/
18. exp counseling/
19. (educat$ or train$ or teach$ or parent$ or counsel$ or supervis$).tw.
20. exp accident prevention/ or injury prevention.tw.
21. exp safety/
22. exp safety management/
23. safety practice$.tw.
24. safety equipment.tw. or exp equipment safety/
25. exp infant equipment/
26. exp protective devices/ or (protect$ adj3 device$).tw.
27. exp "interior design and furnishings"/
28. exp consumer product safety/
29. exp drug storage/
30. ((medicine$ or drug$) adj3 storage).tw.
31. exp hazardous substances/ae, po or (hazardous adj3 substance$ adj3 storage).tw.
32. exp household products/ae, po or (household adj3 product$ adj3 storage).tw.
33. (((child adj3 resistant) or childproof) adj3 (closure$ or cap$ or container$)).tw.
34. ((cupboard$ or cabinet$ or drawer$ or box$) adj3 ($lock$ or latch$)).tw.
35. (medicine$ or cosmetics or ((clean$ or beauty or make-up or household or hazardous or industrial) adj3 (supplies or products or materials))).tw.
36. ((toiletries or vitamin$ or cigarette$) adj3 (storage or cupboard$ or cabinet$ or drawer$ or box$ or reach or label$)).tw.
37. ((toxi$ or pollutant$ or gas$) adj3 prevent$).tw.
38. ((toxic or poison$) adj3 plant$ adj3 prevent$).tw.
39. exp ipecac/
40. (poison$ adj3 (control or sticker$ or telephone or number or emergenc$)).tw.
41. or/14-40
42. exp accidents/ or exp accidents, home/
43. exp poisoning/

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44. exp "wounds and injuries"/
45. (accident$ or poison$ or injur$ or ingest$ or swallow$ or inhal$).tw.
46. or/42-45
47. 7 and 13 and 41 and 46

The above search was adapted to find primary studies published since the most comprehensive systematic review,[352] substituting the terms below for study design terms in lines 1–6.

For experimental study designs

1. randomi?ed controlled trial.pt.
2. randomi?ed controlled trials.sh.
3. randomi?ed controlled trial$.mp. or Randomi?ed Controlled Trials/
4. random allocation.sh.
5. double blind method.sh.
6. single blind method.sh.
7. Random Allocation/
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. Clinical Trials/ or Placebos/
10. CONTROLLED CLINICAL TRIAL.pt.
11. comparative stud$.mp.
12. intervention stud$.mp.
13. control group$.mp. or Control Groups/
14. placebo$.mp. or PLACEBOS/
15. evaluation stud$.mp.
16. 9 or 10 or 11 or 12 or 13 or 14 or 15

For case–control and cohort studies

1. exp Case-Control Studies/
2. exp Cohort Studies/
3. 1 or 2

Scalds

The following search strategy was used to search MEDLINE for overviews of reviews, systematic reviews and meta-analyses. The search strategy was adapted as necessary for the other databases.

1. review.m_titl.
2. systematic.m_titl.
3. meta-analysis.m_titl.
4. review.pt.
5. meta-analysis.pt.
6. 4 or 1 or 3 or 2 or 5
7. limit 6 to humans
8. exp child/
9. exp infant/
10. exp adolescent/
11. exp minors/
12. (child$ or adolesc$ or infan$ or young$ or minor$ or toddl$ or bab$).tw.
13. 8 or 11 or 10 or 9 or 12
14. exp "early intervention (education)"/
15. exp education/
16. exp public health/ed
17. exp parenting/

18. expcounseling/
19. training.tw.
20. (edcat$ or train$ or teach$ or parent$ or counsel$).tw.
21. 18 or 19 or 16 or 17 or 20 or 15 or 14
22. exp accident prevention/ or injury prevention.tw.
23. exp safety/
24. exp safety management/
25. safety practice$.tw.
26. exp cookery/
27. exp "cooking and eating utensils"/
28. microwave.tw.
29. hot water.tw.
30. hot liquid.tw.
31. hot drink$.tw.
32. hot food.tw.
33. (thermo$ or thermostat$).mp. or TMV.tw.
34. safety equipment.tw. or exp equipment safety/
35. exp infant equipment/
36. exp protective devices/ or (protect$ adj3 device$).tw.
37. (kettle* or teapot* or samovar* or coffee pot* or jug*).tw.
38. (kettle$ adj3 (flex$ or cable$ or wire$)).tw.
39. (cook$ adj3 guard$).tw.
40. (oven$ or stove$ or grill$ or hob$).mp.
41. ("saucepan$" or "sauce pan$" or "sauce-pan$").tw.
42. kettle.tw.
43. (water adj3 temperature).mp.
44. hot tap water.tw.
45. bath$.tw.
46. steam$.tw.
47. hotfa*cet water.tw.
48. water temperature.tw.
49. cooker safety.tw.
50. ("table cloth$" or "table-cloth$").tw.
51. exp heat/
52. exp hot temperature/ae
53. or/22-52
54. exp bath/ae
55. exp accidents/ or exp accidents, home/
56. exp burns/
57. exp "wounds and injuries"/
58. (accident$ or burn$ or scald$ or wound$ or injur$).tw.
59. or/54-58
60. 7 and 13 and (21 or 53) and 59

The above search was adapted to find primary studies published since the most comprehensive systematic review,[352] substituting the terms below for study design terms in lines 1–6.

For experimental study designs

1. randomi?ed controlled trial.pt.
2. randomi?ed controlled trials.sh.
3. randomi?ed controlled trial$.mp. or Randomi?ed Controlled Trials/
4. random allocation.sh.

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5. double blind method.sh.
6. single blind method.sh.
7. Random Allocation/
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. Clinical Trials/ or Placebos/
10. CONTROLLED CLINICAL TRIAL.pt.
11. comparative stud$.mp.
12. intervention stud$.mp.
13. control group$.mp. or Control Groups/
14. placebo$.mp. or PLACEBOS/
15. evaluation stud$.mp.
16. 9 or 10 or 11 or 12 or 13 or 14 or 15

For case–control and cohort studies

1. exp Case-Control Studies/
2. exp Cohort Studies/
3. 1 or 2

Other sources searched for overviews of reviews and primary studies for study H

From Wynn P, Zou K, Young B, Majsak-Newman G, Hawkins A, Kay B, Mhizha-Murira J, Kendrick D. Prevention of childhood poisoning in the home: overview of systematic reviews and a systematic review of primary studies. *International Journal of Injury Control and Safety Promotion* 2016;**23**:2–28[390] and Achana FA, Sutton AJ, Kendrick D, Wynn P, Young B, Jones DR, *et al.* (2015) The effectiveness of different interventions to promote poison prevention behaviours in households with children: a network meta-analysis. *PLOS ONE* 10(4): e0121122.[449] http://dx.doi.org/10.1371/journal.pone.0121122

Other electronic sources	Hand searching
Cochrane Database of Systematic Reviews	*Injury Prevention* (journal)
Database of Abstracts of Reviews of Effects	Abstracts from World Conferences on Injury Prevention and Control[a]
NHS Economic Evaluation Database and Health Technology Assessment database	Reference lists of included overviews of reviews, systematic reviews, meta-analyses and primary studies
Injury Prevention Research Centers at the Centers for Disease Control (USA)	
NICE (UK)	
Children's Safety Network (USA)	
International Society for Child and Adolescent Injury Prevention (international)	
Child Accident Prevention Trust (UK)	
RoSPA (UK)	
Injury Control Resource Information Network (USA)	
National Injury Surveillance Unit (Australia)	
SafetyLit (USA)	
National Research Register (UK) (up to September 2007)	
UK Clinical Research Network Portfolio	

a Not searched for the first aid overview.
Note
See *Table 69* for dates of searches.

Other sources searched for study I

Other electronic sources	Hand searching (to June 2009)
Injury Prevention Research Centers at the Centers for Disease Control (USA)	Abstracts from the First to Ninth World Conferences on Injury Prevention and Control
Health Development Agency (UK) (up to March 2005)	*Injury Prevention* (journal) (to March 2009)
NICE (UK)	Reference lists of articles included in the review and of published systematic reviews
Children's Safety Network (USA)	
International Society for Child and Adolescent Injury Prevention (international)	
Child Accident Prevention Trust (UK)	
Injury Control Resource Information Network (USA)	
National Injury Surveillance Unit (Australia)	
SafetyLit (USA)	
National Research Register (UK) (up to September 2007)	
UK Clinical Research Network Portfolio	
*meta*Register of Current Controlled Trials	
Index to Theses	

Search strategy for study I

The following search strategy was used to search MEDLINE. The search strategy was adapted as necessary for the other databases.

1. randomized controlled trial.pt.
2. exp Randomized Controlled Trial/
3. randomi?ed controlled trial*.mp.
4. exp Random Allocation/
5. exp Double-Blind Method/
6. exp Single-Blind Method/
7. exp Clinical Trial/
8. controlled clinical trial.pt.
9. comparative stud*.mp.
10. intervention stud*.mp.
11. control group*.mp.
12. placebo*.mp.
13. evaluation stud*.mp.
14. placebo*.mp.
15. exp Placebos/
16. exp control groups/
17. random allocation.mp.
18. or/1-17
19. Humans/
20. 18 and 19
21. exp Child/

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22. exp Infant/
23. exp Adolescent/
24. exp Minors/
25. (child* or adolesc* or infan* or young* or minor* or toddl* or baby or babies).mp.
26. or/21-25
27. exp "Early Intervention (Education)"/
28. exp Education/
29. exp Patient Education as Topic/
30. exp Health Education/
31. public health/ed
32. exp Parenting/
33. exp Counseling/
34. training.mp.
35. (educat* or train* or teach* or parent* or counsel*).mp.
36. or/27-35
37. exp Accident Prevention/
38. exp Safety/
39. exp Safety Management/
40. safety practice*.mp.
41. exp Drug Storage/
42. exp Hazardous Substances/po, ae [Poisoning, Adverse Effects]
43. or/37-42
44. exp Equipment Safety/
45. (safety adj3 equipment).mp.
46. exp Infant Equipment/
47. exp Protective Devices/
48. (fireguard* or fire-guard*).mp.
49. (stair* adj3 gate*).mp.
50. (bab* adj3 walk*).mp.
51. (protect* adj3 device*).mp.
52. (kettle* adj3 (flex* or cable* or wire*)).mp.
53. (cook* adj3 guard*).mp.
54. (smok* adj3 (alarm* or detect*)).mp.
55. or/44-54
56. exp Accidents/
57. exp Accidents, Home/
58. exp Burns, Chemical/
59. exp Eye Burns/
60. exp Burns/
61. exp Burns, Inhalation/
62. exp Burns, Electric/
63. exp Smoke/
64. exp Smoke Inhalation Injury/
65. exp Poisoning/
66. exp Carbon Monoxide Poisoning/
67. exp "Wounds and Injuries"/
68. (accident* or burn* or scald* or asphyx* or chok* or cut* or suffocat* or poison* or fracture* or wound* or injur*).mp.
69. exp Fractures, Bone/
70. exp Asphyxia/
71. suffocat*.mp.
72. exp Ipecac/
73. exp Drowning/

74. exp Near Drowning/
75. or/56-74
76. 20 and 26
77. 36 or 43 or 55
78. 75 and 76 and 77
79. (2004* or 2005* or 2006* or 2007* or 2008* or 2009*).ed.
80. 78 and 79

Base-case model inputs for the decision analysis for smoke alarms for study K

General base-case model inputs

Parameter description	Point estimate (95% CrI)	Parameter distribution	Source
Stage 1: Intervention model *Cohort settings*			
Total number of households in the UK	26,442,100		Office for National Statistics[502]
Probabilities of possessing a functioning smoke alarms following each intervention			
(1) Usual care	0.695 (0.647 to 0.740)	Posterior distribution inputted directly from NMA	NMA by Cooper *et al.*[374]
(2) Education	0.671 (0.207 to 0.942)	As above	As above
(3) Education + free/low-cost equipment	0.876 (0.459 to 0.986)	As above	As above
(4) Education + free/low-cost equipment + home safety inspection	0.852 (0.448 to 0.983)	As above	As above
(5) Education + free/low-cost equipment + fitting	0.859 (0.400 to 0.982)	As above	As above
(6) Education + home safety inspection	0.880 (0.413 to 0.991)	As above	As above
(7) Education + free/low-cost equipment + fitting + home safety inspection	0.941 (0.651 to 0.993)	As above	As above
Smoke alarm			
Probability of accepting intervention (assumed same for all interventions)	0.9	Fixed	Assumption based on studies included in NMA[374]
Probability of a household having a functioning smoke alarm (baseline)	0.860	Beta ($n = 18,386$)	Department for Communities and Local Government[377] (Table 2.3)
Probability of owning a smoke alarm with a battery life of 1 year	0.750	Beta ($n = 15,850$)	Office of the Deputy Prime Minister[376] (Table 5.3)
Probability of testing smoke alarm at least once a year	0.850	Beta ($n = 18,372$)	Office of the Deputy Prime Minister[376] (Figure 5.1)
Probability of testing smoke alarm less than once a year	0.02	Beta ($n = 18,372$)	Office of the Deputy Prime Minister[376] (Figure 5.1)

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Parameter description	Point estimate (95% CrI)	Parameter distribution	Source
Stages 2 and 3: Preschool and long-term model			
Probability of a fire			
Probability of a fire when functioning smoke alarms present	Fires when smoke alarm was present, operated and raised or not the alarm = 20,706 (out of 43,451 fires); assuming that fires occurred in different dwellings: 20,706/26,442,100 = 0.000783	Beta (n = 26,442,100)	Department for Communities and Local Government[377] (Table 2.4)
Probability of a fire when non-functioning smoke alarms present	Fires when smoke alarm was present but did not operate = 7854 (out of 43,451 fires); assuming that fires occurred in different dwellings: 7854/26,442,100 = 0.000297	Beta (n = 26,442,100)	Department for Communities and Local Government[377] (Table 2.4)
Probability of a fire when no smoke alarms present or unspecified	Fires when smoke alarm was absent or unspecified = 14,891 (out of 43,451 fires); assuming that fires occurred in different dwellings: 14,891/ 26,442,100 = 0.000563	Beta (n = 26,442,100)	Department for Communities and Local Government[377] (Table 2.4)
Probability of inside household fire being attended by the fire and rescue service	0.15	Beta (n = 272)	Office of the Deputy Prime Minister[376] (Table 3.4)
Probability of injury or fatality			
Probability of a fatality following a fire when functioning smoke alarm present	Fires when smoke alarm was present, operated and raised or not the alarm and there were fatal casualties = 122 (out of 287 casualties); 122/20,706 = 0.005892	Beta (n = 20,706)	Department for Communities and Local Government[377] (Table 2.4)
Probability of a fatality following a fire when non-functioning or no smoke alarm	Fires when smoke alarm was present but did not operate or was absent and there were fatal casualties = 165 (out of 287 casualties); 165/(7854 + 14,891) = 0.007254	Beta (n = 22,745)	Department for Communities and Local Government[377] (Table 2.4)
Probability of no injury following a house fire with 'functioning' and 'no/non-functioning' smoke alarms	Probability of injury when functional smoke alarm present = 0.11; therefore, the probability of no injury with 'functioning' smoke alarm = 1 – 0.11 = 0.89 Probability of injury when functional smoke alarm absent = 0.125; therefore, the probability of no injury without 'functioning' smoke alarm = 1 – 0.125 = 0.875	Beta (n = 43,451)	Istre *et al.*[503] (Table 2)
Probability that a child aged 0–4 years incurs a minor, moderate or severe injury given a burn injury, following a house fire	Minor injury 0.368; moderate injury 0.158; severe injury (requires inpatient stay in an intensive care unit of > 5 days) 0.474	Multinomial (n = 19)	Mr Kenn Dunn, University Hospital of South Manchester, 8 September 2010, personal communication
Additional proportion of burn unit costs incurred in an intensive therapy unit	0.4 (assumption SE = 0.1)	Beta (alpha = 9.2, beta = 13.8)	Assumption based on analysis in Hemington-Gorse *et al.*[504]

Parameter description	Point estimate (95% CrI)	Parameter distribution	Source
Probability of having a precautionary check-up following a fire	0.437	Beta ($n = 12,935$)	Department for Communities and Local Government[505] (*Table 8*)
Probability of all-cause mortality for a UK citizen aged from 0 to 100 years (for use in each decision model cycle)	Age dependent		Office for National Statistics 2009[506]

Base-case model inputs for quality-of-life weights and costs (updated to 2012 prices)

Model input	Point estimate (SE)	Parameter distribution	Source
Stage 1: Intervention model *Intervention costs*			
Cost of home safety inspection based on cost of local authority home care worker for 40 minutes of their time including travel	£23 per hour, thus 40 minutes = £15.33	Fixed	Curtis[30]
Cost of smoke alarm giveaway	£4.89	Fixed	Jane Zdanowska, Nottinghamshire County Council, 28 September 2010, personal communication
Cost of providing education programme per household accepting the intervention – based on cost of home care worker for 20 minutes of their time including travel	Assume £20 per hour, thus 20 minutes = £6.66	Fixed	Assumption
Fixed cost of an intervention scheme – programme co-ordination	Considering a simulated cohort of 100,000 households = £79,529	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices
Additional administrative cost incurred for each household that accepts the intervention	Distribution costs divided by the number of households in the cohort and updated to 2012 prices = £0.40	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices
Cost of having the smoke alarm installed	Installation costs divided by the number of smoke alarms installed and updated to 2012 prices = £11.83	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices
Stages 2 and 3: Preschool and long-term model *Health-care costs/resource use*			
Mean number of minutes of paramedic unit – assumed only attends when severe injuries	49.5	Normal [variance = 26.32 (assumption)]	Curtis[508]
Mean number of minutes of emergency ambulance – assumed only attends when moderate injuries	38.6	Normal [variance = 26.32 (assumption)]	Curtis[508]
Mean cost per minute of a paramedic unit	£8.00	Fixed	Curtis[508] – updated to 2012 prices

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APPENDIX 5

Model input	Point estimate (SE)	Parameter distribution	Source
Mean cost per minute of an emergency ambulance	£7.89	Fixed	Curtis[508] – updated to 2012 prices
Mean cost of a minor injury	£1206 (£209)	Log-normal	Mr Kenn Dunn, University Hospital of South Manchester, 8 September 2010, personal communication
Mean cost of a moderate injury	£2855 (£1415)	Log-normal	As above
Mean cost of a severe injury	£64,939 (£32,019)	Log-normal	As above
Mean incurred NHS costs of disability per year	£379.50 (£85.50)	Gamma (alpha = 16, beta = 0.047)	Medical Care Research Unit (J Nicholl, personal communication) – updated to 2012 prices
Mean cost of precautionary check-up	£68.80 (£21.50)	Normal	Department of Health[509]
Out-of-pocket/private costs			
Cost of smoke alarm 1-year battery to individual	£1.54	Fixed	www.safelincs.co.uk (accessed 3 November 2016)
Total cost of damage caused by the fire	£1298 (£245)	Gamma (alpha = 16, beta = 0.016)	Office of the Deputy Prime Minister[510] (Table 3.8) – updated to 2012 prices
Cost of a fatality following a household fire – includes coroner and autopsy costs	£205.50	Fixed	Ginnelly *et al.*[347] (*Table 1*) – updated to 2012 prices
Law enforcement and rescue service costs			
Cost of police attending – assumed only attend when severe injuries	£173.90	Fixed	Ginnelly *et al.*[347] (*Table 1*) – updated to 2012 prices
Cost of fire and rescue service attending a domestic fire	£3386	Fixed	Office of the Deputy Prime Minister[511] (Table 3.6) – updated to 2012 prices
Utility parameters per cycle			
Deficit in utilities for minor injury (DRG 460 + 459)	0.049	Fixed	Sanchez *et al.*[512]
Deficit in utilities for moderate injury (DRG 458 + 457)	0.069	Fixed	Sanchez *et al.*[512]
Deficit in utilities for severe injury (DRG 472)	0.107	Fixed	Sanchez *et al.*[512]
Deficit in utilities following a disability	0.1 (0.025)	Beta (alpha = 14.3, beta = 128.7)	Medical Care Research Unit (J Nicholl, personal communication)
General background utilities for non-injured population	< 25 years 0.94 (SD 0.12); 25–34 years 0.93 (SD 0.15); 35–44 years 0.91 (SD 0.16); 45–54 years 0.85 (SD 0.25); 55–64 years 0.80 (SD 0.26); 65–74 years 0.78 (SD 0.26); > 75 years 0.73 (SD 0.27)	Normal	Kind *et al.*[375]

DRG, diagnosis-related group.

Base-case model inputs for the decision analysis for safe hot tap water temperatures for study K

General base-case model inputs

Model input	Point estimate (95% CrI)	Parameter distribution	Source
Stage 1: Intervention model			
Cohort settings			
Total number of households in the UK	26,442,100		Office for National Statistics[502]
Probabilities of safe hot water following each intervention			
(1) Usual care	0.35 (0.30 to 0.40)	Posterior distribution inputted directly from NMA	From NMA of safe hot water interventions
(2) Education	0.48 (0.34 to 0.63)	As above	As above
(3) Education + thermometer	0.35 (0.19 to 0.54)	As above	As above
(4) Education + free/low-cost not scald equipment + home safety inspection	0.41 (0.20 to 0.66)	As above	As above
(5) Education + thermometer + home safety inspection	0.35 (0.19 to 0.55)	As above	As above
(6) Education + TMV + fitting	0.95 (0.66 to 1.00)	As above	As above
(7) Education + TMV + fitting + home safety inspection	0.27 (0.04 to 0.79)	As above	As above
(8) Education + home safety inspection	0.45 (0.15 to 0.79)	As above	As above
(9) Education + free/low-cost not scald equipment + fitting + home safety inspection	0.49 (0.16 to 0.78)	As above	As above
Safe hot water			
Probability of accepting intervention (assumed same for all interventions)	0.74	Beta ($n = 62$)	Kendrick *et al.*[276]
Probability that a household has safe hot water baseline	0.15 (0.12 to 0.19)	Meta-analysis of trials	
Number of children per household	1.8		
Stages 2 and 3: Preschool and long-term model			
Probability of a scald			
Probability of a scald when safe hot water using TMV	0		Assumption
Probability of a scald when safe hot water using 'other' interventions	0.000057	10% of probability of scald when no safe hot water	Assumption
Probability of a scald when no safe hot water	0.00057	Beta ($n = 3,486,469$) assumes 1.8 children per household	Phillips *et al.*[140] and Office for National Statistics[378]

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Model input	Point estimate (95% CrI)	Parameter distribution	Source
Probability move from safe hot water to no safe hot water at the end of a cycle	0	Assumption	
Probability move from no safe hot water to safe hot water at the end of a cycle	0.13	Beta ($n = 62$)	Kendrick *et al.*[276]
Probability of an injury or a fatality			
Probability of a fatality following a scald	0	NA	Office for National Statistics[513]
Probability of a child aged 0–4 years attending an ED with a scald but not admitted to hospital	0.23	Beta ($n = 653$)	Philips *et al.* 2011[140]
Probability of a child aged 0–4 years incurring a minor, moderate or severe injury given a scald injury	Minor injury 0.21; moderate injury 0.68; severe injury (requires inpatient stay in an intensive care unit of > 5 days) 0.11	Multinomial ($n = 1107$)	Mr Ken Dunn, South Manchester University Hospital, 8 September 2010, personal communication
Probability of all-cause mortality for a UK citizen aged from 0 to 100 years (for use in each decision model cycle)	Age dependent		Office for National Statistics[506]

NA, not applicable.

Base-case model inputs for quality-of-life weights and costs (updated to 2012 prices) for interventions to promote safe hot tap water temperatures

Model input	Point estimate (SE)	Parameter distribution	Source
Stage 1: Intervention model			
Intervention costs			
Cost of home safety inspection based on cost of local authority home care worker for 40 minutes of their time including travel	£23 per hour, thus 40 minutes = £15.33	Fixed	Curtis[30]
Cost of thermometer giveaway	£0.83	Fixed	Katcher *et al.*[272]
Cost of TMV including fitting	£12.37 (assuming part of housing association or local authority new build or refurbishment)	Fixed	Phillips *et al.*[140]
Cost of providing education programme per household accepting the intervention – based on cost of home care worker for 20 minutes of their time including travel	Assuming £20 per hour, thus 20 minutes = £6.66	Fixed	Assumption
Fixed cost of an intervention scheme – programme co-ordination	Considering a simulated cohort of 100,000 households = £79,529	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices
Additional administrative cost incurred for each household that accepts the intervention	Distribution costs divided by the number of households in the cohort and updated to 2012 prices = £0.40	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices

Model input	Point estimate (SE)	Parameter distribution	Source
Stages 2 and 3: Preschool and long-term model			
Health-care costs/resource use			
Mean cost of attending an ED but discharged without admission	£183 (£18.25)	Log-normal	Department of Health[31]
Mean cost of minor scald – no inpatient stay	£1086 (£8)	Log-normal	Mr Ken Dunn, South Manchester University Hospital, 8 September 2010, personal communication
Mean cost of moderate scald – inpatient stay ≤ 5 days	£14,940 (£102)	Log-normal	Mr Ken Dunn, South Manchester University Hospital, 8 September 2010, personal communication
Mean cost of severe scald – inpatient stay > 5 days	£41,157 (£2518)	Log-normal	Mr Ken Dunn, South Manchester University Hospital, 8 September 2010, personal communication
Mean incurred NHS costs of disability per year	£379.50 (£85.50)	Gamma (alpha = 16, beta = 0.047)	Medical Care Research Unit (J Nicholl, personal communication)367 – updated to 2012 prices
Utility parameters per cycle			
Deficit in utilities for minor injury/no inpatient stay (DRG 460)	0.060	Fixed	Sanchez *et al.*[512]
Deficit in utilities for minor injury/ inpatient stay (DRG 459)	0.090	Fixed	Sanchez *et al.*[512]
Deficit in utilities for moderate injury (DRG 458 + 457)	0.093	Fixed	Sanchez *et al.*[512]
Deficit in utilities for severe injury (DRG 472)	0.137	Fixed	Sanchez *et al.*[512]
Deficit in utilities following a disability per year	0.1 (0.025)	Beta (alpha = 14.3, beta = 128.7)	Medical Care Research Unit (J Nicholl, personal communication)
General background utilities for non-injured population	< 25 years 0.94 (SD 0.12); 25–34 years 0.93 (SD 0.15); 35–44 years 0.91 (SD 0.16); 45–54 years 0.85 (SD 0.25); 55–64 years 0.80 (SD 0.26); 65–74 years 0.78 (SD 0.26); > 75 years 0.73 (SD 0.27)	Normal	Kind *et al.*[71]

DRG, diagnosis-related group.

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Base-case model inputs for the decision analysis for safety gates to prevent stairway falls for study K

General base-case model inputs

Model input	Point estimate (95% CrI)	Parameter distribution	Source
Stage 1: Intervention model			
Probabilities of possessing a fitted safety gate following each intervention			
(1) Usual care	0.64 (0.60 to 0.68)	Posterior distribution is inputted directly from NMA	Hubbard *et al.*[446]
(2) Education	0.73 (0.56 to 0.86)	As above	As above
(3) Education + free/low-cost equipment	0.75 (0.56 to 0.88)	As above	As above
(4) Education + free/low-cost equipment + home safety inspection	0.72 (0.46 to 0.89)	As above	As above
(5) Education + free/low-cost equipment + fitting	0.75 (0.49 to 0.91)	As above	As above
(6) Education + home safety inspection	0.74 (0.33 to 0.95)	As above	As above
(7) Education + free/low-cost equipment + fitting + home safety inspection	0.93 (0.75 to 0.98)	As above	As above
Safety gate			
Baseline probability that a household has a fitted safety gate	0.56	Normal on logit scale	Meta-analysis of baseline data and control groups from NMA studies with usual care in control arm
Probability of accepting the intervention	0.76	Normal on logit scale	Meta-analysis of participation rates recorded in NMA studies
No of children per household	1	Assumption	
Stages 2 and 3: Preschool and long-term model			
Number of falls in children aged 0–4 years	Mean 41,246 (SE 84.28)	Normal	HASS 2002 (extracts from the Department of Trade and Industry's Home and Leisure Accident Surveillance System (HASS/LASS), Helen Shaw, RoSPA, 1 May 2014, personal communication). Stairway falls 2002 – lower limit 41,081 and upper limit 41,411 for number of falls
Probability of a fall	Number of falls/3,486,469		Office for National Statistics[514]
Relative risk of a fall downstairs when safety gate is in use vs. no safety gate	Ln(OR) = 0.916, SE[Ln(OR)] = 0.14	Normal	Data from KCS study A: cases compared with community controls adjusted analysis OR (for did not use safety gate vs. closed safety gate) = 2.50 (95% CI 1.90 to 3.29)
Probability of using an emergency ambulance	0.242	Fixed	Hospital Episode Statistics (2012)[2] – 24.2% of all cases arrived by emergency transfer (ambulance/helicopter); used for all severities of injuries

Model input	Point estimate (95% CrI)	Parameter distribution	Source
Probability of a mild fall injury (attends ED but not admitted)	2604/2724 = 0.9560		HASS 2002 (extracts from the Department of Trade and Industry's Home and Leisure Accident Surveillance System (HASS/LASS), Helen Shaw, RoSPA, 1 May 2014, personal communication)
Probability of a moderate fall injury (attends ED and admitted for < 2 days)	88/2724 = 0.0323	Multinomial	
Probability of a severe fall injury (attends ED and admitted for ≥ 2 days) but not long-term disability	(32 – 2)/2724 = 0.0110		Severe injuries with estimated number with long-term disability subtracted, i.e. 0.000652 × 2724 = 1.78 ≈ 2
Probability of a severe fall injury (attends ED and admitted for ≥ 2 days) and a long-term disability	0.000652		SMARTRISK[121]
Probability of a fatal fall injury	0.000000163		Office for National Statistics – England and Wales mortality statistics: four stairway deaths in those aged 0–4 years in 2002–12, average of 0.57 per year;[515] n = 3,496,750 children aged 0–4 year olds in 2011 census[489]
Probability that after a fall the household keeps the safety gate already in place	0.95	Uniform (0.9,1)	Assumption
Probability that after a fall the household remains in the no safety gate arm	0.56	Uniform (0.5,0.62)	Based on Morrongiello and Schwebel[516]

Base-case model inputs for quality-of-life weights and costs (updated to 2012 prices)

Model input	Point estimate (SE)	Parameter distribution	Source
Stage 1: Intervention model			
Intervention costs			
Cost of home safety inspection based on cost of health visitor for 5 minutes of their time	£44 per hour, thus 5 minutes = £3.67	Fixed	Curtis[30]
Cost of safety equipment (safety gates × 2)	£38.30	Fixed	NICE PH30 costing template[27] (£18 per safety gate) updated to 2012 prices
Cost of installation	18 minutes to fit a safety gate at a cost of £24.93 per hour = £7.48	Fixed	Gary Smith, Groundwork Creswell, 29 September 2014, personal communication
Cost of providing education programme per household accepting the intervention – based on cost of home care worker for 5 minutes of their time during a routine visit	Assuming £44 per hour, thus 5 minutes = £3.67	Fixed	Assumption (based on Curtis[30])
Fixed cost of an intervention scheme – programme co-ordination	Considering a simulated cohort of 100,000 households = £79,529	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices

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Model input	Point estimate (SE)	Parameter distribution	Source
Cost of travel (time and travel) when intervention is provided in the home	£5	Fixed	Nottingham home safety scheme hourly rate including on-costs and vehicle costs = £25 (estimated through Gary Smith, Ground work Creswell, 29 September 2014, personal communication) to install five items of safety equipment; one-fifth of hourly rate was allocated to safety gates
Additional administrative cost incurred for each household that accepts the intervention	Distribution costs divided by the number of households in the cohort and updated to 2012 prices = £0.40	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices
Stages 2 and 3: Preschool and long-term model			
Cost of emergency transfers included for 25.4% of all falls injuries	£263 (£21.48)	Gamma	Curtis[30]
Cost of ED treatment of cases not leading to hospital inpatient stay (minor injury)	£112 (£27.46)	Gamma	Curtis[30]
Cost of ED treatment for cases leading to hospital inpatient stay (moderate or severe injury)	£146 (£42.22)	Gamma	Curtis[30]
Cost of a non-elective short (< 2 days) inpatient admission	£586 (£223.70)	Gamma	Curtis[30]
Cost of a non-elective long (≥ 2 days) inpatient admission	£2461 (£810.37)	Gamma	Curtis[30]
Annual cost of chronic ill health	£380.30 (£98.44)	Gamma	Medical Care Research Unit (J Nicholl, personal communication) – updated to 2012 prices
Cost of fatal injury	£205.50	Fixed	Ginelly *et al.*[347] – reported in functional smoke alarm model[373]
Utility parameters per cycle			
Utility deficit for minor injury	0.05	Uniform (0,0.1)	Assumption – half moderate utility deficit
Utility deficit for moderate injury	0.10	Fixed	Utility decrement 0.10 for falls injury in children aged 0–4 years.[517] Brussoni *et al.*[143] looked at all injuries for ages 0–16 years using 1-month change in EQ-5D-3L
Utility deficit for severe injury	0.20	Uniform (0.1,0.3)	Assumption – double moderate and long-term disability
Utility deficit associated with disability per year	0.10 (0.025)	Beta	Medical Care Research Unit (J Nicholl, personal communication)
General background utilities for non-injured population	< 25 years 0.94 (SD 0.12); 25–34 years 0.93 (SD 0.15); 35–44 years 0.91 (SD 0.16); 45–54 years 0.85 (SD 0.25); 55–64 years 0.80 (SD 0.26); 65–74 years 0.78 (SD 0.26); > 75 years 0.73 (SD 0.27)	Normal	Kind *et al.*[375]

Base-case model inputs for the decision analysis for safe storage of medicines for study K

General base-case model inputs

Model input	Point estimate (95% CrI)	Parameter distribution	Source
Stage 1: Intervention model			
Probabilities of safe storage of medicines following each intervention			
(1) Usual care	0.90 (0.84 to 0.94)	Posterior distribution inputted directly from NMA analysis	NMA[449]
(2) Education	0.87 (0.83 to 0.91)	As above	As above
(3) Education + free/ low-cost equipment	0.95 (0.89 to 0.98)	As above	As above
(4) Education + free/ low-cost equipment + home safety inspection	0.90 (0.76 to 0.96)	As above	As above
(5) Education + free/ low-cost equipment + fitting	0.90 (0.81 to 0.96)	As above	As above
(6) Education + free/ low-cost equipment + fitting + home safety inspection	0.93 (0.83 to 0.97)	As above	As above
(7) Free/low-cost equipment	0.94 (0.78 to 0.98)	As above	As above
Safe storage of medicine			
Baseline prevalence of safe storage of medicines	0.75	Beta ($n = 2033$)	Prevalence rate among community controls
Probability of accepting the intervention	0.90	Fixed	Assumption based on value in functional smoke alarm model
Stages 2 and 3: Preschool and long-term model			
Probability of accidental exposure/ingestion	0.00181	Beta ($n = 3{,}599{,}180$)	Poisoning cases in preschool children = 10,837, UK preschool population in 2005–9 = 3,599,180.[451] The numerator ($n = 10{,}837 \times 0.6 = 6502$) was derived based on information[90] suggesting that 1316 (60%) of the 2193 medically reported poisonings identified in the THIN database were due to ingestion of a medicinal substance
Relative risk of exposure to a medicinal substance	Ln(OR) = –0.60 (SE 0.14)	Normal	From KCS study A: OR 1.83 (95% CI 1.38 to 2.42)
Probability of using emergency ambulance	0.242	Fixed	Hospital Episode Statistics[518] – 24.2% of all cases arrived by emergency transfer (ambulance/ helicopter)
Probability of inpatient admission following a medicinal poisoning injury (ICD-10: X40–X44)	0.6992	Beta ($n = 6502$)	Hospital Episode Statistics[518] – number of poisoning cases (X40–X44) admitted in 0- to 4-year-olds (period 2012–13) in England = 3909. Scaled up by a factor of 1.163 (i.e. $3909 \times 1.163 = 4546$ cases for the whole of the UK) based on mid-2012 population estimates for UK and England[519]

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Model input	Point estimate (95% CrI)	Parameter distribution	Source
Probability of severe injury	0.00191	Beta ($n = 4546$)	Mowry *et al.*[520] (*Table 13*) – 1.91% of major poisoning cases (across all age groups) resulted in a permanent health condition; numerator = 0.019 × 4546 = 86
Probability of fatal injury	0.00116	Beta ($n = 87$)	UK mortality statistics[513] – one fatality from medicinal poisonings in 0- to 4-year-olds (assumed fatality occurred after a long inpatient stay)
UK mortality statistics		Normal	Office for National Statistics[506]

ICD-10, *International Statistical Classification of Diseases and Related Health Problems*, 10th Revision; THIN, The Health Improvement Network.

Base-case model inputs for quality-of-life weights and costs (updated to 2012 prices)

Model input	Point estimate (SE)	Parameter distribution	Source
Stage 1: Intervention model *Intervention costs*			
Cost of home safety inspection based on cost of local authority home care worker for 40 minutes of their time including travel	£23 per hour, thus 40 minutes = £15.33	Fixed	Curtis[30]
Cost of safety equipment (cupboard locks ×2) updated to 2012 prices	£6.80 (range £4.54–13.62)	Fixed	NICE PH30 costing template[27]
Cost of installation	£11.83	Fixed	Same as smoke alarms
Cost of providing education programme per household accepting the intervention – based on cost of home care worker for 20 minutes of their time including travel	Assume £20 per hour, thus 20 minutes = £11.33	Fixed	Assumption
Fixed cost of an intervention scheme – programme co-ordination	Considering a simulated cohort of 100,000 households = £79,529	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices
Additional administrative cost incurred for each household that accepts the intervention	Distribution costs divided by the number of households in the cohort and updated to 2012 prices = £0.40	Fixed	DiGuiseppi *et al.*[507] – updated to 2012 prices
Stages 2 and 3: Preschool and long-term model			
Cost of emergency transfers	£263 (£21.48)	Gamma	Curtis[30]
Cost of ED treatment of cases not leading to hospital inpatient stay (minor injury)	£112 (£27.41)	Gamma	Curtis[30]
Cost of ED treatment of cases leading to hospital inpatient stay (major injury)	£146 (£42.22)	Gamma	Curtis[30]
Cost of a non-elective short (< 2 days) inpatient admission	£586 (£223.70)	Gamma	Curtis[30]
Cost of a non-elective long (≥ 2 days) inpatient admission	£2461 (£810.37)	Gamma	Curtis[30]

Model input	Point estimate (SE)	Parameter distribution	Source
Annual cost of chronic ill health	£386.42 (£96.72)	Gamma	Medical Care Research Unit (J Nicholl, personal communication)
Cost of fatal injury	£205.50	Fixed	Ginelly *et al.*[347] – reported in functional smoke alarm model
Cost of 11.7-minute GP consultation	£43	Fixed	Curtis[30]
Cost of a health visitor visit lasting 40 minutes for severe poisonings (i.e. those that result in a permanent injury)	£44 (£15.56)	Gamma	Curtis[30]
Utility parameters per cycle			
Utility deficit for minor injury	0.03 (0.003)	Beta	Utility decrement of 0.03 for poisoning injury;[125] assumed SE is 10% of the mean[521,522]
Utility deficit for moderate injury	0.046 (0.0046)	Beta	Utility decrement of 0.046 for poisoning injury;[517] assumed SE is 10% of the mean[521,522]
Utility deficit for severe injury	0.146 (0.0146)	Beta	Utility decrement of 0.046 for poisoning injury[517] and decrement associated with disability of 0.1 from the HALO study (J Nicholl, personal communication); assumed SE is 10% of mean[521,522]
Utility deficit associated with disability per year	0.10 (0.025)	Beta	Medical Care Research Unit (J Nicholl, personal communication)
General background utilities for non-injured population	< 25 years 0.94 (SD 0.12); 25–34 years 0.93 (SD 0.15); 35–44 years 0.91 (SD 0.16); 45–54 years 0.85 (SD 0.25); 55–64 years 0.80 (SD 0.26); 65–74 years 0.78 (SD 0.26); > 75 years 0.73 (SD 0.27)	Normal	Kind *et al.*[375]

Base-case model inputs for the decision analysis for safe storage of household products for study K

Note that the base-case model inputs for quality-of-life weights and costs are the same as those used for the safe storage of medicines in *Base-case model inputs for the decision analysis for safe storage of medicines for study K*.

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General base-case model inputs

Model input	Point estimate (95% CrI)	Parameter distribution	Source of information
Stage 1: Intervention model			
All parameters are the same as for medicinal poisoning except for those below			
Probabilities of safe storage of non-medicinal poisons			
(1) Usual care	0.608 (0.566 to 0.649)	Posterior distribution inputted directly from NMA	NMA[449]
(2) Education	0.660 (0.518 to 0.789)	As above	As above
(3) Education + free/low-cost equipment	0.779 (0.584 to 0.895)	As above	As above
(4) Education + free/low-cost equipment + home safety inspection	0.799 (0.640 to 0.915)	As above	As above
(5) Education + free/low-cost equipment + fitting	0.676 (0.430 to 0.868)	As above	As above
(6) Education + free/low-cost equipment + fitting + home safety inspection	0.803 (0.453 to 0.960)	As above	As above
(7) Free/low-cost equipment	0.403 (0.003 to 0.961)	As above	As above
Stages 2 and 3: Preschool and long-term model			
Probability of safe storage of non-medicines	0.454	Beta ($n = 2320$)	Prevalence rate among community controls from study A
Relative risk of exposure to a non-medicinal substance comparing children with a poisoning with community controls	OR 0.77 (95% CI 0.59 to 0.99)	Normal on log odds scale	Study A: community controls adjusted analysis
Probability of accidental exposure/ingestion	0.0012	Beta ($n = 3,599,180$)	Orton *et al.*,[451] Tyrrell *et al.*[90]
Probability of inpatient admission following a non-medicinal poisoning injury (ICD-10: X45–X49)	1377 poisoning cases (X45–X49) admitted in 0- to 4-year-olds in England. Scaled up by 1.163 based on mid-2012 population for the UK: (1377 × 1.16)/ 4335.8 = 0.368	Beta	Health and Social Care Information Centre,[518] Office for National Statistics[519]

ICD-10, *International Statistical Classification of Diseases and Related Health Problems*, 10th Revision.

Appendix 6 Statistical appendix, interview schedules and questionnaires for study M, and injury prevention briefings

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Parents' survey for measuring the prevalence of fire protection practices

Keeping Children Safe at Home	**Parents' Survey for measuring prevalence of fire protection practices**		
Study Code: **UIC** which will consist of: **two letters** at the start to identify the study centre (**PI's initials**); then the first **3 letters of the Children's Centre name**; the **final 2 letters of the Children's Centre postcode** and the last **2 digits** will be the **participant number 01-50 e.g. ET HEN RF 01**		**UIC** ☐☐ ☐☐☐ ☐☐ ☐☐	
QUESTIONS ***Prompts in italics***			
First Screening Question: *Are you the parent or carer of a child/ren under 5 years of age who lives with you?* *Y/N* *-if YES then continue with Interview Process-Information Sheet, Consent and then the interview itself.* *If NO then NOT invited to continue with interview* ***Also****-if parent/carer looks very young please check that they are not younger than 16 years of age. If they are <16 then they cannot be invited to take part*			
Question 1	**DEMOGRAPHIC/BACKGROUND INFORMATION**		
1a	**Post-code** ***Or if not known-****first line of address and area*		
1b	**Age group (parent)** *Ask parent to say which group they are in*	1 = 16-20 years, 2 = 21-25 years, 3 = 26-30 years, 4 = 31-35 years, 5 = 36-40 years,	6 = 41-45 years, 7 = 46-50 years, 8 = 51-55 years, 9 = 56-60 years, 10 >60 years
1c	**Gender of respondent**	M/F	
1d	**Ethnicity of respondent-** *Ask participant to respond using categories on Prompt Sheet found on last page of Interview Schedule*		
1e	**What type of accommodation?**	1 = Temporary Accommodation 2 = Privately rented 3 = Rented: social housing/housing association/council housing 4 = Owner occupied 5 = Live with parents 6 = Other – please describe	

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Question 1	DEMOGRAPHIC/BACKGROUND INFORMATION –CONTINUED						
1f	**Number of children (less than 18 years of age) normally resident in household**						
	Information about children resident in household ***If there are more than 6 children, please continue overleaf***	Child 1	Child 2	Child 3	Child 4	Child 5	Child 6
1g	**Ages of children**						
1h	**Gender of children**						
1i	**Number of adults usually resident in household** ***Prompt-****in last 2 weeks (if usual 2 weeks!)*						

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1j	**Has respondent ever experienced or been in a fire at home?**	Y/N	If Yes-record brief details ***Prompt:*** *what happened? How did the fire start? Was anyone injured?*
1k	**Have any of the children or young people in the household needed medical attention for a burn?** ***Prompt-****e.g. GP, A+E, NHS Walk-in Centre*	Y/N-	If Yes- record brief details ***Prompt:*** *What happened? What sort of injury? What treatment was needed? Have there been any long term effects?*

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DOI: 10.3310/pgfar05140

Now we are onto the questions that focus on fire safety in the home - the first section is about smoke alarms and heat sensors						
Question 2: SMOKE ALARMS						
2a	**Is there a smoke alarm where you live?** ***Prompt:*** *Show pictures of smoke alarms*	Y/N				
2b	***If yes* - how many smoke alarms do you have?**					
2c	**How many floors/levels do you have in your house?** ***Prompt*** *show diagram of house for clarity.*					
2d	**Do you have a smoke alarm on every floor/level?** ***Prompt*** *show diagram of house for clarity.*					
		Alarm 1	**Alarm 2**	**Alarm 3**	**Alarm 4**	**Alarm 5**
2e	**Where are they?** ***Prompt:*** *On which floor? Whereabouts? (e.g. On landing, in hall by kitchen door).*					
2f	**Who fitted the alarm*?*** ***Prompt:*** *Could be self, fire brigade, landlord (city council/housing association) or other (e.g. there when family moved in).*					
2g	**What type e.g.** *wired, battery operated, or sealed unit?* **Prompt:** *show pictures here as necessary*					
2h	**Do these alarms work?**	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK
2i	**If the alarm is battery operated, has it had new batteries in last 6 months?**					
2j	**How often are the alarms tested? *Prompt: when was the alarm last tested and offer*** *Daily/weekly/monthly/every 6 months/every year/other* ***Please record frequency in table if response is 'other'***					
2k	**If you *do not have* a smoke alarm (or not on every floor) please can you tell us why?**	*Record brief details*				
2l	**If you *do not have* a smoke alarm (or not on every floor) have you thought about getting a smoke alarm?**	*Record brief details*				
2m	***If no* smoke alarm (or not on every floor) then ask what would help parent/carer to get one?**	*Record brief details*				

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QUESTION 3: HEAT SENSORS - *Researchers please note:* *not everyone will have a heat sensor; these questions are to make sure the information collected is as comprehensive as possible.*						
3a	**Is there a heat sensor where you live?** ***Prompt:*** *Show pictures of heat sensors*	Y/N				
3b	***If yes*- How many heat sensors do you have?**					
3c	**Do you have a heat sensor on every floor/level or your house?** ***Prompt*** *show diagram of house for clarity.*					
		Sensor 1	**Sensor 2**	**Sensor 3**	**Sensor 4**	**Sensor 5**
3d	**Where are they?** ***Prompt:*** *On which floor? Whereabouts? (e.g. On landing, in hall by kitchen door etc).*					
3e	**Who fitted the heat sensor?** ***Prompt:*** *Could be self, fire brigade, landlord (city council/housing association) or other (e.g. there when family moved in).*					
3f	**What type e.g.** *wired, battery operated, or sealed unit?* **Prompt:** *show pictures here as necessary*					
3g	**Do these heat sensors work?**	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK	Yes/No/DK
3h	**If the heat sensor is battery operated, has it had new batteries in last 6 months?**					
3i	**How often are the heat sensors tested? *Prompt: when was the sensor last tested and offer*** *Daily/weekly/monthly/every 6 months/every year/other* ***Please record frequency in table if response is 'other'***					

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FIRE PREVENTION PRACTICES REPORTED BY FAMILIES.		
Question 4	**FIRE SAFETY ROUTINES**	
Now we come to more general questions about fire safety in the home:		
4a	**Do you have a bedtime routine to reduce the risk of fire at night?**	Y/N/unsure
4b	***If yes or unsure,* please can you tell us what you do*?*** ***Prompt if necessary-****e.g. unplug appliances, dispose of smoking materials, close doors*	*Record brief details*
4c	**Do you have an escape plan for your household if there is a fire?** ***Prompt: How would your family escape from a fire in your house?***	Y/N/unsure *Record brief details even if unsure*
4d	***If answer is yes, there is an escape plan*** ***Ask* 'have you practised it with your family'?**	Y/N
4e	***If yes* - ask when was the last time you practised it?**	*Record brief details*
4f	***If no* - ask what prevents you from practising it?**	*Record brief details*

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Question 5	FORMS OF HEATING						
These next questions are about how you heat your home:							
5a	**How do you heat your home?** ***Prompt if necessary:*** *Show pictures of each type of heater if applicable*						
5a1	**Central Heating (includes storage heaters/radiators)**	Y/N					
5a2	**Do you have fireguard/s with your radiators?** *Prompt with pictures of fireguards if necessary*	Y/N	***If yes*, how often do use the fireguard/s?**				
			Never	Rarely	Some-Times	Often	Always
5a3	**Fixed gas fire**	Y/N					
5a4	**Do you have fireguard/s separate from the fire itself with your fixed gas fire?**	Y/N	***If yes*, how often do use the fireguard/s?**				
			Never	Rarely	Some-Times	Often	Always
5a5	***If yes,* is the guard fixed to the wall?**	Y/N					
5a6	**Portable gas fire**	Y/N					
5a7	**Do you have fireguard/s separate from the fire itself with your portable gas fire?**	Y/N	***If yes*, how often do use the fireguard/s?**				
			Never	Rarely	Some-Times	Often	Always
5a8	**Portable paraffin heater**	Y/N					
5a9	**Do you have fireguard/s separate from the fire itself with your portable paraffin heater?**	Y/N	***If yes*, how often do use the fireguard/s?**				
			Never	Rarely	Some-Times	Often	Always

Question 5	FORMS OF HEATING –CONTINUED						
5a10	Fixed electric fire	Y/N					
5a11	Do you have fireguard/s separate from the fire itself with your fixed electric fire?	Y/N	*If yes,* how often do use the fireguard/s?				
			Never	Rarely	Some-Times	Often	Always
5a12	*If yes,* is the guard fixed to the wall?	Y/N					
5a13	Portable electric fan heater	Y/N					
5a14	Do you have fireguard/s separate from the fire itself with your portable electric fan heater?	Y/N	*If yes*, how often do use the fireguard/s?				
			Never	Rarely	Some-Times	Often	Always
5a15	Portable electric convector heater	Y/N					
5a16	Do you have fireguard/s separate from the fire itself with your portable electric convector heater?	Y/N	*If yes*, how often do use the fireguard/s?				
			Never	Rarely	Some-Times	Often	Always

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Question 5	FORMS OF HEATING -CONTINUED					
5a17	**Open coal/wood fire**	Y/N				
5a18	**Do you have fireguard/s separate from the fire itself with your open fire?**	Y/N	***If yes*, how often do use the fireguard/s?**			
			Never	Rarely	Some-Times	Often	Always
5a19	***If yes* is the guard fixed to the wall?**	Y/N				
5a20	**Do you have a spark guard?**	Y/N	***If yes*, how often do use the spark guard?**			
			Never	Rarely	Some-Times	Often	Always
5a21	**Enclosed coal fire/wood stove**	Y/N				
5a22	**Do you have fireguard/s separate from the fire itself with your enclosed fire/wood stove?**	Y/N	***If yes*, how often do use the fireguard/s?**			
			Never	Rarely	Some-Times	Often	Always
5b	**If you do <u>not have a</u> fireguard, please can you tell us why and also say what would help you get one?**	Please record brief details				
5c	**Do you leave gas or electric fires on when you are sleeping?**	Never	Rarely	Sometimes	Often	Always
5d	***If yes*, do you leave a safety guard in front of them?**	Never	Rarely	Sometimes	Often	Always
5e	**Do you leave an open fire (coal or wood) lit when you are sleeping?**	Never	Rarely	Sometimes	Often	Always
5f	***If yes,* do you leave a fire guard in front of it?**	Never	Rarely	Sometimes	Often	Always
5f	***If yes,* do you leave a spark guard in front of it?**	Never	Rarely	Sometimes	Often	Always
5g	**In winter do you ever leave the oven on, with the door open, to warm your home?**	Y/N				

Question 6: USE OF CANDLES, MATCHES AND LIGHTERS AND COOKING PRACTICES IN THE HOME						
6a	**Do you burn candles or tea lights (nightlights) at home?** ***Prompt*:** *Include for birthdays/celebrations? Or for any other reason?*	Y/N				
		Never	Rarely	Sometimes	Often	Always
6b	***If yes:* Do you leave them lit while you are out of the room?**					
6c	**Do you leave them lit when you go to bed?**					
6d	**Do you keep matches and lighters at home?**	Y/N				
6e	***If yes:* Where do you keep them?** **Please prompt:** *locked away? How high up?*	*Record brief details*				
6f	**Would it be possible for children under 5 years old to find them?**	Y/N/DK				
6g	**Would it be possible for children under 5 years old to reach them?**	Y/N/DK				
6h	**Have you ever found your children playing with matches or lighters?**	Y/N				
6i	**At what age would you let your children use the cooker/oven/ by themselves?**	Record age and details here.				
6j	**At what age would you let your children use the microwave by themselves?**	Record age and details here.				

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Question 7	**NOW SOME QUESTIONS ABOUT SMOKING AND DRINKING ALCOHOL.** ***Prompt: Please explain*** *if asked that both* ***smoking and drinking alcohol*** *are risk factors in accidents in the home and that is why we are asking these questions.*			
7a	**Does anyone in your household smoke?**	Y/N		
7b	**How many people in the household smoke?**			
7c	***If yes*: do they smoke inside the house?** **Person 1** **Person 2** **Person 3** **Person 4**	 Y/N/DK Y/N/DK Y/N/DK Y/N/DK		***Record the total number of people who smoke indoors***
7c	**Do they smoke in bed?** **Person 1** **Person 2** **Person 3** **Person 4**	 Y/N/DK Y/N/DK Y/N/DK Y/N/DK		***Record the total number of people who smoke in bed***
7d	**In the past month do you know if anyone in your household regularly has had more than 4 or 5 alcoholic drinks per day? (4 if female; 5 if male)-** ***Prompt: if not every day ask what about at weekends-Friday to Sunday***	Monday-Thursday Y/N	Friday-Sunday Y/N	***Record how many people have had this number of drinks***
7e	***If yes*-would that be mostly beer/cider?** **Person 1** **Person 2** **Person 3** **Person 4**	 Y/N/DK Y/N/DK Y/N/DK Y/N/DK	 Y/N/DK Y/N/DK Y/N/DK Y/N/DK	
7f	***If yes*-would that be mostly wine?** **Person 1** **Person 2** **Person 3** **Person 4**	 Y/N/DK Y/N/DK Y/N/DK Y/N/DK	 Y/N/DK Y/N/DK Y/N/DK Y/N/DK	
7g	***If yes*-would that be mostly spirits?** **Person 1** **Person 2** **Person 3** **Person 4**	 Y/N/DK Y/N/DK Y/N/DK Y/N/DK	 Y/N/DK Y/N/DK Y/N/DK Y/N/DK	

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ELECTRICAL SAFETY			
Question 8: the next questions are about electrical safety-			
8a	**Do you have enough electric sockets for your own or your family's use in your home?** **:**	Y/N	
8b	***If no:*** **how do you cope with that?-** ***Prompt****-multi sockets, extension sockets*	*please record details*	
8c	**If respondent says they *have more than one appliance plugged into some sockets* please ask them how they do this?** ***Prompt-****Show pictures of different kinds of adaptors*	• Switched bar type extension • Non-switched bar type extension • Wire more than one appliance into socket • Cube multi-socket • Plug- in mains adaptor • Any other type of socket? *Please describe*	Y/N Y/N Y/N Y/N Y/N Y/N

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Question 9	Do you own any of the following items? *If yes*, how often are they used in your home? *Please record any additional information given by parent/carer in answer to these questions*						
	Appliance	**Own/have in household**	***Use Daily***	***Use Weekly***	***Use Once or twice a month***	***Use Occasionally***	***Where do you store this item when it is not in use but still hot?***
9a	**Curling tongs**	Y/N					
9b	**Hair Straighteners**	Y/N					
9c	**Deep Fat Fryer**	Y/N					
9d	**BBQ**	Y/N					
9e	**Iron**	Y/N					
9f	**Chip Pan**	Y/N					
9g	**Electric Blanket**	Y/N					**How old is it?** **When did you last have it serviced?**

DOI: 10.3310/pgfar05140

Question 10 Now we have 3 scenarios which are quite common in families with young children and would like to ask you what you would do ineach situation			
10a **Scenario 1**	**If you were in a situation where hot fat in a pan caught on fire - what would you do?** ***(This could be in your own home or someone else's home)*** ***Prompt: ask general questions and then if parent/carer seems uncertain then give out the answer cards*** *Parent/carer may give as many responses as they feel are relevant* ***Prompt:*** *Please also record if respondent says they always use a deep fat fryer or cook 'oven chips'*	1. Put a damp tea-towel over the flames while pan still on the stove 2. Pour water onto the flames while pan still on the stove 3. Carry the pan to sink and pour water over it 4. Turn cooker/stove off 5. Phone 999 6. Leave the house 7. Unsure 8. Anything else? *Please record*	Y/N/DK Y/N/DK Y/N/DK Y/N/DK Y/N/DK Y/N/DK Y/N/DK Y/N/DK

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Question 10 -CONTINUED **Now we have 2 more scenarios which are quite common in families with young children and would like to ask you what you would do in each situation**			
10b **Scenario 2**	**If a young child touched a hot iron and got a contact burn - less than the size of a postage stamp - what would you do?** ***Prompt: ask general questions and then if parent/carer seems uncertain then give out the answer cards*** *Parent/carer may give as many responses as they feel are relevant*	1. Cool burn under cold running water for 10-15 minutes 2. Cool burn in a bowl of water for 10-15 minutes 3. Apply antiseptic ointment 4. Seek medical help 5. Anything else? *Please record*	Y/N/DK Y/N/DK Y/N/DK Y/N/DK Y/N/DK
10c **Scenario 3**	**If a young child touched a hot iron and got a contact burn - larger than the size of a postage stamp - what would you do?** ***Prompt: ask general questions and then if parent/carer seems uncertain then give out the answer cards*** *Parent/carer may give as many responses as they feel are relevant*	1. Cool burn under cold running water for 10-15 minutes 2. Cool burn in a bowl of water for 10-15 minutes 3. Apply antiseptic ointment 4. Seek medical help 5. Anything else? *Please record*	Y/N/DK Y/N/DK Y/N/DK Y/N/DK Y/N/DK

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DOI: 10.3310/pgfar05140

Question 11	**Is there anything else you would like to suggest that would help others make their homes safer from fire?** *Please record briefly*	
Did the parent/carer raise concerns about fire safety in their home? ***If yes*** **Was participant referred to: HV** **Children's Centre Staff**		Y/N Y/N Y/N
Were Fire Safety Leaflets offered to parent/carer?		Y/N

Length of interview: ☐ **minutes**

Researchers please note here any extra relevant information that the participant gave during the interview.
Also please note how the interview went - for example did the participant appear comfortable with the interview, was the interview rushed or perhaps interrupted by children?

Notes:
Extra relevant information provided:

How interview went:

NIHR Journals Library www.journalslibrary.nihr.ac.uk

Keeping Children Safe
Interview Study to explore fire safety practices of parents/carers of children aged 0-4 years

Prompt Sheet for Ethnicity Questions:

White:

British ☐
Irish ☐
Other (please say here)…….....

Asian or Asian British:

Pakistan ☐
Bangladeshi ☐
Indian ☐
Other (please say here)....….....……

Black or black British:

Caribbean ☐
African ☐
Other (please say here)….....……

Mixed background:

White & Black Caribbean ☐
White & Black African ☐
White & Asian ☐
Other (please say here).....

Chinese ☐

Any other ethnic group? (please say here)…….....….

What is your first language? …….....….

Injury prevention briefing 1

Injury Prevention Briefing

Preventing Fire-Related Thermal Injuries in Pre-School Children

Mike Hayes
Child Accident Prevention Trust

Elizabeth Towner
Centre for Child and Adolescent Health
University of the West of England Bristol

keeping children SAFE AT HOME

Version 1.0
September 2011

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This publication presents independent research commissioned by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research funding scheme (RP-PG-0407-10231).

The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

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Section A:
Introduction

Aim and target audience of the Injury Prevention Briefing

This Injury Prevention Briefing (IPB) is the first of four briefings which provide guidance about the importance of home injuries in pre-school children and how these injuries can be prevented. The target audience of the IPB is Sure Start Children's Centres. Children's Centres are in the position to engage with families where children are at risk from poor outcomes and they can act as hubs for family support and as a base for voluntary and community groups.

This IPB is about fire-related thermal injuries in pre-school children, where partnership with the Fire and Rescue Service is encouraged. The other three IPBs will be on the prevention of falls, scalds and poisoning injuries.

How we prepared this briefing

This Briefing has been prepared as part of the 'Keeping Children Safe at Home' programme. This is a major project funded by the National Institute for Health Research, part of the NHS. It is a collaboration between four universities (Nottingham, UWE Bristol, Newcastle and Leicester), Norfolk and Norwich University Hospitals NHS Foundation Trust and the Child Accident Prevention Trust. The project aims to improve our understanding of children's accidents and thus make their prevention more effective.

The IPB brings together the scientific evidence on what works, or can be regarded as best practice, with the practical experience of people who already run injury prevention programmes in the field, both through Children's Centres or elsewhere. Different sources of evidence have been used to prepare this IPB. These include:

- Systematic reviews of what interventions work in preventing injuries from house fires and what health promotion approaches work with families of pre-school children.
- Cost effectiveness analyses.
- Surveys and interviews with Children's Centre managers about injury prevention initiatives in their Centres.
- Interviews with parents of pre-school children about their fire-related practices in the home, e.g. their ownership and maintenance of smoke alarms, whether they have prepared a fire escape plan, etc.
- Interviews with 'key informants' about national policy in this field.
- Workshops of local practitioners and policy makers, which have taken place in Nottingham, Bristol, Norwich and Newcastle, about how to implement programmes in Children's Centres and how to reach families in the community.

Structure of the IPB

After this introductory ***Section A***, this IPB is composed of three main sections:

- ***Section B*** directed at commissioners
- ***Section C*** directed at Children's Centre managers
- ***Section D*** directed at practitioners working directly with families.

The materials developed in the IPB are sufficiently flexible that they can be used in different types of Children's Centres located in different parts of the country. Children's Centres are seen as providing the hub for the injury prevention initiatives (in this case on the prevention of fire-related thermal injuries), working in partnership with other agencies.

Each of the sections B, C and D has been developed to stand alone – as a result, there is some overlap in different sections. However all sections are provided so that, for example, commissioners can read section B in detail but have sections C and D provided for information.

Section B:
Advice for Commissioners

This IPB is about the prevention of fire-related thermal injuries in pre-school children, where partnership working with the Fire and Rescue Service is encouraged.

Key Messages for Commissioners

- House fires are a significant cause of death in pre-school children.
- There is a strong link between deaths and injuries in house fires and social deprivation.
- Preventive programmes are available and merit more widespread implementation.
- Children's Centres working with partners (particularly the Fire and Rescue Service) can make a difference.
- Preventive interventions can be built into Children's Centres' health promotion programmes.

Making the case - why is the prevention of injuries and the prevention of injuries from house fires important?

Scale of the problem

Unintentional injury is a major challenge for the health and well being of preschool children today. It is one of the leading cause of death in children aged 1-4 years in the UK. Falls, poisonings and thermal injuries are the most common injuries resulting in hospital admissions and emergency department (ED) attendance in pre-school children.

A substantial number of children die from unintentional injuries at home or in leisure environments. Children and young people who survive a serious unintentional injury can experience severe pain and may need lengthy treatment and numerous stays in hospital. They could be permanently disabled or disfigured and their injuries may have an impact on their social and psychological wellbeing. A child burned in early infancy may carry the scars for the rest of his/ her life.

House fires

House fires are an important cause of death in pre-school children. In the UK in the three-year period 2006-2008, 42 children under the age of 5 years died as a result of a house fire in the UK (17 in 2006; 15 in 2007 and 10 in 2008) (DCLG, 2010a). House fires can kill and seriously injure both children and adults. While it is often the smoke that kills people, burns can also be very serious injuries which may require long periods of treatment.

House fires can also result in considerable cost and disruption for families, the house can be uninhabitable for a long time and possessions ruined, with a need for furniture and equipment to be replaced and houses redecorated. If the house and contents are not insured, the costs can be very high.

Links with deprivation

There are strong links between childhood injury deaths and families living in deprived circumstances. For all unintentional childhood injury deaths, the children of parents who have never worked or are in long term unemployment are 13 times more likely to die from an injury than those whose parents have higher managerial occupations. When childhood deaths from house fires are examined the gradient is even steeper at 37 times the rate for more advantaged families (Edwards et al. 2006).

Children are particularly vulnerable

Young children's injuries relate closely to their age and stage of development. In a house fire a young child will need the help of an adult to escape from a house fire. In the event of a fire, a young child's natural reaction may be to hide – under a bed or in a cupboard or wardrobe to escape the effects of the fire.

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Costs of injuries

The costs of ED attendances for unintentional injuries in pre-school children exceeds £17 million per year. The average cost of a domestic fire was estimated at £24,900 in 2004, of which approximately £14,600 was accounted for by the economic cost of injuries and fatalities and £7,300 was due to property damage (ODPM 2006).

Prevention of injuries and of house fires

A range of prevention programmes are available to prevent childhood injuries and also injuries from house fires. Children's Centres working with partners (particularly the Fire and Rescue Service) can make a difference if the messages are promoted as part of the Centre's health promotion programme.

A number of interventions are effective in reducing the impact of fires, should they occur (secondary prevention). The programmes where there is good evidence of effectiveness include:

- The correct fitting and maintenance of smoke alarms.
- The development and practising by families of fire escape plans.

This IPB concentrates particularly on these two effective messages:

- In 2008, 91% of households in England had a smoke alarm but some groups had lower ownership rates, for example private tenants (87%) compared with those renting from housing associations (94%) and ethnic minority households (87%) (DCLG 2010b). Ownership of smoke alarms is not the complete picture: alarms need to be positioned and fitted correctly and regularly maintained.
- In a survey of parents of pre-school children conducted as part of the Keeping Children Safe at Home project, 43% of parents said that they had a fire escape plan for their homes and 13% had practised the plan. There is thus much scope for increasing parents' knowledge about fire escape plans.

Secondary fire prevention needs to be complemented by efforts to prevent the fire in the first place (primary prevention) such as through smoking cessation programmes, safe storage of matches and lighters, safe use of candles, reduction in fire play by children and bedtime safety routines. The main cause of deaths in house fires is what is officially described as "careless handling of fire and hot substances (e.g. careless disposal of cigarettes)" (DCLG 2010a).

When Children's Centres work on other areas of health promotion such as programmes aimed at smoking cessation, healthy eating (e.g. reduction in deep fat frying of foods) and alcohol reduction, the messages of house fire prevention can also be supported.

How does the promotion of childhood injury prevention fit into the policy framework for children's health and well being?

Two reports published in November 2010 provide some background to the policy context – these are the Public Health White Paper and NICE guidance on preventing unintentional injuries in children under the age of 15 years.

Public Health White Paper

The Public Health White Paper, 'Healthy Lives, Healthy People: our strategy for public health in England' was published in November 2010 (HM Government, 2010). This emphasised the government's commitment to reducing health inequalities and reinforced the role of Children's Centres for those in most need. Local communities have been placed at the heart of public health and the importance of partnership working has been emphasised. The draft Public Health Outcomes Framework, published in December 2010, includes outcomes related to preventing unintentional injuries among the under 5s (Department of Health, 2010).

NICE Guidance

The National Institute for Health and Clinical Excellence (NICE) published public health guidance on 'Strategies to prevent unintentional injuries among children and young people aged under 15' in November 2010 (NICE 2010). This guidance recommends that local and national plans and strategies for children and young people's health and wellbeing include a commitment to preventing unintentional injuries.

Emphasis is also given to preventing unintentional injuries among the most vulnerable groups in order to reduce inequalities in health.

Partnership working is seen as key to the prevention of injuries, with support for cross-departmental and cross-agency working to achieve national and local commitments. Support for local partnerships is recommended, including those with the voluntary sector, and there is an expectation that partners work together to ensure children and young people can lead healthy, active lives.

Other areas to highlight

Local conditions vary and these may be important in implementing this Injury Prevention Briefing. Some locality features may enhance the risk of injuries to pre-school children – for example, the nature of the housing stock, socio-economic conditions, different ethnic groups, cultural differences, urban/ rural localities, whether there are temporary migrant groups in the locality, etc.

Section C for Children's Centre Managers provides more detailed suggestions about training and how to organise initiatives related to the prevention of fire related thermal injuries.

Section D for Practitioners working directly with families provides a summary of the key messages and range of suggested activities for working. These two sections are provided for information.

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Section C:
Advice for Children's Centre Managers

This Injury Prevention Briefing is about the prevention of fire-related thermal injuries in pre-school children, where partnership working with the Fire and Rescue Service is encouraged. Section C is directed at Children's Centre managers and provides suggestions about training and how to organise initiatives related to the prevention of fire related thermal injuries.

Key Messages for Children's Centre Managers

- House fires are a significant cause of death in pre-school children, particularly in families living in more deprived conditions.
- Children's Centres working with partners (particularly the Fire and Rescue Service) can make a difference using proven preventive programmes.
- Preventive interventions can be built into Children's Centres' health promotion programmes.
- Training for practitioners working directly with families needs to concentrate on six key messages and involve input from the Fire and Rescue Service.
- Opportunistic and planned approaches can be used to reach families, including one-to-one contacts in the home or Children's Centre and small group work in the Children's Centre or other setting.

Making the case - Why is the prevention of injuries and the prevention of injuries from house fires important?

Importance of child injuries

Unintentional injury is a major challenge for the health and wellbeing of preschool children. It is one of the leading cause of death in children aged 1-4 years in the UK. Children and young people who survive a serious unintentional injury can experience severe pain and may need lengthy treatment and numerous stays in hospital. They could be permanently disabled or disfigured and their injuries may have an impact on their social and psychological wellbeing. A child burned in early infancy may carry the scars for the rest of his/ her life.

House fires are an important cause of death in preschool children. In the UK in the three-year period 2006-2008, 42 children under the age of 5 years died as a result of a house fire in the UK. While it is often the smoke that kills people, burns can also be very serious injuries which may require long periods of treatment. House fires can also cause considerable cost and disruption for families, with a house uninhabitable for a long time and possessions ruined.

Links with deprivation

There are strong links between childhood injury deaths and families living in deprived circumstances. For all unintentional childhood injury deaths, the children of parents who have never worked or in long term unemployment are 13 times more likely to die from an injury compared with children whose parents have higher managerial occupations and this figure is 37 times higher for deaths from house fires.

Children are particularly vulnerable

Young children's injuries relate closely to their age and stage of development. In a house fire a young child will need the help of an adult to escape from the house. Many fatal house fires occur at night. If a fire occurs in the house, a young child's natural reaction may be to hide – under a bed or in a cupboard or wardrobe to escape the effects of the fire.

Prevention of injuries and of house fires

A range of prevention programmes are available to prevent childhood injuries and also injuries from house fires. Children's Centres working with partners (particularly the Fire and Rescue Service) can make a difference if the messages are promoted as part of the Centre's health promotion programme.

A number of interventions are effective in reducing the impact of fires, should they occur (secondary prevention). The programmes where there is good evidence of effectiveness include:

- The correct fitting and maintenance of smoke alarms.

- The development and practising by families of fire escape plans.

Secondary fire prevention needs to be complemented by efforts to prevent the fire in the first place (primary prevention) such as through smoking cessation programmes, safe storage of matches and lighters, safe use of candles, reduction in fire play by children and bedtime safety routines.

When Children's Centres work on other areas of health promotion such as programmes aimed at smoking cessation, healthy eating (e.g. reduction in deep fat frying of foods) and alcohol reduction, the messages of house fire prevention can also be supported.

Who is the target group?

The target group for the programme includes children under five and their families. All families are at risk of fires in their homes but some groups are at particular risk, including families living in more socially deprived conditions, those living in privately rented homes, children from some ethnic groups, and households where there is a smoker or a family member with hearing impairment.

The interventions

Children's Centres can act as the 'hub' for programmes on the prevention of fire-related thermal injuries in pre-school children. A member of the Children's Centre staff can act as the champion for injury prevention to lead and coordinate activities. In partnership with the Fire and Rescue Service, these may include the training of different practitioners who work directly with families: family support workers, health visitors, nursery nurses and social services staff. This allows practitioners to give consistent advice to parents and carers about fire-related thermal injuries.

In section 0, a package of primary and secondary prevention measures is suggested, emphasising in particular the ownership and maintenance of smoke alarms and the important of families developing and practising a fire escape plan for their homes.

The key messages of the package are:

- The importance of smoke alarm use and maintenance.
- Having a family fire escape plan.
- Identifying potential causes of house fires.
- Understanding children's behaviour and its relationship to prevention - safe storage of matches and lighters.
- Having a bedtime fire safety routine.

In section 0, a series of practical exercises based around these messages is provided. These can be adapted for use by Children's Centre staff working directly with parents.

In addition, fire safety can be incorporated into existing smoking cessation and healthy eating programmes run at Children's Centres as cigarettes and matches, and chip pans are major cause of house fires.

Practical advice tailored to the individual home may be the helpful. Members of the local Fire and Rescue Service may be able to make a 'home fire risk assessment' visit to people's homes (**http://www.fireservice.co.uk/safety/hfsc**). The home visit focuses on three areas:

1. Identification and awareness of the potential fire risks within the home (e.g. electrical safety, smoking safety and the use of electric blankets, etc).
2. Knowledge of what to do to reduce or prevent these risks (e.g. overloaded electrical sockets, wires trapped under carpets, ensuring that doors shut correctly, etc).
3. Putting together an escape plan in case a fire does break out and ensuring that smoke alarms work.

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Creative ways of reaching target groups

The best ways of reaching parents may vary for the different populations served by Children's Centres and individual centres may be able to work creatively with other partners to involve some traditionally 'hard to reach' groups. Both opportunistic and planned approaches may be possible for:

- Small group work with parents in Children's Centres.
- Small group work with parents in other settings, e.g. nurseries.
- One-to-one work with parents in Children's Centres and other settings.
- One- to-one work with parents in the home environment.

Messages need to be reinforced in different settings, with an emphasis on the consistency of messages being delivered. Use needs to be made of 'opportunity windows' when interest in the subject is high, such as a fire that hits the headlines in the media, a local fire in the area, Child Safety Week or national fire safety week.

Innovative ways of working with parents may include:

- A parent who has experienced a house fire may be willing to act as a peer supporter to the programme in the Children's Centre. Their experience could be developed as a constructive case study.
- The Children's Centre parents advisory group can be consulted for different ways of reaching parents in their neighbourhood.
- Parents may be willing to act as champions or advocates for home fire safety, for example working with a tenants' association on safety measures.
- Popular activities within the Centre, e.g. first aid can be used as an entrée to discussion about injury prevention. Healthy eating classes could include messages related to deep frying and healthier alternatives.

Evaluation of the programme

Evaluation of the programme needs to be built in from the start. It is important to document all activities and to consider which elements work and for whom. A local evaluation of the programme may be useful for inclusion in an Ofsted report for the Children's Centre.

Outcome measures

It will not be possible for an individual Children's Centre to demonstrate that a programme on fire-related injuries in pre-school children has an impact on reducing outcomes such as specific injuries to children or the number of house fires experienced by families in its catchment area. The numbers in any one area will be too small to allow this. However, more realistic intermediate outcome measures include: the number of families with functioning smoke alarms at every level in their homes, the number of families who have developed and practised a family fire escape plan, and the number of families who have taken up smoking cessation classes.

Process measures

Documentation of the process of the intervention would be helpful. Some suggestions of questions are given below:

Training sessions for practitioners

- Was training for practitioners conducted?
- Who initiated the training?
- Who conducted the training?
- What messages were included in the training?
- How long did the session last?
- How many people attended the training session/s?
- Was the training acceptable to the target group? What elements were considered good, what were considered less good? Were there any omissions?

Small group work with parents in the Children's Centre

- Who initiated the small group session?
- Who conducted the small group session?
- What messages were included in the session?
- How long did the session last?
- How many people attended the session/s?
- Was the training acceptable to the target group? What elements were considered good, what were considered less good? Were there any omissions?

One-to-one contacts with parents in the Children's Centre settings and other formal settings

- How did these occur?
- How many contacts were made with parents and by whom?

One-to-one contacts with parents in their homes

- Did any home fire risk assessment visits to families' homes take place by Fire and Rescue Service staff?
- Did family support staff or health visitors have the opportunity to include messages about fire safety in their home visits?

Other

- Was a Children's Centre parents advisory group involved in planning the programme?
- Did any parents act as Parent Peer Supporters or Parent Advocates for the programme?
- Was any use made of 'opportunity windows' when interest in the subject was high?
- Were there any ways in which it was possible to involve 'hard to reach' groups?
- Were there any barriers that hindered the adoption of the programme in your Children's Centre?
- Were there any facilitators that encouraged the adoption of the programme in your Children's Centre?
- What advice would you give to another Children's Centre in running the programme?

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Section D:

Advice for Practitioners

This Injury Prevention Briefing is about the prevention of fire-related thermal injuries in pre-school children, where partnership working with the Fire and Rescue Service is encouraged. This section is directed at Children's Centre staff. It provides suggestions about programmes that can be run with parents and carers to highlight the causes of house fires and ways to minimise risk of deaths and injuries.

Key Messages for Children's Centre Staff

- House fires are a significant cause of death in pre-school children, particularly in families living in more deprived conditions.
- Children's Centres working with partners (particularly the Fire and Rescue Service) can make a difference using proven preventive programmes.
- Using the programmes set out in this section, particularly those relating to the ownership and correct use of smoke alarms, and having and practising a family fire escape plan, the risks of deaths and injuries can be reduced.

Why is the prevention of house fires important?

House fires kill and seriously injure children and adults. While it is often the smoke that kills people, burns are very serious injuries, often requiring prolonged treatment while the child continues to grow.

House fires cause massive disruption to the family. The house is likely to become uninhabitable for a long time. It will require redecoration, furniture will need replacement and rooms such as the kitchen may need to be re-equipped. If the family home is not insured, the costs can be prohibitive.

Even though statistics may say that fire deaths in your area are very low, the next major fire, like the one described below, may happen in your town.

Extract from a story on *Mail Online*

Mother rescued three sons from blazing home but died alongside daughter as she tried to coax her out from under her bed.

A mother who battled flames to rescue her three sons from their blazing home died in a desperate bid to save her little girl as she hid under a bed, an inquest heard yesterday. Michelle Thomas managed to pull the three boys from the inferno before she dashed back inside for four-year-old Courtney. But her efforts were in vain and firefighters later found their two bodies lying side by side on the floor in the child's bedroom.

Fire investigator David Phillips said: 'Michelle was cooking their tea in the kitchen when the alarm was raised. 'But Courtney appears to have run upstairs to escape the fire. Michelle had left the property but then re-entered in an attempt to rescue Courtney. From a small fire from the cigarette lighter to the whole bedroom being engulfed would have taken about a minute.'

Post mortem examinations showed Courtney died after breathing in smoke. Her mother died of smoke inhalation and burns.

The inquest heard the semi-detached home had no working smoke alarms.

Coroner Philip Rogers said: 'The fire spread very rapidly. There are several lessons which can be learned, including the danger of allowing children access or to play with any combustible material.' He recorded verdicts of accidental death on both mother and daughter.

Who is at greatest risk?

Research shows that children in the most disadvantaged families are 37 times more likely to die in a house fire than the most affluent.

Why? There are many reasons. For example:

- They may live in older houses.
- They may live in overcrowded conditions.
- They may have old furniture that does not meet current flammability requirements and that may give off very toxic smoke when it burns.

Young children are particularly high risk because:

- Toddlers tend to hide from danger, rather than try and escape.
- Even if they are old enough to help themselves, they may not know what to do when the smoke alarm goes off.
- If they are babies, they are completely dependent on adults for help.

However, although there some very high risk groups, fire safety is important for everyone.

What are the main causes of house fires?

- Cigarettes that have not been extinguished properly.
- Chip pans.
- Faulty electrical wiring.
- Children playing with matches and lighters. The combination of the fact that children are attracted by flames and that they try and copy adult behaviour can be fatal.
- Candles and tea lights.
- Clothes and furnishings that are too close to fires and heaters.

Some of these cause can be exacerbated by the consumption of excess alcohol. A classic scenario is for an adult to return home from the pub, perhaps drunk and tired, light a cigarette and fall asleep in a chair. The cigarette falls and sets light to the chair. Instead of lighting a cigarette, the adult may put on the chip pan to make a snack but then fall asleep. The chip pan catches light causing a house fire.

What you can do to help

Prevent the fire from happening – this is called primary prevention in that it aims to prevent the hazardous situation arising at all.

Make sure that if the fire does occur the family can escape – this approach is called secondary prevention; the hazardous event (the fire) occurs so prevention activities are focussed on making sure that injuries do not happen or their severity is minimised.

Primary and secondary prevention are both important approaches and are not alternatives.

What works to prevent house fires and their consequences?

There is good evidence that certain prevention programmes can make a real difference. Using these programmes means that you are working as effectively as possible. The programmes that are known to work include:

- The correct fitting and maintenance of smoke alarms.
- The development and practising by families of fire escape plans.

Other activities are equally important but have not been fully evaluated.

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Where to get specialist advice and help

All Fire and Rescue Services have staff whose role is to promote fire prevention. You should find out what your local Fire and Rescue Service will do for you, but it may include some or all of the following:

- Fitting free smoke alarms in homes, especially those with vulnerable families (children and older people, people with disabilities including hearing and sight problems).
- Giving advice to families whose smoke alarms keep going off inadvertently.
- Testing and, if necessary, replacing smoke alarms that are reaching the end of their normal life.
- Undertaking fire safety risk assessments in family homes. Linked with this, they will give advice to families.
- Speaking to groups of children and/or parents on fire safety in whatever settings are available, including Children's Centres.
- Training others who have the opportunity to pass on fire safety messages.
- Providing leaflets and other resources for families.

Examples of things you can do with parents

How you get the safety messages across to parents depends on your opportunities, working practices, staff skills and/or existing relationships with other agencies, such as your local Fire and Rescue Service. You may be able to work with parents one-to-one at the Children's Centre or in their homes, have the opportunity to run mini workshops or just highlight the messages through posters and handouts.

If you have the opportunity to run mini workshops, you could use some or all of the exercises presented in Annex 1. These highlight the key messages about preventing house fires and ensuring that if a fire does occur everyone manages to escape safely.

Below are the key messages that need to be presented to parents by whatever method you choose. These messages contain advice based on up to date evidence and should be presented as they appear below.

If you only have the opportunity to highlight a couple of topics, choose the key messages associated with exercises 1 and 5. These have the strongest evidence base; in other words, the approaches – the use of smoke alarms and having a family fire escape plan – are known to make a difference.

To support whatever method of emphasising the importance of fire safety for families that you use, you may also seek to highlight what fires are really like by, for example, inviting the fire prevention staff from your local Fire and Rescue Service along to speak to families, or they may have resources such as a DVD that you can use. Another powerful way of presenting the horrors, inconvenience and cost of having a house fire is to get a person who has experienced one first hand to speak to families.

Key messages

The importance of smoke alarms

- If you haven't got a smoke alarm, speak to the local Fire and Rescue Service – they may provide and fit one for you. If they can't do this, they will give you the best available advice.
- There should be a smoke alarm on every level of the home.
- Check that the alarm is working every week by pressing the test button until the alarm sounds.
- Replace the battery every year (unless it's a ten-year alarm or is wired into the electric mains).
- If the alarm keeps going off when there is no fire, ask the local Fire and Rescue Service for advice.

See also Information Sheet 1.

A family fire escape plan

A family escape plan should cover the following issues:

- Know what the smoke alarm sounds like so it does not come as a complete surprise to them. They should know what sound it makes from testing it regularly.
- Have a torch next to the bed.
- Be aware that the children may be hiding in their bedroom because they are frightened. Don't assume that if you cannot see them they have already escaped. Be prepared to look under the bed, in the wardrobe and anywhere else they could hide.
- Leave the front door key on a hook near the door, out of the reach of young children and not accessible to someone reaching through the letter box.
- Make sure that the stairs and the hall are clear of clutter that could slow you down.
- Think about a second escape route if the primary one – usually down the stairs and out of the front or back door – is not usable.
- Make sure that the key for the window locks is accessible to you, probably on a hook near the window, but not accessible to the children.

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Identifying potential causes of house fires The major causes of house fires are:

- Cigarettes, especially when not put out properly, e.g. when the smoker falls asleep in bed or a chair.
- Unattended chip pan, especially when it's too full of fat or oil. Cooking appliances used in some cultural groups may also produce similar hazards.
- Clothes drying on the fireguard. -

Clothes horse too close to a fire. -

Frayed electric wiring.

- Overloaded electric sockets (hot plugs or sockets, scorch marks, fuses that often blow, or flickering lights – they are all signs of loose wiring or other electrical problems).
- Candles and tea lights left unattended or with something too close above them. -

Young children having access to and playing with matches and lighters. - Old electric blankets.

- Electric cables running under rugs or carpets – you can't see if they are worn.
- Electric plugs that have not been wired properly - coloured wires sticking out of plugs is an indication of this.

Information sheet 2 presents many more common causes.

Children's behaviour and fire prevention – safe storage of matches and lighters Children's behaviours that can be associated with house fires include:

- Their understanding that a hidden object still exists (matches or a lighter hidden in drawer or cupboard).
- Being able to move something and then climb on it to reach and then open cupboard. -

Ability to hold a small object (a match box), open the box, handle a single match. - Wish to copy adult behaviour by striking a match or operating a lighter.

Children find a range of things appealing. A match or lighter will be appealing because it makes a sound when you strike it, there is a flash as it ignites and then the flame is a flickering light.

Matches and lighters need to be stored out of reach and out of sight.

Bedtime fire safety routine

To help prevent fires occurring through the night, it's important to check your home for fire hazards before you go to bed. Make sure you:

- Close inside doors at night to stop a fire from spreading.
- Check the cooker is turned off.
- Turn off and unplug electrical appliances (unless they are meant to be left on, like the freezer).
- Put candles and cigarettes out properly.
- Turn heaters off and put up sparkguards (if you have a coal or wood-burning fire) and fireguards.
- Keep all exits clear.

Annex 1.
Exercises that can be run with parents

The exercises below are intended to help you encourage people to reduce the risk of fire in their homes and provide guidance on what to do if there is a fire so as to minimise the risk of death and injury.

Five exercises are presented. The first introduces the key importance of smoke alarms, the most effective tool in preventing deaths and injuries. The next three present the key messages to prevent fires. The final one aims to ensure that people know what to do if the worst happens.

If you only have the opportunity to run a couple of these exercises, choose numbers 1 and 5. These have the strongest evidence base; in other words, the approaches – the use of smoke alarms and having a family escape plan – are known to make a difference:

- Exercise 1 explores people's understanding of house fires and their knowledge about smoke alarms.
- Exercise 2 is about minimising the risk of there being a fire by helping participants to identify what can cause a fire.
- Exercise 3 explores how child behaviour can lead to house fires.
- Exercise 4 stresses the importance of having a routine that families should follow at bedtime to make sure that things that can cause fires are made as safe as possible before you go to bed.
- Exercise 5 considers the problems of escaping when the smoke alarm sounds, stressing the importance of having a family escape plan.

IMPORTANT - BEFORE YOU RUN THESE EXERCISES

There are three things you need to do before you run the exercises presented below:

1. You should contact the fire prevention staff at your local Fire and Rescue Service (FRS) to check what help and advice they can provide to families who may contact them. Find out if there is a telephone number that people should use to obtain help and advice from the FRS. If the FRS prefers to be contacted by another means, for example, people sending in a postcard requesting a visit, you should ask for a supply of these. They may also be able to provide you with resources that you can use or give to families, or even offer to come along to support your initiatives.
2. You should ensure that families have working smoke alarms. If any do not have alarms or are having problems, such as alarms going off when cooking, you should strongly advise them to contact your local FRS who will be able to help. You can help them to make contact.
3. Check whether any of the participants has suffered a house fire or has had relatives of friends injured in one. If this is the case, you may need to cope with a distressed and upset person.

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Exercise 1. The importance of smoke alarms

If you cannot run the whole of this exercise, then use as much of it as you can.

Key messages

- If you haven't got a smoke alarm, speak to the local Fire and Rescue Service – they may provide and fit one for you. If they can't do this, they will give you the best available advice.
- There should be a smoke alarm on every level of the home.
- Check that the alarm is working every week by pressing the test button until the alarm sounds.
- Replace the battery every year (unless it's a ten-year alarm or is wired into the electric mains).
- If the alarm keeps going off when there is no fire, ask the local Fire and Rescue Service for advice.

Background

This exercise is about ensuring that families benefit from one of the most effective tools to prevent death and injury in house fires – the smoke alarm. It tests people's knowledge of house fires and leads them to realise the importance of having correctly functioning, appropriately located, regularly tested smoke alarms. It also touches on the needs of people with hearing difficulties.

Ownership of smoke alarms in the UK is very high – approaching 90 percent – thanks largely to initiatives that Fire and Rescue Services (FRS) have run for several years, providing and fitting smoke alarms in homes. However, ownership rates vary, depending on such factors as whether there is a smoker in the home and the degree of poverty – in both of these situations ownership rates are lower than the average.

There is strong evidence that functioning smoke alarms are a real life-saver in the event of a house fire. They provide extra crucial seconds of warning that there is a fire. It is not an exaggeration to say that they can make the difference between living and dying.

But simply having a smoke alarm is not enough. They have to be working correctly – the only way to ensure that this is the case is for the family to test them regularly. A smoke alarm that doesn't work for whatever reason, the most common being that the batteries have been removed, is not a smoke alarm – it's a piece of plastic attached to the ceiling that gives a completely false sense of security.

Information snippet

House fires in which smoke alarms raise the alarm:

- Are discovered more rapidly after ignition.
- Are associated with lower fatal casualty rates.
- Cause less damage as they are more often confined to the item first ignited.

Casualty rates are significantly higher through the night. The higher casualty rates during the night probably reflect the lack of awareness of the casualties at the time of ignition.

Learning objective

To highlight the importance of having smoke alarms and ensuring that they are working correctly.

Time

About 30 mins, including time to discuss some of the issues that may arise. The quiz about fire safety and smoke alarms only takes about 15 mins.

Equipment needed

Enough copies of the appended **Fire Safety Quiz Sheet** for people to work in groups of two or three and a supply of pens or pencils. Alternatively, if you run the quiz as a single group exercise, the questions could be on a series of pre-prepared flipcharts.

Enough copies of Information sheet 1. All about smoke alarms so that everyone can take a copy home. Your local FRS may have a leaflet that presents the same information more attractively.

Having a smoke alarm as a visual aid is useful and fun. Make sure it works by pressing the test button!

A small, fun prize for anyone who gets all the quiz answers correct.

Method

Hand out the quiz sheets and invite participants to spend 15 minutes answering the questions. (If the group has reading problems, the questions could be read out and answered with a show of hands.) [10 mins]

When everyone has completed the quiz sheet, tell participants what the correct answers are. On a question by question basis, if anyone has an incorrect answer, use this as a discussion leader so that people understand why the correct answer is what it is. [5 mins]

Discussion points

It's possible that some people may say that because they live in privately-rented accommodation, they are not allowed to fix anything to the walls or ceiling, or they are afraid that they will lose their deposit if they do so. (This is not usually an issue for people living in social housing.) Unless the building is a so-called house in multiple occupation, a landlord doesn't have to comply with any specific laws but has a general duty to keep a home fit to live in.

If a tenant doesn't think their accommodation is fire safe, the first step should always be to try negotiating with the landlord. They may be prepared to provide fire safety precautions, such as a smoke alarm, if requested.

If the problem is caused by disrepair (for example, loose wiring or a faulty electrical heater) the landlord is probably responsible for getting the necessary repairs done. The fire prevention officer at your local FRS may be able to give further advice on this topic.

If someone has a smoke alarm that keeps going off, the FRS will be able to advise on the best solution. It may mean changing the type of alarm or, moving it. [10 mins]

Conclusions

When all the questions have been dealt with, emphasise the importance of:

- Having a working smoke alarm – they save lives.
- Having the right number of smoke alarms – one on each floor.
- Making sure that they are checked frequently – at least once a week.
- Replacing batteries each year (unless it is an alarm with a ten year battery life or is connected to the mains electricity).
- Replacing the whole alarm every ten years.

If any members of your group do not have smoke alarms, strongly recommend that they contact the local FRS. They may well be able to provide and fit them free of charge.

Give everyone a copy of Information sheet 1. All about smoke alarms to take home. You may find that your local FRS has a leaflet that covers the topics more attractively than this information sheet. [2 mins]

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Exercise 2. Identifying potential causes of house fires

If you cannot run the whole of this exercise, then use as much of it as you can.

Key messages

The major causes of house fires are:

- Cigarettes, especially when not put out properly, e.g. when the smoker falls asleep in bed or a chair.
- Unattended chip pan, especially when it's too full of fat or oil. Cooking appliances used in some cultural groups may also produce similar hazards.
- Clothes drying on the fireguard. -

Clothes horse too close to a fire. -

Frayed electric wiring.

- Overloaded electric sockets (hot plugs or sockets, scorch marks, fuses that often blow, or flickering lights – they are all signs of loose wiring or other electrical problems).
- Candles and tea lights left unattended or with something too close above them.
- Young children having access to and playing with matches and lighters.
- Old electric blankets.
- Electric cables running under rugs or carpets – you can't see if they are worn.
- Electric plugs that have not been wired properly - coloured wires sticking out of plugs is an indication of this.

Background

This exercise is about preventing fires from happening, not what to do if there is a fire.

While the exercise initially addresses dangers, the discussion that follows should concentrate on how to avoid or minimise those dangers.

The exercise addresses the causes of **accidental house fires**, not those started deliberately or through vandalism.

Learning objective

To highlight the hazards in the home that can lead to a house fire and hence to take steps to reduce the risks

Time

50 – 60 mins including time for discussion. The part of the exercise that deals with identifying the main causes of fires takes about 25 mins.

Equipment needed

Ideally, each group of participants needs a sheet of flipchart paper and a marker pen. If these are not available in sufficient quantities, each group can be given one or two sheets of A4 paper and a pen, with the facilitator having the flipchart and marker pen.

Blu Tack or some drawing pins

Method

Introduce the topic by explaining that house fires can cause death and serious injury. If there has been an incident reported in the press recently, use this as an excuse for bringing up the subject. Remind them that even if no-one is injured, a fire can mean they have to move out of their home, at least temporarily, with all the inconvenience this would mean. They may lose their possessions, especially treasured ones such as the baby photos, their clothes, documents, etc. They will also be left with a smell that pervades everything in the home. [5 mins]

Ask participants to work in groups of three or four. Ask each group to write down as many things that they can think of that might result in a house fire. (It's not a description of their own home that you are seeking, it is an especially dangerous hypothetical home.) [15 mins]

Invite each group to tell everyone what they have written down. After the first group has reported, other groups will simply identify new issues that they have recorded. Explain that you can discuss what people have reported when everyone has finished. [Time depends on the number of groups, but assume 3 or 4 mins per group. The first one may take longer but the others will be briefer.]

As you go along, make a list of all the points that people have raised so you have one consolidated list. Stick this on the wall with Blu Tack and ask people which they think are the most serious points.

Outline any points that they have not identified (see Information sheet 2). [2 mins]

Open the floor for discussion and questions. Remember that if you don't know the answer to a question, don't guess as this could lead to wrong advice. Make a note of the question and ask the specialists for their advice.

Discussion points

You can use this exercise as an opportunity to get participants to think about what their children are capable of doing at present and what they may do in the future. For example, a participant may say that her toddler can move a chair and climb on it, and open a cupboard. This matters in the context of the safe storage of matches and lighters – they need to be out of sight and out of reach, and if possible somewhere secure, so that the climbing and naturally inquisitive toddler can't get at them and play with them. Remind participants that children are fascinated by fire and that fire play is a common and potentially very dangerous phenomenon.

Ask participants whether there are any issues that they think would be difficult to address (e.g. grandfather often falls asleep in the evening with a cigarette in his hand) – other participants may have additional suggestions. [As much time as you wish, say 10 mins]

Will your landlord allow you to install equipment, e.g. smoke alarm? How do you handle this if the answer is "No"?

What about common areas in blocks of flats? Do people leave rubbish or other flammable materials there? Who is responsible for ensuring that these spaces are clear? Could the rubbish left in these areas cause problems if you had to get out in a hurry?

In conclusion, highlight the devastating effects that fires can have, and remind participants of the major issues that they have listed: cigarettes, matches, lighters, candles, chip pans, fires and heaters too close to furniture and curtains, curtains blowing if the window is open, [2 mins]

Prompts

If participants are stuck, get them to think on a room-by-room basis to identify dangers.

Remember that it's not all about equipment. Behavioural issues, e.g. smoker in the home, someone comes home drunk, are also relevant.

Information snippet

Cigarettes burn at 700°C and contain chemicals that keep them alight.

Follow up work

Ask participants to come to the next session and tell you about any of the issues they found in their own homes. If there are things they could not resolve, ask the FRS for help and advice.

Sources of information

Quick guide to fire safety in the home:
http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_10030963

Advice about safe cooking:
http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_071645

Electric appliance fire safety:
http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_071712

Safe use of electric blankets and heaters:
http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_174329

Fire safety tips for smokers:
http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_071693

Using candles, decorative lights and decorations safely:
http://www.direct.gov.uk/en/HomeAndCommunity/ InYourHome/FireSafety/DG_180798

Fire safety advice for parents and child carers:
http://www.direct.gov.uk/en/Parents/Yourchildshealthandsafety/Yourchildssafetyinthehome/DG_10038395

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Exercise 3. Children's behaviour and fire prevention – safe storage of matches and lighters

If you cannot run the whole of this exercise, then use as much of it as you can.

Key messages

Children's behaviours that can be associated with house fires include:

- Their understanding that a hidden object still exists (matches or a lighter hidden in drawer or cupboard).
- Being able to move something and then climb on it to reach and then open cupboard.
- Ability to hold a small object (a match box), open the box, handle a single match.
- Wish to copy adult behaviour by striking a match or operating a lighter.

Children find a range of things appealing. A match or lighter will be appealing because it makes a sound when you strike it, there is a flash as it ignites and then the flame is a flickering light.

Matches and lighters need to be stored out of reach and out of sight.

Background

Many accidents to children arise because parents do not always realise the consequences of their child's rapidly changing physical and behavioural development. For example, one day a child may not be able to or may not be interested in climbing the stairs and then the next day you find him or her half way up – and ready to fall down! Anticipating this sort of change can allow parents to take precautions before the accident happens.

Also, it is not always well understood by parents what attracts children so that one object is appealing to a child while another may not be. It is known that young children are attracted by characteristics such as bright colours, sounds, movement, figures (such as cartoon characters that they may recognise), etc. These attractions can lead to fires and injuries if children have access to matches and lighters as flickering flames and their appearance when an action such a striking a match or operating a lighter can be very appealing.

Children also like to copy adult behaviour, so if they see someone strike a match or ignite a lighter they may well want to try this for themselves.

Learning objective

To help families understand how a child's physical and behavioural development and what children are attracted by can result in accidents in general and house fires in particular.

Time

About 30 mins, including time for discussion.

Equipment needed

A sheet of flipchart paper and a marker pen. Divide the sheet of paper into quarters, labelling them as shown below. (Alternatively, you could use more than one sheet of paper.)

1 year old	
3 years old	

2 years old

4 years old

Method

Explain that while many house fires are started by the actions or inactions of adults or because of faulty equipment, some arise because of children's behaviours. [1 min]

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Part 1 – exploring with participants what children of different ages can do.

(This exercise works best if the participants have children of different ages.)

Ask each person in turn to describe something that they can remember that their child started doing at a particular age. This could be walking, climbing on to furniture, up stairs or over the safety gate, opening containers, using a spoon, running, sitting and playing quietly, playing with noisy toys, watching cartoons on TV, putting everything in their mouths, etc. Keep going until people have no further suggestions. (Remind participants that children are not all the same and that some do things at a particular age while others may do the same action earlier or later, or not at all.) [5 – 10 mins]

The behaviours are likely to fall into a handful of major groups – gross motor skills (walking, running, climbing, playing with push-along toys, etc), fine motor skills (holding a crayon and drawing, opening a container, stacking bricks, putting a key in a lock, trying to copy adult actions, etc), and cognitive skills (solving problems such as finding a hidden object).

Part 2 – exploring what children find attractive

Ask participants to tell you what their children find attractive. This does not just mean things that the child plays with, it could also be things they like watching. Write down the responses. [5 mins]

Then, for each response, ask why they think that the item is attractive. As noted above, it is likely to be characteristics such as bright colours, sounds, movement, figures (such as cartoon characters that they may recognise), imitates adult behaviour, texture, taste, etc. It may be more than one characteristic. Write these next to each item. [5 mins]

Part 3 – combining the results of parts 1 and 2

We now know what children can do at specific ages and what they find attractive.

Ask participants which of the behaviours and attractions you have recorded could be relevant to children starting fires. The relevant ones are likely to be understanding that a hidden object still exists (matches or a lighter hidden in drawer or cupboard), gross motor skills to be able to move something and then climb on it to reach and then open cupboard, fine motor skill to take hold of a small object (the match box), open the box, handle a single match and then copy adult behaviour by striking a match or operate a lighter. [5 mins]

The match may be appealing because it makes a sound when you strike it, there is a flash as it ignites and then the flame is a flickering light. So, in other words, it's completely understandable why children like to play with matches and lighters!

Discussion points

Get participants to discuss where they could keep matches and lighters that would be as inaccessible as possible. [5 mins]

Consider as a group how to deal with the fact that someone in the house smokes so matches and lighters may be left lying around. [5 mins]

Conclusion

The prevention message is the need to keep matches and lighters well out of reach and out of sight, to try and make sure that there is nothing convenient for children to use to climb, and to try not to let children see you striking a match or operating a lighter.

Exercise 4. Bedtime fire safety routine

If you cannot run the whole of this exercise, then use as much of it as you can.

Key messages

To help prevent fires occurring through the night, it's important to check your home for fire hazards before you go to bed. Make sure you:

- Close inside doors at night to stop a fire from spreading.
- Check the cooker is turned off.
- Turn off and unplug electrical appliances (unless they are meant to be left on, like the freezer).
- Put candles and cigarettes out properly.
- Turn heaters off and put up sparkguards (if you have a coal or wood-burning fire) and fireguards.
- Keep all exits clear.

Background

This exercise builds on exercise 2 in which participants identified possible causes of house fires. Fires at night present a particular hazard so having a bedtime safety routine is an important tool.

Most house fires that result in death start at night, in other words when the family is fast asleep.

The exercise considers what to do at bedtime to prevent fires and the steps needed to minimise the spread of a fire if one does start, hence improving the chances of escape.

Learning objective

To help families understand the importance of having a bedtime fire safety routine and to develop one for their own home, thereby minimising the risk of a fire occurring.

Time

Less than 20 mins.

Equipment needed

Use the list of the causes of fire that was developed when you ran Exercise 2. Alternatively, you can use the list in Information Sheet 2.

There are different ways to run this exercise. It can be run with a single group in which case all you will need is a flipchart and a marker pen for the facilitator.

Alternatively, you could split the group into small subgroups and ask them to think about what they would do if the smoke alarm sounded, then take a report back. In this situation, each subgroup needs some paper and a pen and the facilitator will need a flipchart and a marker pen.

Method

Explain where a bedtime routine fits into the sequence of preventing a fire and ensuring that everyone can escape safely. [2 mins]

Invite people to say what they think would be the main causes of fires that they should address before they go to bed. The key actions to prevent fires that they should identify are likely to include:

- The cooker is turned off. Apart from reducing the risk from anything left in the oven or on the cooker, such as the chip pan, this can also reduce the risk of a fire if, for example, a tea towel falls on to the cooker.
- Electrical appliances are off and unplugged (unless they are meant to be left on, like the freezer).
- Candles and cigarettes are out properly, and there is nothing smouldering in the ashtray.
- Electric, gas or oil heaters are off. This prevents them from setting fire to furnishings, etc.
- Sparkguards and fireguards are in place, if appropriate. (Sparkguards are needed for solid fuel fires – wood or coal fires – as these can spit sparks into the room. Sparkguards have a very fine mesh that should stop sparks passing through. Fireguards are larger and stronger. They need to be attached to the fire surround or the wall. They are intended to stop people and objects falling into the fire or on to the heater and are needed for all types of fires and heaters.)

When someone makes a suggestion, you could ask the group why they think this is important. [10 mins]

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Information snippets

In 2008, the most common rooms for a fatal fire to start were the living or dining rooms, not the kitchen.

Fatality rates in house fires in which smoke alarms raise the alarm are lower than those in which smoke alarms are either absent or do not raise the alarm (3 per 1,000 detected fires compared to 8 per 1,000 for undetected fires).

Then, ask them to identify what other steps they should take so that if a fire did start they would improve their chances of escaping safely. They should mention:

- Closing all internal doors – a normal room door can stop the spread of a fire for up to 30 minutes.
- Making sure that escape routes are free from clutter.
- Ensuring that door and window keys are accessible in case they are needed in a hurry.

(These are key elements of the family escape plan that is considered in Exercise 5 below.) [5 mins]

Model bedtime check

Do a bedtime check – develop the habit

When you are asleep, it takes longer to notice the signs of a fire. If you don't have a working smoke alarm there will be nothing to wake you.

To help prevent fires occurring through the night, it's important to check your home for fire hazards before you go to bed. Make sure you:

- Close inside doors at night to stop a fire from spreading.
- Check the cooker is turned off.
- Turn off and unplug electrical appliances (unless they are meant to be left on, like the freezer).
- Put candles and cigarettes out properly.
- Turn heaters off and put up sparkguards and fireguards.
- Make sure exits are kept clear.

Source: http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_071793

Exercise 5. A family fire escape plan

If you cannot run the whole of this exercise, then use as much of it as you can.

Key messages

A family escape plan should cover the following issues:

- Know what the smoke alarm sounds like so it does not come as a complete surprise to them. They should know what sound it makes from testing it regularly.
- Have a torch next to the bed.
- Be aware that the children may be hiding in their bedroom because they are frightened. Don't assume that if you cannot see them they have already escaped. Be prepared to look under the bed, in the wardrobe and anywhere else they could hide.
- Leave the front door key on a hook near the door, out of the reach of young children and not accessible to someone reaching through the letter box.
- Make sure that the stairs and the hall are clear of clutter that could slow you down.
- Think about a second escape route if the primary one – usually down the stairs and out of the front or back door – is not usable.
- Make sure that the key for the window locks is accessible to you, probably on a hook near the window, but not accessible to the children.

Background

Families are invited to identify the issues they may have to address in developing their own fire escape plan and hence develop a plan that is relevant to their own home and family circumstances.

There is scientific evidence that giving families advice about fire escape plans is effective in increasing the proportion of families that have such a plan, so this is an important exercise.

Learning objective

To give families the ability to develop a fire escape plan for their own home so that they could cope if their smoke alarm went off in the middle of the night.

Time

About 60 mins.

Equipment needed

There are different ways to run this exercise. It can be run with a single group in which case all you will need is a flipchart and a marker pen for the facilitator.

Alternatively, you could split the group into small subgroups and ask them to think about what they would do if the smoke alarm sounded, then take a report back. In this situation, each subgroup needs some paper and a pen and the facilitator will need is a flipchart and an marker pen.

Method

Introduce the topic by explaining that house fires can cause death and serious injury to them and their families. If there has been an incident reported in the press recently, use this as an excuse for bringing up the subject. Remind them that even if no-one is injured, a fire can mean they have to move out of their home at least temporarily, with all the inconvenience this would mean. They may lose their possessions, especially treasured one such as the baby photos, their clothes, documents, etc. [5 mins]

Ask participants:

- How many have a smoke alarm?
- How many have one on each floor of their home?
- How many have checked it in the past seven days? [2 mins]

If anyone does not have a smoke alarm, does not have one on each floor of their home or does not know how to check their alarm(s), strongly recommend that they contact the local Fire and Rescue Service (FRS) for advice. Provide participants with the information they need. (When you next meet the participants, ask them whether they have been in touch with the FRS.) [2 mins]

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Scenario

At 12.30am, a neighbour, who was about to go to bed, spotted flames in a downstairs room in the house across the street. He called the fire brigade and fire fighters arrived about ten minutes later.

Although the fire crews were able to bring the blaze under control quickly, a mother and her two children, aged 18 months and 3 years, died, their deaths being attributed to inhaling toxic smoke. When the fire fighters wearing breathing apparatus went upstairs, they found the mother on the bedroom floor and the children apparently asleep in their beds. Efforts to resuscitate the mother and one child were not successful and the second child died later in hospital.

In their report on the incident, the fire brigade noted that the house had no smoke alarm. The cause of the fire was never identified.

Present the group with the scenario above.

Ask the participants what they would do if the smoke alarm in their home sounded in the middle of the night. If they do not have a fire escape plan, they are likely to say that they would grab the children, run out of the house and call 999 from a neighbour's house or on their mobile. This is not the wrong answer but the exercise is intended to explore the reality more deeply.

The key message in a house fire is "Get out, stay out, call 999"

- Get everyone out of the house quickly. Don't try to pick up valuables or pets.
- Stay out – don't go back in until a fire officer tells you it is safe to do so.
- Call 999 – dial 999 and ask for the fire brigade. Know how to do this and what to expect when you are connected to an operator.

Ask them to describe potential problems that they could face that may stop them from escaping rapidly? Write on a flipchart the points that people mention. [5 mins]

They should mention at least the following:

- You would be fast asleep so completely disorientated and there is a piercing noise from the smoke alarm that is adding to the confusion.
- It's pitch dark.
- The children may be screaming.
- The staircase may have a safety gate to prevent the 18 month old falling.
- The front door needs a key to open it but this is in your handbag in the kitchen.
- Your partner, who is away for the night, left his bike in the hall.
- The stairs have the children's shoes on the bottom step.
- The hall and stairs cannot be used because of the fire.
- The bedroom windows are locked to prevent burglars getting in, so you need a key to open them.

If not all of these situations are mentioned, prompt them with questions such as "Do you ever leave anything on the stairs when you go to bed?"

When participants run out of ideas, ask them to suggest what they could do to address each of the problems they have mentioned. These could include:

- Know what the smoke alarm sounds like so it does not come as a complete surprise to them. They should know what sound it makes from testing it regularly.
- Have a torch next to the bed.
- Realise that the children may be hiding in their bedroom because they are frightened. Don't assume that if you cannot see them they have already escaped. Be prepared to look under the bed, in the wardrobe and anywhere else they could hide.
- Leave the front door key on a hook near the door, out of the reach of young children and not accessible to someone reaching through the letter box.
- Make sure that the stairs and the hall are clear of clutter that could slow you down.
- Think about a second escape route if the primary one – usually down the stairs and out of the front or back door – is not usable.
- Make sure that the key for the window locks is accessible to you, probably on a hook near the window, but not accessible to the children. [10 mins]

Variations you can consider during discussion could include:

- You live in an apartment in a tower block.
- Your elderly mother is staying with you. She is not too stable on her legs when she first gets out of bed and is not familiar with your home.
- It's the middle of the evening and you are out. A 14 year old babysitter is looking after the children. [10 mins]

Escaping from a high-rise building

Living above the first floor doesn't necessarily make you any more at risk from fire. High-rise flats are built to be fire-proof – walls, ceilings and doors will hold back flames and smoke.

Most of your planning should be the same as homes at ground level, but there are some key differences:

- You won't be able to use the lift if there's a fire, so choose an escape route that takes this into account.
- Count how many doors there are on the route to get to the stairs when you can't use the lift, in case you can't find your way.
- Make sure stairways and fire escapes are kept clear of all obstructions and that fire doors are never locked.
- Regularly check that you can open the doors to stairways or escapes from both sides.

If there's a fire elsewhere in the building, you are usually safest in your own flat, unless heat or smoke is affecting you. If you are affected, you should get out, stay out and call 999.

Source: **http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_071793**

Open the floor for discussion and questions. Remember that if you don't know the answer to a question, don't guess as this could lead to wrong advice. Make a note of the question and ask the specialists for their advice.

Ask participants whether there are any issues that they think would be difficult to address (e.g. landlord refuses to supply a spare front door key; nowhere else to store the bike other than in the hall) – other participants may have suggestions. [As much time as you wish, say 10 mins]

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Model family fire escape plan

When you make an escape plan, involve everyone who lives in your home, including children, older or disabled people and any lodgers.

Choosing an escape route

- The best escape route is the normal way in and out of your home.
- Think of any difficulties you may have getting out, e.g. at night you may need to have a torch to light your way.
- Choose a second escape route, in case the first one is blocked.
- Keep all exits clear of obstructions, like bicycles.
- If there are children, older or disabled people or pets, plan how you will get them out.

Think about a safe place to go if you can't escape

- The first priority is to keep people safe by getting them out of the building. If you can't escape, you'll need to find a room to take refuge in. This is especially important if you have difficulty moving around or going downstairs on your own.

Make sure everyone knows where door and window keys are kept

- Decide where the keys to doors and windows should be kept and always keep them there. Make sure that all the adults and older children in your household knows where they are.

Explain the plan

Once you have made your plan, go through it with all the adults and older children in the household.

You could also:

- Put a reminder of what to do in a fire somewhere where it will be seen regularly, like on the fridge door.
- Put your address by the phone so that children can read it out to the emergency services.

Practise the plan

Make sure you have 'walked through' the plan with all the adults and the older children in your household. Regularly remind everyone of what to do, and what not to do, in the event of a fire.

Source: http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_071793

Discussion points

What about common areas in blocks of flats? Do people leave rubbish or other flammable materials there? Who is responsible for ensuring that these spaces are clear? Could the rubbish left in these areas cause problems if you had to get out in a hurry? [10 mins]

Follow up work

Ask participants to come to the next session and tell you about any of the issues they found in their own homes. If there are things they could not resolve, ask the FRS for help and advice.
[2 mins]

Sources of information

Quick guide to fire safety in the home: http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_10030963

Fire safety quiz sheet

1. **Fire is one of the biggest killers of children in the home**

   True False

2. **You're more likely to be killed by a daytime fire than one that starts at night.**

   True False

3. **Adults will be woken by the noise that a house fire makes so they don't need a smoke alarm**

   True False

4. **The battery in a smoke alarm needs to be checked once a year**

   True False

5. **In a house fire, you're more likely to die from the flames than from breathing in smoke.**

   True False

6. **You should have a smoke alarm on every floor of your house, upstairs as well as downstairs, to wake you up if there is a fire.**

   True False

7. **Cigarettes, matches and lighters are the biggest cause of house fires where people die.**

   True False

8. **Smokers are more likely to own smoke alarms than non-smokers**

   True False

9. **Some smoke alarms are 'toast-proof'. They recognise burning toast and don't go off when they 'smell' it burning.**

   True False

10. **Children often sleep more deeply than grown-ups and find it harder to wake up quickly if a smoke alarm goes off.**

    True False

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Fire safety quiz answers

1. True. Although deaths from house fires have fallen dramatically in recent years, largely thanks to the widespread ownership of smoke alarms, significant numbers of children (and adults) die in fires each year.
2. False. Most fires in which people die are at night when you become aware of the fire later because you are asleep.
3. False. If a fire is just smouldering, as it may be if a cigarette has fallen down the side of the sofa, it will make no noise. It may, however, be giving off poisonous smoke that will kill.
4. False. The battery needs to be checked every week, not every year. It's usually easy to test the battery – there will usually be a button on the alarm that you press and the alarm sounds. If it makes no noise, the battery should be replaced immediately.
5. False. It's the poisonous smoke that kills people in house fires, not the flames. A few deep breaths of smoke is enough to kill or incapacitate you.
6. True. The more alarms you have, the safer you'll be. As a minimum, you should have one on each floor. However, if you have only one alarm and two floors, put it somewhere you'll be able to hear it when you're asleep, such as on the landing outside the bedroom. If you have a TV or other large electrical appliance (such as a computer) in any of the bedrooms, you should fit a smoke alarm there too.
7. True. Make sure that cigarettes are completely extinguished before going to bed and that matches and lighters are stored so that children cannot get at them.
8. False. In fact, it's the other way round. The latest designs of smoke alarms are not activated by cigarette smoke.
9. True. Optical alarms are good at detecting slow burning fires, as opposed to those that produce a lot of flames, and are less likely to go off accidentally and so are best for ground-floor hallways and for homes on one level. (They don't actually "smell" the smoke!)
10. True. This reinforces the need for alarms to be close to bedrooms to improve the chances of their waking the children as well as the adults.

Information sheet 1

All about smoke alarms

- You are more than twice as likely to die in a fire at home if you haven't got a smoke alarm.
- A smoke alarm is the easiest way to alert you to the danger of fire, giving you precious time to escape.
- They are cheap, easy to get hold of and easy to fit.

How many smoke alarms do you need?

The more alarms you have, the safer you'll be. At minimum you should have one on each floor. However, if you have only one alarm and two floors, put it somewhere you'll be able to hear it when you're asleep.

If you have a TV or other large electrical appliance (such as a computer) in any of the bedrooms, you should fit a smoke alarm there too.

Installing your smoke alarm

Many Fire and Rescue Services (FRS) in England offer free home fire risk checks. This involves firefighters visiting your home and offering fire safety advice for you and your household. They may be able to install your smoke alarm for free.

It usually takes a few minutes to install your smoke alarm yourself - just follow the manufacturer's instructions that come with it. The best place for your smoke alarm is on the ceiling, near or at the middle of the room or hall. The alarm should be at least 30cm (one foot) away from a wall or light.

If it is difficult for you to fit your smoke alarm yourself, ask a family member or friend to help you, or contact your local fire service.

Choosing a smoke alarm

There are two types of smoke alarm:

Ionisation alarms

These are the cheapest and most readily available and are very sensitive to flaming fires (ones that burn fiercely such as chip-pan fires). Ionisation alarms will detect flaming fires before the smoke gets too thick.

Optical alarms

These are more expensive and more effective at detecting slow-burning fires (such as smouldering foam-filled furniture or overheated wiring). Optical alarms are less likely to go off accidentally and so are best for ground-floor hallways and for homes on one level.

For the best protection, you should install one of each. However, if you can't have both, it's still safer to have either one, rather than none at all.

Whichever model you choose, you should make sure that it meets British Standard 5446, Part 1 (BS 5446-1) and ideally also carries the British Standard Kitemark. Your local FRS will help you decide which is best for your circumstances if you would like some advice.

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The different models available

A lot of people forget to check their smoke alarms, so the best choice of power supply is usually the one that lasts longest.

Standard-battery alarms

An 'ionisation battery alarm' is the cheapest and most basic smoke alarm available. An 'optical battery alarm' is a little more expensive. Both run off 9-volt batteries.

Battery alarms with an emergency light

These come fitted with an emergency light which comes on when the alarm is triggered. They are particularly suitable if someone in your house has hearing difficulties.

Alarms with 10-year batteries

These are slightly more expensive, but you save on the cost of replacing batteries. They are available as ionisation or optical alarms and are fitted with a long-life lithium battery or a sealed power pack that lasts for 10 years.

Models with a 'hush' or 'silence' button

Some models are available with a 'hush' button which will silence the alarm for a short time. This can be used when cooking, for example. If there is a real fire, giving off lots of smoke, the hush system is overridden and the alarm sounds. These models will continue to remind you they have been silenced by 'chirping' or by displaying a red light.

Mains-powered alarms

These are powered by your home's electricity supply and need to be installed by qualified electricians. There's no battery to check, although they are available with battery back-up in case of a power cut.

Interconnecting or linked alarms

Some alarms can be connected to each other so that when one senses smoke, all the alarms in the property sound. They are useful for people with hearing difficulties and also in larger homes.

Mains-powered alarm with strobe light and vibrating pad

These are designed for people who are deaf or have hearing difficulties. If there's a fire, the alarm alerts you with a flashing light and vibrating pad (which is placed beneath your pillow).

Mains-powered alarm which plugs into a light socket

This type of alarm uses a rechargeable battery that charges up when the light is switched on. It lasts for 10 years and can be silenced or tested by the light switch.

Maintaining your smoke alarm

- Test it once a week, by pressing the test button until the alarm sounds.
- If it has a battery, change the battery once a year (unless it's an alarm with a ten-year battery).
- Replace the smoke alarm every ten years because the detector mechanism in the alarm becomes less effective over time.

Source: http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_071751

Information sheet 2

What should participants identify as causes of house fires ?

All of the information here comes from the website "Fire safety in the home – a quick guide" http://www.direct.gov.uk/en/HomeAndCommunity/InYourHome/FireSafety/DG_10030963

Some or all of the following and possibly many more issues:

- Cigarettes, especially when not put out properly, e.g. when the smoker falls asleep in bed or a chair.
- Unattended chip pan, especially when it's too full of fat or oil. Cooking appliances used in some cultural groups may also produce similar hazards.
- Clothes drying on the fireguard. -

Clothes horse too close to a fire. -

Frayed electric wiring.

- Overloaded electric sockets (hot plugs or sockets, scorch marks, fuses that often blow, or flickering lights – they are all signs of loose wiring or other electrical problems).
- Candles and tea lights left unattended or with something too close above them.
- Young children having access to and playing with matches and lighters.
- Old electric blankets.
- Electric cables running under rugs or carpets – you can't see if they are worn.
- Coloured wires sticking out of plugs – this means they have not been wired properly.

Cooking

- Filling the chip pan or other deep-fat fryer more than one-third full of fat or oil. Use a thermostat-controlled deep-fat fryer, which will make sure the fat or oil doesn't get too hot, or use oven chips.
- Leaving the pans on the heat if you're called away from the cooker, eg by a phone call.
- Wearing loose clothing that can catch fire easily.
- Cooking when you have been drinking alcohol or taken prescription drugs - you may get drowsy or lose concentration.
- Leaving the cooker on when you have finished cooking.
- Hanging tea-towels over the cooker and putting the oven gloves on top of a hot cooker.
- Not cleaning the oven, hob and grill – a built-up fat and bits of food can start a fire.
- Not emptying the crumb tray on the toaster and putting it too close to curtains.

Electrical safety

- Hot plugs or sockets, scorch marks, fuses that often blow, or flickering lights.
- Badly wired plugs – any coloured wires sticking out could come loose and debris could also get into the plug.
- Overloaded sockets – plugging too many electrical appliances into one socket can lead to overheating.

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Smoking

- Not keeping lighters, matches and smoking materials out of the reach of children – you can also buy child-resistant lighters and containers for matches.
- Smoking in bed - it's very easy to fall asleep and allow your cigarette to set light to your bedclothes or furnishings.
- Smoking if you're drowsy - especially if you're sitting in a comfortable chair or if you've been drinking or taking prescription drugs; again, it's easy to fall asleep.
- Leaving a lit cigarette (or cigar or pipe) – they can easily overbalance and land on the carpet or other flammable material; and make sure your ashtray is heavy and can't tip easily.
- Not making totally sure that your butts (and any remains in your pipe bowl) aren't still smouldering when you've finished with them; wet them and empty your ashtray into a metal bin outside the house.

Candles

Candles not:

- On a heat-resistant surface – be especially careful with night lights and tea lights, which get hot enough to melt plastic.
- In a proper candle holder, so they can fall over. -

Out of the reach of children and pets.

- Out of draughts and away from curtains, other fabrics or furniture, which could catch fire.
- With at least 1 metre (3 feet) between the candle and any surface above it.
- With at least 10 centimetres (4 inches) between any two candles.
- Away from clothes and hair - if there's any chance you could forget a candle is there and lean across it, put it somewhere else.

Candles left unattended, especially when you go to bed.

A burning candle or oil burner in a child's bedroom.

Candles in, or by, a Christmas tree, plants, flowers or other foliage.

Candles near ribbons, greetings cards and other decorations.

Notes

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Keeping Children Safe at Home is a collaboration between the organisations shown below.
It aims to improve our understanding of children's accidents and make their prevention more effective.

For further information visit **www.nottingham.ac.uk/injuryresearch/**

Injury prevention briefing training evaluation questionnaire



EVALUATION OF THE TRAINING SESSION ABOUT THE INJURY PREVENTION BRIEFING (IPB)

We need to collect your impressions of today's training session. It would be very helpful if you could spend a few minutes commenting on the session and provide any general comments that you may have.

There is a box at the end where you can make general comments. .Please feel free to comment on issues such as the content, length of sections, order of the topics covered, supporting materials, practical arrangements, presentation style, etc.

Thank you.

Your name: .....

Children's Centre name: .....

(We only need your contact details to ensure that we send reminders to the right people.)

Please tell us whether you agree or disagree with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
The training session was too long	1	2	3	4	5
The presenter's style was poor	1	2	3	4	5
I feel confident about presenting the key fire safety messages to parents at my Children's Centre	1	2	3	4	5
The handouts were useful	1	2	3	4	5
The presentation from the fire and rescue service was helpful	1	2	3	4	5
The training session brought home to me the horrors of a house fire	1	2	3	4	5
I don't understand what is meant by a fire escape plan	1	2	3	4	5
I will make telling parents about fire safety a priority	1	2	3	4	5
I will check my smoke alarms when I get home	1	2	3	4	5
I will look for opportunities to get the fire safety messages across to parents as soon as possible	1	2	3	4	5
I will read the Injury Prevention Briefing as soon as I can	1	2	3	4	5
I don't have the time to deal with this issue at my Children's Centre	1	2	3	4	5

M3_training evaluation form v1 16_02_2012

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Is there anything we can do to improve the training sessions for other Children's Centres?

General comments

M3_training evaluation form v1 16_02_2012

Baseline self-completion questionnaire for parents



Helping Children's Centres to improve home safety: a new research study. Parents' questionnaire

We are carrying out a study to look at how Children's Centres can provide home safety advice to families. We would like to know about falls, poisoning and fires because these are common types of accidents. We would be grateful if you could fill in this questionnaire and return it in the envelope provided or give it to the researchers in the Children's Centre. Your answers will be used to help Children's Centres give better advice to parents.

To thank you for your time we will send you a £5 gift voucher when you send back the questionnaire.

Is your child 0 - 2 years old *Please place a tick to show your answer*

Yes ☐ No ☐

Are you over 16 years old? Yes ☐ No ☐

If you have answered NO to either of these questions, please do not continue with the questionnaire. Either return it in the envelope provided or give it to the researchers in the Children's Centre

If you answered YES to both questions please complete the rest of the questionnaire.

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Keeping Children Safe at Home. Helping Children's Centres to enhance home safety: a new research study. Parent baseline questionnaire. Version 2: 1st Dec2011

Home safety

1.1. **Do you have any of the following in your home to help prevent accidents?** (please tick *one* box on each row)

Items	**Yes**	**No**	**Not relevant.** Please explain why: *eg. live in a flat with no stairs*
a) Safety gates at the bottom and/or top of the stairs			
b) Safety gates elsewhere			
c) Corner covers for furniture			
d) Locked medicine cupboard			
e) Fridge lock			
f) Cupboard and/or drawer locks			
g) Spark guard (eg. to stop sparks from open fire)			
h) Fixed fire guard in front of open, electric or gas fire			
i) Fire blanket			
j) Fire extinguisher			
k) A torch next to the bed			
l) Other safety items (please describe)			

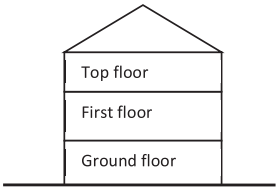
1.2 **Which three things do you think could be most likely to cause a fire in people's homes *generally*?**

1. ……

2. ……

3.……

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1.3. **Do you have a smoke alarm on every floor of your home?**
Please don't include cellars (please tick *one* box on each row).

Floor	**Yes**	**No**	**Don't know**	**Not relevant.** Please explain why
Top floor				
First floor				
Ground floor				
Basement				

If you have smoke alarms please complete the questions on this page.
If you have *no* smoke alarms please go to question 1.8 on the next page.

1.4. **If you have smoke alarms, is the alarm on each floor of your home working?**
Please don't include cellars (please tick *one* box on each row).

Floor	**Yes**	**No**	**Don't know**	**Not relevant.** Please explain why
Top floor				
First floor				
Ground floor				
Basement				

1.5. **If you have smoke alarms, how often do you test them?**

Floor	**More than once a week**	**Every week**	**Every month**	**Every 6 months**	**Don't know**	**Not relevant** Please explain why
Top floor						
First floor						
Ground floor						
Basement						

1.6. **How long is it since you replaced the batteries in your smoke alarms?**
Less than 6 months..... ☐
6 – 12 months..... ☐
Between 1 and 2 years..... ☐
2 years or more..... ☐
Don't know..... ☐

1.7. **If you have a smoke alarm, do you know what it sounds like?**

Yes ☐ No ☐ Don't know ☐

1.8. **These are some of the things people do before going to bed. How often do you do any of these?** *Please tick one box for each activity*

Activity	Never	Once a week or less	2-3 days/ week	4-5 days/ week	6-7 days/ week	Not relevant	Don't know
a) Close all internal doors.							
b) Check front door is locked.							
c) Make sure your front door key is kept somewhere it could easily be reached in case there is a fire.							
d) Close stair gates (if you have them).							
e) Make sure exits from the house are clear of toys/other items.							
f) Make sure window key locks are available to you (but not to your children).							
g) Put any medicines away.							
h) Turn off lights.							
i) Turn electrical appliances off at the sockets eg TV, game consoles.							
j) Turn off electric/gas fires.							
k) Make sure a fireguard/ spark guard is in place.							
l) Check that the oven and all the rings on the cooker are turned off.							
m) Make sure cigarettes are put out.							
n) Put matches/lighters out of reach of children.							
o) Blow out candles.							
p) Other (please describe).							

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1.9. **Which three things do you think could be most likely to cause a fire *in YOUR own home*?**

1. ……

2. ……

3……

Safety actions

2.1. **What would you do if you woke up in the middle of the night, you could smell smoke and/or your smoke alarm was sounding?**

Please include everything that you can think of.

……

……

……

2.2 a) **Does your family have a fire escape plan?** This is a plan of what you would do to escape from the house if a fire broke out or the smoke alarm went off.

Yes ☐ No ☐ Don't know ☐

If no, go to question 2.3 on page 8. Otherwise answer 2.2 b – f

2.2 b) **Have you discussed this with all adults and older children living in your household?**

Yes ☐ No ☐ Don't know ☐

2.2 c 1) **Have you tried the plan out by practising what you would do if there was a fire?**

Yes ☐ No ☐ Don't know ☐

c 2) **If you haven't, please tell us why:**……

……

2.2 d) **Please describe in as much detail as possible what your fire escape plan includes.**

……

……

……

2.2 e) **Does your family have a second fire escape plan?** This is a plan of what you would do if you couldn't use your first plan.

Yes ☐ No ☐ Don't know ☐

If no, go to question 2.3 on page 8, if yes answer question 2.2f

2.2 f) **Please describe in as much detail as possible what your second fire escape plan includes.**

……

……

……







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2.3. **Families often get safety information from lots of people and places.**

How satisfied are you with the home safety information provided *over the last year* by each of the following people or places? (Please tick *one* box on each row.)

People or place	Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Haven't received any information from them
a) GP or Practice Nurse						
b) Health Visitor						
c) Children's Centre staff						
d) School or nursery						
e) Local groups, eg. Mother and Toddler						
f) Other – please tell us who this was below						

2.4. a) **Have you talked to anyone from the Fire and Rescue Service about fire safety?**

Yes ☐ No ☐ Don't know ☐

b) **If yes, did they visit you at your home and do a home safety check?**

Yes ☐ No ☐ Don't know ☐

2.5 **Please could you tell us who gave you advice about the things below?**

Has anyone told you about…….

a 1) …..preventing falls? Yes ☐ No ☐

a 2) Who gave you this advice?.....

b 1) …..preventing poisonings? Yes ☐ No ☐

b 2) Who gave you this advice?.....

c 1) ……preventing fires? Yes ☐ No ☐

c 2) Who gave you this advice?.....

2.6 **If there was a fire in your home or your smoke alarm sounded at night, where do you think your child might be when you went to look for them?** (please tick *one* box on each row)

Items **My child is likely to be:**	**Strongly agree**	**Agree**	**Neither agree or disagree**	**Disagree**	**Strongly disagree**	**Not relevant.** Please explain why: *eg child can't get out of cot*
a) in bed asleep						
b) awake in bed/cot waiting for you						
c) outside their bedroom door						
d) looking for you in your bedroom						
e) hiding under their bed						
f) hiding in a cupboard or wardrobe						
g) waiting for you by the front door						
h) already outside your home waiting for you						
i) somewhere else, please describe						

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Previous accidents

3.1.a) **Has your child/children ever been hurt at home in a fall that needed medical attention?** Yes ☐ No ☐

b) **If yes**, **can you tell us briefly what happened, please?**

(*How long ago? In what way was your child hurt e.g. bruise, broken bone?)*

……..

……..

……..

……..

3.2.a) **Has your child/children taken anything at home that could have been poisonous that needed medical attention?**

Yes ☐ No ☐

b) **If yes**, **can you tell us briefly what happened, please?**

(*How long ago? What did your child eat/swallow?)*

……..

……..

……..

……..

3.3.a) **Have you ever been at home when a fire took place?**

Yes ☐ No ☐

b) **If yes**, **can you tell us briefly what happened?**

(*How long ago? How did the fire start? Was anyone hurt?)*

……..

……..

……..

……..

3.4. **a) Have you ever found any of your children playing with matches or lighters?**

Yes ☐ No ☐

b) If yes, please tell us what happened in as much detail as possible.

……

……

3.5. **What are your top three safety tips for families with children under three years old to prevent fires, poisoning or falls?**

1……

2……

3……



We would be grateful if you could tell us something about yourself by answering the following questions.

4.1 **What is your postcode?** ……..

If you don't know your postcode, please give us the first line of your address and area in which you live:……..

……..

4.2 **Who is in your family?** *Please put a number in each box for the number of adults and children*

Number of adults who live in your household (18 years and older) ☐

Number of children who live in your household (under 18 years) ☐

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4.3 **Age group of parent(s) who live in the household:** *Please put a tick in the box for the age of each parent.*

Mother	16-20 years	☐	**Father**	16-20 years ☐
	21-25 years	☐		21-25 years ☐
	26-30 years	☐		26-30 years ☐
	31-35 years	☐		31-35 years ☐
	36-40 years	☐		36-40 years ☐
	41-45 years	☐		41-45 years ☐
	46 yrs or more	☐		46 yrs or more ☐
	Not applicable	☐		Not applicable ☐

4.4 **What ages are your children?** *Please tell us the number of children for each age group who live at in the household.*

Number of children

Under 1 year old ☐
1 - 2 years…… ☐
3 - 4 years…… ☐
5 - 9 years ……. ☐
10 - 14 years…… ☐
15 - 17 years….. ☐

4.5 **What type of home do you live in?** *Please tick one box*

	House	Flat
Privately rented		
Rented: social housing/housing association/council housing		
Owner occupied		
Live at parents' or other relative's home		
Temporary accommodation		
Other – please describe eg. hostel		

4.6 a). **If you live in a house, bungalow or flat, how many other families live with you?**

Number of other families ☐

4.6 b) **If you live in a flat, what floor is your flat on?**

Number of floor ☐

4.6 c) **If you live in any other accommodation, what floor is it on?**

Number of floor ☐

4.7 a) **How many people in your household smoke?**

Nobody smokes ☐ 1 person ☐ 2 people ☐ 3 or more people ☐

b) **How many cigarettes does each person smoke a day?**

(Place the number of cigarettes smoked in the box for each person)

Person 1 ☐

Person 2 ☐

Person 3 ☐

4.8 **How often do people in your household have a drink containing alcohol?**

Please tick one box on each line for people aged over 14 in your household. If there are more than 3 people just do this for the oldest 3.

	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
Person 1					
Person 2					
Person 3					

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4.9 **How many drinks containing alcohol do people in your household have on a typical day when they have a drink?**

Please tick one box on each line for people aged over 14 in your household. If there are more than 3 people just do this for the oldest 3.

	None	1 or 2	3 or 4	5 or 6	7 - 9	10 or more
Person 1						
Person 2						
Person 3						

4.10 **How often do members of your household have six or more drinks on one occasion?**

Please tick one box on each line for people aged over 14 in your household. If there are more than 3 people just do this for the oldest 3.

	Never	Less than monthly	Monthly	Weekly	Daily/almost daily
Person 1					
Person 2					
Person 3					

5.1 **What is your first language?:**

English ☐

Other ☐ please describe……

5.2 **What is your ethnic group?** ***Please tick one box only.***

White:

British ☐ Irish: ☐

Other ☐ *Please describe*……

Asian or Asian British:

Pakistan ☐ Bangladeshi ☐ Indian ☐

Other ☐ *Please describe*……

Black or black British:

Caribbean ☐ African ☐

Other ☐ *Please describe*……..

Mixed background:

White & Black Caribbean ☐ White & Black African ☐

White & Asian ☐

Other ☐ *Please describe*……..

Chinese: ☐

Any other ethnic group? ☐ *Please describe* ……

5.3 **Did you complete this questionnaire yourself?** yes ☐ no ☐

If no who helped you, please? ……..

Thank you for completing this questionnaire.

Please return this completed questionnaire in the FREEPOST envelope to:

Keeping Children Safe Research Team [Local research team address]

For Office use only: **UIC:** ☐☐ ☐☐ ☐☐☐☐ ☐☐

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Follow-up self-completion questionnaire for parents

The University of Nottingham

keeping Children SAFE AT HOME

Helping Children's Centres to improve home safety: a research study. Parents' questionnaire

Thank you for being part of our study which looks at how Children's Centres can provide home safety advice to families. You may remember filling in a questionnaire last year for this study. We would be grateful if you would help us again by filling in this questionnaire; when you have filled it in please post it back in the envelope provided or give it to the researchers or staff in the Children's Centre. Your answers will be used to help Children's Centres give better advice to parents.

To thank you for your time we will send you a £5 gift voucher when you send back the questionnaire.



For Office use only:

UIC: | | | | | | | |

Keeping Children Safe at Home. Helping Children's Centres to enhance home safety: a new research study. Parent follow up questionnaire. Version 2: 26 Feb 2013

Home safety

1.1 **Do you have any of the following in your home to help prevent accidents?**
(*please tick one box on each row*)

Items	**Yes**	**No**	**Not relevant.** Please explain why: *eg. live in a flat with no stairs*
a) Safety gates at the bottom and/or top of the stairs			
b) Safety gates elsewhere			
c) Corner covers for furniture			
d) Locked medicine cupboard			
e) Fridge lock			
f) Cupboard and/or drawer locks			
g) Spark guard (i.e. to stop sparks from open fire)			
h) Fixed fire guard in front of open, electric or gas fire			
i) Fire blanket			
j) Fire extinguisher			
k) A torch next to the bed			
l) Other safety items (please describe)			

1.2 **Which three things do you think could be most likely to cause a fire in people's homes *generally*?**

1. .....

2. .....

3.....

1.3 **Do you have any smoke alarms in your home?**

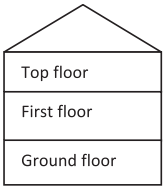
No ☐ **go to** ⇨ **Question 1.10**

Yes ☐ **go to** ⇨ **Question 1.4**

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1.4 **Do you have a smoke alarm on every floor of your home?**
Please don't include cellars (*please tick one box on each row*).

	Yes	No	Don't know	Don't have this floor
Top floor				
First floor				
Ground floor				



1.5 **Does the smoke alarm on each floor of your home work?**
Please don't include cellars (*please tick one box on each row*).

	Yes	No	Don't know	Don't have this floor
Top floor				
First floor				
Ground floor				

1.6 **How often do you test your smoke alarms?**
Please don't include cellars (*please tick one box on each row*).

	At least once a week	Between once a week and once a month	Between once every 2 months and once every 3 months	Between once every 4 months and once every 6 months	Don't know	Not relevant Please explain why
Top floor						
First floor						
Ground floor						

1.7 **Are your smoke alarms:** (*please tick one box on each row*)

	Yes	No	Don't know
Fitted with normal batteries			
Fitted with a 10 year battery			
Wired into the mains electrical supply			

1.8 **If your alarms have normal batteries how long is it since you replaced the batteries?** (*Please tick all that apply*)

Less than 6 months..... ☐
6 – 12 months..... ☐
Between 1 and 2 years..... ☐
2 years or more..... ☐
Don't know..... ☐

1.9 **Do you know what all your smoke alarms sound like?** (*please tick one box*)

Yes ☐ No ☐

1.10 **These are some of the things people do before going to bed. How often do you do any of these?** (*Please tick one box on each row*)

Activity	Never	Once a week or less	2-3 days/ week	4-5 days/ week	6-7 days/ week	Not relevant	Don't know
a) Close all internal doors.							
b) Check external doors are locked.							
c) Make sure your door key is kept somewhere it could easily be reached in case there is a fire.							
d) Close stair gates (if you have them).							
e) Make sure exits from the house are clear of toys/other items.							
f) Make sure window key locks are somewhere you can easily reach them (but cannot be reached by your children).							
g) Put any medicines away.							
h) Turn off lights.							
i) Turn electrical appliances off at the sockets eg TV, game consoles.							

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Activity	Never	Once a week or less	2-3 days/ week	4-5 days/ week	6-7 days/ week	Not relevant	Don't know
j) Turn off electric/gas fires.							
k) Make sure a fireguard/ spark guard is in place.							
l) Check that the oven and all the rings on the cooker are turned off.							
m) Make sure cigarettes are put out.							
n) Put matches/lighters out of reach of children.							
o) Blow out candles.							
p) Other (please describe).							

1.11 **Which three things do you think could be most likely to cause a fire *in YOUR own home*?**

1. ……

2. ……

3……

2. Safety actions

2.1 **What would you do if you woke up in the middle of the night and you could smell smoke and/or your smoke alarm was sounding?** (*Please include everything that you can think of*).

……

……

……

……

2.2 **If there was a fire in your home or your smoke alarm sounded at night, where do you think your child aged under 3 years might be when you went to look for them?**

……

……

……

……

2.3 **Does your family have a fire escape plan?** This is a plan of what you would do to escape from the house if a fire broke out or the smoke alarm went off (*please tick one box)*

No ☐ **go to** ⇨ **Question 3.1**

Yes ☐ **go to** ⇨ **Question 2.4**

2.4 **Have you discussed this with all adults and/or older children living in your household?** (*please tick one box*)

Yes ☐ No ☐ Not relevant ☐

2.5 **Have you tried the plan out by practising what you would do if there was a fire?** (*please tick one box*)

Yes ☐ No ☐

2.6 **If you haven't, please tell us why:**……

……

……

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2.7 **Please describe in as much detail as possible what your fire escape plan includes.**

……

……

……

……

2.8 **Does your family have a back up fire escape plan?** This is a plan of what you would do if you couldn't use your first plan (*please tick one box*)

No ☐ **go to** ⇨ **Question 3.1**

Yes ☐ **go to** ⇨ **Question 2.9**

2.9 **Please describe in as much detail as possible what your back up fire escape plan includes.**

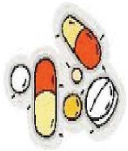
……

……

……

……







3. Safety Advice

3.1 **Families often get safety information from lots of people and places. Have you received any advice about the following in the last year?** (*Please tick one box on each row*)

	Yes	Please write who gave this advice	No	Don't know
Smoke alarms				
Children playing with matches or starting fires				
Making a plan for how to escape from your home if there is a fire				
Bedtime routines to help prevent fires				
The causes of fire in the home				
Other (please state)				

3.2 **Have you attended a session about fire safety in the home in the last year?** (*please tick one box*)

No ☐ **go to** ⇨ **Question 3.4**

Yes ☐ **go to** ⇨ **Question 3.3 a**

3.3 a **How many sessions about fire safety have you attended in the last year?**

.....

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3.3 b **Was this at a** (*please tick all that apply*)

Children's Centre ☐
Health centre ☐
Fire station ☐
Other..(please state).....

3.3 c **What were the sessions about?** (*please tick all that apply*)

Smoke alarms ☐
Children playing with matches or starting fires ☐
Making a plan for how to escape from your home if there is a fire ☐
Bedtime routines to help prevent fires ☐
The causes of fires in the home ☐
Other (please state).....

If you went to more than one session please answer question 3.3d for the most recent session you went to

3.3 d i) **How long was the session?** _____ hours _____ minutes

ii) **Did the travel to the session cost you any money?** (*please tick one box*)

Yes ☐ No ☐

If Yes, please give details below:

Private car ☐ _____Number of miles round trip

Public transport ☐ _____Return cost (£)

iii) **Did you need someone to look after your children whilst you went to the session?** (*please tick one box*)

Yes ☐ No ☐

If you had to pay for this childcare, please tell us how much you paid

Crèche at Children's Centre ☐ £_____
Family/Friends ☐ £_____
Childminder ☐ £_____
Other (Please state who):_____ £_____

3.3 e **Have you been able to put into practice any of the fire safety advice you were given in the last year?** (*please tick one box*)

Yes ☐ No ☐

3.4 **Have you had a home safety check in the last year?** (*please tick one box*)

Yes ☐ No ☐

If Yes, who did the home safety check? (*please tick all that apply*)

Fire and rescue service ☐

Children's Centre ☐

Other (please state) _____

3.5 **Have you been given any free fire safety equipment in the last year?**

(*Please tick the yes or no box on each row and tell us who gave you the equipment and who fitted it*)

	No	**Yes**	**Who gave it to you? E.g. fire and rescue service**	**Who fitted the equipment? E.g. fire and rescue service/self**
Smoke alarm				
Batteries for smoke alarms				
Fire guard				
Spark guard				Not applicable
Torch				Not applicable
Other (please state)				

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3.6 **Have you bought any fire safety equipment for your home in the last year?** (*Please tick the yes or no box on each row and tell us who fitted the equipment and how much you spent*)

	No	Yes	Who fitted the equipment?	Cost (£) (including fitting if applicable)
Smoke alarm				
Batteries for smoke alarms				
Fire guard				
Spark guard			Not applicable	
Torch			Not applicable	
Other (please state)				

3.7 **How satisfied are you with the home safety information provided *over the last year* by each of the following people or places?** (*Please tick one box on each row*.)

People or place	Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Haven't received any information from this type of person
a) GP or Practice Nurse						
b) Health Visitor						
c) Children's Centre staff						
d) Fire and Rescue service						
e) Other- please tell us who this was						



4. We would be grateful if you could tell us something about yourself by answering the following questions. All your answers are confidential.

4.1. **Has there been a house fire in your home in the last year?** (*please tick one box*)

Yes ☐ No ☐

If yes, can you tell us briefly what happened?

(*How did the fire start? Was anyone hurt?)*

……..

……..

……..

4.2. **Have you found any of your children playing with matches or lighters in the last year?** (*please tick one box*)

Yes ☐ No ☐

4.3 **How many people in your household smoke?** (*please tick one box*)

Nobody Smokes ☐ 1 person ☐ 2 people ☐ 3 or more people ☐

4.4 **Has anyone in your household tried to stop smoking in the last year?**

(*please tick one box*)

No ☐ **go to** ⇨ **Question 4.8**

Yes ☐ **go to** ⇨ **Question 4.5**

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We are also very keen to find out how much it costs people to stop smoking. If you have tried to stop smoking in the last year please fill in these questions for us.

4.5 **What kind of help have you or people in your household had to help stop smoking?** (*please tick the yes or no box on each row and tell us the number of times you had each type of help*)

	No	Yes	Number of times
Phoned NHS smoking helpline			
Seen an NHS smoking advisor			
Attended an NHS stop smoking group			
Used NHS mobile phone text service			
Ordered NHS leaflets/quit pack online			
Seen the practice nurse about stopping smoking			
Seen the GP about stopping smoking			
Been prescribed nicotine patches, gum etc			
Been prescribed tablets to help stop smoking			
Other (please state)			

4.6 **Have you or people in your household been prescribed or bought any patches, gum, tablets etc to help stop smoking?** (*Please tick the yes or no box on each row and if yes, tick the other boxes if they apply and tell us the cost*)

	No	Yes	On prescription	Bought	Cost (£)
Nicotine replacement patches					
Nicotine gum					
Tablets to help stop smoking					
Other (please state)					

4.7 **Have you or people in your household been to any sessions at the Children's Centre to help stop smoking in the last year?** (*please tick all that apply*)

Yes ☐ **go to** ⇨ **Question 4.7 i**

No ☐ **go to** ⇨ **Question 4.8**

i) **What sort of sessions were these**

Sessions with a smoking advisor ☐

Support groups sessions ☐

Other (please state).....

ii) **Did the travel to the most recent session or support group cost you any money?** (*please tick one box*)

Yes ☐ No ☐

If Yes, please give details below:

Private car ☐ _____Number of miles round trip

Public transport ☐ _____Return cost (£)

4.8 **Did you complete this questionnaire yourself?** yes ☐ no ☐

If no, please tell us who helped you? ……..

4.9 **Please tell us the date you completed the questionnaire**……

Thank you for completing this questionnaire.

Please return this completed questionnaire in the FREEPOST envelope to:

FREEPOST

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Baseline manager/staff questionnaire

CHILDREN'S CENTRE SURVEY

1. Your Children's Centre

Please would you tell us the following:

1.1 Name of Children's Centre.....

1.2 Lead Agency for Children's Centre.....

1.3 Your job title? .....

1.4 Your employer? .....

1.5 What professional group are you from?

Administration ☐ Health Promotion ☐ Nursing ☐ Social care services ☐
Education ☐ Other - *Please specify*.....

1.6 What do you consider to be the **3 main** priority areas for children's Health for your Centre?

I.....

II.....

III.....

1.7 If *Accident Prevention is not included in your top three, please add a comment about how important accident prevention is in relation to your priorities:*

.....

.....

2. Key documents

2.1 Has child accident prevention been included in local plans and strategies for children and young people's health and well being?

Yes ☐ No ☐ Don't know ☐

2.2 Do the following have a written **child accident prevention strategy?**
(or a broader strategy of which child accident prevention is a part?)

	Yes	No	Don't know
• Your Children's Centre	☐	☐	☐
• Your PCT	☐	☐	☐
• Local Authority	☐	☐	☐

2.3 Since your Children's Centre was established do you recall receiving any:
policy documents/guidance/training relating to accident prevention? Yes ☐ No ☐

If YES, please list the documents/training below:

.....

.....

3. Activities

Please answer the following questions by ticking the relevant box:

Activities: *(Please tick 1 box per row)*	**Yes**	**No**	**Don't know**
The Children's Centre is involved in accident prevention			
Posters on child safety have been displayed in the Centre			
The Centre takes part in Child Safety Week			
The Centre has had media coverage about accident prevention			
First aid kits are given to parents			
Staff lobby or campaign on local safety issue(s)			
The Centre has collected data on children's accidents			
Outside speakers are invited in to talk to parents on accident prevention			

If outside speakers talk about accident prevention what topics do they cover?

.....

.....

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4. Preventing Falls

4.1 Does your children's centre provide advice and/or leaflets on any of the following topics?

(Please tick at least 1 box per row)	**No Advice**	**One to one advice**	**Advice in groups**	**Leaflets**	**Don't Know**
General falls prevention					
High chair and push chair safety					
Baby walker safety					
Climbing hazards					
Stair safety					
What to do if a child has a head injury					

4.2 Do your Children's Centre staff carry out any of these activities?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
Home safety checks			
Provide safety gates			
Provide corner covers			
Provide window locks			
Teach first aid			

4.3 Do your Children's Centre staff refer families to other agencies?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
To **Safety Equipment Scheme** home safety checks			
To **Safety Equipment Scheme** for safety gates			
To **Safety Equipment Scheme** for corner covers			
To **Safety Equipment Scheme** for window locks			
To **Safety Equipment Scheme** for other safety equipment			

Please specify the type of other safety equipment……

5. Preventing Fires

5.1 Does your Children's Centre provide advice and/or leaflets on any of the following topics?

(Please tick at least 1 box per row)	**No Advice**	**One to one advice**	**Advice in groups**	**Leaflets**	**Don't Know**
General fire prevention					
Smoke alarms					
Safe use and storage of cigarettes, lighters and matches					
Cooking safety					
Using candles/tealights safely					
Electrical safety					
Handling hot irons safely					
How to make a fire escape plan					
Bed time routines to prevent fires					
Smoking cessation					

5.2 Do your Children's Centre staff carry out any of these activities?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
Conduct home fire safety risk assessments			
Provide smoke alarms			
Fit smoke alarms			
Provide smoke alarm batteries			
Exchange chip pans for deep fat fryers			
Provide electric blanket checking/exchange service			
Teach families how to test smoke alarms			
Help families to make an escape plan			
Teach families a bedtime routine to prevent fires			
Teach families about the safe storage of matches/lighters			
Teach families about the dangers of cooking when under the influence of alcohol			

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5.3 Does your Children's Centre staff refer families to other agencies?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
To ***Fire and Rescue Service (FRS)*** for home fire safety risk assesments			
To ***FRS*** for smoke alarms			
To ***FRS*** for exchange of chip pans for deep fat fryers			
To ***FRS*** for fire extinguishers/fire blankets			
To ***FRS*** for electric blanket checking/exchange service			
To ***FRS*** for advice on making an escape plan			
To ***FRS*** for advice on fire setting			
To child mental health services for advice on fire setting			
To ***NHS smoking cessation services***			
To ***Safety Equipment Scheme*** for smoke alarms			

6. Preventing Poisoning

6.1 Does your Children's Centre provide advice and/or leaflets on any of the following topics?

(Please tick at least 1 box per row)	**No Advice**	**One to one advice**	**Advice in groups**	**Leaflets**	**Don't Know**
General poisoning prevention					
Keeping hazardous substances out of reach					
Use of child resistant containers					
Safe disposal of unwanted medicines					
Awareness of poisonous plants					
What to do if a child swallows something potentially harmful					

6.2 Do your Children's Centre staff carry out any of these activities?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
Conduct home safety checks			
Provide safety catches for cupboards and drawers			
Provide fridge locks			
Teach families about the safe storage of hazardous substances			
Teach families about plants that are poisonous			

6.3 Does your Children's Centre staff refer families to other agencies?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
To ***Safety Equipment Scheme*** for safety catches			
To ***Safety Equipment Scheme*** for fridge locks			
To ***Pharmacists*** for the safe disposal of unwanted medicines			

7. Joint working

7.1 Is there an organised group/alliance specifically for child accident prevention in your area? Yes ☐ No ☐ Don't Know ☐

7.2 If YES, give the name of this group/alliance and any others that specifically deal with accident prevention.

.....
.....

7.3 Is your Children's Centre working with any of the following organisations on child accident prevention?

	Yes	No	Don't know
Accident & Emergency Dept.	☐	☐	☐
Community Nursing Services e.g. Health Visitors, School Nurses	☐	☐	☐
Fire and Rescue Service	☐	☐	☐
Local Authorities	☐	☐	☐
Road Safety	☐	☐	☐
Voluntary organisations	☐	☐	☐
Others	☐	☐	☐

Please specify "Others".....

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8. Your views

8.1 What do you see as the main barriers / enabling factors **to accident prevention work** for your Centre?
(*Please give a brief description*.)

BARRIERS	**ENABLING FACTORS**

Additional comments

If you have any additional comments about accident prevention that you would like to make, please use the space below:

Thank you for completing this questionnaire.

If you would like me to send you a summary of the results of this survey, *please tick*..... ☐

Your name..... Your email.....
(please print)

Please return this completed questionnaire in the FREEPOST envelope to:

Clare Bryan, Research Secretary,
NHS Nottinghamshire County,
Birch House, Southwell Road West,
Mansfield, NG21 0HJ.

Follow-up manager/staff questionnaire

CHILDREN'S CENTRE SURVEY

1. Your Children's Centre

Please give us the following information:

1.1 Name of Children's Centre.....

1.2 Lead Agency for Children's Centre.....

1.3 Your job title.....

1.4 Your employer.....

1.5 What professional group are you from?

Administration ☐ Health Promotion ☐ Nursing ☐ Social care services ☐
Education ☐ Other - *Please specify*.....

1.6 What do you consider to be the **3 main** priority areas for children's health for your Centre?

I.....

II.....

III.....

RCT of injury prevention briefing in Children's Centres: Follow up Children Centre questionnaire version 1: 23.01.2013

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2. Key documents

2.1 Has child accident prevention been included in local plans and strategies for children and young people's health and well being?

Yes	No	Don't know
☐	☐	☐

2.2 Do the following have a written **child accident prevention strategy?**
(or a broader strategy of which child accident prevention is a part?)

	Yes	No	Don't know
• Your Children's Centre	☐	☐	☐
• Your local community NHS health services	☐	☐	☐
• Local Authority	☐	☐	☐

2.3 In the last 12 months do you recall receiving any policy documents/guidance/training relating to accident prevention? Yes ☐ No ☐

***If YES**, please list the documents/training below:*

……

……

3. Activities

Please answer the following questions by ticking the relevant box:

In the last 12 months: *(Please tick 1 box per row)*	**Yes**	**No**	**Don't know**
The Children's Centre has been involved in accident prevention			
Posters on child safety have been displayed in the Centre			
The Centre took part in Child Safety Week			
The Centre has had media coverage about accident prevention			
First aid kits have been given to parents			
Staff have lobbied or campaigned on local safety issue(s)			
The Centre has collected data on children's accidents			
Outside speakers have been invited in to talk to parents on accident prevention			

If outside speakers have talked about accident prevention what topics did they cover?

……

……

RCT of injury prevention briefing in Children's Centres: Follow up Children Centre questionnaire version 1: 23.01.2013

4. Preventing Fires

4.1 Has your Children's Centre provided advice and/or leaflets on any of the following topics in the last 12 months?

(Please tick at least 1 box per row)	**No Advice**	**One to one advice**	**Advice in groups**	**Leaflets**	**Don't Know**
General fire prevention					
Smoke alarms					
Safe use and storage of cigarettes, lighters and matches					
Cooking safety					
Using candles/tealights safely					
Electrical safety					
Handling hot irons safely					
Handling hair straighteners safely					
How to make a fire escape plan					
Bed time routines to prevent fires					
Smoking cessation					

4.2 Have your Children's Centre staff carried out any of these activities in the last 12 months?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
Conducted home fire safety risk assessments			
Provided smoke alarms			
Fitted smoke alarms			
Provided smoke alarm batteries			
Exchanged chip pans for deep fat fryers			
Provided electric blanket checking/exchange service			
Taught families how to test smoke alarms			
Helped families to make an escape plan			
Taught families a bedtime routine to prevent fires			
Taught families about the safe storage of matches/lighters			
Taught families about the dangers of cooking when under the influence of alcohol			

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4.3 Has your Children's Centre run any sessions specifically about fire prevention for parents in the last 12 months?

Yes ☐ **No** ☐ **Don't know** ☐

If YES how many sessions did you run?.....

If YES, did the Fire and Rescue Service (FRS) attend the Children's Centre to help provide any of these fire prevention sessions?

Yes ☐ **No** ☐ **Don't know** ☐

Please give details of how many Children's Centre and FRS staff provided the sessions, how long they lasted and any extra costs incurred in running the session (e.g. providing a crèche, cost of supporting materials etc):

	Number of Children's Centre staff providing each session	Number of FRS staff providing each session	Length of session (number of hours)	Extra costs incurred in £'s	
				Amount	Details
Session 1					
Session 2					
Session 3					
Session 4					
Session 5					

4.4 Has your Children's Centre had any **other** help from the FRS in providing fire prevention activities or advice for parents in the last 12 months? (e.g. visits to discuss how the Children's Centre might promote fire safety, provision of training or resources etc).

Yes ☐ **No** ☐ **Don't know** ☐

If YES, did this involve any visits by the FRS to the Children's Centre (in addition to those sessions listed above)

Yes ☐ **No** ☐ **Don't know** ☐

If YES, how many times did the **FRS** visit your Children's Centre in the last 12 months?

Please give details of how many FRS staff attended each visit, how long the visit lasted, and any extra costs incurred during the visit (e.g. costs for training, resources etc).

	Number of FRS staff who attended visit	Length of visit (number of hours)	Extra costs incurred in £'s	
			Amount	Details
Visit 1				
Visit 2				
Visit 3				
Visit 4				
Visit 5				

4.5 Have your Children's Centre staff attended any training sessions on fire safety since joining this study?

Yes ☐ **No** ☐ **Don't know** ☐

If YES, please list the training sessions attended, how many staff members attended, length of session and any extra costs incurred (e.g. session fee, travel etc).

	Description of session attended	Number of your staff who attended session	Who provided the session	Length of session (number of hours)	Extra costs incurred in £'s	
					Amount	Details of resources used
Session 1						
Session 2						
Session 3						
Session 4						
Session 5						

RCT of injury prevention briefing in Children's Centres: Follow up Children Centre questionnaire version 1: 23.01.2013

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4.6 Have your Children's Centre staff referred families to other agencies in the last 12 months?

(Please tick 1 box per row)	**Yes**	**No**	**Don't Know**
To ***Fire and Rescue Service (FRS)*** for home fire safety risk assesments			
To ***FRS*** for smoke alarms			
To ***FRS*** for exchange of chip pans for deep fat fryers			
To ***FRS*** for fire extinguishers/fire blankets			
To ***FRS*** for electric blanket checking/exchange service			
To ***FRS*** for advice on making an escape plan			
To ***FRS*** for advice on fire setting			
To child mental health services for advice on fire setting			
To ***NHS smoking cessation services***			
To ***Safety Equipment Scheme*** for smoke alarms			

5. Joint working

5.1 Is there an organised group/alliance specifically for child accident prevention in your area? **Yes** ☐ **No** ☐ **Don't Know** ☐

5.2 If YES, give the name of this group/alliance and any others that specifically deal with accident prevention.

……
……

5.3 Has your Children's Centre worked with any of the following organisations on child accident prevention in the last 12 months?

	Yes	**No**	**Don't know**
Accident & Emergency Dept.	☐	☐	☐
Community Nursing Services e.g. Health Visitors, School Nurses	☐	☐	☐
Fire and Rescue Service	☐	☐	☐
Local Authorities	☐	☐	☐
Road Safety	☐	☐	☐
Voluntary organisations	☐	☐	☐

If YES *please specify which voluntary organisations*.....

.....

Others

Please specify "Others".....

6. Your views

6.1 What do you see as the main barriers / enabling factors **to accident prevention work** for your Centre?
(*Please give a brief description*.)

BARRIERS	**ENABLING FACTORS**

Additional comments

If you have any additional comments about accident prevention that you would like to make, please use the space below:

Thank you for completing this questionnaire. The results of this study will be available in 2014 and we will send a summary of our findings to your Children's Centre.

Please return this completed questionnaire in the FREEPOST envelope to:

[INSERT ADDRESS HERE]

RCT of injury prevention briefing in Children's Centres: Follow up Children Centre questionnaire version 1: 23.01.2013

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Facilitation contacts questionnaires

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB ONLY

UIC:

STUDY M3 – HELPING CHILDREN'S CENTRES TO ENHANCE HOME SAFETY WITH FAMILIES

UIC: .....

Name: .....

Date completed.....

Title/role: .....

Children's Centre name: .....

Please tell us how you have been getting on with the IPB. Please place tick either 'yes', 'no' or don't know (D/K). There is no need to write explanations because we will be contacting you in [xxx] to ask you for some further details.

Questions	Yes	No	D/K
1. Did you make a plan of how you would use the IPB in your Children's Centre?			
2. Did you make any alterations to this plan?			
3. Have you had any problems or difficulties in relation to using the IPB? Eg in planning and/or delivering sessions.			
4. Has anything gone particularly well in relation to using the IPB?			
5. Did all your staff who work face-to-face with parents in the Children's Centre know about the IPB?			
6. Were any staff trained in getting the fire safety messages across?			
7. Were there some staff who were more enthusiastic than others about delivering the information in the IPB?			
8. Have you had contact with staff from the Fire and Rescue Service during the last 12 months?			

M3: enhancing home safety in Children's Centres: IPB Only , 12 months questionnaire v1 16_02_2012.

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB ONLY

Questions	Yes	No	D/K
9. Have you had contact with staff from other multi-agency partners in delivering the sessions, or in getting fire safety messages across during the last 12 months?			
10. Did you run any **group** sessions for parents? **If no, please go to question 14.** **If yes:** were these: a) Sessions set up specifically for using the information in the IPB?? b) Information from the IPB slotted in to existing sessions? c) Other ways – and we will contact you to find out more about this?			
11. Was it difficult to get the families to attend the session(s)?			
12. Did you make a plan for how you would evaluate getting fire safety messages across in the sessions that you put on?			
13. Have there been any difficulties recording on the Activity Logs which of the recruited families in the study have attended sessions? *Number of families* who have attended sessions……			
14. Did you try to get the fire safety messages across to families in any ways other than in sessions?			
15. Did you make a plan for how you would evaluate getting fire safety messages across *other than in sessions*?			
16. Have there been any difficulties recording on the Activity Logs which of the recruited families in the study have received the fire safety messages *other than in sessions*? *Number of families* who have received fire safety messages outside the sessions……..			
17. Did families outside of the recruited families receive the fire safety messages? E.g. have they been disseminated to the wider Centre users?			
18. Did you have a plan to ensure that the fire safety messages in the IPB were delivered consistently and not distorted?			
19. Did you use any of the exercises from the IPB with families?			
20. Has there been anything that you have found helpful in delivering the sessions, or in getting the fire safety messages across, that you would like to share with other Centres?			
21. Have there been any negative effects of delivering the sessions and the content of them, or in getting fire safety messages across, for either yourselves or for the parents? (*eg. a parent or staff member became upset because they had experienced a fire*.)			

M3: enhancing home safety in Children's Centres: IPB Only , 12 months questionnaire v1 16_02_2012.

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB ONLY

Questions	Yes	No	D/K
22. Is there anything else that would have been helpful for you in getting the fire safety messages across?			

Implementation fidelity questions

1.1 Did your Children's Centre promote any of the following fire safety messages from the IPB with parents? (*pp15-16 in the IPB*)
- a) Importance of smoke alarm use and maintenance;
- b) Having a family fire escape plan;
- c) Identifying potential causes of house fires;
- d) Understanding children's behaviour and fire prevention;
- e) Having a bedtime fire safety routine.

1.2 Did your Centre use any of the exercises in Section D of the IPB with parents?
- a) Importance of smoke alarms;
- b) Identifying potential causes of house fires;
- c) Children's behaviour and fire prevention;
- d) Bedtime safety routine;
- e) Family fire escape plan.

1.3 Did your Centre promote fire safety in any other ways with parents (additional to what were suggested in the IPB)?

2.1 Was your Centre able to promote the fire safety messages as often, or as long, as you had originally planned?
- a) Importance of smoke alarm use and maintenance;
- b) Having a family fire escape plan;
- c) Identifying potential causes of house fires;
- d) Understanding children's behaviour and fire prevention;
- e) Having a bedtime fire safety routine.

3. Overall, how would you rate the quality of the delivery of the fire safety messages? (Response options: very good, good, adequate, poor, very poor)
- a) Importance of smoke alarm use and maintenance;
- b) Having a family fire escape plan;
- c) Identifying potential causes of house fires;
- d) Understanding children's behaviour and fire prevention;
- e) Having a bedtime fire safety routine.

M3: enhancing home safety in Children's Centres: IPB Only , 12 months questionnaire
v1 16_02_2012.

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB ONLY

4.1 Overall, the families were fully engaged with the fire safety messages and advice provided by your Centre (Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree)

4.2 Overall, the parents enjoyed the fire safety messages and advice provided by your Centre. (Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree)

4.3 Overall, the parents thought that the fire safety messages and advice provided by your Centre were relevant to themselves. (Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree)

5.1 How important do you think it is to promote the following fire safety messages to parents at your Centre? (Responses options: very important, important, neither important or unimportant, not very important, not important at all)

a) Smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

5.2 How important do you think it is to use the exercises in the IPB to promote the following fire safety messages to parents at your Centre? (Responses options: very important, important, neither important or unimportant, not very important, not important at all)

a) The importance of smoke alarms;
b) Identifying potential causes of house fires;
c) Children's behaviour and fire prevention – safe storage of matches and lighters;
d) Bedtime fire safety routine;
e) A family fire escape plan.

6.1 Were there any factors that affected the promotion of fire safety messages in your Centre? *(Please give brief details)*

6.2 Do you have any other brief comments on your experience of promoting fire safety messages?

Please return this questionnaire to:

[study centre address**]**

M3: enhancing home safety in Children's Centres: IPB Only , 12 months questionnaire v1 16_02_2012.

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB+FAC

UIC:

STUDY M3 – HELPING CHILDREN'S CENTRES TO ENHANCE HOME SAFETY WITH FAMILIES

UIC: .....

Name: .....

Date completed.....

Title/role: .....

Children's Centre name: .....

Please tell us how you have been getting on with the IPB. Please place tick either 'yes', 'no' or don't know (D/K). There is no need to write explanations because we will be contacting you in [xxx] to ask you for some further details.

Questions	Yes	No	D/K
1. Did you make an implementation plan?			
2. Have you done anything further in relation to the IPB since you last filled in this questionnaire?			
3. Have you had any problems or difficulties in relation to using the IPB? Eg in planning and/or delivering sessions.			
4. Has anything gone particularly well in relation to using the IPB?			
5. Did all your staff who work face-to-face with parents in the Centre know about the IPB?			
6. Have any staff, other than those who attended the first training session with the Keeping Children Safe staff, been trained in getting the fire safety messages across?			
7. Were there some staff who were more enthusiastic than others about delivering the IPB?			

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB+FAC

Questions	Yes	No	D/K
8. Have you had contact with staff from the Fire and Rescue Service since you last filled in this questionnaire?			
9. Have you had contact with staff from other multi-agency partners in delivering the sessions, or in getting fire safety messages across, since you last filled in this questionnaire?			
10. Did you run any sessions for parents? **If no, please go to question 13.** **If yes:** were these: a) Sessions set up specifically for this purpose? b) Slotted in to existing sessions? c) Other ways – and we will contact you to find out more about this?			
11. Was it difficult to get the families to attend the session(s)?			
12. Have there been any difficulties recording which of the recruited families in the study have attended sessions? *Number of families* who have attended sessions…….			
13. Did you try to get the fire safety messages across to families in any ways other than in sessions?			
14. Did you make a plan for how you would evaluate getting fire safety messages across *other than in sessions*?			
15. Have there been any difficulties recording which of the recruited families in the study have received the fire safety messages *other than in sessions*? *Number of families* who have received fire safety messages outside the sessions……..			
16. Did families outside the recruited families received the fire safety messages? Eg. have they been disseminated to the wider Centre users?			
17. Did you have a plan to ensure that the fire safety messages are delivered consistently and not distorted?			
18. Did you use any of the exercises from the IPB with families?			
19. Has there been anything that you have found helpful in delivering the sessions, or in getting the fire safety messages across, that you would like to share with other Centres?			
20. Have there been any negative effects of delivering the sessions and the content of them, or in getting fire safety messages across, for either yourselves or for the parents? (*eg. a parent becomes upset because they had experienced a fire*.)			

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB+FAC

Implementation fidelity questions

1.1 Did your Children's Centre promote any of the following fire safety messages from the IPB with parents? (pp15-16 in the IPB)

a) Importance of smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

1.2 Did your Centre use any of the exercises in Section D of the IPB with parents?

a) Importance of smoke alarms;
b) Identifying potential causes of house fires;
c) Children's behaviour and fire prevention;
d) Bedtime safety routine;
e) Family fire escape plan.

1.3 Did your Centre promote fire safety in any other ways with parents (additional to what were suggested in the IPB)?

2.1 Was your Centre able to promote the fire safety messages as often, or as long, as you had originally planned?

a) Importance of smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

Response options: very good, good, adequate, poor, very poor

3 Overall, how would you rate the quality of the delivery of the fire safety messages?

a) Importance of smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB+FAC

Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree

4.1 Overall, the families were fully engaged with the fire safety messages and advice provided by your Centre.

4.2 Overall, the parents enjoyed the fire safety messages and advice provided by your Centre.

4.3 Overall, the parents thought that the fire safety messages and advice provided by your Centre were relevant to themselves.

Responses options: very important, important, neither important or unimportant, not very important, not important at all

5.1 How important do you think it is to promote the following fire safety messages to parents at your Centre?

a) Smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

5.2 How important do you think it is to use the exercises in the IPB to promote the following fire safety messages to parents at your Centre?

a) The importance of smoke alarms;
b) Identifying potential causes of house fires;
c) Children's behaviour and fire prevention – safe storage of matches and lighters;
d) Bedtime fire safety routine;
e) A family fire escape plan.

6.1 Were there any factors that affected the promotion of fire safety messages in your Centre? (Please give brief details.)

6.2 Do you have any other brief comments on your experience of promoting fire safety messages?

Please return this questionnaire to:

[study centre address**]**

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Facilitation contacts interview

1 MONTH IPB + FACILITATION INTERVIEW SCHEDULE

UIC

STUDY M3 – HELPING CHILDREN'S CENTRES TO ENHANCE HOME SAFETY WITH FAMILIES: 1 Month INTERVIEW SCHEDULE.

Interviewers will have a copy of the questionnaire completed by the Children's Centre staff member relevant to the time point of the interview. Interviewers should have a copy of the IPB to hand to refer to during the interview if necessary. The interviewer will remind the interviewee of the question and their responses on the questionnaire and ask the questions from this schedule which begin "if answered yes/no on the questionnaire".

Questions
1. Thinking about the training session run by us, are there any matters that you feel are not clear or about which you would like more information? **If answered yes on questionnaire:** • Can you tell us about what you are unsure about/need information on?
2. Did you *start* making your implementation plan at the first training session with us? If **answered 'no' on questionnaire:** • Have you done any work on it since the training session? • Are you able to say when you expect to have a plan?

M3: enhancing home safety in Children's Centres: facilitation interview schedule v1.1; 29th June, 2012.

3. Have you now finalised your implementation plan?

If answered yes on questionnaire:

- Is this a written plan?
- Can we have a copy, please?
- Can you tell us about it/give us some details, please?
- Have you made any changes to your original plan and timetable?
- What changes and why?
- In retrospect, what do you think might have been helpful in supporting you to develop it? (*Go through implementation plan template.)*

If answered no on questionnaire:

- What stage is it at?
- Has anything stopped you?
- Do you know when you might finalise your plan?

4. Have you used or are you using the IPB in any way at all?

If answered yes on questionnaire:

- Can you tell us what you have done since the first training/since you filled in the questionnaire, please?

If answered no on questionnaire:

- When will you be able to do anything with the IPB?

5. Have you had any problems or difficulties in relation to using the IPB?

If answered yes on questionnaire:

- Can you describe them, please?
- What hasn't gone as well as you hoped it would?
- What would you like to see working better?

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6. Has anything gone particularly well in relation to using the IPB?

If answered yes on questionnaire:

- What sort of things have gone well?
- Can you give us examples, please?

7. Do all your staff who work face-to-face with parents in the Centre know about the IPB?

If answered yes on questionnaire:

- Which staff are these? *Eg., job titles and numbers of staff*)?

If answered no on questionnaire:

- Do you intend that all staff who work face-to-face with parents will know about the IPB?
- If answers NO to this: - can you tell us why you have made this decision?

8. Have any staff, other than those who attended the first training session, been trained in getting the fire safety messages across? (For researchers info the safety messages are on pp 15 & 16 in the IPB – in case anybody asks us what they are and where they can be found.)

If answered yes on questionnaire:

- Which staff are these and why? *Eg. job titles and numbers of staff.*

9. Are there some staff who are more enthusiastic than others about using the information in the IPB?

If answered yes on questionnaire:

- Do you know why this might be?

M3: enhancing home safety in Children's Centres: facilitation interview schedule v1.1; 29th June, 2012.

10. Have you had contact with staff from the Fire and Rescue Service since the training session?

If answered yes on questionnaire:

- Please describe this contact.

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from having contact with them?

11. Have you had contact with staff from other multi-agency partners in delivering the sessions, or in getting fire safety messages across, since the training session?

If answered yes on questionnaire:

- Which staff and in what capacity (*record job titles, numbers of staff, what the contact involved)?*
- Are these staff those who your Children's Centre usually engages with?

12. Have you made any plans to run any group sessions for parents?

If answered yes on questionnaire:

- What have you done?
- What are your plans?
- What sort of group sessions are these and how many/how often?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from running group sessions (ask them to describe what has stopped them)? (*Then go to question 16)*

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13. Was it difficult to get the families to attend the group session(s)?

If answered yes on questionnaire:

- Can you tell us about this, please?
- Have you managed to overcome the difficulties? If yes, how?
- How have parents responded to the session(s)? (*This may include: interested, good discussion, own examples of accidents/injuries, changes they have or will make.)*

If answered no on questionnaire:

- Why do you think this hasn't been difficult?

14. Have there been any difficulties recording which of the recruited families in the study have attended group sessions?

If answered yes on questionnaire:

- Please can you tell us why?
- Can you tell us what you have tried, please?

If answered no on questionnaire:

- Can you describe how you will be/have been doing this please?

15. Have there been any difficulties recording on the activity logs those families in the study who have attended group sessions?

If answered yes on questionnaire:

- Please can you tell us why?
- Can you tell us what you have tried, please?

If answered no on questionnaire:

- Can you describe how you will be/have been doing this please?

16 . Have you tried, or are you planning, to get the fire safety messages across to recruited families in any ways *other than in group sessions*, eg., 1-1 and/or outreach work/groups?

If answered yes on questionnaire:

- Can you describe how you will/did this?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from trying to do this?

17 . Have there been any difficulties recording on the activity logs those families in the study who have received the fire safety messages *other than in group sessions*, eg., 1-1 and/or outreach work/groups?

If answered yes on questionnaire:

- Can you tell us about this, please?
- Can you tell us what you have tried?

If answered no on questionnaire:

- Can you describe how you will be/have been doing this?

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18. Have families outside the recruited families received the fire safety messages, eg. have they been disseminated to the wider Centre users, eg., 1-1 and/or outreach work/groups ?

If answered yes on questionnaire:

- Which families?
- Are they families from particular sections from your community, eg., ethnic groups, English not first language, young parents etc ?
- How have the messages been delivered?
- Do you know how many families? *Record total to date……..*

19. Have you made a plan for how you will evaluate getting fire safety messages across?

If answered yes on questionnaire:

- Please can you tell us about your evaluation (and give us details)?

If answered no n questionnaire:

- Please can you tell us why?
- Has something stopped you from making a plan – please describe?

20. Have you a plan to ensure that the fire safety messages are delivered consistently and not distorted?

If answered yes on questionnaire:

- Can you tell me about how you are doing this, please?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from making a plan?

M3: enhancing home safety in Children's Centres: facilitation interview schedule v1.1; 29th June, 2012.

21. Have you used any of the exercises from the IPB with families?

If answered yes on questionnaire:

- Which one(s) did you use?
- Why did you choose these?
- Have you got any plans to use any of the other exercises in the IPB?
- If yes, which ones and why?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from using the exercises?

22. Has there been anything that you have found helpful in delivering the sessions, or in getting the fire safety messages across, that you would like to share with other Centres?

If answered yes on questionnaire:

- Ask them to describe and *collect vignettes/scenarios.*

23. Have there been any negative effects of delivering the sessions and the content of them, or in getting fire safety messages across, for either yourselves or for the parents? (*eg. a parent becomes upset because they had experienced a fire*.)

If answered yes on questionnaire:

- Can you tell us about them, please?

24. Is there anything else that we could do to help you start planning or running sessions or in getting the fire safety messages across?

If answered yes on questionnaire:

- Can you tell us what we could do, please?

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25. Is there anything else that you would like to tell us about the project and/or your experience in being part of it?

UIC



STUDY M3 – HELPING CHILDREN'S CENTRES TO ENHANCE HOME SAFETY WITH FAMILIES:

3 – 8 MONTH INTERVIEW SCHEDULE.

Interviewers will have a copy of the questionnaire completed by the Children's Centre staff member relevant to the time point of the interview. The interviewer will remind the interviewee of their responses on the questionnaire and ask the questions from this schedule which begin "if answered yes/no on the questionnaire"

Questions
1. Have you now finalised your implementation plan? **If answered yes on questionnaire:** • Is this a written plan? • Can we have a copy, please? • Can you tell us about it/give us some details, please? • Have you made any changes to your original plan and timetable? If yes, what changes and why? • In retrospect, what do you think might have been helpful in supporting you to develop it? (*Go through implementation plan template*.) **If answered no on questionnaire:** • What stage is it at? • Has anything stopped you? • Do you know when you might finalise your plan?

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Questions
2. a) Have you done anything further in relation to the IPB since you last filled in the questionnaire, a couple of months ago? **If answered yes on questionnaire:** • Can you tell us what you have done since you last filled in the questionnaire, please? **If answered no on questionnaire:** • When will you be able to do anything further with the IPB?
3. Have you had any problems or difficulties in relation to using the IPB? **If answered yes on questionnaire:** • Can you describe them, please? • What hasn't gone as well as you hoped it would? • What would you like to see working better?
4. Has anything gone particularly well in relation to using the IPB? **If answered yes on questionnaire:** • What sort of things have gone well? • Can you give us examples, please?
5. Do all your staff who work face-to-face with parents in the Centre know about the IPB? **If answered yes on questionnaire:** • Which staff are these? *Eg., job titles and numbers of staff*? **If answered no on questionnaire:** • Do you intend that all staff who work face-to-face with parents will know about the IPB? • If answers NO to this: can you tell us why you have made this decision?

M3: enhancing home safety in Children's Centres: facilitation interview schedule 3-8 months; v1.2 15_07_2012.

Questions
6. Have any staff, other than those who attended the first training session, been trained in getting the fire safety messages across? (If they ask what we mean, see pp 15 & 16 in the IPB.) **If answered yes on questionnaire:** • Which staff are these and why? *Eg., job titles and numbers of staff.*
7. Are there some staff who are more enthusiastic than others about using the information in the IPB? **If answered yes on questionnaire:** • Do you know why this might be?
8. Have you had contact with staff from the Fire and Rescue Service since you last filled in the questionnaire? **If answered yes on questionnaire:** • Please describe this contact. **If answered no on questionnaire:** • Please can you tell us why? • Has something stopped you from having contact with them?
9. Have you had contact with staff from other multi-agency partners in delivering the sessions, or in getting fire safety messages across, since you last filled in the questionnaire? **If answered yes on questionnaire:** • Which staff and in what capacity (*record job titles, numbers of staff, what the contact involved)?* • Are these staff those who your Children's Centre usually engages with?

M3: enhancing home safety in Children's Centres: facilitation interview schedule 3-8 months; v1.2 15_07_2012.

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10. Have you made any plans to run, or are you already running, any group sessions for parents?

If answered yes on questionnaire:

- What have you done?
- What are your plans?
- What sort of group sessions are these and how many/how often?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from running group sessions? *(Ask them to describe what has stopped them. Then go to question 13.)*

11. Was it difficult to get the families to attend the group session(s)?

If answered yes on questionnaire:

- Can you tell us why this was, please?
- Have you managed to overcome the difficulties? If yes, how?
- How have parents responded to the session(s)? (*This may include: interested, good discussion, own examples of accidents/injuries, changes they have or will make.)*

If answered no on questionnaire:

- Why do you think this hasn't been difficult?

12. Have there been any difficulties recording on the activity logs those families in the study who *have attended group sessions?*

If answered yes on questionnaire:

- Please can you tell us why?
- Can you tell us what you have tried, please?

If answered no on questionnaire:

- Can you describe how you will be/have been doing this please?

13. Have you tried, or are you planning, to get the fire safety messages across to recruited families in any ways *other than in group sessions*, eg., in one-to-one and/or outreach work/groups?

If answered yes on questionnaire:

- Can you describe how you will/have done this?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from trying to do this?

14. Have there been any difficulties recording on the activity logs those families in the study who have received the fire safety messages *other than in group sessions,* eg., in one-to-one and/or outreach work?

If answered yes on questionnaire:

- Can you tell us about this, please?
- Can you tell us what you have tried?

If answered no on questionnaire:

- Can you describe how you will be/have been doing this, please?

15. Have families outside the recruited families received the fire safety messages, eg., have they been disseminated to the wider Centre users, eg., one-to-one and/or outreach work/groups?

If answered yes on questionnaire:

- Which families?
- Are they families from particular sessions from your community, eg., ethnic groups, English not first language, young parents, etc?
- How have the messages been delivered?
- Do you know how many families? *Record total to date……*

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16. Have you made a plan for how you will evaluate getting fire safety messages across?

If answered yes on questionnaire:

- Please can you tell me about your evaluation (and give me details)?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from making a plan – please describe?

17. Have you a plan to ensure that the fire safety messages are delivered consistently and not distorted?

If answered yes on questionnaire:

- Can you tell me about how you are doing this, please?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from making a plan?

18. Have you used any of the exercises from the IPB with families?

If answered yes on questionnaire:

- Which one(s) did you use?
- Why did you choose this one/these?
- Have you got any plans to use any of the other exercises in the IPB?
- If yes, which ones and why?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from using the exercises?

M3: enhancing home safety in Children's Centres: facilitation interview schedule 3-8 months; v1.2 15_07_2012.

19. Has there been anything that you have found helpful in delivering the sessions, or in getting the fire safety messages across, that you would like to share with other Centres?

If answered yes on questionnaire:

- Ask them to describe and *collect vignettes/scenarios.*

20. Have there been any negative effects of delivering the sessions and the content of them, or in getting fire safety messages across, for either yourselves or for the parents? (*eg. a parent becomes upset because they had experienced a fire*.)

If answered yes on questionnaire:

- Can you tell us about them, please?

21. Is there anything else that we could do to help you start planning or running sessions or in getting the fire safety messages across?

If answered yes on questionnaire:

- Can you tell us what we could do, please?

22. Is there anything else that you would like to tell us about the project and/or your experience in being part of it? Please state below.

M3: enhancing home safety in Children's Centres: facilitation interview schedule 3-8 months; v1.2 15_07_2012.

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12-month follow-up facilitation and implementation fidelity questionnaires

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB ONLY

UIC:



STUDY M3 – HELPING CHILDREN'S CENTRES TO ENHANCE HOME SAFETY WITH FAMILIES

UIC: .....

Name: .....

Date completed.....

Title/role: .....

Children's Centre name: .....

Please tell us how you have been getting on with the IPB. Please place tick either 'yes', 'no' or don't know (D/K). There is no need to write explanations because we will be contacting you in [xxx] to ask you for some further details.

Questions	Yes	No	D/K
1. Did you make a plan of how you would use the IPB in your Children's Centre?			
2. Did you make any alterations to this plan?			
3. Have you had any problems or difficulties in relation to using the IPB? Eg in planning and/or delivering sessions.			
4. Has anything gone particularly well in relation to using the IPB?			
5. Did all your staff who work face-to-face with parents in the Children's Centre know about the IPB?			
6. Were any staff trained in getting the fire safety messages across?			
7. Were there some staff who were more enthusiastic than others about delivering the information in the IPB?			
8. Have you had contact with staff from the Fire and Rescue Service during the last 12 months?			

M3: enhancing home safety in Children's Centres: IPB Only , 12 months questionnaire v1 16_02_2012.

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB ONLY

Questions	Yes	No	D/K
9. Have you had contact with staff from other multi-agency partners in delivering the sessions, or in getting fire safety messages across during the last 12 months?			
10. Did you run any **group** sessions for parents? **If no, please go to question 14.** **If yes:** were these: a) Sessions set up specifically for using the information in the IPB?? b) Information from the IPB slotted in to existing sessions? c) Other ways – and we will contact you to find out more about this?			
11. Was it difficult to get the families to attend the session(s)?			
12. Did you make a plan for how you would evaluate getting fire safety messages across in the sessions that you put on?			
13. Have there been any difficulties recording on the Activity Logs which of the recruited families in the study have attended sessions? *Number of families* who have attended sessions……			
14. Did you try to get the fire safety messages across to families in any ways other than in sessions?			
15. Did you make a plan for how you would evaluate getting fire safety messages across *other than in sessions*?			
16. Have there been any difficulties recording on the Activity Logs which of the recruited families in the study have received the fire safety messages *other than in sessions*? *Number of families* who have received fire safety messages outside the sessions……..			
17. Did families outside of the recruited families receive the fire safety messages? E.g. have they been disseminated to the wider Centre users?			
18. Did you have a plan to ensure that the fire safety messages in the IPB were delivered consistently and not distorted?			
19. Did you use any of the exercises from the IPB with families?			
20. Has there been anything that you have found helpful in delivering the sessions, or in getting the fire safety messages across, that you would like to share with other Centres?			
21. Have there been any negative effects of delivering the sessions and the content of them, or in getting fire safety messages across, for either yourselves or for the parents? (*eg. a parent or staff member became upset because they had experienced a fire*.)			

M3: enhancing home safety in Children's Centres: IPB Only , 12 months questionnaire v1 16_02_2012.

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB ONLY

Questions	Yes	No	D/K
22. Is there anything else that would have been helpful for you in getting the fire safety messages across?			

Implementation fidelity questions

1.1 Did your Children's Centre promote any of the following fire safety messages from the IPB with parents? (*pp15-16 in the IPB*)
- a) Importance of smoke alarm use and maintenance;
- b) Having a family fire escape plan;
- c) Identifying potential causes of house fires;
- d) Understanding children's behaviour and fire prevention;
- e) Having a bedtime fire safety routine.

1.2 Did your Centre use any of the exercises in Section D of the IPB with parents?
- a) Importance of smoke alarms;
- b) Identifying potential causes of house fires;
- c) Children's behaviour and fire prevention;
- d) Bedtime safety routine;
- e) Family fire escape plan.

1.3 Did your Centre promote fire safety in any other ways with parents (additional to what were suggested in the IPB)?

2.1 Was your Centre able to promote the fire safety messages as often, or as long, as you had originally planned?
- a) Importance of smoke alarm use and maintenance;
- b) Having a family fire escape plan;
- c) Identifying potential causes of house fires;
- d) Understanding children's behaviour and fire prevention;
- e) Having a bedtime fire safety routine.

3. Overall, how would you rate the quality of the delivery of the fire safety messages? (Response options: very good, good, adequate, poor, very poor)
- a) Importance of smoke alarm use and maintenance;
- b) Having a family fire escape plan;
- c) Identifying potential causes of house fires;
- d) Understanding children's behaviour and fire prevention;
- e) Having a bedtime fire safety routine.

M3: enhancing home safety in Children's Centres: IPB Only , 12 months questionnaire v1 16_02_2012.

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB ONLY

4.1 Overall, the families were fully engaged with the fire safety messages and advice provided by your Centre (Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree)

4.2 Overall, the parents enjoyed the fire safety messages and advice provided by your Centre. (Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree)

4.3 Overall, the parents thought that the fire safety messages and advice provided by your Centre were relevant to themselves. (Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree)

5.1 How important do you think it is to promote the following fire safety messages to parents at your Centre? (Responses options: very important, important, neither important or unimportant, not very important, not important at all)

a) Smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

5.2 How important do you think it is to use the exercises in the IPB to promote the following fire safety messages to parents at your Centre? (Responses options: very important, important, neither important or unimportant, not very important, not important at all)

a) The importance of smoke alarms;
b) Identifying potential causes of house fires;
c) Children's behaviour and fire prevention – safe storage of matches and lighters;
d) Bedtime fire safety routine;
e) A family fire escape plan.

6.1 Were there any factors that affected the promotion of fire safety messages in your Centre? *(Please give brief details)*

6.2 Do you have any other brief comments on your experience of promoting fire safety messages?

Please return this questionnaire to:

[study centre address**]**

M3: enhancing home safety in Children's Centres: IPB Only , 12 months questionnaire v1 16_02_2012.

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB+FAC

UIC:

STUDY M3 – HELPING CHILDREN'S CENTRES TO ENHANCE HOME SAFETY WITH FAMILIES

UIC: .....

Name: .....

Date completed.....

Title/role: .....

Children's Centre name: .....

Please tell us how you have been getting on with the IPB. Please place tick either 'yes', 'no' or don't know (D/K). There is no need to write explanations because we will be contacting you in [xxx] to ask you for some further details.

Questions	Yes	No	D/K
1. Did you make an implementation plan?			
2. Have you done anything further in relation to the IPB since you last filled in this questionnaire?			
3. Have you had any problems or difficulties in relation to using the IPB? Eg in planning and/or delivering sessions.			
4. Has anything gone particularly well in relation to using the IPB?			
5. Did all your staff who work face-to-face with parents in the Centre know about the IPB?			
6. Have any staff, other than those who attended the first training session with the Keeping Children Safe staff, been trained in getting the fire safety messages across?			
7. Were there some staff who were more enthusiastic than others about delivering the IPB?			

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB+FAC

Questions	Yes	No	D/K
8. Have you had contact with staff from the Fire and Rescue Service since you last filled in this questionnaire?			
9. Have you had contact with staff from other multi-agency partners in delivering the sessions, or in getting fire safety messages across, since you last filled in this questionnaire?			
10. Did you run any sessions for parents? **If no, please go to question 13.** **If yes:** were these: a) Sessions set up specifically for this purpose? b) Slotted in to existing sessions? c) Other ways – and we will contact you to find out more about this?			
11. Was it difficult to get the families to attend the session(s)?			
12. Have there been any difficulties recording which of the recruited families in the study have attended sessions? *Number of families* who have attended sessions…….			
13. Did you try to get the fire safety messages across to families in any ways other than in sessions?			
14. Did you make a plan for how you would evaluate getting fire safety messages across *other than in sessions*?			
15. Have there been any difficulties recording which of the recruited families in the study have received the fire safety messages *other than in sessions*? *Number of families* who have received fire safety messages outside the sessions……..			
16. Did families outside the recruited families received the fire safety messages? Eg. have they been disseminated to the wider Centre users?			
17. Did you have a plan to ensure that the fire safety messages are delivered consistently and not distorted?			
18. Did you use any of the exercises from the IPB with families?			
19. Has there been anything that you have found helpful in delivering the sessions, or in getting the fire safety messages across, that you would like to share with other Centres?			
20. Have there been any negative effects of delivering the sessions and the content of them, or in getting fire safety messages across, for either yourselves or for the parents? (*eg. a parent becomes upset because they had experienced a fire*.)			

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB+FAC

Implementation fidelity questions

1.1 Did your Children's Centre promote any of the following fire safety messages from the IPB with parents? (pp15-16 in the IPB)

a) Importance of smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

1.2 Did your Centre use any of the exercises in Section D of the IPB with parents?

a) Importance of smoke alarms;
b) Identifying potential causes of house fires;
c) Children's behaviour and fire prevention;
d) Bedtime safety routine;
e) Family fire escape plan.

1.3 Did your Centre promote fire safety in any other ways with parents (additional to what were suggested in the IPB)?

2.1 Was your Centre able to promote the fire safety messages as often, or as long, as you had originally planned?

a) Importance of smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

Response options: very good, good, adequate, poor, very poor

3 Overall, how would you rate the quality of the delivery of the fire safety messages?

a) Importance of smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY QUESTIONNAIRE IPB+FAC

Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree

4.1 Overall, the families were fully engaged with the fire safety messages and advice provided by your Centre.

4.2 Overall, the parents enjoyed the fire safety messages and advice provided by your Centre.

4.3 Overall, the parents thought that the fire safety messages and advice provided by your Centre were relevant to themselves.

Responses options: very important, important, neither important or unimportant, not very important, not important at all

5.1 How important do you think it is to promote the following fire safety messages to parents at your Centre?

a) Smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

5.2 How important do you think it is to use the exercises in the IPB to promote the following fire safety messages to parents at your Centre?

a) The importance of smoke alarms;
b) Identifying potential causes of house fires;
c) Children's behaviour and fire prevention – safe storage of matches and lighters;
d) Bedtime fire safety routine;
e) A family fire escape plan.

6.1 Were there any factors that affected the promotion of fire safety messages in your Centre? (Please give brief details.)

6.2 Do you have any other brief comments on your experience of promoting fire safety messages?

Please return this questionnaire to:

[study centre address]

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12-month follow-up facilitation and implementation fidelity interview schedules

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

UIC



STUDY M3 – HELPING CHILDREN'S CENTRES TO ENHANCE HOME SAFETY WITH FAMILIES: 12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

We are aware that nationally there have been a large number of changes that may have impacted on how Children's Centres are organised in your area.

Please can we take this opportunity to ask you a few questions about changes that have happened in this area, and in this Children's Centre? This may help us understand more of the context to how you have been able to use the IPB in your Children's centre.

Questions and prompts:

1. Have there been any changes in how the Children's Centres in your area are organised?
    a. eg. Change in the organisation that leads the CC (from education to social care, LA to Charity, LA to health, health to social enterprise etc etc)
2. If YES –has there been any impact on your work generally?
   If yes, please explain/describe the main impact…..

    a. Have there been any changes in the health promotion topics that you prioritise?
    Eg – move away from health related topics such as healthy eating and more focused on getting parents into work

    b. Has there been an increased focus on providing day care?
    c. Any other changes?
    If yes, please describe

3. Have there been any changes to the staffing in your organisation since (insert here dates CC agreed to join the study and attendance at training session)
4.
    a. If YES, please tell us more about this – has it been changes in staff – if yes, at what level and when did this occur
    b. Has there been an overall reduction in staff numbers?

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

Interviewers will have a copy of the questionnaire completed by the Children's Centre staff member relevant to the time point of the interview. The interviewer will remind the interviewee of their responses on the questionnaire and ask the questions from this schedule which begin "if answered yes/no on the questionnaire"

Questions
1. Did you make a plan for how you would use the IPB during the study? **If answered yes on questionnaire:** • Please describe it....
2. Did you make any alterations to this plan? • If yes, what were they?
3. Have you had any problems or difficulties in relation to using the IPB? **If answered yes on questionnaire:** • Can you describe them, please? • What hasn't gone as well as you hoped it would? • What would you like to have seen working better?
4. Has anything gone particularly well in relation to using the IPB? **If answered yes on questionnaire:** • What sort of things have gone well? • Can you give us examples, please?

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

Questions
5. Did all your staff who work face-to-face with parents in the Children's Centre know about the IPB? **If answered yes on questionnaire:** • Which staff are these? *Eg., job titles and numbers of staff*? **If answered no on questionnaire:** • Did you intend that all staff who work face-to-face with parents would know about the IPB? • If answers NO to this: can you tell us why you have made this decision?
6. Were any staff, trained in getting the fire safety messages across? (If they ask what we mean, see pp 15 & 16 in the IPB.) **If answered yes on questionnaire:** • Which staff were these and why? *Eg., job titles and numbers of staff.*
7. Were there some staff who were more enthusiastic than others about using the information in the IPB? **If answered yes on questionnaire:** • Do you know why this might have been?
8. Have you had contact with staff from the Fire and Rescue Service in the last 12 months? **If answered yes on questionnaire:** • Please describe this contact. **If answered no on questionnaire:** • Please can you tell us why? • Has something stopped you from having contact with them?

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

Questions
9. Have you had contact with staff from other multi-agency partners in delivering the sessions, or in getting fire safety messages across, during the last 12 months? **If answered yes on questionnaire:** • Which staff and in what capacity (*record job titles, numbers of staff, what the contact involved)?* • Are these staff those who your Children's Centre usually engages with?
10. Did you run any **group** sessions for parents? **If answered yes on questionnaire: were these** a) Sessions set up specifically for using the information in the IPB?? b) Information from the IPB slotted in to existing sessions? **c)** Other ways – please describe **If answered no:** • Please can you tell us why? • Did something stop you from running group sessions? *(Ask them to describe what stopped them. **Then go to question 14**.)*
11. Was it difficult to get the families to attend the group session(s)? **If answered yes on questionnaire:** • Can you tell us why this was, please? • Have you managed to overcome the difficulties? If yes, how? **If answered no on questionnaire:** • Why do you think this hasn't been difficult? • How did parents respond to the session(s)? (*This may include: interested, good discussion, own examples of accidents/injuries, changes they have or will make.)*

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

Questions
12. Did you make a plan for how you would evaluate getting fire safety messages across in **group** sessions*?* **If answered yes on questionnaire**: • Please can you tell me about your evaluation (and give me details)? **If answered no on questionnaire:** • Please can you tell us why? • Has something stopped you from making a plan – please describe?
13. Have there been any difficulties recording on the Activity Logs those families in the study who ***have attended group sessions****?* **If answered yes on questionnaire:** • Please can you tell us why? • Can you tell us what you have tried, please? **If answered no on questionnaire:** • Can you describe how you have been doing this please?
14. Did you try to get the fire safety messages across to recruited families in any ways *other than in group sessions*, eg., in one-to-one and/or outreach work/groups? **If answered yes on questionnaire:** • Can you describe how you have done this? **If answered no on questionnaire:** • Please can you tell us why? • Has something stopped you from trying to do this?

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

Questions
15. Did you make a plan for how you would evaluate getting fire safety messages across for one to one/outreach sessions? **If answered yes on questionnaire**: • Please can you tell me about your evaluation (and give me details)? **If answered no on questionnaire:** • Please can you tell us why? • Has something stopped you from making a plan – please describe?
16. Have there been any difficulties recording on the Activity Logs those families in the study who have received the fire safety messages *other than in group sessions,* eg., in one-to-one and/or outreach work? **If answered yes on questionnaire:** • Can you tell us about this, please? • Can you tell us what you have tried? **If answered no on questionnaire:** • Can you describe how you have been doing this, please?

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

Questions
17. Did families outside the recruited families receive the fire safety messages, eg., have they been disseminated to the wider Centre users, eg., one-to-one and/or outreach work/groups? **If answered yes on questionnaire:** • Which families? • Are they families from particular sessions from your community, eg., ethnic groups, English not first language, young parents, etc? • How have the messages been delivered? • Do you know how many families? *Record total to date……*
18. Did you have a plan to ensure that the fire safety messages were delivered consistently and not distorted? **If answered yes on questionnaire:** • Can you tell me about how you did this, please? **If answered no on questionnaire:** • Please can you tell us why? • Has something stopped you from making a plan?

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

Questions
19. Did you use any of the exercises from the IPB with families? **If answered yes on questionnaire:** • Which one(s) did you use? • Why did you choose this one/these? • Did you have any plans to use any of the other exercises in the IPB? • If yes, which ones and why? **If answered no on questionnaire:** • Please can you tell us why? • Has something stopped you from using the exercises?
20. Has there been anything that you have found helpful in delivering the sessions, or in getting the fire safety messages across, that you would like to share with other Centres? **If answered yes on questionnaire:** • Ask them to describe and *collect vignettes/scenarios.*
21. Have there been any negative effects of delivering the sessions and the content of them, or in getting fire safety messages across, for either yourselves or for the parents? (*eg. a parent becomes upset because they had experienced a fire.*) **If answered yes on questionnaire:** • Can you tell us about them, please?
22. Is there anything else that would have been helpful for you in getting the fire safety messages across? • Can you tell us what this would be?

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12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE

Questions
23. Is there anything else that you would like to tell us about the project and/or your experience in being part of it? • Please describe

Implementation fidelity questions

1.1 In the survey monkey questionnaire, you said that your Centre promoted [x] out of the 5 fire safety messages from the IPB**:**

a) Importance of smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

1.1a Why did you select these particular ones?

1.1b Were each of these implemented as you had planned? Why was this?

1.2 You said that you had completed [x] exercises.

- Why did you select these?
- Did you include any changes to these or did you follow the exercises as set?
- Did you add any additional components in your programme? What were these?
- Were there any additional partners involved in the delivering the safety messages? Who were these and what was their role?

1.3 You said that your Centre promoted fire safety in other ways with parents.

- Can you tell me about these, please?
- Do you feel that they were well received?

2.1 For those fire safety messages you promoted, I am going to ask you for the reasons why you could/could not promote them as often or as long as planned.

2.1a Importance of smoke alarm use and maintenance;

- How long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).

2.1b Having a family fire escape plan,

- How long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).

2.1c Identifying potential causes of house fires;

- How long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).

2.1d Understanding children's behaviour and fire prevention

- How long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).

2.1e Having a bedtime fire safety routine

- How long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).

(Response options: very good, good, adequate, poor, very poor)

3.a For the Importance of smoke alarm use and maintenance; you rated the quality of the delivery as [x], why was this?

3.b Having a family fire escape plan you rated the quality of the delivery as [x], why was this?

3.c Identifying potential causes of house fires; you rated the quality of the delivery as [x], why was this?

3.d Understanding children's behaviour and fire prevention; you rated the quality of the delivery as [x], why was this?

3.e Having a bedtime fire safety routine you rated the quality of the delivery as [x], why was this?

3.1 Were there any problems related to how each of the fire safety message was delivered

(Prompt: lack of staff, lack of support from staff, number of parents present, lack of time, lack of crèche/childcare)?

Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree

4.1 Overall, you [insert response option] that parents were fully engaged the fire safety messages and advice provided by your Centre.

- Why was this?
- Can you give us any examples about how parents were engaged?

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4.2 Overall, you [insert response option] that parents enjoyed the fire safety messages and advice provided by your Centre.

- Why was this?
- Can you give us any examples of why you think this?

4.3 Overall, you [insert response option] that parents thought that the fire safety messages and advice provided by your Centre were relevant to themselves.

- Why was this?
- Can you give us any examples of why you think this?

4.4 Were there any changes you would suggest to make the materials more relevant to the parents that attend your Centre? *(Prompt: issues to do with ethnic minorities, particular groups of parents.)*

Responses options: very important, important, neither important or unimportant, not very important, not important at all

5.1 You said in the questionnaire that promoting [x] fire safety messages to parents at your centre was [insert response option]

- Why was this?
- Were there any elements that you would suggest:
  a) leaving out?
  b) adding in?

5.2 You said in the questionnaire that [x] exercises were [insert response option] for promoting the fire safety messages to parents at your Centre.

- Why was this?
- Were there any exercises that you would suggest:
  a) leaving out?
  b) adding in?

6a I would like to talk about the level of the fire safety messages**.**

- How complex did you feel the fire safety messages were? Did you feel they were too complex, about right or too straightforward?
- Can you tell me why?

6b Did you have any particular strategies to promote the fire safety messages?

(Prompt: repetition of messages in different contexts, practical exercises, discussions, topical relevance, e.g. fire reported in local media.)

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- Do you know what the Centre staff thought about promoting the fire safety messages?

6c Can you identify the barriers and facilitators that affected the way that you promoted the fire safety messages?

6.1 You said there were some factors that affected the way in which the fire safety messages were promoted.

- What were these?
- Did these have any effect on how your Centre promoted the fire safety messages?

(Prompt: were these facilitators and/or barriers? Were these staff shortages, staff illness, changes in management of CC, new staff, lack of time for formal sessions to be run etc., language issue?.)

6.1a If you were to promote the fire safety messages again in your Centre, are there any new ideas that you would recommend?

6.1b Are there any conditions that you feel are critical to promoting the fire safety messages successfully?

6.1c Do you have any concerns about promoting the fire safety messages?

6.2 You commented briefly on your experience of promoting the fire safety messages, would you like to say anything more about this? *(Refer to comments on questionnaire.)*

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IPB+FAC

UIC

STUDY M3 – HELPING CHILDREN'S CENTRES TO ENHANCE HOME SAFETY WITH FAMILIES:

Interviewers will have a copy of the questionnaire completed by the Children's Centre staff member relevant to the time point of the interview. The interviewer will remind the interviewee of their responses on the questionnaire and ask the questions from this schedule which begin "if answered yes/no on the questionnaire"

Questions
1. Did you modify your implementation plan during the study? **If answered yes on questionnaire:** • How did you change it? What changes and why? • In retrospect, what do you think might have been helpful in supporting you to develop it? (*Go through implementation plan template.*)
2. a) Have you done anything further in relation to the IPB since you last filled in the questionnaire, a couple of months ago? **If answered yes on questionnaire:** • Can you tell us what you have done since you last filled in the questionnaire, please? **If answered no on questionnaire:** • Had you planned to do anything further with the IPB?

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IPB+FAC

Questions
3. Have you had any problems or difficulties in relation to using the IPB that you haven't told us about? **If answered yes on questionnaire:** • Can you describe them, please? • What hasn't gone as well as you hoped it would? • What would you like to have seen working better?
4. Has anything gone particularly well in relation to using the IPB? **If answered yes on questionnaire:** • What sort of things have gone well? • Can you give us examples, please?
5. Do all your staff who work face-to-face with parents in the Centre know about the IPB? **If answered yes on questionnaire:** • Which staff are these? *Eg., job titles and numbers of staff*? **If answered no on questionnaire:** • Did you intend that all staff who work face-to-face with parents would know about the IPB? • If answers NO to this: can you tell us why you have made this decision?
6. Were any staff, other than those who attended the first training session, trained in getting the fire safety messages across? (If they ask what we mean, see pp 15 & 16 in the IPB.) **If answered yes on questionnaire:** • Which staff were these and why? *Eg., job titles and numbers of staff.*

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IPB+FAC

Questions
7. Were there some staff who were more enthusiastic than others about using the information in the IPB? **If answered yes on questionnaire:** • Do you know why this might have been?
8. Have you had contact with staff from the Fire and Rescue Service since you last filled in the questionnaire? **If answered yes on questionnaire:** • Please describe this contact. **If answered no on questionnaire:** • Please can you tell us why? • Has something stopped you from having contact with them?
9. Have you had contact with staff from other multi-agency partners in delivering the sessions, or in getting fire safety messages across, since you last filled in the questionnaire? **If answered yes on questionnaire:** • Which staff and in what capacity (*record job titles, numbers of staff, what the contact involved)?* • Are these staff those who your Children's Centre usually engages with?

10. Did you run any group sessions for parents?

If answered yes on questionnaire:

- What have you done?
- What sort of group sessions were these and how many/how often?

If answered no:

- Please can you tell us why?
- Did something stop you from running group sessions? *(Ask them to describe what stopped them. Then go to question 13.)*

11. Was it difficult to get the families to attend the group session(s)?

If answered yes on questionnaire:

- Can you tell us why this was, please?
- Have you managed to overcome the difficulties? If yes, how?
- How have parents responded to the session(s)? (*This may include: interested, good discussion, own examples of accidents/injuries, changes they have or will make.)*

If answered no on questionnaire:

- Why do you think this hasn't been difficult?

12. Have there been any difficulties recording on the activity logs those families in the study who *have attended group sessions?*

If answered yes on questionnaire:

- Please can you tell us why?
- Can you tell us what you have tried, please?

If answered no on questionnaire:

- Can you describe how you have been doing this please?

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13. Did you try to get the fire safety messages across to recruited families in any ways *other than in group sessions*, eg., in one-to-one and/or outreach work/groups?

If answered yes on questionnaire:

- Can you describe how you have done this?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from trying to do this?

14. Did you make a plan for how you would evaluate getting fire safety messages across*?*

If answered yes on questionnaire:

- Please can you tell me about your evaluation (and give me details)?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from making a plan – please describe?

15. Have there been any difficulties recording on the activity logs those families in the study who have received the fire safety messages *other than in group sessions,* eg., in one-to-one and/or outreach work?

If answered yes on questionnaire:

- Can you tell us about this, please?
- Can you tell us what you have tried?

If answered no on questionnaire:

- Can you describe how you have been doing this, please?

16. Did families outside the recruited families receive the fire safety messages, eg., have they been disseminated to the wider Centre users, eg., one-to-one and/or outreach work/groups?

If answered yes on questionnaire:

- Which families?
- Are they families from particular sessions from your community, eg., ethnic groups, English not first language, young parents, etc?
- How have the messages been delivered?
- Do you know how many families? *Record total to date……*

17. Did you have a plan to ensure that the fire safety messages were delivered consistently and not distorted?

If answered yes on questionnaire:

- Can you tell me about how you did this, please?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from making a plan?

18. Did you use any of the exercises from the IPB with families?

If answered yes on questionnaire:

- Which one(s) did you use?
- Why did you choose this one/these?
- Did you have any plans to use any of the other exercises in the IPB?
- If yes, which ones and why?

If answered no on questionnaire:

- Please can you tell us why?
- Has something stopped you from using the exercises?

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19. Has there been anything that you have found helpful in delivering the sessions, or in getting the fire safety messages across, that you would like to share with other Centres? **If answered yes on questionnaire:** • Ask them to describe and *collect vignettes/scenarios.*
20. Have there been any negative effects of delivering the sessions and the content of them, or in getting fire safety messages across, for either yourselves or for the parents? (*eg. a parent becomes upset because they had experienced a fire.*) **If answered yes on questionnaire:** • Can you tell us about them, please?
21. Is there anything else that we could have done to help you run sessions or in getting the fire safety messages across? **If answered yes on questionnaire:** • Can you tell us what we could have done, please?
22. Is there anything else that you would like to tell us about the project and/or your experience in being part of it? Please state below.

12 MONTH FOLLOW-UP FACILITATION AND IMPLEMENTATION FIDELITY INTERVIEW SCHEDULE
IPB+FAC

Implementation fidelity questions

In the survey monkey questionnaire, you said that your Centre promoted [x] out of the 5 fire safety messages from the IPB:

a) Importance of smoke alarm use and maintenance;
b) Having a family fire escape plan;
c) Identifying potential causes of house fires;
d) Understanding children's behaviour and fire prevention;
e) Having a bedtime fire safety routine.

- Why did you select these particular ones?
- Were each of these implemented as you had planned? Why was this?

You said that you had completed [x] exercises.

- Why did you select these?
- Did you include any changes to these or did you follow the exercises as set?
- Did you add any additional components in your programme? What were these?
- Were there any additional partners involved in the delivering the safety messages? Who were these and what was their role?

You said that your Centre promoted fire safety in other ways with parents.

- Can you tell me about these, please?
- Do you feel that they were well received?

For those fire safety messages you promoted, I am going to ask you for the reasons why you could/could not promote them as often or as long as planned.

- For fire safety message (a), how long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).
- For fire safety message (b), how long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).
- For fire safety message (c), how long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).
- For fire safety message (d), how long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).
- For fire safety message (e), how long did this take? Was it by a formal or informal session? Please describe what you did and/or who was involved (other Centres and/or others).

Response options: very good, good, adequate, poor, very poor

- For fire safety message (a) you rated the quality of the delivery as [x], why was this?
- For fire safety message (b) you rated the quality of the delivery as [x], why was this?
- For fire safety message (c) you rated the quality of the delivery as [x], why was this?
- For fire safety message (d) you rated the quality of the delivery as [x], why was this?

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- For fire safety message (e) you rated the quality of the delivery as [x], why was this?
- Were there any problems related to how each of the fire safety message was delivered (Prompt: lack of staff, lack of support from staff, number of parents present, lack of time, lack of crèche/childcare)?

Responses options: strongly agree, agree, neither agree/disagree, disagree, strongly disagree

Overall, you [insert response option] that parents were fully engaged the fire safety messages and advice provided by your Centre.

- Why was this?
- Can you give us any examples about how parents were engaged?

Overall, you [insert response option] that parents enjoyed the fire safety messages and advice provided by your Centre.

- Why was this?
- Can you give us any examples of why you think this?

Overall, you [insert response option] that parents thought that the fire safety messages and advice provided by your Centre were relevant to themselves.

- Why was this?
- Can you give us any examples of why you think this?

Were there any changes you would suggest to make the materials more relevant to the parents that attend your Centre? (Prompt: issues to do with ethnic minorities, particular groups of parents.)

Responses options: very important, important, neither important or unimportant, not very important, not important at all

You said in the questionnaire that promoting [x] fire safety messages to parents at your centre was [insert response option]

- Why was this?
- Were there any elements that you would suggest:
  a) leaving out?
  b) adding in?

You said in the questionnaire that [x] exercises were [insert response option] for promoting the fire safety messages to parents at your Centre.

- Why was this?
- Were there any exercises that you would suggest:

a) leaving out?
b) adding in?

I would like to talk about the level of the fire safety messages.

- How complex did you feel the fire safety messages were? Did you feel they were too complex, about right or too straightforward?
- Can you tell me why?

Did you have any particular strategies to promote the fire safety messages?

(Prompt: repetition of messages in different contexts, practical exercises, discussions, topical relevance, eg. fire reported in local media.)

- Do you know what the Centre staff thought about promoting the fire safety messages?

Can you identify the barriers and facilitators that affected the way that you promoted the fire safety messages?

You said there were some factors that affected the way in which the fire safety messages were promoted.

- What were these?
- Did these have any effect on how your Centre promoted the fire safety messages? (Prompt: were these facilitators and/or barriers? Were these staff shortages, staff illness, changes in management of CC, new staff, lack of time for formal sessions to be run etc., language issue?.)

If you were to promote the fire safety messages again in your Centre, are there any new ideas that you would recommend?

Are there any conditions that you feel are critical to promoting the fire safety messages successfully?

Do you have any concerns about promoting the fire safety messages?

What was your expectation of the facilitation contacts from the researchers? Were your expectations met? (Prompt: What would you change if they were going to be offered facilitation from a researcher again? Would you prefer less or fewer contacts? What else could researchers have done to help?)

You commented briefly on your experience of promoting the fire safety messages, would you like to say anything more about this? (Refer to comments on questionnaire.)

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Statistical appendix

Below is an algebraic outline of the hierarchical model applied in the economic analysis conducted alongside the multicentre cluster RCT reported in *Chapter 7*.

$$
\begin{aligned}
&e_{ijk} \sim Bernulli(p_{ijk}) \\
&c_{ijk} \sim Gamma(\eta_k, \lambda_{ijk}) \\
&logit(p_{ijk}) = \mu_j^e \\
&\lambda_{ijk} = \frac{\eta_k}{\varphi_{ijk}} \\
&\varphi_{ijk} = \mu_j^c + \beta_j \times (e_{ijk} - p_{ijk}) \\
&\mu_j^e \sim Normal(\theta_j^e, \tau.e^2) \\
&\mu_j^c \sim Normal(\theta_j^c, \tau.c^2) \\
&\theta_j^e = \mu_k^{e.clus} \\
&\theta_j^c = \mu_k^{c.clus} + \beta_k^{c.clus} \times (\mu_j^e - \theta_j^e)
\end{aligned}
\qquad (1)
$$

where e_{ijk} and c_{ijk} are the effects ($e = 0$ no fire escape plan; $e = 1$ fire escape plan exists) and costs in the ith family of the jth cluster allocated to the kth intervention arm ($k = 1$, usual care; $k = 2$, IPB only; $k = 3$, IPB+); p_{ijk} is the underlying probability of a fire escape plan at the family level; η_k is the shape parameter of the gamma distribution and is intervention arm specific and λ_{ijk} is the rate parameter of the gamma distribution at the family level; φ_{ijk} is the underlying mean of the costs (and is a function of λ_{ijk} and η_k) at the family level; μ_j^e is the underlying mean effect on the logit scale for the jth cluster and μ_j^c is the intercept of the linear predictor for the cost for the kth cluster; β_j is the regression coefficient that links the cost and effect equations at the family level and is treatment arm specific; θ_j^e (defined further down as $\mu_k^{e.clus}$) and θ_j^c are the underlying cluster-specific means, which, within a intervention arm, are assumed to be exchangeable and normally distributed with variance $\tau.e^2$ and $\tau.c^2$, respectively; $\mu_k^{c.clus}$ is the intercept of the linear predictor for the cost for the underlying mean effect; and $\beta_k^{c.clus}$ is the regression coefficient that links the cost and effect equations at the cluster level. The model was extended to include covariates. These were incorporated, as for any regression model, by adding them to the linear predictor.

WinBUGS uses the Bayesian statistical approach to inference and as such requires prior distributions to be placed on all unknown model parameters. For all parameters, vague prior distributions were specified, allowing the data to dominate the analysis. Preliminary analyses indicated that the mixing of the MCMC chains was poor because of high autocorrelation between consecutive samples, even when re-parameterising the model to incorporate hierarchical centring[523] (an approach aimed at reducing this problem). This means that the MCMC estimation is very inefficient and it was necessary to run the MCMC chains for a very large number of iterations to guarantee an accurate estimation of model parameters. Thus, the model was 'burnt in' for 20,000 iterations followed by a further 130,000 iterations on which parameter estimation and inference were based. Convergence of the MCMC sampler was assessed using the Gelman–Rubin diagnostic by running multiple chains with different starting values.[488]

Injury Prevention Briefing

Preventing unintentional injuries to the under fives: a guide for practitioners

Mike Hayes
Child Accident Prevention Trust

Denise Kendrick
University of Nottingham

Toity Deave
University of the West of England Bristol



June 2014

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DOI: 10.3310/pgfar05140

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The *Keeping Children Safe at Home* project

The *Keeping Children Safe at Home* (KCS) project was a major research programme designed to investigate several aspects of the prevention of unintentional injuries in the home to pre-school children. It was led by Professor Denise Kendrick, University of Nottingham. It involved research teams at Newcastle University, University of the West of England Bristol, Norfolk and Norwich University Hospitals NHS Foundation Trust, Nottinghamshire Healthcare NHS Trust, Child Accident Prevention Trust and University of Leicester.

The programme:

- was a 5 year programme (running from 2009 to 2014).
- was funded by the National Institute for Health Research (part of the NHS).
- involved local parents to help design the study.
- was reviewed and approved by local Research Ethics Committees and Research and Development Departments.

Further information about the programme can be found at http://www.nottingham.ac.uk/research/groups/injuryresearch/projects/kcs/index.aspx

Electronic version

A pdf version of this document is freely available at http://www.nottingham.ac.uk/research/groups/injuryresearch/projects/kcs/index.aspx. This version contains navigation tools that allow the user to move easily through the document.

Acknowledgements

This Injury Prevention Briefing has been made possible through the contributions of many people, in particular the following members of the *Keeping Children Safe at Home* research team:

Joanne Ablewhite, Penny Benford (University of Nottingham)

Trudy Goodenough, Elizabeth Towner (University of the West of England, Bristol)

Richard Reading, Gosia Majsak-Newman, Lisa McDaid (Norfolk and Norwich University Hospitals NHS Foundation Trust)

Elaine McColl (Newcastle University), Adrian Hawkins, Paul Hindmarch (Newcastle upon Tyne Hospitals NHS Foundation Trust)

And the staff at numerous children's centres who participated in workshops that helped with its development.

Disclaimer

This guide presents independent research funded by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research Programme (Reference Number RP-PG-0407-10231). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

DOI: 10.3310/pgfar05140

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Section A:
INTRODUCTION

Accidents and injuries – predictable and preventable

A few words of explanation

In this Injury Prevention Briefing (IPB), we use the terms *accidents* and *unintentional injuries* (or just *injuries*). These can be controversial so a few words of explanation may help.

Accident is the generic term we use to describe an event that is unintended and that may or may not lead to *injuries*. Such events may be falls, poisonings, strangulations, etc.

Injuries or *unintentional injuries* are the consequences of *accidents*, although not all *accidents* result in *injuries*.

Intentional injuries, the consequences of child abuse, bullying, fights between children, etc, are outside the scope of this resource.

It is important to remember that *accidents* are **predictable** events and are frequently **preventable**. If they do occur the *injuries* can be avoided or reduced in severity.

They are **predictable** because we know who is most likely to have an *accident*, and why, where and when they are most likely to happen.

The fact that *accidents* are preventable is what we need to get across to families, dispelling the myth that they just happen and there is nothing we can do about them.

Outline of the Injury Prevention Briefing

This guide is aimed at people who have the opportunity to help families keep their pre-school children as safe at home as is practical. The target audiences are managers and practitioners of organisations such as children's centres, health visiting teams, family support agencies and fire and rescue services.

Although its focus is on four specific types of accidents, it contains information that is widely relevant, including the factors that place some children at greater risk than others, to help workers target their efforts as accurately as possible.

The IPB is divided into three sections:

- **Section A.** An introduction that presents information about the general aspects of children's accidents and injuries.
- **Section B.** A series of activities that can be run to help parents and carers gain an understanding of:
  - cross-cutting topics - the links between accidents and child development, things that may appeal to babies and young children but may be harmful, and the broader aspects of home safety and safety products.

Some of these prevention activities can be used for more than one type of accident and injury so they have been included in this section rather than in the specific injury-related sections.

- injury topic-related issues - reducing poisonings, falls, scalds and fire-related injuries.

- **Section C**. Supporting information about these four injuries. This section also contains a short checklist to help practitioners plan, implement and evaluate activities; advice on where to find specialist advice and resources – websites, organisations, etc; and a commentary on the principles of and approaches to prevention, expanding on the text in this chapter.

The aim of the prevention activities is to help parents think about safety rather than simply give them the answers.

While providing a list of dos and don'ts may be quick and easy, encouraging parents to think about the way their children behave and the safety consequences is likely to have a more sustained effect.

The activities are adaptable, capable of being used in different formats (e.g. as practical demonstrations, displays, quizzes, etc), in different locations (children's centre, the family home, at events, etc), and with groups or individuals.

Aim and target audience of the Injury Prevention Briefing

This Injury Prevention Briefing (IPB) provides information about the importance of home injuries to pre-school children and how these injuries can be prevented, drawing on evidence from multiple sources.

The target audience of the IPB is children's centres, health visiting teams, family support agencies, fire and rescue services and other organisations that have the opportunity to provide help in preventing accidental injuries among pre-school children.

Surveys as part of the *Keeping Children Safe at Home* programme show that the great majority of children's centres and many other organisations recognise that accident prevention is a high priority and undertake child accident prevention activities.

This briefing is intended to extend the work that they do, helping them to use effective methods to address real issues, overcome some of the barriers that they tell us they face and share knowledge about the facilitators that are available.

> *The majority would like more education for parents and to have it tailored to different stages of child development. They suggested that health visitors or the children's centres would be the right people/places to deliver this.*
>
> Conclusion from KCS interview with parents

The topics covered by this IPB are limited to those that were the focus of the *Keeping Children Safe at Home* programme: falls, poisonings, scalds and fire-related injuries. These are the most common types of injuries that result in emergency department attendance or hospital admission in children aged under 5 years. It is not a comprehensive guide to preventing all accidents to children.

Not all children are the same so a one-size-fits-all approach to child safety is not possible. Further, we cannot prevent all accidents, except by stopping children doing the things that they need to do to grow and learn. Having said this, we should concentrate on preventing deaths, and serious and disabling injuries. Being open about these points can help to make prevention a more realistic issue with parents who may otherwise feel that we are aiming for the impossible.

> *The child's character was perceived as an important factor in relation to injury risk. A range of terms were used to describe how children in a family were different from one another, such as 'well behaved', 'energetic', 'curious', 'more daring', 'clumsy'.*
>
> Conclusion from KCS interview with parents

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DOI: 10.3310/pgfar05140

PROGRAMME GRANTS FOR APPLIED RESEARCH 2017 VOL. 5 NO. 14

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How we prepared this briefing

This briefing has been prepared as part of the *Keeping Children Safe at Home* programme. This was a major project funded by the National Institute for Health Research, part of the NHS. It was a collaboration between four universities (Nottingham, University of the West of England (UWE) Bristol, Newcastle and Leicester), Norfolk and Norwich University Hospitals NHS Foundation Trust and the Child Accident Prevention Trust. The programme aimed to improve our understanding of children's accidents, what works to prevent these and how those with a role in promoting child health can be effective in preventing accidents.

The IPB brings together the scientific evidence on what works, or can be regarded as best practice, with the practical experience of people who already provide injury prevention programmes, including children's centres and health visiting teams and the organisations they may work with to help prevent accidents.

To ensure that the IPB is an authoritative source of advice and guidance, evidence from a variety of studies, surveys and events was used in defining the IPB's scope and content. These included:

- Five major studies of the most common injuries that pre-school children who attend hospital A&E departments suffered and a comparison of these children and their carers' safety practices with their counterparts who were not injured.
- Systematic reviews of the scientific literature to explore what interventions work in preventing falls, poisoning, scalds and injuries from house fires and what health promotion approaches work best with families of pre-school children.
- Economic assessments of different prevention approaches.
- Surveys of and interviews with children's centre managers and staff about injury prevention initiatives in their centres and what helps them deliver injury prevention.
- Surveys of parents of pre-school children about their home safety practices, e.g. their ownership and maintenance of smoke alarms, whether they have prepared a fire escape plan, the safety equipment they own, where they store hazardous products, whether they have safety "rules", etc.
- Interviews with parents of children who have had injuries and those that have not to find out what would help parents prevent accidents.
- A trial set in 36 children's centres that evaluated the effect of providing an IPB on the prevention of fire-related injuries, with training and support to help children's centres to use the IPB.
- Workshops and focus groups involving local practitioners and policy makers in Nottingham, Bristol, Norwich and Newcastle, that explored how to implement programmes in children's centres, how to reach families in the community and what the content of this IPB should be.

Cross-cutting issues

Some issues apply to virtually all types of accidents and injuries. An understanding of these issues is key to getting the right information across to families. In fact, prevention messages may be more to do with introducing families to child development and its consequences than telling them what to do and what not to do.

The links between accidents and child development

When studying the four types of injuries covered in this IPB, it is obvious that many accidents are strongly associated with the natural and predictable stages of physical and intellectual development of children. For example:

- Young babies are largely immobile but are susceptible to the actions (and inactions) of their carers and siblings who will carry them – and occasionally drop them.
- As babies start to wriggle and roll, they may fall from beds and other furniture where they may have been placed to have their nappies changed and for many other reasons. Their mobility can also result in strangulation if there are cords from objects such as blinds, cot bumpers, toys and clothing in their cots.
- Crawling babies may also be able to climb with the risk of falls.

DOI: 10.3310/pgfar05140

- Mobility also allows access to objects. It is natural for babies and young children to explore taste and texture by putting things into their mouths, risking ingestion, suffocation and poisoning.
- Crawling and walking can lead to falls down unguarded stairs.
- The wish to explore combined with the attractiveness of objects that may be brightly coloured, have cartoon characters on them, resemble toys, etc can result in injuries such as serious burns when they reach out for mugs of hot drinks on low tables, pan handles on cookers, etc.
- With increasing manual dexterity but a lack of understanding of risk, young children may try and play with matches, lighters, knives and other hazardous objects if they are not stored safely.
- Young children rapidly become able to walk, run and climb so falls from heights, trips and stumbles, etc are very common.
- Medicines and household chemicals such as cleaning products are often stored in child-resistant containers. These are not completely childproof so some children will be able to access the contents, a greater number being able to do this as children get older. Putting things into their mouth is normal so playing with tablets or swallowing toxic liquids can result in harm.

The links between accidents, injuries and child development are explored in detail in the Child Accident Prevention Trust publication *Accidents and child development*.

The causes of accidents are not all the same. Some are a natural result of child development as described above but others are due to adult actions (or inactions). Sometimes parents do not anticipate their child's development nor realise that the risk of their child having an injury can change very quickly as their child learns new skills. Sometimes parents do not fully appreciate the consequences of their actions (or inactions). This "failure" is not a criticism of parental behaviour as we often learn about caring for children through "mistakes" or "near misses".

Accidents and deprivation

Children from the poorest families are known to suffer more accidents and more serious accidents than their more affluent counterparts. Research has shown that this social class gradient is true for injuries that result in children being taken to their family doctor, being admitted to hospital and dying from injuries. The difference between the death rate in children in the most affluent and poorest families is greater for injuries than for any other cause of death in childhood.

This is important when deciding on which families to focus attention. Local accident information may not be sufficient to allow precise targeting, especially when studying more serious injuries, because the number of more serious injuries in a local area is likely to be small. It is therefore important to target injury prevention towards the most disadvantaged areas and families and not simply rely on the number of injuries in small areas.

Children and parents with disabilities

Physical and behavioural disabilities are complex issues and beyond the scope of this IPB to discuss in depth. Suffice to say that one should remember that not all children behave similarly or have the same physical and behavioural characteristics as their peers. These traits may require special consideration when putting injury prevention measures in place.

In addition, some carers may not be capable of implementing some actions in an emergency. For example, if a fire escape plans requires a person to carry a baby or even to search for a toddler under the bed, they may not be able to do this easily or promptly. Their needs should be taken into account when providing advice and support.

Other cross-cutting issues

Local conditions vary and these may be important in implementing the safety messages in this IPB. Some locality features may enhance the risk of injuries to pre-school children – for example, the nature of the housing stock, socio-economic conditions, cultural differences within the population, urban / rural localities, and whether there are temporary migrant groups in the locality.

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Making the case for action

The scale of the problem

Unintentional injury is a major challenge for the health and well-being of pre-school children. It is one of the leading causes of death in children aged 1 - 4 years in the UK. Falls, poisonings and thermal injuries are the most common injuries resulting in hospital A&E department attendance and hospital admission in pre-school children.

Each year, many children die from unintentional injuries at home or in leisure environments. Children and young people who survive a serious unintentional injury can experience long-lasting pain and may need lengthy treatment and numerous stays in hospital. They could be permanently disabled or disfigured and their injuries may have an impact on their social and psychological wellbeing. A child burned in early infancy may carry the scars for the rest of his/her life.

Local data

Using local data can be important. Its use can ensure that activities are responsive to local issues, whether they are revealed through the views of the community, or data from hospitals or other sources. Ofsted encourages the use of local data, but may fail to recognise the problems that this creates.

Each year, an average upper tier local authority in England will have about 270 injury-related admissions of children under 5 years. When these are broken down by accident type, the numbers quickly become too small to give clear guidance on local needs and on prevention programmes. Thankfully, fatalities are even rarer – an average council area will see about one home accident death among the under 5s every 2 years – far too few to base action on.

The absence of comprehensive local data can be a problem when trying to make the case for action. While hospitals, often through the local council's public health team, will usually be able to provide data on admissions resulting from accidents, this data will not be very detailed in terms of the injury circumstances, may be limited because of confidentiality and is likely to cover small numbers of events, especially when specific types of accidents are being reviewed.

Accident and emergency department cases, which are much more numerous with about 20 attendances for each admission, are rarely collected in a form that allows easy local analysis.

Using hospital data at a very local level, for example the catchment area of a children's centre, either to identify the need for action or to measure the impact of programmes, is virtually impossible as the numbers involved would be meaningless in statistical terms.

As a result, alternatives to injury data may need to be used. The relationship between deprivation and injury is well established so if one is trying to identify where programmes need to be put in place such data that is usually held by public health teams or council planning departments can be helpful.

Further, using measures such as practices that link with common accidents and their prevention, for example, the ownership of safety gates, knowledge of a fire escape plan or the safe storage of poisons, can allow us to identify the need for interventions and act as measures of their effectiveness.

The challenge can be to convince senior managers and budget-holders that programmes should be based on measures that are not local, i.e. the national situation, or on "softer" measures such as safety behaviours. An analogy that may be useful is that of lung cancer. Local smoking cessation programmes are not judged by their effect on the lung cancer death rate or the number of admissions to hospital with lung cancer in their local area. Instead, they are judged on the number of smokers who have used their services who stop smoking. The effectiveness of local avoidable injury programmes can be more usefully gauged by measuring important safety behaviours that we know are strongly linked to avoidable injuries. This includes, for example, having fitted and working smoke alarms, using safety gates or storing medicines safely (above adult eye level or in locked cupboards, drawers or cabinets).

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DOI: 10.3310/pgfar05140

The burden of injury – costs and consequences

Accidents result in far more than the immediate need for medical treatment. They can result in:

- Pain (from injury or subsequent treatment).
- Fear / anxiety - a dog bite may mean that the child has a lasting fear of dogs.
- Physical disability and, in the extreme, a resulting need for housing adaptations.
- Emotional effects.
- Education – loss of schooling.
- Disruption to usual routine for the child and family.
- Family stress and the breakdown of relationships.
- Financial costs - to the family, NHS and emergency services.

While statistics are one way of illustrating the need for action, case studies that bring home the impact of accidents can also be a powerful tool. Finding a child and/or parent who can describe the consequences of an injury can get the message across more vividly than a list of numbers on a piece of paper.

Evaluation methods

Evaluation of a programme needs to be built in from the start. It is important to document all activities and to consider which elements work and for whom.

A local evaluation of the programme may be useful for inclusion in local reports, such as an Ofsted report for a children's centre.

Outcome measures

It will not be possible for an individual children's centre or other local agency to demonstrate that a programme on a single injury prevention topic has an impact on reducing outcomes such as the specific injuries in its catchment area. The numbers in any one area are likely to be too small to allow this. More realistic intermediate outcome measures include the number of families with, for example, functioning smoke alarms at every level in their homes, or safety gates at the top and bottom of the stairs. More intermediate outcome measures are described in each injury topic chapter of this IPB.

Process measures

Documentation of the process of the intervention can be helpful. Some suggestions of questions are given below:

Training sessions for practitioners

- Was training for practitioners conducted?
- Who initiated the training?
- Who conducted the training?
- What messages were included in the training?
- How long did the session last?
- How many people attended the training session/s?
- Was the training acceptable to the target group? What elements were considered good, what were considered less good? Were there any omissions? What would you do differently if you were to deliver this training again?

Small group work with parents in, for example, a children's centre

- Who initiated the small group session?
- Who conducted the small group session?
- What messages were included in the session?
- How long did the session last?
- How many people attended the session/s?
- Was the training acceptable to the target group? What elements were considered good, what were considered less good? Were there any omissions? What would you do differently if you were to deliver this small group session again?

One-to-one contacts with parents in a children's centre and other formal setting

- How did these occur?
- How many contacts were made with parents and by whom?

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- Have you had any feedback from parents about how useful they found the one-to-one contacts? What would you do differently if you were to provide one-to-one contacts in the future?

One-to-one contacts with parents in their homes

- Did any home fire risk or general safety check visits to families' homes take place by fire and rescue service staff and/or others?
- Did family support staff or health visitors have the opportunity to include messages about child safety in their home visits that were not related to injury prevention?
- Have you had any feedback from parents about how useful they found the one-to-one contacts? What would you do differently if you were to provide one-to-one contacts in the future?

Other

- Were parents involved in planning the programme?
- Did any parents act as Parent-Peer Supporters or Parent Advocates for the programme?
- Was any use made of 'opportunity windows' or other brief interventions when interest in the subject was high?
- Were there any ways in which it was possible to involve 'hard to reach' groups?
- Were there any barriers that hindered the adoption of the programme in a children's centre or other setting?
- Were there any facilitators that encouraged the adoption of the programme in a children's centre or other setting?
- What advice would you give to another setting in running the programme?

Creative ways of reaching target audiences

Accident prevention is no different from other health promotion activities. There is scope for using inventive approaches to getting messages across as you know your audience better than anyone. There are many ways that accident prevention information can be presented. Creativity can be the key.

If information is presented personally, either to one person or to a group, both the initial advice and responses to follow-up questions may have to have regard for issues such as:

- personal circumstances. These may differ so answers have to be personalised, having regard for topics such as family size and the age of the children in the family, type and ownership of housing (social, private rented, etc), the ability of the family to buy or be allowed to fit safety equipment, etc.
- changes in safety equipment, practices and advice. These change over time as new equipment becomes available or research shows that what we thought was the best approach has changed.

The best ways of reaching parents may vary for the different populations served by children's centres and other agencies. Individual centres or health visiting teams may be able to work creatively with other partners to involve some traditionally 'hard to reach' groups. Both opportunistic and planned approaches may be possible for:

- small group work with parents in children's centres and other settings, e.g. health centres, clinics or nurseries.
- one-to-one work with parents in children's centres, health centres, clinics and other settings.
- one- to-one work with parents in the home environment.

Messages need to be reinforced in different settings, with an emphasis on the consistency of messages being delivered. Use needs to be made of 'opportunity windows' when interest in subject is high, such as a serious fire or fall from a window that hits the headlines in the media, especially in your area, news about the risks associated with button batteries, or Child Safety Week.

Innovative ways of working with parents may include:

- A parent who has experienced a house fire or injury to their child being willing to act as a peer supporter to the programme in the children's centre and other setting. Their experience could be developed as a constructive case study.
- Consulting the setting's parents advisory group for different ways of reaching parents in their neighbourhood.

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DOI: 10.3310/pgfar05140

- Parents being willing to act as champions or advocates for different injury topics, for example working with a tenants' association on home fire safety and safety measures.
- Popular activities within the setting, e.g. first aid, being used as an entrée to discussions about injury prevention. Healthy eating sessions could include messages related to deep frying and healthier alternatives.

Remember that no one knows all the answers. The key is often to know where to find the answers or how others have addressed similar problems, using other local agencies or individuals, reliable websites, national organisations such as Child Accident Prevention Trust, RoSPA, Lullaby Trust, etc. Contact details and web addresses can be found in Section C.

Parents often learn about parenting and keeping children safe by being parents. They may receive advice from friends and other family members, especially grandparents, but this advice may be out of date or incomplete. Competing with such advice, especially when you know it to be inappropriate, can be challenging.

How does the promotion of childhood injury prevention fit into the policy framework for children's health and wellbeing?

Different parts of the UK have different policies that can be used as a framework for promoting and undertaking the prevention of unintentional injuries. These policies fall into a number of areas: public health, early years and health and wellbeing policies, provision of good quality housing, etc.

NICE Guidance

The National Institute for Health and Care Excellence (NICE) published public health guidance *PH29 Strategies to prevent unintentional injuries among children and young people aged under 15* in November 2010. Evidence published since the development of the document was reviewed in 2013 but did not result in any changes to the recommendations *(Strategies to prevent unintentional injuries among children and young people aged under 15: Evidence Update February 2013).* A second document, *PH30 Preventing unintentional injuries among under-15s in the home: guidance,* was also published in 2010.

PH29 recommends that local and national plans and strategies for children and young people's health and wellbeing include a commitment to preventing unintentional injuries.

Emphasis is also given to targeting injury prevention towards the most vulnerable groups to reduce inequalities in health.

Partnership working is seen as key to the prevention of injuries, with support for cross-departmental and cross-agency working to achieve national and local commitments. Support for local partnerships is recommended, including those with the voluntary sector, and there is an expectation that partners work together to ensure children and young people can lead healthy, active lives.

The two NICE documents were also published in April 2011 by NHS Health Scotland as *Scottish Briefing on NICE public health guidance 29: Strategies to prevent unintentional injuries among children and young people aged under 15* and *Scottish Briefing on NICE public health guidance 30: Preventing unintentional injuries in the home among children and young people aged under 15: home safety assessments and providing safety equipment.*

The principles of and approaches to prevention

While not every reader will have the opportunity to apply all of the principles and approaches described here, it may be useful to understand these topics so that the opportunities and responsibilities that others may have will be understood. This can be helpful when working in partnership or when one's own opportunities may not be sufficient to implement

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measures of the greatest effectiveness. A more extensive commentary on principles and approaches is presented in Section C. The key approaches and principles to consider include:

Primary, secondary and tertiary prevention

- Primary prevention - trying to prevent the occurrence of the accident from which an injury can result.
- Secondary prevention - reducing the risk of injury once the event has occurred.
- Tertiary prevention - providing appropriate treatment and/or rehabilitation following an injury may reduce the adverse effects and long-term consequences of that injury.

Approaches to prevention – the Es

- Education and awareness-raising, including training. The targets for this approach are extensive, ranging from children and parents to decision-makers, budget-holders and elected representatives.
- Empowerment – giving families the opportunities to act for themselves.
- Environmental modification and engineering – changing the environments, including the home, and products that children may come into contact with, even though they might not be primarily intended for children.
- Enforcement – ensuring that the laws, regulations and standards covering products, services (such as child care) and environments are obeyed.

Active and passive prevention

- Protection that is provided without an individual needing to do anything or not having to act repeatedly is called passive prevention.
- Injury prevention measures that requires individuals to change their behaviour or to take action repeatedly are known as active measures.

Partners in prevention

Preventing unintentional injuries to young children is an activity that benefits from cooperation and collaboration between agencies and professions. Many agencies, from the statutory and voluntary sectors, support families so have the opportunity to lead or contribute.

The key to successful collaboration is a mutual understanding of who is leading the exercise, the aim of the collaboration, and the roles of each collaborator. The degree of collaboration may range from just sharing information on what each is doing to sharing budgets and carrying out group activities. It is important that all concerned are giving similar advice and know who to refer families to for help when needed.

A handful of localities have injury prevention coordinators who can ensure that activities are optimised and can also act as a local centre of knowledge and resources.

Examples of agencies and occupations with opportunities to undertake or support accident prevention
A&E departments
Childminders
Children's centres (in the centre and through outreach activities)
Community midwives
Family Nurse Partnerships
Fire and rescue services
GPs
Health visiting teams
Home safety officers
Housing associations
Housing departments
Nurseries
Pharmacists
Public health departments
Road safety officers
Social services
Tenant organisations
Trading standards departments
Voluntary organisations such as Home-Start
This list is illustrative, not comprehensive. The opportunities of each agency and occupation will vary from one area to another, depending on resources, priorities, etc

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DOI: 10.3310/pgfar05140

Parenting challenges

Caring for a new baby or a young, active child can be a challenge, especially when it is the first child as the parents have no experience of what to expect and how to act.

> *There was also a lack of confidence from several parents about which safety strategies worked best. This seemed to be primarily interviewees who were first time mums.*
>
> Conclusion from KCS interview with parents

As part of the *Keeping Children Safe at Home* programme, parents reported they felt that child factors such as inquisitiveness and child energy increased the risk of injury, as did the number of children in the household and the child being able to do more than the parent anticipated.

For families who are under stress for whatever reason – multiple demands, lack of money, the cost of safety equipment, living in poor housing that may be overcrowded, living in rented accommodation where changes cannot be made, maternal fatigue, unemployment, not being close to their extended families, only a single parent in the home, where the mother is young and hence inexperienced, no safe play areas (indoors or outdoors), etc – the challenge is even greater and accidents are likely to be more frequent than the average.

Interviews with parents revealed that after an accident took place some parents described increased awareness of injury risks, increasing safety rules and increased direct, visual supervision.

However, research also tells us that preventing accidents and injuries is not achieved just by using safety equipment. Supervision makes a difference, even though it is difficult, especially when there is more than one young child in the family.

> *Parents find it difficult to watch their children continuously; it becomes more difficult to supervise the more children you have; as children get older they need to be given more freedom to explore.*
>
> Conclusion from KCS interview with parents

Prevention activities

The activities outlined in this IPB are intended for use by anyone who can provide advice and other services to families. They include activities that you may be able to run alone or as part of a wider local initiative.

Which activities are appropriate will depend on your opportunities and resources and also on the wishes of your target audience. A local incident or national headline may provoke families to seek help and advice.

Wherever possible, the activities are based on programmes that are known to be effective, although the evidence base for child accident prevention is limited.

Where there is good evidence of effectiveness, this is noted as it may support making the case for the activity. The absence of a programme from the list may be because there is no evidence to support its use, rather than an indication that it is ineffective or harmful.

It is important to remember that your specific contribution to a prevention programme may be limited because, for example, your resources, including time, staffing and money, may be limited. However, you may still have an important role to play in a wider initiative so your small contribution may still be of value. For example, your access to families at your setting or your home visits can be valuable resources to other local practitioners.

The activities may be used in different settings (for example, a children's centre or the child's home), in group sessions, on a one-to-one basis, or on an active or passive basis (i.e. as an activity or by creating a display on a notice-board).

The principle that underpins all the activities is that they help families to explore child safety and develop solutions that are right for them.

Having regard for and particularly anticipating child development and its consequences for safety cuts across virtually all safety programmes, regardless of the injury topic being addressed. The first activity, Activity 1 – Exploring child development, provides a foundation for the others.

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The biggest barriers emerging ... were the fact that 13 out of the 16 interviews mentioned being surprised that the accident happened and over half of the parents interviewed (9 interviews) thought there was no risk of an accident at the time it happened.

Another significant element, given that parents mentioned the lack of safety advice at different stages of development as a barrier to injury prevention strategies, is the fact that many of the interviews describe a child doing something they had never done before or being able to do more that the parent(s) thought they could.

Conclusion from KCS interview with parents

The way that you use the activities presented in Section B will depend on your opportunities, resources, skills, etc. They do not have to be used in their entirety or in just one session. They can be adapted, although it is important not to lose sight of the key safety messages that you are trying to get across – the key safety messages are listed at the beginning of each activity.

When planning activities, an ordered approach helps to ensure that nothing has been overlooked. Section C contains a short checklist that helps you do this, covering planning, partnerships, piloting, implementation, evaluation, etc.

Using the IPB for other purposes, e.g. staff training

This document can be used for more than just providing guidance on how and what to present to parents and carers. It can be used as a training tool for colleagues on topics other than just accident prevention, for example, as the theme that runs through a number of the activities is child development, the IPB may help staff to learn about this topic.

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DOI: 10.3310/pgfar05140

Section B:

ACTIVITIES TO HELP PARENTS

These activities are intended to help you encourage parents to reduce injuries to pre-school children in their homes. There are 11 activities, some of which can be used to cover any type of injury while others address just one injury.

> The aim of the prevention activities is to help parents think about safety rather than simply give them the answers.
>
> While providing a list of dos and don'ts may be quick and easy, encouraging parents to think about the way their children behave and the safety consequences is likely to have a more sustained effect.

Some activities focus strongly on the provision and use of safety equipment. While safety equipment can be an effective way of preventing accidents and injuries, not all accidents can be prevented by safety equipment. Some are related to how we look after children and what we allow them to do, for example, changing a nappy on a raised surface or allowing them to climb on furniture. These behaviour change interventions link with the need to understand what children do and want to do, and our knowledge of child development and its consequences.

Some of the cross-cutting activities form the foundation for the behaviour change activities as they allow parents to explore and enhance their knowledge of different aspects of child development.

The activities are adaptable – they can be run in bite-sized pieces or as a single session, or can be interactive sessions, displays or things that parents can take home to do in their homes.

If you cannot run the whole of an activity, then use as much of it as you can.

General lessons from *Keeping Children Safe at Home* programme

A comprehensive review of the scientific literature identified a number of facilitators that can enhance home safety interventions aimed at children under five and barriers that can obstruct such interventions. Whether using the activities set out below or developing your own, the lessons from the research can be helpful. A brief summary of the barriers and facilitators identified in this research is shown in the following table.

Facilitators	Barriers
Approach Home visits; combined educational and environmental; community involvement; partnership working; tailored methods	Cultural barriers Distrust of home visits; language barriers; lifestyle; generalisability
Focused message One injury type; tailored to the individual; simple message	Socio-economic Low literacy; low income; ethnicity
Minimal changes Educational; physical	Complex interventions Multiple injuries; multiple methods
Role of the deliverer Benefits to participants—using health professionals, other professionals or volunteers; benefits to the deliverer; time and place	Deliverer constraints Training; time involved; sustainability; communication
Accessibility to equipment Free provision and fitting of safety equipment; coupons; information	Physical barriers Rented accommodation; multiple occupancy; frequent moves; access to devices; faulty devices
Behaviour change Reinforcing messages; motivational techniques; theoretical models used; organisational change; community involvement and awareness	Behavioural barriers Existing behaviour; behaviour change
Incentives Facilitators and barriers for home injury prevention	

Reproduced from Ingram JC, Deave T, Towner E et al (2012). *Identifying facilitators and barriers for home injury prevention interventions for pre-school children: a systematic review of the quantitative literature.* Health Education Research, 27, 2, 258–268 by permission of Oxford University Press.

General activities

These activities do not relate to specific types of accidents and injuries. Some allow information about child development to be explored, while others help parents to look at the physical safety of their homes.

1. **Exploring child development**
   Covers children's ability to undertake tasks, including climbing and manipulating objects and the safe storage of potentially harmful products such as matches, lighters, medicines, knives, etc.
2. **What is appealing to children but may harm them?** Helps parents think about what makes some everyday items attractive to young children and may harm them.
3. **Checking home safety**
   Help parents to develop a checklist for them to use in their own homes. The list covers the most important things to look out for and the key safety products to use, depending on the age and ability of the child. It is an extension of Activities 1 and 2.
4. **Where are your harmful products?**
   Builds on Activity 3 - Checking home safety by helping parents think about the safety consequences of some of their actions, such as what may be in their coat pockets, shopping bags or handbags and where they are.
5. **Designing an unsafe kitchen**
   A fun way of thinking about dangers. It can be adapted for other parts of the home.
6. **Home safety equipment – what do families need?** Helps parents think about essential safety equipment that they may need.

Activities for specific injuries

These activities cover specific types of accidents and injuries. They draw on the findings of the *Keeping Children Safe at Home* programme and other sources.

Just as with the cross-cutting activities, some are equipment-related while others are designed to encourage behaviour change.

Falls prevention activity

7. **Preventing falls – more than just safety gates!**
   Even falls from what seem like relatively low heights can result in serious injuries. Simple changes in parenting practices can make a difference. This activity allows parents to understand the need for implementing safety practices.

Scald prevention activities

8. **How far does a hot drink spread on a baby?** Even what may seem like a small quantity of liquid can extensively cover a baby.
9. **How long does a drink stay hot?**
   Drinks stay hot enough to cause injury for a surprisingly long time.

Fire safety activities

10. **The importance of smoke alarms**
    Smoke alarms are an essential item of safety equipment. Families need to understand this and what they should do to ensure that they will save lives if there is a fire.
11. **A family fire escape plan**
    When the smoke alarm sounds, the whole family needs to be able to escape quickly and safely. This activity is designed to ensure that they are equipped to get out or stay safe if this is not possible.

IMPORTANT - BEFORE YOU RUN THESE ACTIVITIES

Check whether any of the participants have children who have suffered a serious injury or a near miss. If this is the case, you may need to cope with a distressed person. Even an injury to the child of a relative or friend may upset a parent.

For activities in which you suggest families go to other agencies for further help, such as the local fire and rescue service for a home fire safety check or to have a smoke alarm fitted, check that the agency is able to provide the appropriate help. Check how the agency likes to be contacted. (They may also be able to provide you with resources that you can use or give to families, or even offer to come along to support your initiatives.)

When someone asks for safety advice, guessing the answer is not an option. The wrong answer may lead to more harm than good or an illegal situation. If you don't know the answer say so and either find the right answer or point the family towards an appropriate source explaining why you are not able to give them advice.

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DOI: 10.3310/pgfar05140

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CROSS-CUTTING ACTIVITIES

Activity 1 – Exploring child development

KEY MESSAGES

- As children grow, their ability to move themselves and manipulate objects, wish to explore, unreliable reaction to rules, and copying adult behaviour, etc are normal, but can lead to accidents and injuries.
- The types of accidents can change as they develop.
- Parents should be encouraged to anticipate what their child is going to do next and take appropriate steps to prevent accidents. Children develop rapidly and may take their parents by surprise – they cannot do something one day but then do it next!

Relevant injuries

This activity is relevant to all injuries covered by this IPB and others that are outside of the scope of this document. It is the foundation for other activities.

Background

This commentary of the links between child development and accidents is a brief illustration rather than a comprehensive review of the subject.

A more extensive description can be found in *Accidents and child development*, published by Child Accident Prevention Trust.

> *Increasing awareness with regard to child home injury risks and the ages and stages of development was described by some parents as something that would help them to prevent unintentional injuries.*
>
> Conclusion from KCS interview with parents

(This activity links closely with Activity 2, which focuses on objects that may be appealing but harmful to young children.)

Although the focus of this activity is preventing injuries to children, it can be used to illustrate other aspects of child development and behaviour.

Many accidents to children arise because parents do not always realise the consequences of their child's rapidly changing physical and behavioural development. Anticipating these changes can help parents to take precautions before accidents happens.

> *Another significant element, given that the lack of safety advice at different stages of development is mentioned as a barrier to injury prevention strategies, is the fact that 13 of the interviews describe a child doing something they had never done before or being able to do more that the parent(s) thought they could.*
>
> Conclusion from KCS interview with parents

Gross motor skills

Babies start by being largely immobile but are soon able to wriggle and roll. If they are on raised surfaces they are at risk of falling. Then they become able to crawl, shuffle along on their bottoms, walk and climb, not necessarily in this order as some babies will climb before they can walk. This enables them to gain access to all sorts of hazards.

One day, a child may not be able to or may not be interested in climbing the stairs and then the next day you find him or her half way up – and ready to fall down!

They also gain the strength to move objects such as chairs, boxes, large toys, all of which can be used to climb on and hence reach products that you may think are safely out of reach. Fall injuries are not the only risks. Young children have been strangled when they have climbed but then become entangled in the cords on a window blind as they fall.

While their strength develops rapidly, babies may not be able to get out of dangerous situations. If left unattended in the bath, they may be able to turn on to their front but not be able to turn back. As they have limited ability to raise their head, they can easily drown, even in very shallow water. Even young children will be at risk if they fall into something like an ornamental garden pond.

When children start walking and running, they are initially unsteady so falls are inevitable. But when they can move on their own, they may escape from you quickly and get to risky locations before you can grab them.

Fine motor skills

As children develop, they become able to undertake increasingly precise actions with their hands and fingers, such as opening containers – bottles, locks, drawers, etc – turning taps on, operating switches, striking matches and operating cigarette lighters, etc.

Cognitive development

Babies do not understand that a hidden object still exists, but this understanding changes as the child develops. Just putting things out of sight (but not out of reach) for safety is not an option for young children.

Babies and young children have little understanding of the consequences of their behaviour. They simply do not understand the risks associated with their actions. Conversely, they do not understand the consequences of their inactions – if something that is potentially dangerous occurs, they will not try to move away from it and may try and hide, putting themselves into greater danger. They will also not remember that something that has hurt them will do so again in the future.

Just because young children may be able to repeat back to an adult an instruction or a warning, they may not understand what it means nor follow it consistently so may be injured again.

> *"Parents assumed safety rules would prevent injuries and mostly implemented rules in reaction to evidence of injury risk. Parents equated noncompliance with not understanding, assuming that if children understood they would comply."*
> Source: Morrongiello et al. *Parents teaching young children home safety rules: Implications for childhood injury risk.* J Applied Developmental Psychology. Available online 29 March 2014.

Children like to copy adult behaviour, so if they see someone strike a match, ignite a lighter, take a tablet or use a knife, they may well want to try to do this for themselves.

Exploratory behaviour

One way that babies and young children learn about taste and texture is to put things in their mouths. This can lead to poisoning, suffocation and ingestion of potentially harmful objects.

Young children may want to discover what an object sticking out over the edge of cooker is, not knowing that it is a pan full of boiling water.

Learning objective

To help families understand how a child's physical and behavioural development and what children are attracted by can result in accidents.

Equipment needed

A sheet of flipchart paper and a marker pen. Divide the sheet of paper into quarters, labelling them as shown below. (Alternatively, you could use more than one sheet of A4 paper or a white board.)

1 year old	2 years old
3 years old	4 years old

Method

Explain that many accidents to babies and young children are linked with what children can do and that as a result the types of accidents change as children grow up.

(This activity works best if the participants have children of different ages.)

Ask each person in turn to describe something that they can remember that their child started doing at a particular age. The behaviours are likely to fall into a handful of the major groups mentioned in the background section above:

- gross motor skills – rolling and wriggling, waving their arms around (when they are babies, often in an uncontrolled way), walking, running (and hence tripping or just being unsteady), climbing (on to furniture, up stairs, and over a safety gate, into the bath, etc), playing with push-along toys, etc.

DOI: 10.3310/pgfar05140

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- fine motor skills (holding a crayon and drawing, using a spoon, opening a container, stacking bricks, putting a key in a lock, trying to copy adult actions, etc).
- exploring behaviour – putting things in their mouth.
- cognitive skills – solving problems such as finding a hidden object.

Keep going until people have no further suggestions.

Write the responses on the appropriate part of the sheet of paper.

Remind participants that children are not all the same and that some do things at a particular age while others may do the same action earlier or later, or not at all.

Variation 1

The facilitator draws up the list of potential behaviours beforehand and just asks the participants to indicate when such behaviours started for their children.

Variation 2

You could run a two stage process – first, get parents to identify development tasks/behaviours, and then secondly get them to put them into the specific (approximate) ages based on their own experiences.

We now know what children do at specific ages.

Ask participants which of the behaviours you have recorded could lead to accidents and injuries and what they can do to prevent the injuries. Remember that we don't want to stop children being active, even though this can make injury prevention challenging.

The relevant behaviours are likely to include:

- gross motor skills:
  - rolling off beds or changing tables.
  - waving arms and knocking mugs of hot drinks. - being able to move something, climb on it to reach and then open a cupboard.
  - climbing out of a highchair, up stairs or over a safety gate.
- fine motor skills:
  - open a box or a cupboard.
  - handle a match or bottle.
  - copy adult behaviour by striking the match.
  - putting pills in their mouth.
  - turn on a tap.
  - drinking from the bottle.
- exploratory behaviour:
  - reaching up to grab a pan handle.
  - tasting something.
  - putting a small object in their mouth.
- cognitive development:
  - not understanding the consequences of their actions, e.g. grabbing hot hair straighteners or the iron, touching the oven door.
  - realising that a hidden object still exists (e.g. tablets, matches or lighters hidden in drawer or cupboard).

Discussion points

Get participants to discuss where they could keep matches, lighters, pills, knives, cleaning products, etc that would be as inaccessible as possible.

Variation

A variation that may link with your smoking cessation activities would be to consider as a group how to deal with the fact that someone in the house smokes so matches and lighters may be left lying around.

Conclusion

The prevention message is the need to keep potentially harmful items ideally locked away, well out of reach and out of sight (i.e. above adult eye height and ideally in a locked drawer or cupboard), to try and make sure that there is nothing convenient for children to access. Further, it's important to try not to let children see you carrying out activities that may be harmful to them. There are lots of low or no cost things that can be done to keep children safe from harmful items in the home.

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DOI: 10.3310/pgfar05140

Activity 2 – What is appealing to children but may harm them?

KEY MESSAGES

- Babies and young children find a range of characteristics of objects appealing, including movement, light, colour, sound, texture, etc. In consequence, they will be attracted to many objects that may be harmful.
- Parents need to be aware of this and to ensure that, as far as possible, appealing objects are out of sight and out of reach, namely above adult eye height and ideally in a locked drawer or cupboard.
- Objects that are appealing to babies and young children can result in burns and scalds, house fires and poisonings.

Relevant injuries

This activity is relevant to most injuries covered by this IPB, especially poisoning and burns, as well as others that are outside of the scope of this document. Further information on poisonings, scalds and fire-related injuries can be found in Section C.

Background

Many everyday items are very attractive to young children, even though they may harm them. This short activity helps parents think about the characteristics that make them attractive so that they can take appropriate safety actions. It is an aspect of child development.

It is not always well understood what attracts children so that one object is appealing to a child while another may not be. It is known that young children are attracted by characteristics such as bright colours, sounds, movement, figures (such as cartoon characters that they may recognise), etc. These attractions can lead to:

- house fires and burns if children have access to matches and lighters as flickering flames and their appearance when an action such a striking a match or operating a lighter can be very appealing.
- burns if an object changes colour when it gets hot, e.g. thermochromic mugs.
- poisoning if pills look like sweets or a household chemical, even something like a laundry or dishwasher tablet, looks like a small cake!

Learning objective

To help parents understand what characteristics make products attractive to young children as a normal part of their development.

Equipment

A sheet of flipchart paper or a white board and a marker pen.

Method

Ask participants to tell you what everyday objects their children find attractive. This doesn't just mean things that they play with, it could also be things they like watching on TV, such as cartoons. Write down the responses.

Then, for each response, ask why they think that the item is attractive. As noted above, it is likely to be characteristics such as:

- bright colours.
- sounds.
- movement, including flames and flickering lights.
- figures (such as cartoon characters that they may recognise).
- things that imitate adult behaviour.
- texture.
- taste.

It may be more than one characteristic. Write the characteristic next to each object that was mentioned.

Finally, ask participants to think of everyday objects that may not be on list that exhibit these attractive characteristics but that may harm children.

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Typical objects are:

- matches.
- lighters.
- candles.
- fires, including gas, electric and solid fuel fires and barbecues.
- tablets.
- laundry and dishwasher tablets and "liquitabs".
- cleaning products in brightly coloured bottles.
- brightly coloured cups, mugs and hair straighteners.

Discussion points

Ask parents to think about what they have already done to reduce the risks from products that are child-appealing.

Were the changes as a result of an accident or a near miss?

What risks do they feel are the most significant? In other words, get them to identify priorities.

How practical would any changes be?

If there is a scheme in your area that provides and fits safety equipment at low or no cost, refer the families who need drawer and cupboard locks (or other equipment) to the scheme.

Generally, share ideas.

Conclusions

The prevention message is the need to keep potentially harmful items ideally locked away, well out of reach and out of sight (i.e. above adult eye height and ideally in a locked drawer or cupboard), to try and make sure that there is nothing that would be easy for children to access. Further, it's important to try not to let children see you carrying out activities that may be harmful to them. There are lots of low or no cost things that can be done to keep children safe from harmful items in the home.

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Activity 3 – Checking home safety

KEY MESSAGES

Research findings

- Home safety education and the provision and fitting of safety equipment **improves** safety behaviours and may reduce injuries.
- Not using a safety gate on stairs **increases** the risk of a fall on stairs and leaving the gate open **increases** the risk even more.
- An overview of the evidence on preventing falls and the analysis of different combinations of falls prevention strategies reveal that the combination of education, low cost or free safety gates, home safety checks and fitting of safety gates is the **most effective way of increasing the possession of a fitted safety gate.**
- The home safety checks and fitting of safety gates as part of the package are particularly important as families receiving both of these components in the package are **much more likely** to have a fitted safety gate than those provided with education or safety gates without the home safety checks and the fitting of safety gates.
- Fitting a thermostatic mixing valve (TMV) and providing education is **more effective** in reducing bath water temperature to a safe level (one that will not cause serious and rapid injury, usually about 46°C) than education alone or than giving parents thermometers to test their water temperature and lower it if it is too high.
- Families without smoke alarms are **more likely to die in a house fire** than those with smoke alarms.
- **The most effective method** for increasing the number of families with a functional smoke alarm is to educate families, provide and fit free or low cost alarms and do a home safety check. Where fitting smoke alarms and doing home safety checks is not possible, providing education and free or low cost alarms is a cost effective option.
- Providing families with only education about how to prevent poisoning is **less effective** than providing education along with provision of safety equipment (e.g. cupboard locks) and home safety checks.

This activity help parents to develop a checklist for them to use in their own homes. The list covers the most important things to look out for and the key safety products to use, depending on the age and ability of the child. It is an extension of Activities 1 and 2.

Relevant injuries

This activity covers all injuries that occur in the home that are related to products, the design of the home and issues such as where things are stored. Further information about poisonings, falls, scalds and fire-related injuries is presented in Section C.

Background

Pre-school children spend much of their time at home, so that is where they have most of their accidents. When they go to school, they have more accidents at school and outside the home than at home.

We can never make the home completely safe but we can try to ensure that the most serious hazards are identified and the risks associated with them reduced.

This activity develops a checklist to help parents make and keep their homes reasonably safe. It is important to remember that a checklist alone makes little difference. One has to act on what is identified when completing the checklist.

Not all parents will be able to do this for a variety of reasons, notably financial and cultural reasons, the fact that they may not own the property, may have competing priorities for their time and money, and may be influenced by other family members.

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So carrying out an action that the checklist suggests is needed may not always be possible.

Babies and children develop and change rapidly. They are not all at risk of the same accidents and injuries. For example, a newborn baby is not at risk of falling down stairs (unless you or a "helpful" sibling drops them) and a toddler is unlikely to be sleeping in a cot and so be at risk from cot bumpers. As a result, a single checklist may not be the best approach so part of the activity is to identify what matters to which developmental (or age) group. However, creating a developmentally-related checklist may add to the time it takes to run the activity.

This activity builds on Activities 1 and 2.

Learning objectives

To help parents develop the knowledge needed to identify injury risks in their home by developing a checklist and take appropriate action.

Ideally, the activity should help parents become proactive rather than reactive with regard to safety by encouraging them to think about what to do next.

Equipment

A few sheets of flip chart or whatever you can find and marker or ordinary pens.

Method

The activity can be run in three ways:

- As an activity completely in your setting where participants think about their own homes, or
- Participants are asked to go home, list issues that they find, possibly just in one or two rooms, note them down and bring them back to the setting to be consolidated with the contributions from others, or
- On a one-to-one basis when working with a family in their home, walking around it to help them develop their own personalised checklist.

Variation

A variation that can act as an example of what you want parents to do is to develop a checklist for your own setting – children's centre, nursery or wherever.

Method 1

Outline the aim of the activity. Split the participants up into groups of two or three and assign a different room to each small group -kitchen, living room, circulation space (halls, stairs and landing), bathroom, bedroom (children's and parents'). If you do not have many participants, the subgroups can have more than one room.

Ask each group to imagine their own home and list the things that they think of as being risky for their children. (It makes it easier if everyone in a subgroup has children of more or less the same age as the risks will then be similar. If this is not practical, ask the participants to note whether they think the risk applies to a specific age group.) If you need to prompt the groups, suggest that they think about the design of the rooms (low glass, steps, doors that slam, etc), the things kept in the rooms, etc.

Invite each group to tell everyone what they listed for their room. Jot the results down for everyone to see. Ask others to suggest other points to be added.

Method 2

Outline the aim of the activity. Ask each participant to check their own home (or part of it), having regard for the age / development stage of their own children, note the risky aspects they found and bring their notes back to a further session.

At the next session, invite everyone to tell others what they listed for their home / room. Jot the results down for everyone to see. Ask others to suggest other points to be added.

For Methods 1 and 2

When the whole house has been covered, ask participants to identify the issues that they think are the most significant in terms of the possible injuries.

If your setting runs computer classes, ask someone to design the final list into something that can be printed and distributed.

Method 3

This method allows the development of a checklist focussed on the specific needs and circumstances of a particular family. It can be used just to check the safety of the home without developing a checklist as such.

It is a more time-consuming option but may be appropriate when there is clearly something that needs to be addressed in one family's home. It also allows advice to be given without making people reveal their issues in front of their peers.

When you are visiting the home, walk around the home with the parent and ask them to identify issues that might injure their child, having regard for the way that the child behaves. Make notes for you both to review.

If not all issues are identified, help them to identify the ones that have been missed.

Talk through the points raised, in particular those that could cause the most serious injuries.

An example of a comprehensive home safety checklist is given below. This can be adapted to suit local needs. A list of "Best Buys", the most important safety products that parents should have, when they are needed and guidance on their cost is part of Activity 6.

Discussion points

Consider why some issues are more important than others. For example, they can cause life-threatening, disabling or disfiguring injuries.

Invite people to think about the issues that vary by the developmental stages of children.

Discuss why some of the solutions may not be practical and invite people to suggest workarounds.

Talk about where safety equipment may be available from. Is there a local safety equipment scheme? If so, what do your families need to do to benefit from it? (See Activity 6)

To reinforce the links between home safety and child development, discuss how frequently parents should check the safety of their homes to accommodate changing behaviours and skills, where children spend their time (e.g. alone in the garden), and the emergence of new risks, perhaps because you have bought a new product, another family member has moved in or you have moved home.

Invite parents to think about what the safety issues will be when their child develops new skills and behaviours. This is important as anticipating potential issues and acting upon them before they cause harm can make a real difference – encourage them to be proactive rather than reactive.

If possible, give the parents leaflets or flyers to take home as a reminder of what you have discussed.

A few weeks later, ask parents whether they have made any changes to their homes. If they haven't, you may need to consider why not and what else you can do to help.

Conclusions

Making the physical aspects of the home safer can make a big difference as it means that families do not have to remember to take action every time a possibly harmful situation arises. However, child safety is not just about equipment, changing everyone's behaviour, based on an understanding of what can go wrong, is also important. There are lots of low or no cost things that can be done to make homes safer.

Model home safety checklist

This checklist has been prepared by Bradford Safeguarding Children Board and the Child Accident Prevention Trust. A cross in a cell of the table shows that the question is relevant to the age group. It is very long. You may decide to edit it down to a more manageable size to suit the needs of the families you are supporting. Be careful when you do this as you may remove some key items.

> Checklists have limitations. The most important point is that checklists alone do not prevent accidents and injuries. It is the actions that follow the completion of the checklist that make the difference.

To ensure that the appropriate actions are taken, the person who oversees the use of the checklist needs to know why the questions are asked, their relative importance, what to do when a "wrong" answer appears, e.g. where to point the family for help, and be able to answer any questions that will inevitably arise.

Not all questions are relevant to all families because some will depend on the nature of the home, and some families will not be capable of acting to correct any problems identified.

DOI: 10.3310/pgfar05140

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FIRE SAFETY	Baby	Crawler	Toddler
Is there a smoke alarm on each level of the home?	X	X	X
Do all smoke alarms work when tested?	X	X	X
Does the family have an escape plan in case of fire?	X	X	X
Are keys to window locks readily accessible for an adult? (This is also a falls issue)	X	X	X
Before going to bed, is a check made for cigarettes that are still alight, electrical appliances are turned off and doors are closed?	X	X	X
Are matches and lighters stored out of reach and out of sight?			X
Are there multiple plugs in sockets?	X	X	X
FALLS PREVENTION			
Is the baby's nappy changed on the floor?	X		
Are there safety gates (at top AND bottom of stairs)?		X	X
Are stairs and landing free of clutter? (This is also a fire safety issue)	X	X	X
Does the highchair have a harness that is used every time the baby is in it?	X	X	
Does the buggy have a harness?	X	X	
Are there locks / restrictors on all upstairs windows?			X
Does the child sleep on the top bunk of a bunk-bed?			X
Does the garden have any climbing play equipment mounted over a hard surface?			X
Does the garden have a trampoline without appropriate safety equipment?			X
POISONING PREVENTION			
Are there cupboard door locks?		X	X
Are there kitchen drawer locks?		X	X
Are all cleaning products and other household chemicals kept in locked cupboards or high out of reach?		X	X
Are all medicines (tablets and liquids) kept in locked cupboards/drawers or high out of the reach?		X	X
Are all household chemicals only stored in their original containers?			X
CUTS PREVENTION			
Are all sharp items placed out of reach, e.g. knives, scissors, needles?		X	X

The "safe" answer to most of the questions is *Yes*. However, for the shaded questions, it is *No*.

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BURNS PREVENTION	Baby	Crawler	Toddler
Is the bath water temperature always checked (with an elbow) before putting the child in?	X	X	X
Are there fire guards on all fires?		X	X
Is cold water always put in the bath before the hot?		X	X
Is there a thermostatic mixing valve (TMV) fitted to the bath hot water tap?		X	X
Is the electric kettle at the back of the work surface?		X	X
Are pan handles turned away from the front of the cooker?			X
Is the child kept out of the kitchen or secured in the highchair or playpen when cooking is taking place?		X	X
Is the baby held on the lap while the parent drinks a hot drink?	X	X	
Are hot drinks left on the floor or low tables?		X	X
Are hair straighteners left around immediately after use?		X	X
Is the iron left to cool where it could be touched?		X	X
DROWNING PREVENTION			
Are babies and young children always supervised in the bath to prevent drowning?	X	X	X
Is the paddling pool emptied immediately after use?		X	X
Is there a garden pond?			X
STRANGULATION, SUFFOCATION AND CHOKING PREVENTION			
Are nappy sacks stored well out of reach of the baby?	X	X	
Is the baby "prop-fed"?	X	X	
Are cot bumpers used?	X	X	
Is a duvet and/or pillow used in the cot?	X	X	
Are large toys removed from the baby's cot? (This is also a falls issue)	X		
Are plastic bags knotted and thrown away or put away safely to avoid suffocation?		X	X
Are there window blinds in the children's bedrooms with cords that could present a strangulation hazard?	X	X	X
Is the child made to sit still while eating?		X	X

The "safe" answer to most of the questions is *Yes*. However, for the shaded questions, it is *No*.

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Activity 4 – Where are your harmful products?

KEY MESSAGES

General points

- Young children and, to a lesser extent, babies naturally explore and play with whatever they can get their hands on.
- Babies and young children explore taste and texture by putting things in their mouths.
- They have no understanding of the consequences of their actions. Young children cannot identify hazards.
- Babies and young children are attracted by products that have certain child-appealing characteristics.
- The tops on bottles of tablets, liquid medicines and products such as cleaning products can be opened by some children. Some children can also operate cigarette lighters. They are not childproof so should never be completely relied upon.
- So-called strip and blister packs slow young children's access to tablets but may not completely stop them from getting at the tablets.
- Household chemicals such as cleaning products may taste horrible to adults but the sense of taste in young children is still developing so they may not find them so unpleasant.
- While long-term harm is rare, poisoning from some products – medicines and household products – can require prolonged stays in hospital.

Research findings

- Safe storage of medicines – at or above adult eye height or locked away – **reduces the risk of poisoning**. This may seem obvious but the key point is that the research confirms this.
- *Keeping Children Safe at Home* research tells us that not putting medicines and household products away immediately after use **increases the risk of poisoning**.
- Children who are taught rules about what to do or not do if medicines are left in places they can reach, such as on worktops, **are poisoned less frequently**. Remember that we are dealing with young children who do not always act reliably.
- Children who have access to things to climb on and so gain access to harmful substances are likely to be **more seriously injured**.
- Children who have been poisoned are **likely to be aged over 12 months and less than about 4 years**. However, even children aged under one year may suffer accidental poisoning.
- Children who have a poisoning are **more likely to be from the most disadvantaged families**, similar to most types of accidents, although children from all social groups are at risk.
- Providing families with education about how to prevent poisoning is **less effective** than **providing education along with provision of safety equipment** (e.g. cupboard locks) and home safety checks.

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DOI: 10.3310/pgfar05140

This activity builds on Activity 3 - Checking home safety by helping parents think about the safety consequences of some of their actions, such as what may be in their coat pockets, shopping bags or handbags and where they are. It is also relevant when visiting friends and relatives who might not be as switched on to safety as the parents.

Relevant injuries

It mainly addresses poisonings and fire-related injuries, but also suffocation and ingestions from small articles such as coins, and lacerations and puncture wounds from scissors and pins. Background information on these injuries can be found in Section C.

Burns can require long-term treatment, may be disfiguring and can impact on future life chances.

While most poisonings are not life-threatening nor require a stay in hospital, they can be very distressing for the child and the family, disrupt normal family routines when a child has to be taken to A&E and consume significant NHS resources.

Learning objectives

To help parents to minimise the risk of poisoning and other hazards.

Background

This activity can:

- focus on children of specific developmental stages, notably babies and young children who are exploring and who have fine motor skills that are developing.
- be used with groups of parents in children's centres or other settings, or can also be used with parents to help them identify hazards in their own home.
- be used to illustrate child development with respect to fine motor skills, i.e. the ability to manipulate objects with their fingers, and introduce the concept of anticipatory guidance.

One of the most common items that mothers, grandmothers and friends have is their handbag. It may contain various items that are hazardous to children such as tablets, lighters, matches, cigarettes, cosmetics and sharp objects (scissors, nail files, etc).

> It's important to note that for many people handbags are necessary and the things they contain are there for a reason. The activity is not an anti-handbag exercise but aims to highlight the need for bags to be kept away from babies and young children.

Not everyone uses a handbag. Sometimes, when mum or dad and the children go out, everything needed gets pushed into whatever is available – the handbag may be one such item, but it may be the shopping bag, baby bag, coat pockets, etc. While this activity refers to handbags, it is equally relevant to these other containers.

It is not easy to control and/or supervise young children, and if there is more than one child in the family it can be even more difficult to keep them all safe.

Playing with lighters and matches can lead to clothing and house fires.

Method

Explain that the aim of the activity is to remind parents that children, especially young children, love to explore everyday objects but that this can result in injuries.

There are two parts to this activity that can be run together or on separate occasions.

Where are handbags kept?

Ask participants, their female friends and/or grandparents to tell you where they normally put their handbag when they arrive home. List these locations. (If there are men in the group, ask them where they leave their coats, briefcases, etc and where their partners put their handbags.)

Ask them to judge whether these locations are such that a toddler could or could not reach them.

Examples of accessible locations may be:

- the hall table.
- the kitchen work surface.
- your bed.
- on the floor.

Examples of inaccessible locations may include:

- hanging on a coat hook.
- in a high cupboard, such as the top shelf in your wardrobe.
- on top of the wardrobe.

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Explain that young children can often move chairs around and then climb and reach things that you think are out of reach.

Exploring what hazardous items are in handbags

This activity may embarrass people – you know them best so can judge how to handle this activity. It can be run anonymously or openly.

The anonymous method

Give everyone the checklist and ask them to tick if they have the various items in the list in their handbag. Note that their names are not required on the checklist.

Collect up the checklists and transfer the information to a flipchart or white-board (or something similar) so that everyone can see that, for example, four people have painkillers, one has prescribed tablets, etc.

The open method

Draw the checklist on a flipchart or white-board.

Ask participants to come and tick the checklist if they have any of the items. (An even more open method is to go around the room and ask people to reveal whether they have any of the items.)

Ask participants whether they have items not listed on the checklist that they think may be hazardous and add these to your flipchart.

Extensions to the activity

Ask participants who else may bring a handbag into the home, or where else children may encounter handbags. Examples will be grandparents, friends and other relatives, including older siblings, who may be visiting. Discuss how you will pass the safety messages on to these people.

Consider what makes objects particularly appealing to young children and whether any of the items listed are child-appealing. Common child-appealing characteristics include objects:

- with bright and shiny colours.
- that have cartoon characters on them.
- shaped like toys.
- that play sounds and music.
- with lights and flames.
- that look like food.

Put the list of hazardous items on your notice board and ask people who did not participate in the activity to check their own handbags and to add items to the list.

Discussion points

Highlight that

- young children explore anything and everything.
- some objects are very attractive to children.
- some young children can open containers that you may think are "childproof". (See the note about child resistance on page 58).
- young children can sometimes operate lighters and strike matches.
- young children try to copy adult behaviour and also notice where things are being put away.
- young children will be able to climb so potentially harmful products need to be stored out of reach and out of sight.

Further information

Painkillers: Are they in bottles or strip packs? Both are child-resistant but it's important to remember that up to one child in five can gain access to the pills even when they are in child-resistant packaging.

Contraceptive pills. While not particularly harmful, they are not intended for young children and should be kept secure.

Prescribed tablets. These can be very dangerous, even in small doses, so it's essential that they are kept away from children. When you are given tablets, ask your pharmacist how dangerous they may be to children and act accordingly.

Lighters and matches can be really dangerous. They can lead to burns if a child manages to strike a match and drops it on to themselves or sets fire to their own clothes, or can lead to house fires. While most disposable lighters are now child-resistant, we know that some children will be able to operate them, and also it is still possible to buy cheap, illegal lighters that are not child-resistant.

Cigarettes. Some children may chew them, even though for adults they may taste horrible. Older young children may try to copy their parents and smoke them!

F-cigarettes. The nicotine that is contained in them is very dangerous - it is highly toxic.

Scissors, tweezers and penknives have sharp points and/or blades that can result in puncture wounds or cuts.

Cosmetics may be harmful and are not intended to be swallowed.

Aerosols may have propellant gases that are flammable or may cause problems if sprayed into children's eyes.

Conclusions

This activity demonstrates that not all safety measures need to involve buying equipment. In this example, changing parental behaviour by putting things away can make a difference.

If equipment is needed, remember that there may be a scheme in your area that provides and fits some items.

Checklist

	Yes	No
Painkillers (aspirin, paracetamol, etc)		
Contraceptive pills		
Tablets prescribed by your doctor		
Lighter		
Matches		
Cigarettes, including e-cigarettes		
Scissors with points		
Scissors without points		
Tweezers		
Penknife		
Cosmetics		
Aerosols (e.g. hair spray)		

Activity 5 – Designing an unsafe kitchen

KEY MESSAGES

- The kitchen is an especially dangerous room because of hot water and appliances, sharp objects, cleaning materials and activities such as carrying hot food around.
- Young children want to be with their parents but they need to be kept away from dangerous situations.
- There are lots of things in the kitchen that may be appealing to young children.

This can be a fun way of thinking about dangers in the kitchen. It can be adapted for other parts of the home.

Relevant injuries

Almost anything can happen in the kitchen, except stair falls and bath drownings. See Section C for background information on poisonings, falls, scalds and fire-related injuries.

DOI: 10.3310/pgfar05140

PROGRAMME GRANTS FOR APPLIED RESEARCH 2017 VOL. 5 NO. 14

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Background

This short activity illustrates that the kitchen is the most dangerous room in the home. It has:

- hot water in abundance (in mugs, kettles and saucepans).
- hot oven doors.
- hobs or burners on cookers that can be reached by young children.
- very hot food being carried from the cooker to the table or worktop.
- knives and other sharp utensils in accessible drawers or on worktops when they are being used.
- electric gadgets such as the kettle and food mixer that can be very harmful in the wrong (small) hands.
- cleaning products usually stored under the sink.
- the highchair if this where the baby is fed.
- a tiled, and hence hard, floor that is unforgiving if it is fallen on.
- pills and other medicines may be kept in a cupboard, in the fridge or just left on the worktop.
- cigarettes (including e-cigarettes), matches and lighters may have been left lying around.
- a busy and possibly distracted parent!

Learning objective

To allow parents to identify what in the kitchen may harm a baby or young child.

Equipment

Some sheets of flip chart paper and marker pens, or just pens and paper.

Method

Explain to participants that the kitchen can be a very dangerous room for babies and young children, but don't tell them why it is so dangerous.

Ask participants, working individually, in small groups or as a single group, to write down (or call out) all the features that they can think of that would make a kitchen really dangerous. Either they or you should write down the responses. The list will include everything in the Background section above, possibly plus other items.

Get the participants to identify what ages of children would be associated with each dangerous feature and capture this on the paper.

If time permits, invite participants to suggest solutions to the hazards that have been listed. You can help to complete the list of solutions. The activity still works without this stage as it still makes people think about hazards.

Discussion points

It is not always practical to achieve perfection. Invite participants to consider what should be the key preventive actions.

Some parents, because of financial circumstances, space limitations, the fact that it is a rented property, etc, may not be able to address all of the hazards. Investigate whether there is a safety equipment scheme locally.

Explore how some people may have overcome some of the issues that have been identified. Learning from each other can be an attractive way of presenting advice as it is not seen as officialdom telling people what to do.

Allow parents to visit the kitchen in your setting to see whether they can find any hazards and see how you have addressed them.

Distribute the list of Best Buys, part of Activity 6, and other safety leaflets if you have any.

Conclusion

The kitchen is a popular, yet dangerous, room in the home. Making it safe and keeping it that way can be challenging as it is working space used by everyone. However, some of the hazards are very dangerous so it cannot be neglected. There are lots of low or no cost things that can be done to make a kitchen safer.

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DOI: 10.3310/pgfar05140

Activity 6 – Home safety equipment – what do families need?

KEY MESSAGES

General points

- Many parents may not be able to afford the safety equipment that they need.
- There is a strong association between deprivation and children's accidents.

Research findings

- Home safety education and the provision and fitting of safety equipment **improves** safety behaviours and may reduce injuries.
- Not using a safety gate on stairs **increases** the risk of a fall on stairs and leaving the gate open **increases** the risk even more.
- An overview of the evidence on preventing falls and the analysis of different combinations of falls prevention strategies reveal that the combination of education, low cost or free safety gates, home safety checks and fitting of safety gates is the **most effective way of increasing the possession of a fitted safety gate**.
- The home safety checks and fitting of safety gates as part of the package are particularly important as families receiving both of these components in the package are **much more likely** to have a fitted safety gate than those provided with education or safety gates without the home safety checks and the fitting of safety gates.
- Fitting a thermostatic mixing valve (TMV) and providing education is **much more effective** in reducing bath water temperature to a safe level (one that will not cause serious and rapid injury, usually about 46°C) than education alone or than giving parents thermometers to test their water temperature and lower it if it is too high.
- Families without smoke alarms are **more likely to die in a house fire** than those with smoke alarms.
- **The most effective method** for increasing the number of families with a functional smoke alarm is to educate families, provide and fit free or low cost alarms and do a home safety check. Where fitting smoke alarms and doing home safety checks is not possible, providing education and free or low cost alarms is a cost effective option.
- Providing families with only education about how to prevent poisoning is **less effective** than providing education along with provision of safety equipment (e.g. cupboard locks) and home safety checks.

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This activity provides guidance on evidence-based safety equipment for families. Many children's centres and health visiting teams run schemes that provide, and in some cases fit, free or low cost safety equipment, or refer families to schemes run by other agencies. We have produced a resource sheet showing which items of safety equipment have the best evidence and which safety equipment schemes may wish to provide.

It would be wrong to interpret the findings in the box above as meaning that no other safety equipment is effective. These findings come from the *Keeping Children Safe at Home* programme which had limited scope. Other safety equipment may well be effective but without additional research this cannot be stated categorically.

See Section C for further background information on poisonings, falls, scalds and fire-related injuries.

Relevant injuries

This activity is intended to reduce the likelihood of a range of injuries, especially falls, fire-related injuries, poisonings and bath scalds.

Background

Home safety equipment, as outlined in the box above, can help with keeping the home safe. In some areas, there are schemes that provide and often fit home safety equipment for families who cannot afford to buy it themselves. Such schemes:

- benefit from the involvement of a number of organisations and practitioners to handle referrals, auditing families' needs, education, fitting, etc. These can include health visiting teams, fire and rescue services, children's centres, charities such as Home-Start and Care & Repair, social services departments, housing providers, tenants associations, public health departments, etc.
- because of the need for multi-agency involvement, require good leadership, a clear strategy, and recognition by all concerned of what their roles are.
- need to have several components to be effective – they are not just about supplying equipment. They need to be a combination of selection of equipment, training for staff, an education package for both staff and parents, auditing home safety to identify the equipment needed and any fitting issues, a fitting service, resources to reinforce the importance of using the equipment correctly, etc.
- can be expensive to operate as they rely on the purchase of new equipment, but will be good value for money because of their effectiveness.
- should be directed to help those in greatest financial need who may not be able to afford safety equipment themselves. It is well established that children from the most disadvantaged families are at greatest risk of death and injuries from accidents.

Learning objectives

Families learn which items of safety equipment are most effective and the cost and local availability of them.

Families will have considered the barriers to having safety equipment and how they might overcome them, e.g. cost, fitting, landlords, nuisance, etc.

They will have learnt important home safety issues.

Equipment

Flipchart or whiteboard and marker pens. Write three headings: babies, crawlers, young children.

Sticky dots for voting.

Method

Outline the potential benefits of having safety equipment and explain that you want to hear parents' views about such equipment and their experiences of using it.

Stage 1

Ask parents to identify the safety equipment that they think would help them make their homes safer. Get them to write their ideas on the flipcharts under one or more of the headings.

When all the ideas have been exhausted, ask them why they have included some of the items, especially the ones that are unusual.

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DOI: 10.3310/pgfar05140

The following items may be listed, although those marked with crosses may be omitted as they are not common:

- Bath seats
- Bed guards

X Blind cord safety devices

- Fireguards
- Hair straightener insulating bags
- Highchair harnesses

X Lockable medicine cupboards

- Safety gates

X Carbon monoxide (CO) alarms

- Corner protectors
- Drawer and cupboard locks
- Smoke alarms
- Socket covers

X Thermostatic mixing valves (TMVs)

X Walking reins

- Window locks

If you feel that there are important items missing, prompt the parents to think about them. Have a look at the list of "Best Buys" at the end of this activity. Most of the items in the "Best Buys" list are based on evidence of effectiveness and need in that they address accidents that are frequent and/or serious.

Give each person five sticky dots and ask them to place one next to each item that they think are most important. (If you don't have any sticky dots, just ask them to put a cross with a pen next to the five most important items.)

Give each person three more sticky dots and ask people to choose which ones they would buy if they could only afford three items.

Discuss what has emerged from the voting.

Stage 2

During our research, parents have identified barriers to having safety equipment or using it properly, including the size and layout of the property, other children in the household, and landlords who do not allow safety equipment to be installed.

Ask people to say what they think makes it difficult for families to get and to use safety equipment (ask about families in general, not the people in the group in particular). Write the barriers on the flip chart or white board.

Brainstorm ideas for how families might overcome these barriers and what people in the group have done themselves. This might include:

- getting referred to schemes that provide and fit safety equipment (and discuss eligibility if there is one in your area).
- asking advice about how to get safety equipment from health visiting teams, children's centre staff, voluntary organisations etc.
- asking the landlord, housing association or council to repair the property or fit safety equipment; or asking the health visitor, children's centre staff or voluntary organisations to do this on behalf of parents.
- getting advice from Citizens Advice if families think their house is unsafe and the landlord will not make the necessary changes and people in the group may have come up with some other innovative solutions.

If you feel it appropriate – you know your client group – discuss whether people would be able to buy some items of safety equipment. Discuss where people can buy safety equipment locally and the approximate cost of safety equipment using the "Best Buys" table below.

Discussion points

Some of the items on the equipment list are of dubious value or may even add to risks.

- Electrocution at sockets is extremely rare because of the way that sockets are designed. It is a popular tale that young children push things like knitting needles into sockets – they don't or if they do the risk of electrocution is minimal. The only possible value to socket covers is that they may prevent children plugging in some appliances such as the iron, electric fire or hair straighteners. The better way of preventing this from happening is to put things away!

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The other problem with socket covers is that some are so poorly designed and made that they can actually make matters worse because they can be inserted upside down, thus opening the safety shutters that are inside the socket and revealing the live terminals.

- Bath seats are not safety products. They can create a false sense of security and may mean that a parent is tempted to leave a baby unattended in the bath, even if only briefly to answer the phone or door or fetch something like a towel that has been forgotten. This can be fatal. Babies may be able to tip bath seats or squirm out. Drowning happens very quickly and is silent.
- There is no evidence that corner protectors make a difference.
- Fireguards are not just needed on open fires. They are also needed around gas and electric fires to stop unsteady young children falling against the hot parts and stop things being dropped into the fire. Open coal or wood fires need spark guards to stop sparks spitting on to the carpet.
- As other activities have explained, smoke alarms are needed on each floor of the home.
- Lockable medicine cupboards are not easy to find. There are alternatives to using such a cupboard, such as ensuring that medicines are kept out of sight and out of reach (above adult eye height, ideally in a locked cupboard or drawer).

Keep medicines in the fridge?

Some medicines say "Keep this in a cool place" but does that mean in the fridge?

Always check with the pharmacist if a medicine MUST be kept in the fridge as most do not.

It is better not to keep medicines in the fridge if they don't need to be there as things in the fridge are intended to be eaten.

If they do need to be kept in the fridge make sure the bottle is correctly closed and they are stored as far out of reach as possible for a child.

Conclusions

Not all items of safety equipment have good evidence to support their use. The items with the best evidence are smoke alarms, thermostatic mixing valves, safety gates and cupboard locks. Other items may be effective but research does not currently confirm this.

Safety equipment schemes are effective in increasing the use of safety equipment, especially when combined with home safety education.

Families who meet the eligibility criteria for safety equipment schemes should be offered referral to the scheme. Families who don't meet the criteria should be offered advice about evidence-based items of safety equipment, how much these cost and where they can be bought locally.

"Best buys" – Key safety products

The table below shows products that can make a big difference to the safety of babies and young children and at what ages and stages of development they matters. (The equipment is important for the ages and stages of development shown by shaded cells.)

Some of the recommendations arise from the *Keeping Children Safe at Home* programme, others do not because they fell outside the scope of the programme. Further, some recommendations are based on solid evidence while others are not, although this does not mean that they are ineffective.

It is important to remember that safety equipment is not the be all and end all when it comes to keeping children safe. Changes in family practices, such as not placing hot drinks on low coffee tables or the arm of the chair, are also very important.

The ages and developmental stages shown in the table on page 38 are for guidance. Some of these characteristics are when a child may start to do something, not just the period during which it matters.

Not all children do the same things at the same age so some may need equipment sooner than others. The best approach is to anticipate when it may be needed and put it in place too soon rather than after the accident has occurred.

The approximate cost of each product, including the cost of installation if this is relevant, is provided for guidance.

DOI: 10.3310/pgfar05140

In some areas, safety equipment schemes provide and fit some items of equipment for families who may not be able to afford them. Health visitors and children's centres often know if there is a scheme in your area and who to contact for help and advice.

The products in the table on page 38 are all important but the earlier items can prevent fatal and very serious injuries. Some products, especially the smoke and CO alarms and TMVs, can benefit all members of the family, not just young children.

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	Approx cost •	Birth – 6 months	6 months – 12 months	12 months – 18 months	18 months – 2 years	2 years – 3 years	3 years onwards
Gross motor skills		Rolling and wriggling	Shuffling, crawling and may start to walk	Walking and starting to climb	Walking, running unsteadily and climbing Can move large objects	Walking, running and climbing	
Fine motor skills		May wave arms around	Plays with toys and small objects	Starts to open containers Can operate knobs and switches			May open child-resistant containers, operate lighters, strike matches
Exploratory behaviours				Puts objects in mouth to explore			Wants to help and copy adults
Smoke alarms	££ - £££*						
CO alarms	£££						
Thermostatic mixing valve (TMV)	££££						
Blind cord safety devices	£						
Fireguards	£££						
Safety gates	£££					*	*
Child-resistant window locks	££						
Insulated bags for hair straighteners	££						
Child-resistant cupboard and drawer locks	£						

• £ = less than £5 ££ = £5 - £10 £££ = £10 - £25 ££££ = The only item with this symbol is the TMV. The cost of purchasing and installing a TMV is approximately £100 and needs to be done by a plumber

* Smoke alarms can be purchased for less than £10 but these need their batteries replacing annually. Alarms with a 10-year battery life and a battery that cannot be removed so it will always work cost about £20.

* Safety gates are only suitable on stairs until a child is aged 24 months, even though we know that children are not able to use stairs safely after this age. The reason for this age limit relates to the way that gates are tested and the relevant standard. If you advise parents to use gates on stairs after this age and a child climbs over or dislodges the gate and falls down the stairs, there may be liability issues. If a gate is used across the kitchen or another door, the consequences of the gate not providing complete protection may be less.

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DOI: 10.3310/pgfar05140

FALLS PREVENTION ACTIVITY

Activity 7 – Preventing falls – more than just using safety gates!

KEY MESSAGES

General points

- Falling over is inevitable as babies and young children learn to walk and run. The challenge is to minimise the serious injuries from falls.
- Falls from relatively low heights can result in serious injuries, including head injuries and limb fractures.
- Some babies will be able to climb when they become able to crawl. They do not have to be able to walk before they can climb.
- The focus has to be on preventing falls from heights, such as down stairs, out of windows, from furniture, off kitchen work surfaces and from highchairs.
- Babies' and young children's movements – wriggling, rolling, fidgeting, climbing, etc – can result in falls from beds, changing tables, work tops, tables and highchairs.

Research findings

- Not using a safety gate on stairs **increases** the risk of a fall on stairs and, unsurprisingly, leaving the gate open **increases** the risk even more.
- Carpeted stairs **reduce** fall injuries.
- Changing nappies on raised surfaces (e.g. changing tables, beds etc) means that the children are **more likely to need to go to hospital following a fall** compared with those whose nappies are not changed on raised surfaces.
- Leaving babies unattended on raised surfaces (e.g. bed, sofa), even for a moment, **greatly increases** the risk of falls
- Babies under 1 year from families who place car or bouncing seats on raised surfaces (e.g. worktops, tables etc) were **more likely to need to go to hospital** because of a fall from furniture than those who don't place car or bouncing seats on raised surfaces.
- Children under 5 years from families without safety gates across doorways are **slightly more likely to need to go to hospital** because of a fall from furniture (e.g. beds, sofas, chairs etc) that they can access than those in families who do use safety gates.
- Children aged 3-5 years who climbed or played on furniture more often were **very much more likely to need to go to hospital** because of a fall from furniture than those who climbed or played on furniture less often.
- Children under 5 years who were taught not to climb on objects in the kitchen were **less likely to need to go to hospital** because of a fall from furniture than children who were not taught about this.
- Interventions including education, low cost or free safety gates, home safety checks and fitting of safety gates were the most effective in increasing the possession of a fitted safety gate. Families receiving interventions containing all of these components were **very much more likely to have a fitted safety gate** compared to families who received no special treatment, just what is termed "usual care". Actually fitting safety gates was particularly important as families receiving this part of the intervention were **much more likely to have a fitted safety gate** than those just provided with education or safety gates or home safety checks, or any combination of these.

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Some parts of this activity, especially those concerning safety gates, overlap with those covered in Activity 6 – Home safety equipment – what do parents need? That activity focused on home safety equipment to address a variety of accidents. This one concentrates on educating parents about falls prevention generally – the use of safety gates in various locations, changing parenting practices and understanding relevant aspects of child development. See Section C for further background information on falls.

Relevant injuries

Falls can be very serious. In simple terms, the higher the fall, the more serious the consequences are likely to be. Falls are the most common cause of injury-related admission to hospital and A&E attendances.

Each year, a handful of children die as a result of falls from heights, often from windows or balconies. But even a fall from what may seem like a relatively low height such as from a highchair or off a table can lead to prolonged hospital treatment.

Head and brain injuries can have long-lasting and occasionally disabling consequences. Limb fractures are another result of falls.

Background

As can be seen from the evidence, some practices are more likely to lead to injuries from falls from furniture than others. The challenge is how to get families to change their safety behaviours.

Some of the behaviours reveal a lack of understanding of the ways that children develop, notably how babies and young children move around, such as rolling and wriggling off raised surfaces. These general issues are covered in Activity 1 – Exploring child development.

This activity concentrates on getting parents to think about the consequences of some of their everyday actions as they relate to falls – changing nappies, putting the baby where he or she can see them, etc – and the usefulness of safety gates in preventing more than just falls on stairs.

It is important not to make people feel guilty about their own behaviour by simply asking them where they place their children and what they allow them to do. The method below aims to prevent this and allows parents to think constructively.

Learning objective

Parents should understand the potential consequences of placing children on raised surfaces and the beneficial effects of safety gates.

Equipment

Drawings or photographs of different parts of the home: a kitchen (with a table and worktops), living room (with a sofa), bedroom (with a normal height bed and a changing table) and circulation spaces (hall, stairs, landing, balcony, etc).

A flipchart or whiteboard and marker pens.

Method

How this activity is run depends slightly on the ages of the children in your group of parents (or of the individual parent).

Split the group up into four subgroups.

Give each subgroup one of the illustrations and ask them to discuss where they think a child of an age that you choose may fall from. Ask them to jot down each location that they identify.

Move the illustrations around so that eventually each subgroup has discussed each situation.

Ask one subgroup to report where they thought a child may fall from in one of the areas. Record the responses on a flipchart or whiteboard. Ask other subgroups to add to the list. Do this for all areas of the home rooms.

Discussion points

With regard to actual fall injury events, 11 out of 16 interviewed parents were not visually supervising their child at the time of the injury. Five were visually supervising but four of them did not anticipate the injury.

Conclusion from KCS interview with parents

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DOI: 10.3310/pgfar05140

The participants should identify at least the following possible fall locations (including some that are not furniture-related):

- Kitchen:
  - Table
  - Worktop
  - Washing machine
  - Highchair
- Living room:
  - Sofa
  - Chairs
  - Table
- Bedroom:
  - Bed
  - Bunk bed
  - Changing table
  - Chest of drawers
  - Window (could apply to any room but the bedroom may present a special risk because children may be unsupervised there. If it's upstairs, the injuries are likely to be more serious than those resulting from a fall from a ground floor window)
- Circulation spaces:
  - Stairs
  - Through or over landing banisters
  - Communal stairs
  - Balcony (within the home and in communal areas)

Highlight the fact that the participants have identified many places that cannot apparently be protected by safety gates. Ask participants to suggest different preventive approaches: changing where they place or leave children, supervision, teaching "rules", and restricting access (including using gates).

If necessary, provoke discussion by asking why a baby may fall off a worktop or table (because their baby car seat or bouncing cradle has been placed there), or how a baby may fall off a bed or changing table (because they can wriggle and roll and have been left unattended). The discussion could be extended to consider what parents think of as "unattended". Does it mean within arm's reach, the same room, within hearing range or what?

If the group has children who are active (old enough to climb), ask them what their children enjoy climbing on when playing. They are likely to say chairs and other items of furniture. If they say bunk beds, remind them that the higher a child falls, the worse the injuries will be. Discuss how you can deter this behaviour – restricting access to the furniture through the use of a safety gate across the doorway is one solution if the children are under 24 months (see page 61 for a consideration of the use of safety gates with by older children).

Consider where safety gates may be useful. The obvious answer is to restrict access to stairs – they are often (wrongly) called "stair gates". They can also be placed across doors to prevent access to rooms where children may be able to climb on furniture, reach hot substances in the kitchen, etc.

In the context of restricting access to stairs, discuss where the gate at the top of the stairs should be placed – see the box on page 61 for advice on this. Also, ask whether among participants who have gates all members of the family always close them – gates left open are useless!

Discuss the need for teaching young children "rules" about not climbing on furniture and not placing babies on raised surfaces, but emphasise the fact that young children cannot be relied upon you follow rules, even though they may appear to understand them.

Recap on the fact that babies will move if left unattended – this may not be happening one day but as they develop rapidly they may catch you out by wriggling off something next day. And remind your audience that young children will climb on anything that they can access when playing. (We want to encourage activity but make it safe.) You could present the facts outlined in the evidence section above to illustrate the significance of the issue.

Conclusions

Falls are common accidents and can result in very serious injuries, even when falling from what may appear to be a low level.

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SCALD PREVENTION ACTIVITIES

Activity 8 – How far does a hot drink spread?

KEY MESSAGES

General points

- Scalds, as with all burns, can be very serious injuries, requiring prolonged hospital treatment and long-term disfigurement.
- The more liquid involved and the hotter that it is, the more serious the burn can be so kettles and saucepans must be kept out of reach.
- Babies and young children should always be supervised when you run a bath and when in the bath to ensure that they don't play with the hot tap.
- It is natural child behaviour to try to grab items, such as mugs, and for babies to wave their arms around running the risk of knocking mugs that you may be holding.
- Even a mug of liquid can cover a large area of a baby's body. The hot liquid can soak into the baby's clothes.
- A hot drink can be hot enough to burn 15 minutes after it is made.
- Appropriate first aid can make a major difference to the long-term consequences of scalds.

Research findings

- Educating parents as part of wider home safety programmes **makes a difference.**
- Leaving a hot drink within reach of a child **greatly increases** the likelihood of a scald.
- Teaching children what not to do when cooking or using the kettle **reduces** the risk of scalding.
- Teaching children not to climb on things in the kitchen **reduces** the risk of scalding.

This activity is based on one contained in the Child Accident Prevention Trust training resource *Preventing accidents. Session plans for parents and carers groups.*

See Section C for further background information on scalds.

Relevant injuries

This activity addresses scalds from hot drinks.

Background

Scalds from hot drinks are very common injuries to babies and young children. They can be very serious, requiring prolonged treatment.

They occur as a result of normal childhood behaviour. Activity 1 - Exploring child development and Activity 2 – What is appealing to children but may harm them? are closely linked with this activity as they allow the general aspects of chid development and child-appealing items to be explored.

There are three classic scenarios for hot drink scalds:

- A baby is held on the lap while the carer is having a hot drink. The baby waves his or her arms around and knocks the drink over themselves.
- A hot drink is passed over a baby or toddler and is spilt over them.

- A mobile baby or toddler, one who can at least crawl, is able to grab a drink that has been left on a low surface such as a coffee table or the arm of a chair.

This vivid demonstration shows that even a relatively small quantity of liquid – a mug may contain 200-300 ml, about half a pint – can spread over a large area of a baby or toddler. It can be the equivalent of pouring a bucket of water over an adult.

An aspect of child development that is probably not understood is that a baby's skin is just one-fifteenth the thickness of an adult's so a burn can be very serious.

If you have the opportunity, run first aid training relevant to children's needs – typically burns, poisoning, head injuries and choking. Appropriate and timely first aid can make a major difference to the long-term consequences of a scald.

Learning objective

To illustrate the extent of a scald from a mug of liquid.

Equipment

A baby-sized doll, dressed in a babygro.

A mug of liquid, ideally containing a coloured liquid such as blackcurrant juice.

A bouncing cradle.

A large plastic sheet (or undertake the demonstration outside so that spill does not matter).

Method

Explain the way that babies naturally behave, waving their arms around, fidgeting, etc when they are sitting on a lap. This behaviour could be identified through a brief discussion session.

Put the doll into the bouncing cradle.

Throw the mug of liquid over the doll.

Note how extensive the stain is (and the fact that the baby is sitting in a pool of liquid).

Discussion points

Discuss the other scenarios that could lead to a mug of liquid being spilled over a baby. One possible situation is when you are carrying a hot drink from a coffee shop – the lid may be insecure and the drink may be very hot. (Some pushchairs have drink holders on their handles so the drink is naturally very close to the baby.)

Consider why babies may try and grab a mug. It may be related to the child-appealing nature of the mug – be colourful, have cartoon characters on it, etc.

Use the opportunity to talk about child development, adult behaviour, and the need to anticipate children's behaviour.

Initiate a conversation about first aid as this can make a major difference to the treatment and recovery from burns. Consider whether families would like you to organise first aid sessions.

Conclusions

This dramatic demonstration creates a good opportunity to talk about what can be a very serious injury with potentially long-term consequences, closely linked to child development.

DOI: 10.3310/pgfar05140

PROGRAMME GRANTS FOR APPLIED RESEARCH 2017 VOL. 5 NO. 14

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Activity 9 – How long does a hot drink stay hot?

KEY MESSAGES

General points

- Scalds, as with all burns, can be very serious injuries, requiring prolonged hospital treatment and long-term disfigurement.
- The more liquid involved and the hotter that it is, the more serious the burn can be so kettles and saucepans must be kept out of reach.
- Babies and young children should always be supervised when you run a bath and when in the bath to ensure that they don't play with the hot tap.
- It is natural child behaviour to try to grab items, such as mugs, and for babies to wave their arms around running the risk of knocking mugs that you may be holding.
- Even a mug of liquid can cover a large area of a baby's body. The hot liquid can soak into the baby's clothes.
- A hot drink can be hot enough to burn 15 minutes after it is made.
- Appropriate first aid can make a major difference to the long-term consequences of scalds.

Research findings

- Educating parents as part of wider home safety programmes **makes a difference.**
- Leaving a hot drink within reach of a child **greatly increases** the likelihood of a scald.
- Teaching children not to climb on things in the kitchen **reduces** the risk of scalding.

Relevant injuries

This activity addresses scalds from hot drinks.

Background

Scalds from hot drinks are very common injuries to babies and young children. They can be very serious, requiring prolonged treatment.

They occur as a result of normal childhood behaviour.

Activity 1 - Exploring child development and Activity 2 – What is appealing to children but may harm them? are closely linked with this activity as they allow the general aspects of chid development and child-appealing items to be explored.

There are three classic scenarios for hot drink scalds:

- A baby is held on the lap while the carer is having a hot drink. The baby waves his or her arms around and knocks the drink over themselves.
- A hot drink is passed over a baby or toddler and is spilt over them
- A mobile baby or toddler, one who can at least crawl, is able to grab a drink that has been left on a low surface such as a coffee table or the arm of a chair.

This demonstration shows that hot drinks can stay hot enough to burn a baby long after it is made.

Hot liquids can cause burns down to about 50°C. This temperature will feel hot, but not intolerably so, to an adult. For a child it would be very uncomfortable. The table below shows the approximate relationship between water temperature and the time it takes to cause a third degree, i.e. full thickness, burn.

An aspect of child development that is probably not understood is that a baby's skin is just one-fifteenth the thickness of an adult's so a burn can be very serious.

If you have the opportunity, run first aid training relevant to children's needs – typically burns, poisoning, head injuries and choking. Appropriate and timely first aid can make a major difference to the long-term consequences of a scald.

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DOI: 10.3310/pgfar05140

Learning objective

To illustrate that hot drinks stay hot long after they have been made.

Equipment

A couple of freshly-made hot drinks, one with cold milk added and another without milk.

A thermometer capable of reading between 50°C and 100°C. A cooking thermometer may be suitable.

A flipchart or white board and a marker pen. A

stopwatch (or just a wristwatch).

If you can produce it, a large print copy of the table below. Alternatively, just copy the values on to a piece of flipchart paper.

A trivial prize!

Method

Ask everyone to guess how long it will take a freshly made hot drink to cool to 50°C.

As soon as the drink is made, get someone to measure its temperature. Note this down on the flipchart or whiteboard. Repeat the measurement every minute until the temperature is down to below 50°C, noting the time and the temperature as you go along.

You could also get someone to take a sip of another drink made at the same time – note down the time when it becomes comfortable to drink.

(For information, a cup of coffee from a coffee shop may be served at up to 85°C.)

Compare the time-temperature table with the one opposite.

Give the prize to whoever made the best guess.

Discussion points

You will find that it will take about 15 minutes for a drink to cool to a temperature that will not cause rapid and serious burns to a child. Remember that this time will depend on the insulating properties of the mug – a well-insulated mug may take much longer.

Discuss the consequences of the time to cool to a safe temperature – it will be far longer than people expect – such as where freshly-made hot drinks should be placed.

Initiate a conversation about first aid as this can make a major difference to the treatment and recovery from burns. Consider whether families would like you to organise first aid sessions.

Conclusions

Hot drinks can scald long after they are made. People do not appreciate this.

You can use this activity to justify rules you may have set for keeping children away from hot drinks in your

Time for a third degree (full thickness) burn to occur in a child

°C	Time
40	(Safe for bathing)
49	5 min
52	2 min
54	10 sec
60	3 sec
64	2 sec
68	1 sec

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FIRE SAFETY ACTIVITIES

Activity 10 – The importance of smoke alarms

KEY MESSAGES

General points

- Over half of house fires that the fire and rescue services attend DO NOT have a working smoke alarm, despite the fact that well over 80% of homes have smoke alarms.
- When smoke alarms raise the alarm, dwelling fires are discovered more rapidly (less than 5 minutes) after ignition and are associated with lower fatal casualty rates.
- There should be a smoke alarm on every level of the home.
- Check that the alarm is working every week by pressing the test button until the alarm sounds.
- Replace the battery every year (unless it's a ten-year alarm or is wired into the electric mains).
- If the alarm keeps going off when there is no fire, ask the local fire and rescue service for advice.
- House fires are a significant cause of death in pre-school children, particularly in families living in more deprived conditions.

Research findings

- Families with working smoke alarms are **less likely to die** in a house fire than families without smoke alarms.
- There is **strong evidence** to suggest that home fire safety fire checks reduce domestic fires and related injuries. Children's centres and others can refer families to their local fire and rescue service for such checks.
- The **most effective** method for increasing the number of families with a functional smoke alarm is to educate families, provide and fit free or low cost alarms and do a home safety check. Where fitting smoke alarms and doing home safety checks is not possible, providing education and free or low cost alarms is a cost effective option.

Relevant injuries

This activity is intended to reduce the likelihood of deaths and injuries from house fires.

Background

This activity is about ensuring that families benefit from one of the most effective tools to prevent death and injury in house fires – the smoke alarm.

It tests people's knowledge of house fires and leads them to realise the importance of having correctly functioning, appropriately located, regularly tested smoke alarms. It also touches on the needs of people with hearing difficulties.

Ownership of smoke alarms in the UK is very high – approaching 90 percent – thanks largely to initiatives that fire and rescue services (FRS) have run for several years, providing and fitting smoke alarms in homes. However, ownership rates vary, depending on such factors of whether there is a smoker in the home and the degree of poverty – in both of these situations ownership rates are lower than the average.

There is strong evidence that functioning smoke alarms are a real life-saver in the event of a house fire. They provide extra crucial seconds of warning that there is a fire. It is not an exaggeration to say that they can make the difference between living and dying.

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DOI: 10.3310/pgfar05140

But simply having a smoke alarm is not enough. They have to be working correctly – the only way to ensure that this is the case is for the family to test them regularly. A smoke alarm that doesn't work for whatever reason, the most common being that the batteries have been removed, is not a smoke alarm – it's a piece of plastic attached to the ceiling that gives a completely false sense of security.

This activity links closely with Activity 6, which is about safety equipment, including smoke alarms.

Information snippet

House fires in which smoke alarms raise the alarm:

- are discovered more rapidly after ignition.
- are associated with lower fatal casualty rates.
- cause less damage as they are more often confined to the item first ignited.

Casualty rates are significantly higher during the night. These higher rates probably reflect the fact that the casualties are not aware of the fire as quickly.

Learning objective

To highlight the importance of having smoke alarms and ensuring that they are working correctly.

Equipment needed

Enough copies of the *Fire Safety Quiz Sheet* on page 49 for people to work in groups of two or three and a supply of pens or pencils. Alternatively, if you run the quiz as a single group activity, the questions could be on a series of pre-prepared flipcharts.

Enough copies of *Information sheet - All about smoke alarms* on page 50 so that everyone can take a copy home. Your FRS may have a leaflet that presents the same information more attractively.

Having a smoke alarm as a visual aid is useful and fun. Make sure it works by pressing the test button!

A small, fun prize for anyone who gets all the quiz answers correct.

Method

Hand out the quiz sheets and invite participants to spend a few minutes answering the questions. (If the group has reading problems, the questions could be read out and answered with a show of hands.)

When everyone has completed the quiz sheet, tell participants what the correct answers are.

Use any incorrect answers as discussion leaders so that people understand why the correct answers are what they are.

If you are concerned that using the quiz in a group session may embarrass some of your audience by revealing their ignorance, you could use the quiz sheet as part of a feature on smoke alarms, using it as a display item with the correct answers highlighted.

Discussion points

> *"Fire safety quiz - we just got parents talking about it and thinking about it. It just got parents talking about it and they were interested in questions and activities around it.*
>
> *"There was a lot of discussion around the group because some parents have said 'oh no, that I wouldn't do that' and others would say 'but if you didn't do that then what would happen?' And so they were already problem-solving themselves"*
>
> Comment from a children's centre worker on the first edition of the Injury Prevention Briefing

It's possible that some people may say that because they live in privately-rented accommodation, they are not allowed to fix anything to the walls or ceiling, or they are afraid that they will lose their deposit if they do so. (This is not usually an issue for people living in social housing.) Unless the building is a so-called house in multiple occupation, a landlord doesn't have to comply with any specific laws but has a general duty to keep a home fit to live in.

If a tenant doesn't think their accommodation is fire safe, the first step should always be to try negotiating with the landlord. They may be prepared to provide fire safety precautions, such as a smoke alarm, if requested.

If the problem is caused by disrepair (for example, loose wiring or a faulty electrical heater) the landlord is probably responsible for getting the necessary repairs done. The fire prevention officer at your local FRS may be able to give further advice on this topic.

If someone has a smoke alarm that keeps going off, the FRS will be able to advise on the best solution. It may mean changing the type of alarm or moving it.

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Conclusions

When all the questions have been dealt with, emphasise the importance of:

- having a working smoke alarm – they save lives.
- having the right number of smoke alarms – one on each floor.
- making sure that they are checked frequently – at least once a week.
- replacing batteries each year (unless it is an alarm with a ten year battery life or is connected to the mains electricity).
- replacing the whole alarm every ten years because the sensor may deteriorate over time.

If any members of your group do not have smoke alarms, speak to the fire prevention staff at the local FRS and let your families know what the FRS can do for them. They may well be able to provide and fit them free of charge.

If there is a scheme to provide free or low cost home safety equipment in your area, it may provide smoke alarms free or at reduced prices. (See Activity 6)

Give everyone a copy of *Information sheet - All about smoke alarms* to take home. You may find that your local FRS has a leaflet that covers the topics more attractively than this information sheet.

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DOI: 10.3310/pgfar05140

FIRE SAFETY QUIZ SHEET

1. Fire is one of the biggest killers of children in the home.
   True U False U
2. You're more likely to be killed by a daytime fire than one that starts at night.
   True U False U
3. Adults will be woken by the noise that a house fire makes so they don't need a smoke alarm.
   True U False U
4. The battery in a smoke alarm needs to be checked once a year.
   True U False U
5. In a house fire, you're more likely to die from the flames than from breathing in smoke.
   True U False U
6. You should have a smoke alarm on every floor of your house, upstairs as well as downstairs, to wake you up if there is a fire.
   True U False U
7. Cigarettes, matches and lighters are the biggest cause of house fires where people die.
   True U False U
8. Smokers are more likely to own smoke alarms than non-smokers.
   True U False U
9. Some smoke alarms are 'toast-proof'. They recognise burning toast and don't go off when they 'smell' it burning.
   True U False U
10. Children often sleep more deeply than grown-ups and find it harder to wake up quickly if a smoke alarm goes off.
    True U False U

FIRE SAFETY QUIZ ANSWERS

1. **True.** Although deaths from house fires have fallen dramatically in recent years, largely thanks to the widespread ownership of smoke alarms, significant numbers of children (and adults) die in fires each year.
2. **False.** Most fires in which people die are at night when you become aware of the fire later because you are asleep.
3. **False**. If a fire is just smouldering, as it may be if a cigarette has fallen down the side of the sofa, it will make no noise. It may, however, be giving off poisonous smoke that will kill.
4. **False.** The battery needs to be checked every week, not every year. It's usually easy to test the battery – there will usually be a button on the alarm that you press and the alarm sounds. If it makes no noise, the battery should be replaced immediately.
5. **False.** It's the poisonous smoke that kills people in house fires, not the flames. A few deep breaths of smoke is enough to kill or incapacitate you.
6. **True.** The more alarms you have, the safer you'll be. As a minimum, you should have one on each floor. However, if you have only one alarm and two floors, put it somewhere you'll be able to hear it when you're asleep, such as on the landing outside the bedroom. If you have a TV or other large electrical appliance (such as a computer) in any of the bedrooms, you should fit a smoke alarm there too.
7. **True.** Make sure that cigarettes are completely extinguished before going to bed and that matches and lighters are stored so that children cannot get at them.
8. **False.** In fact, it's the other way round. The latest designs of smoke alarms are not activated by cigarette smoke.
9. **True.** Optical alarms are good at detecting slow burning fires, as opposed to those that produce a lot of flames, and are less likely to go off accidentally and so are best for ground-floor hallways and for homes on one level. (They don't actually "smell" the smoke!)
10. **True.** This reinforces the need for alarms to be close to bedrooms to improve the chances of their waking the children as well as the adults.

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INFORMATION SHEET – ALL ABOUT SMOKE ALARMS

- You are more likely to die in a fire at home if you haven't got a smoke alarm.
- A smoke alarm is the easiest way to alert you to the danger of fire, giving you precious time to escape.
- They are cheap, easy to get hold of and easy to fit.
- Look at the booklet *Fire safety in the home*, downloadable from https://www.gov.uk/government/publications/fire-safety-in-the-home for further information.

How many smoke alarms do you need?

The more alarms you have, the safer you'll be. At minimum you should have one on each floor. However, if you have only one alarm and two floors, put it somewhere you'll be able to hear it when you're asleep.

If you have a TV or other large electrical appliance (such as a computer) in any of the bedrooms, you should fit a smoke alarm there too.

Installing your smoke alarm

Many fire and rescue services in England offer free home fire safety checks. This involves firefighters visiting your home and offering fire safety advice for you and your household. They may be able to install your smoke alarm for free.

It usually takes a few minutes to install your smoke alarm yourself - just follow the manufacturer's instructions that come with it.

The best place for your smoke alarm is on the ceiling, near or at the middle of the room or hall. The alarm should be at least 30cm (one foot) away from a wall or light.

If it is difficult for you to fit your smoke alarm yourself, ask a family member or friend to help you, or contact your local fire service.

Choosing a smoke alarm

There are two types of smoke alarm:

Ionisation alarms

These are the cheapest and most readily available and are very sensitive to flaming fires (ones that burn fiercely such as chip-pan fires). Ionisation alarms will detect flaming fires before the smoke gets too thick.

Optical alarms

These are more expensive and more effective at detecting slow-burning fires (such as smouldering foam-filled furniture or overheated wiring). Optical alarms are less likely to go off accidentally and so are best for ground-floor hallways and for homes on one level.

For the best protection, you should install one of each. However, if you can't have both, it's still safer to have either one, rather than none at all.

Whichever model you choose, you should make sure that it meets the standard BS EN 14604:2005 and ideally also carries the British Standard Kitemark or the LPCB symbol. Your local Fire and Rescue Service will help you decide which is best for your circumstances if you would like some advice.

The different models available

A lot of people forget to check their smoke alarms, so the best choice of power supply is usually the one that lasts longest.

Standard-battery alarms

An 'ionisation battery alarm' is the cheapest and most basic smoke alarm available. An 'optical battery alarm' is a little more expensive. Both run off 9-volt batteries.

Battery alarms with an emergency light

These come fitted with an emergency light which comes on when the alarm is triggered. They are particularly suitable if someone in your house has hearing difficulties.

Alarms with 10-year batteries

These are slightly more expensive, but you save on the cost of replacing batteries. They are available as ionisation or optical alarms and are fitted with a long-life lithium battery or a sealed power pack that lasts for 10 years.

Models with a 'hush' or 'silence' button

Some models are available with a 'hush' button which will silence the alarm for a short time. This can be used when cooking, for example. If there is a real fire, giving off lots of smoke, the hush system is overridden and the alarm sounds. These models will continue to remind you they have been silenced by 'chirping' or by displaying a red light.

Mains-powered alarms

These are powered by your home's electricity supply and need to be installed by qualified electricians. There's no battery to check, although they are available with battery back-up in case of a power cut.

Interconnecting or linked alarms

Some alarms can be connected to each other so that when one senses smoke, all the alarms in the property sound. They are useful for people with hearing difficulties and also in larger homes.

Mains-powered alarm with strobe light and vibrating pad

These are designed for people who are deaf or have hearing difficulties. If there's a fire, the alarm alerts you with a flashing light and vibrating pad (which is placed beneath your pillow).

Mains-powered alarm which plugs into a light socket

This type of alarm uses a rechargeable battery that charges up when the light is switched on. It lasts for 10 years and can be silenced or tested by the light switch.

Maintaining your smoke alarm

To keep your smoke alarm in good working order, you should:

- test it once a week, by pressing the test button until the alarm sounds.
- if it has a battery, change the battery once a year (unless it's an alarm with a ten-year battery).
- replace the smoke alarm every ten years because the detector mechanism in the alarm becomes less effective over time.

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DOI: 10.3310/pgfar05140

PROGRAMME GRANTS FOR APPLIED RESEARCH 2017 VOL. 5 NO. 14

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Activity 11 – A family fire escape plan

KEY MESSAGES

General points

- Family fire escape plans should cover the following issues:
  - Know what the smoke alarm sounds like so it does not come as a complete surprise to them. They should know what sound it makes from testing it regularly.
  - Have a torch next to the bed.
  - Be aware that the children may be hiding in their bedroom because they are frightened. Don't assume that if you cannot see them they have already escaped. Be prepared to look under the bed, in the wardrobe and anywhere else they could hide.
  - Leave the front door key on a hook near the door, out of the reach of young children and not accessible to someone reaching through the letter box.
  - Make sure that the stairs and the hall are clear of clutter that could slow you down.
  - Think about a second escape route if the primary one – usually down the stairs and out of the front or back door – is not usable.
  - Make sure that the key for the window locks is accessible to you, probably on a hook near the window, but not accessible to the children.

Research findings

- A major review of the home safety literature tells us that education is **effective** in increasing the proportion of families with a fire escape plan.
- While **less than half** of families in our study had a family fire escape plan, most had discussed this with other adults in the house. However, most of those with a plan had not practised it and did not have a backup plan in case they were unable to use their first plan for some reason.

Relevant injuries

This activity is intended to reduce the likelihood of deaths and injuries from house fires.

Background

Families are invited to identify the issues they may have to address in developing their own fire escape plan and hence develop a plan that is relevant to their own home and family circumstances.

Having a fire escape plan may make a difference to the chances of being killed or injured when a house fire occurs, so this is a very important activity to run.

> *'I think they focused your thinking. For instance, the escape plans were on some of the sessions where we actually got people to stop and think, what would be the routes through your home. You would even write down thoughts that you would then take home and work out what actually is under the balcony, is it actually feasible to get to your front door from your bedroom if there is a fire in the kitchen so if there wouldn't be and actually almost feel like... we were almost like doing little drawings what if went this way, what if we went that way and I think that's actually just about getting you thinking. It's focusing your thinking rather than sitting having a chat'.*
>
> Comment from a children's centre worker on the first edition of the Injury Prevention Briefing

DOI: 10.3310/pgfar05140

Learning objective

To give families the ability to develop a fire escape plan for their own home so that they could cope if their smoke alarm went off in the middle of the night.

Equipment needed

There are different ways to run this activity. It can be run with a single group in which case all you will need is a flipchart and a marker pen for the facilitator.

Alternatively, you could split the group into small subgroups and ask them to think about what they would do if the smoke alarm sounded, then take a report back. In this situation, each subgroup needs some paper and a pen and the facilitator will need is a flipchart and a marker pen.

Method

Introduce the topic by explaining that house fires can cause death and serious injury to them and their families. If there has been an incident reported in the press recently, use this as an excuse for bringing up the subject. Remind them that even if no-one is injured, a fire can mean they have to move out of their home at least temporarily, with all the inconvenience this would mean. They may lose their possessions, especially treasured one such as the baby photos, their clothes, documents, etc.

Ask participants:

- how many have a smoke alarm?
- how many have one on each floor of their home?
- how many have checked it in the past seven days?

If anyone does not have a smoke alarm, does not have one on each floor of their home or does not know how to check their alarm(s), strongly recommend that they contact the local fire and rescue service (FRS) for advice. Provide participants with the information they need. (When you next meet the participants, ask them whether they have been in touch with the FRS.)

SCENARIO

At 12.30am, a neighbour, who was about to go to bed, spotted flames in a downstairs room in the house across the street. He called the fire service and fire fighters arrived about ten minutes later.

Although the fire crews were able to bring the blaze under control quickly, a mother and her two children, aged 18 months and 3 years, died, their deaths being attributed to inhaling toxic smoke. When fire fighters wearing breathing apparatus went upstairs, they found the mother on the bedroom floor and the children apparently asleep in their beds. Efforts to resuscitate the mother and one child were not successful and the second child died later in hospital.

In their report on the incident, the fire brigade noted that the house had no smoke alarm. The cause of the fire was never identified.

Present the group with the scenario above, just to bring home the reality of a house fire.

Ask the participants what they would do if the smoke alarm in their home sounded in the middle of the night.

If they do not have a fire escape plan, they are likely to say that they would grab the children, run out of the house and call 999 from a neighbour's house or on their mobile. This is not the wrong answer although they could be placing themselves even more deeply at risk if they did just this. This activity is intended to explore the reality more deeply.

The key message in a house fire is "Get out, stay out, call 999"

- Get everyone out of the house quickly. Don't try to pick up valuables or pets.
- Stay out – don't go back in until a fire officer tells you it is safe to do so.
- Call 999 – dial 999 and ask for the fire brigade. Know how to do this and what to expect when you are connected to an operator.

Ask them to describe potential problems that they could face that may stop them from escaping rapidly? Write on a flipchart the points that people mention.

They should mention at least the following:

- You would be fast asleep so completely disorientated and there is a piercing noise from the smoke alarm that is adding to the confusion.

- It's pitch dark.

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- The children may be screaming.
- The staircase may have a safety gate to prevent the 18 month old falling.
- The front door needs a key to open it but this is in your handbag in the kitchen.
- Your partner, who is away for the night, left his bike in the hall.
- The stairs have the children's shoes on the bottom step.
- The hall and stairs cannot be used because of the fire.
- The bedroom windows are locked to prevent burglars getting in, so you need a key to open them.

If not all of these situations are mentioned, prompt them with questions such as "Do you ever leave anything on the stairs when you go to bed?"

When participants run out of ideas, ask them to suggest what they could do to address each of the problems they have mentioned. These could include:

- Know what the smoke alarm sounds like so it does not come as a complete surprise to them. They should know what sound it makes from testing it regularly.
- Have a torch next to the bed.
- Realise that the children may be hiding in their bedroom because they are frightened. Don't assume that if you cannot see them they have already escaped. Be prepared to look under the bed, in the wardrobe and anywhere else they could hide.
- Leave the front door key on a hook near the door, out of the reach of young children and not accessible to someone reaching through the letter box.
- Make sure that the stairs and the hall are clear of clutter that could slow you down.
- Think about a second escape route if the primary one – usually down the stairs and out of the front or back door – is not usable.
- Make sure that the key for the window locks is accessible to you, probably on a hook near the window, but not accessible to the children.

A model family fire escape plan that can be printed and distributed is provided at the end of this activity.

Discussion points

Open the floor for discussion and questions. Remember that if you don't know the answer to a question, don't guess as this could lead to wrong advice. Make a note of the question and ask the specialists for their advice.

Ask participants whether there are any issues that they think would be difficult to address (e.g. landlord refuses to supply a spare front door key; nowhere else to store the bike other than in the hall) – other participants may have suggestions.

Variations and issues you can consider during discussion could include:

- You live in an apartment in a tower block.
- Your elderly mother is staying with you. She is not too stable on her legs when she first gets out of bed and is not familiar with your home.
- It's the middle of the evening and you are out. A 14 year old babysitter is looking after the children.
- What about common areas in blocks of flats? Do people leave rubbish or other flammable materials there? Who is responsible for ensuring that these spaces are clear? Could the rubbish left in these areas cause problems if you had to get out in a hurry?

Escaping from a high-rise building

Living above the first floor doesn't necessarily make you any more at risk from fire. High-rise flats are built to be fire-proof – walls, ceilings and doors will hold back flames and smoke.

If there's a fire elsewhere in the building, you are usually safest in your own flat, unless heat or smoke is affecting you. If you are affected, you should get out, stay out and call 999.

- As with all buildings, you should plan and practise an escape route.
- Avoid using lifts and balconies if there is a fire.
- It is easy to get confused in smoke, so count how many doors you need to go through to reach the stairs.
- Check there is nothing in the corridors or stairways that could catch fire – like boxes or rubbish.
- Make sure doors to stairways are not locked.
- Make sure everyone in the building knows where the fire alarms are.

- You should still get a smoke alarm for your own home, even if there is a warning system in the block.

Source: This advice is based on the booklet *Fire safety in the home*, available from https://www.gov.uk/government/publications/fire-safety-in-the-home

Follow up work

Ask participants to come to the next session and tell you about any of the issues they found in their own homes. If there are things they could not resolve, ask the FRS or help and advice.

Sources of information

An extensive series of fire safety booklets can be downloaded from https://www.gov.uk/government/collections/fire-safety-guidance

INFORMATION SHEET – MODEL FAMILY FIRE ESCAPE PLAN

When you make an escape plan, involve everyone who lives in your home, including children, older or disabled people and any lodgers.

Choosing an escape route

- The best escape route is the normal way in and out of your home.
- Keep all exits clear of obstructions, like bicycles.
- Think of a second escape route, in case the first one is blocked.
- Think of any difficulties you may have getting out, e.g. at night you may need to have a torch to light your way.
- If there are children, older or disabled people or pets, plan how you will get them out.
- Review your plan if the layout of your home changes.

Make sure everyone knows where door and window keys are kept

- Decide where the keys to doors and windows should be kept and always keep them there. Make sure that all the adults and older children in your household knows where they are.

What to do if there is a fire

- Keep calm and act quickly, get everyone out as soon as possible.
- Don't waste time investigating what's happened or rescuing valuables.
- If there's smoke, keep low where the air is clearer.
- Before you open a door check if it's warm. If it is, don't open it – fire is on the other side.
- Call 999 as soon as you're clear of the building. 999 calls are free.

Think about a safe place to go if you can't escape

- If you can't get out, get everyone into one room, ideally with a window and a phone.
- Put bedding around the bottom of the door to block out the smoke, then open the window and call "HELP FIRE".
- If you're on the ground or first floor, you may be able to escape through a window.
- Use bedding to cushion your fall and lower yourself down carefully. Don't jump.

Explain the plan

Once you have made your plan, go through it with all the adults and older children in the household.

You could also:

- put a reminder of what to do in a fire somewhere where it will be seen regularly, like on the fridge door.
- put your address by the phone so that children can read it out to the emergency services.

Practise the plan

Make sure you have 'walked through' the plan with all the adults and the older children in your household. Regularly remind everyone of what to do, and what not to do, in the event of a fire.

This plan is based on advice in the general fire safety booklet *Fire safety in the home*. The booklet can be downloaded from https://www.gov.uk/government/publications/fire-safety-in-the-home

An easy read version, *Fire: make your home safe (easy read)*, is available from https://www.gov.uk/government/publications/make-your-home-safe-from-fire

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DOI: 10.3310/pgfar05140

PROGRAMME GRANTS FOR APPLIED RESEARCH 2017 VOL. 5 NO. 14

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Section C:
BACKGROUND INFORMATION

POISONINGS

Why focus on poisoning?

Poisoning is the third most common cause of injury-related hospital admissions among the under 5s in England with about 4,000 admissions a year, 95 percent of them for less than 2 days. About 21,000 under 5s go to A&E annually as a result of poisoning incidents.

While deaths are very rare – just one or two a year nationally – poisonings can be very serious with about 100 children staying in hospital for more than 3 days each year.

It is a cause of harm that is preventable. The counter-measures need not be expensive to put in place and can be applied by virtually everyone.

Poisoning prevention can provide a good illustration of the need to be aware of the association between child development and accidents and can be an example that can be applied to other injury topics.

Throughout this IPB, we talk about preventing poisoning. It would be more accurate to refer to poisoning and suspected poisoning as many cases either involve a child swallowing a dose that may not cause harm or not actually swallowing anything at all but is suspected of having done so. As it's a matter of chance whether something has been swallowed and how much may have been taken, we have to try and avoid both these scenarios.

Small children are at higher risk of harm than adults because their small body size means that a similar dose of a harmful substance will have a proportionately greater adverse impact on a child.

Why are babies and young children at risk of poisonings?

As with most types of childhood accidents, they are strongly associated with child development:

- Babies and young children naturally explore by, among other things, putting objects in their mouths. They also drink anything they can lay their hands on, especially if they think it's a drink.
- As gross and fine motor skills develop, poisoning becomes more likely. The ability to climb (gross motor skill) and open cupboards, drawers, bottles and strip and blister packs (fine motor skills) are natural stages in children's development.
- Young children are attracted by bright colours, objects that resemble toys, etc. Some household chemicals and their containers are brightly coloured. While the containers may be child-resistant they may be attractive to young children. Even some liquid medicines specifically for children are attractively coloured.
- Also associated with exploratory behaviour is the tendency to copy adult behaviour so if they see an adult taking a medicine they may try to do the same.
- In some babies and young children the lack of taste discrimination means that tastes that might be very unpleasant for adults are not rejected by children.
- Their cognitive development is changing but babies and young children are unlikely to understand the consequences of their actions.

What poisons babies and young children?

The simple answer is almost anything that they can get their hands on that is not food.

There can be a number of consequences when they put something solid in their mouth:

- The object can enter their windpipe, in the worst case leading to suffocation. In less serious cases, the object will probably need to be removed in hospital.

- It can be swallowed. If the object is made of an inert substance, for example, a small coin or a plastic button, it will not usually cause any harm as it will pass through the body and emerge into their potty or the toilet.
- It can be swallowed and potentially cause serious harm. Some seemingly solid products such as very small batteries (called button or coin batteries) can dissolve in the gut resulting in very serious harm. Objects such as small magnets can become stuck in the gut, especially if more than one is swallowed, and cause serious internal damage that may need to be repaired surgically.
- It can be swallowed and dissolve the way that tablets are supposed to. If the dose is large enough they can cause serious harm and in very rare cases death.

Liquids also produce problems. Some, especially those that are strongly caustic or acidic, are so harmful that they can damage the oesophagus – the tube from the mouth to the stomach – requiring surgical repair.

Other liquids, including medicines and substances such as cleaning products and garden chemicals, can result in poisoning, in simple terms upsetting the way that the body works.

Other substances are also poisonous. One is carbon monoxide, produced when organic fuel (coal, coke, wood, petrol, oil, natural gas, LPG, etc) is burnt without sufficient oxygen. It kills a handful of people annually.

Parts of some garden and indoor plants are also poisonous. It may be the berries, leaves or other parts. Some mushrooms and toadstools can also be harmful.

Some products that are poisonous can also cause harm in other ways. For example, the liquid in some laundry and dishwasher capsules (sometimes called liquitabs) can cause eye damage; this can occur if a child bites these soft capsules, bursting it so that the contents squirt into the face. Some products and plants are skin irritants.

Nicotine products – electronic cigarettes, sublingual tablets, gum, patches, inhalator cartridges, lozenges and nasal sprays – may contain doses that could have very serious consequences for children. Nicotine can be highly toxic, particularly in children or infants. It is highly toxic by ingestion, inhalation and skin contact. Not all e-cigarettes are the same. Different brands and products have varying amounts of nicotine content. Some e-cigarette refills are formulated with sweet smelling chemicals and packaged in brightly coloured tubes that could appear attractive to babies or young children.

What research tells us about poisonings and their prevention

As part of the *Keeping Children Safe at Home* programme, a number of different studies were carried out to inform our knowledge of what works and, equally importantly, doesn't work. Existing literature was reviewed, children's centre staff were interviewed about their safety promotion opportunities, and parents were interviewed about their safety practices and the barriers to keeping their children safe. In addition, data was collected at several hospitals and through interviews with parents whose children had been poisoned. This data was compared with information from parents whose children of similar ages and who lived nearby but had not had accidents. The various studies revealed the findings presented in the box that is part of Activity 4.

Other research has shown that there is a greater risk of poisoning in specific situations when there is maternal depression or disruption from normal routines, such as when visiting or being visited by grandparents who may leave their medicines accessible, or when there are celebrations in progress that may reduce supervision.

Local data on poisonings

Local data on poisonings may be available from the sources outlined in Section A.

The only relevant additional sources of epidemiological data are the national poisons information service (NPIS). Access to advice from these centres is only available to frontline NHS staff. When a child is taken to hospital having been poisoned, it is possible that A&E department staff may contact NPIS to find out about appropriate treatment. Calls are logged and national statistics are produced. The service's annual report is publicly available.

Emergency action

In an emergency, call 999 (or 112).

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DOI: 10.3310/pgfar05140

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Knowing what to do in an emergency is important. Having knowledge of first aid related to the needs of young children can be very helpful.

Typical accident scenarios

The actions or inactions by adults, in combination with the developmental characteristics of babies and young children, can lead to actual or suspected poisonings. For example:

- Products may be stored where they are easily accessible – drawers and cupboards that are not locked and/or not well out of reach.

  "At the moment we have all got colds and coughs. Again they are on top of the kitchen bench pushed to the back but again they all have the child locks on. They are not in a cupboard because we are actually using them regularly but normally all the medicines are at a height that even I have trouble to reach so they wouldn't be able to reach those at all."

  Comment from parent of a four year old

- Tablets are often carried in a handbag or whatever is used for odds and ends when out and about. On returning home, the bag is left lying around.
- While parents may take all the appropriate steps to reduce the risk of accidental poisoning, this may not be the case at the grandparents who may leave their tablets on the bedside table for convenience.
- Liquid medicines often carry the instruction to store them in a cool place. This can be incorrectly interpreted as being in the fridge, which is very accessible to children and that naturally contains things that are eaten or drunk.
- We sometimes think that child-resistant containers (CRCs – bottles that are reclosable – and strip and blister packs where you pop tablets out by pressing them) are childproof. This is definitely not the case – they are only a contributor to reducing the risk of poisoning.
- Medicines may not be put away after they have been used, perhaps because of tiredness or for convenience if they are going to be given to sick child during the night.

Child-resistant packaging

Such packaging is tested with a large panel of children aged between 42 and 51 months. If less than 85 percent of the panel cannot open the packaging or release more than eight tablets in a strip or blister pack, it is regarded as child-resistant.

The reverse of this is that up to 15 percent of children in this age range may be able access the harmful product. Because of the age composition of the panel, this percentage may be greater for children at the top end of the panel's age range.

Research shows that child-resistant packing greatly reduces children's ability to reach the product but it does not prevent it in 100 percent of cases. It is not childproof.

- It takes little time for a young child to gain access to a hazardous substance, even when it is in child-resistant packaging. A brief distraction such as answering the door or the phone can be long enough for tablets to be released from their packaging and swallowed.
- Child-resistant bottles have to be closed after use; otherwise they are useless from the child safety viewpoint.
- If you show adults a display of tablets and a similar display of sweets, it is difficult to tell which is which. For young children, it would be impossible so it should be no surprise that they may think that they are putting sweets in their mouth.
- When trying to persuade children to take tablets or other medicine, parents occasionally tell children that what they being given are sweets. It should be no surprise that children will be confused.
- For convenience, adults may decant a small quantity of a liquid from its large (safe) container into a cup or another, for example soft drink, bottle. Children are used to drinking from cups and soft drink bottles so it is natural for them to drink the fluid.
- The lack of taste discrimination can result in a child swallowing substances that adults may think of as having an unpleasant taste. Many household chemicals, for example, kitchen and bathroom cleaners, may contain a bittering agent, such as Bitrex. Adults and most children find this a truly foul tasting substance that usually results in the fluid

being spat out so a toxic quantity is not swallowed. However, there is research evidence that a small proportion of children do not react in this way and still swallow the fluid. The lesson is that bittering agents are a help but are not a complete deterrent, just as CRCs are not the complete solution. (See above for remarks about CRCs).

- Some laundry and dishwasher detergents are supplied in transparent, brightly coloured, flexible single dose packages (liquitabs). Some resemble sweets. Major manufacturers have adopted a code of practice to reduce poisoning from these products by making the packaging opaque and the boxes less easy for a young child to access.
- The lack of maintenance of heating systems, including the need to sweep the chimney, can lead to a build-up of carbon monoxide (CO). Further, using products in the wrong environments, such as using the barbecue in the garage or even putting it in there to allow it to cool, or running a petrol-driven generator indoors with inadequate ventilation, can result in harmful CO concentrations.
- Not having a working CO alarm in situations where CO could be present is a dangerous practice for adults and children.
- Very occasionally, left-over drinks, sometimes brightly coloured and sweet, and hence child-appealing, and cigarette ends left around after a party may be drunk or eaten when the toddler is the first person up in the morning.

The consequences of poisoning

In the great majority of cases, there are no long-term health effects of a poisoning incident. In fact, many incidents are not actual poisonings but are suspected events – but we cannot take the chance that a child will not be harmed.

However, even a suspected incident is distressing for the family and the child, causes disruption to normal routines, may need care to be found for siblings while the affected child is taken to and is in hospital, can require time off work with financial consequences, etc.

General prevention methods

The general methods of preventing poisoning include:

- Supervising children when products are being used and not being distracted, even for a moment.
- Storing potentially harmful products safely. ("Products" means anything that can cause harm – solid and liquid medicines, household cleaning products, chemicals such as white spirit and bleach, garden and garage chemicals, etc). Ideally, this means in a locked cupboard or drawer, but if this is not possible then well out of children's reach and out of sight. Child-resistant cupboard and drawer locks are available in DIY stores and nursery goods shops.
- Ensure that products that are provided in child-resistant containers have their tops replaced securely after every use.
- Referring families to local schemes that provide and fit safety equipment – in this context, cupboard and drawer locks, and CO alarms.
- Not having indoor plants that may be harmful and, if possible, clearing poisonous garden plants and fungi.

Out of sight and out of reach

We often say that harmful substances and objects should be kept out of sight and out of reach – but what does this really mean?

In the *Keeping Children Safe at Home* programme, we used the definition of out of reach as being at or above adult eye height.

Just remember that young children are very creative and may be able to move chairs around to climb on worktops. A locked cupboard or drawer is a safer solution.

Prevention activities

Some general prevention principles and advice are set out in Sections A and C.

The activities in Section B that are relevant to preventing accidents in general, including poisoning, include:

- Exploring child development (Activity 1).
- What is appealing to children but may harm them? (Activity 2).

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DOI: 10.3310/pgfar05140

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- Checking home safety (Activity 3).
- Where are your harmful products? (Activity 4).
- Designing an unsafe kitchen (Activity 5).
- Home safety equipment – what do families need? (Activity 6).

These activities can be supported by providing awareness-raising resources. These may have limited value in isolation but can provide valuable reminders of the safety messages.

Possible outcome measures

Using A&E attendances or hospital admissions to measure the impact of a local prevention programme, for example centred on a small geographical area such as a housing estate or the families using a local facility such as a children's centre, is unlikely to produce meaningful results. Alternative outcome measures relating to poisoning prevention programmes could include using information on how many families have drawer and cupboard locks, owning (and using) a lockable medicine cupboard or changes in knowledge of and practices regarding the safe storage of medicines and household products.

FALLS

Why focus on falls?

Fall injuries are the most common cause of injury-related hospital admissions among the under 5s in England with almost 20,000 admissions a year, 90 percent of them for less than 2 days. An estimated 230,000 under 5s go to A&E annually in the UK after falls in the home and garden and a further 75,000 following falls elsewhere.

Deaths are rare – about 5 a year nationally – but fall injuries can be very serious with about 700 children staying in hospital for more than 3 days each year.

While it is difficult to prevent all falls without severely restricting children's activities, there are ways of preventing many of the most serious falls. The counter-measures need not be expensive to put in place and can be applied by virtually everyone.

Why do babies and young children fall?

The baby and toddler period is a time of rapid changes that can lead to falls:

- physically – they grow and their body proportions change: their heads start as a large proportion of the body mass but this reduces as they grow, changing their centre of gravity. They also become stronger so may, for example, move objects such as chairs that they may climb on (and fall off).
- gross motor skills – they learn to roll, wriggle, crawl, walk, run and climb.
- exploratory behaviour – they like to investigate everything around them.
- cognitive behaviour – although they are learning, they have little understanding of the consequences of their actions so they may get themselves into situations from which they cannot safely escape. It is also a time when they copy the behaviour of adults and older siblings.

What research tells us about falls and their prevention

As part of the *Keeping Children Safe at Home* programme, a number of different studies were carried out to inform our knowledge of what works and, equally importantly, doesn't work. Existing literature was reviewed, children's centre staff were interviewed about their safety promotion opportunities, and parents were interviewed about their safety practices and the barriers to keeping their children safe. In addition, data was collected at several hospitals and through interviews with parents whose children had had a fall. This data was compared with information from parents whose children of similar ages and who lived nearby but had not had accidents. The various studies revealed the findings presented in the box at the beginning of Activity 7.

Local data on falls

Local data on falls may be available from the sources outlined in Section A.

DOI: 10.3310/pgfar05140

Typical accident scenarios

Many characteristics relating to child behaviour and comprehension can lead to falls:

- Babies are placed on beds, changing tables and other raised surfaces for nappy changing. If they can wriggle or roll, they may fall off when left unattended. Even a fall from a relatively low height can lead to an injury requiring admission to hospital.
- Babies in cots may pull themselves to standing, climb on a large toy or cot bumper and, if the cot side is not at the correct height, fall out. This scenario is exacerbated by their high centre of gravity.
- Babies in bouncing cradles or car seats are placed on worktops or tables. Their fidgeting results in the seat moving and falling to the floor.
- Young children are inevitably unsteady on their feet when learning to walk. Injuries are not just as a result of hitting the ground; they may fall on to sharp corners, etc.
- Falls from highchairs are common. Unless a child is properly strapped in, they may pull themselves to standing and fall. Landing on a tiled kitchen floor can lead to serious injury.
- Crawlers and walkers are at great risk of stair falls. While we always think of children falling from the top of a flight, they can also fall when they try and climb the first few steps. Safety gates correctly fitted to prevent access to the top and bottom of the stairs can make a big difference.

The use, positioning and fitting of safety gates

Safety gates are not recommended for children over the age of 24 months, as tests in the standard (BS EN 1930) reflect the size and some of the abilities and behaviours of children under 2 years.

However, this does not mean that all children over this age will be able to manage stairs safely. If parents choose to remove the safety gate before their child can reliably cope with the stairs, there can be a risk of a serious fall.

The position of a safety gate to prevent falls down stairs is important. The main function of the gate is to prevent a young child accessing the stairs. This does not require the gate to be directly across the top of the flight. By placing the gate in this location, there can be a risk of an adult, older child or even an adventurous toddler climbing over the gate without opening it and falling down the stairs. By placing the gate across the landing or the toddler's bedroom door, this risk is minimised while access to the stairs is also prevented.

Some gates have a rectangular bar at floor level. This can present a tripping hazard so a gate close to the stairs, even when it is used correctly by an adult or older child, can lead to a stair fall.

Some landlords may not allow tenants to fit safety gates, claiming that they will damage the walls and staircase. Gates are available that rely solely on pressure mounts so that there is no need to screw mountings to the wall. It is essential that for any gate it is fitted exactly in accordance with the manufacturer's instructions to ensure that it works properly.

(Gates are also needed at the bottom of the stairs to stop babies and young children climbing. Follow the manufacturers' instructions on where to place them. The scenario described above is not a problem when the gate is at the foot of the stairs.)

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- The wish to explore and reach objects can result in young children moving chairs, etc and climbing on them. A serious example of this is when a toddler wants to look out of their bedroom window, perhaps to wave to someone or just to see what's going on. If the window is not securely latched, the fall can be extremely serious. Even a fall from a ground floor window – perhaps a metre or so – on to concrete can cause serious injury.
- Bunk beds are great space savers but are also associated with falls. They make exciting climbing frames for young children. The rule is that the top bunk is not suitable for children under 6 years and is not somewhere where children should play.
- Another consequence of a fall in a bedroom can be strangulation. A fall can result in the child becoming entangled in the window blind cord. Sadly, there have been over 25 such deaths in recent years.
- Babies using old baby walkers – those that do not comply with the current standard BS EN 1273:2005 – may topple over if one wheel goes over a step.

The consequences of falls

In the great majority of cases, there are no long-term health effects of a fall. However, there are a handful of deaths annually and many serious injuries. The most serious injuries are those involving the head and brain as these can have long-term consequences.

Fractured limbs are also common serious injuries possibly requiring a stay in hospital although most will repair without long-term consequences.

Even a relatively minor incident – one that does not present a threat to life – is distressing for the family and the child, causes disruption to normal routines, may need care to be found for siblings while the affected child is taken to and is in hospital, can require time off work with financial consequences, etc.

General prevention methods

The general methods of preventing falls include:

- Constantly supervising babies and children when they have been placed on a raised surface, for example to change a nappy or feed them.
- If the child is in a highchair, securing the child using the seat's harness.
- Using safety gates to prevent babies from when they start crawling, and hence climbing, from accessing the top and bottom of the stairs and making sure gates are not left open. Gates can also prevent access to furniture that they can climb on and then fall from.
- Teaching children safety "rules" for example teaching young children not to climb on objects from which they could fall.
- Supervising children when they may be in hazardous situations, such as climbing or playing on furniture.
- Not placing baby seats – bouncing cradles, child car seats, etc – on kitchen worktops and tables.
- Fitting child-resistant catches to windows, especially but not only those above the ground floor.
- Not using baby-walkers that were made before 2005. Later baby-walkers comply with a different standard that is aimed at reducing the risk of falls. If families use baby-walkers, look for those complying with BS EN 1273:2005.

Prevention activities

Some general prevention principles and advice are set out in Sections A and C.

Activity 7 - Preventing falls – more than just using safety gates! considers safety practices and rules linked with falls prevention.

Other, more general activities in Section B that are relevant to many types of accidents, including falls prevention, include:

- Exploring child development (Activity 1).
- Checking home safety (Activity 3).
- Where are your harmful products? (Activity 4).
- Designing an unsafe kitchen (Activity 5).
- Home safety equipment – what do families need? (Activity 6).

These activities can be supported by providing awareness-raising resources. These may have limited value in isolation but can provide valuable reminders of the safety messages.

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DOI: 10.3310/pgfar05140

Possible outcome measures

Using A&E attendances or hospital admissions to measure the impact of a local prevention programme, for example centred on a small geographical area such as a housing estate or the families using a local facility such as a children's centre, is unlikely to produce meaningful results. Alternative outcome measures relating to falls prevention programmes could include ownership and fitment of safety gates on stairs or use of window locks or changes in knowledge of and practices regarding falls prevention.

SCALDS

Why focus on scalds?

Scalds are simply burns caused by a hot liquid or steam.

Scalds are a relatively common injury among babies and young children. They result in over 7,000 hospital admissions among the under 5s in England annually and have some of the longest periods of admission of any injury.

Deaths are rare – less than one a year.

The peak age for admissions to hospital as a result of scalds from drinks, tap water and pots and pans is one year. For every tap water scald admission, there are two scalds due to pots and pans and four due to hot drinks.

While tap water scalds can be prevented using engineering measures (thermostatic mixing valves – see below for further information), hot drink and cooking-related scalds need adults to change their behaviour or restrict where children go when the dangers are present.

Why do babies and young children get scalded?

Just as with other types of accidents, scalds are related to the exploratory behaviour and increasing mobility of babies and young children, in particular:

- gross motor skills – they crawl, walk, run and climb and can therefore move towards dangerous items.
- fine motor skills – these are developing but may be imprecise so if they grab at something they may not grasp it properly.
- exploratory behaviour – they like to investigate everything around them, especially if the item is appealing to children, for example is brightly coloured, has a design such as a cartoon character, resembles a toy, etc.
- cognitive behaviour – although they are learning, they have little understanding of the consequences of their actions. It is also a time when they copy adult behaviour and that of older siblings. Also, they may be able to say "hot" after you teach them but this does not mean that they understand what it means or act reliably by not touching hot objects.
- physiological characteristics – babies are at high risk of serious injury from hot liquids because their skin is very thin, just one fifteenth the thickness of an adult's.

What research tells us about scalds and their prevention

As part of the *Keeping Children Safe at Home* programme, a number of different studies were carried out to inform our knowledge of what works and, equally importantly, doesn't work. Existing literature was reviewed, children's centre staff were interviewed about their safety promotion opportunities, and parents were interviewed about their safety practices and the barriers to keeping their children safe.

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In addition, data was collected at several hospitals and through interviews with parents whose children had been scalded. This data was compared with information from parents whose children of similar ages and who lived nearby but had not had accidents. The research findings are presented in the boxes at the beginning of Activities 8 and 9.

The research also showed that fitting a TMV and providing education is more effective in reducing bath water temperature to a safe level (one that will not cause serious and rapid injury, usually about 46°C) than education alone or than giving parents thermometers to test their water temperature and lower it if it is too high.

Just as with most children's accidents, by comparing children who did or did not suffer scalds, the KCS research confirmed that the children who were injured were more likely to come from more disadvantaged families.

Local data on scalds

Local data on scalds may be available from the sources outlined in Section A.

Typical accident scenarios

Many characteristics relating to child behaviour and comprehension can lead to scalds:

- Babies on a lap may wave their arms around and knock a mug of hot liquid that is being held. Spilling a mug of liquid over a baby is equivalent to pouring a bucket of liquid over an adult.
- A drink is placed on a low coffee table and is grabbed by a crawling baby or a toddler.
- A toddler in the kitchen reaches up to grab the handle of a saucepan that is hanging over the edge. The volume of very hot water can have a devastating effect.
- In the past, the leads of electric kettles used to create problems if they hung over the edge of the worktop and were pulled by a child. This is now less of a problem since the introduction of curled or short kettle flexes and cordless kettles although these do, of course, have cords attached to the base unit. Cordless kettles introduce their own hazards as it is now easier to carry a full kettle of boiling water around the kitchen.
- The most severe scalds are from bath water because a child can be almost completely immersed in the water. A toddler left unattended in the bathroom while the bath is filling, often just from the hot tap, may drop a toy into the bath and reach in to try and retrieve it, falling in because of their high centre of gravity.
- A variation on this bath scald occurs when a toddler and baby are left alone in the bath and the toddler plays with the hot tap. While the toddler may be able to escape, the baby would not be able to do so.

The consequences of scalds

Even relatively minor burns can have long-term effects as they can result in scarring. They can also be distressing for the family and the child, causes disruption to normal routines, may need care to be found for siblings while the affected child is taken to and is in hospital, can require time off work with financial consequences, etc.

Extensive and/or deep burns can require long-term and repeated treatment and lead to extensive scarring. This can have psychological effects in adulthood and may impact on life chances.

General prevention methods

The general methods of preventing scalds include:

- Changing adult behaviour so, for example, - they

  do not hold a baby while holding a hot drink.

  - hot drinks are placed where babies and young children cannot reach them.

  - pans are placed on the back burners or hobs of the cooker. If the front burners or hobs have to be used, the handles are turned away from the edge.
- Keeping babies and young children out of the kitchen when you are cooking by placing a safety gate across the kitchen door. If the kitchen is large enough or the area is open plan so there is no door, a child can be placed in a playpen to keep them away from hot liquids.
- Plumbing a thermostatic mixing valve (TMV) into the bath hot water system to prevent bath water scalds.

What is a thermostatic mixing valve (TMV)?

A TMV is a device that mixes hot and cold water before it emerges from the bath hot tap so that it is not at a scalding hot temperature. It is not the same as a simple mixer tap.

A TMV is plumbed into the system and set so that the water emerges from the hot tap at about 47°C, plenty hot enough for a bath but not so hot that it will cause immediate and severe burns. (We normally bath at about 38°C. Water at 47°C will feel uncomfortably hot but will not cause injury.)

TMVs are now required under Building Regulations in new homes and when a major refurbishment of the bathroom is carried out.

Why is tap water so hot? Most domestic water heating systems produce water above 60°C to minimise the risk of legionella bacteria developing in the system.

TMVs are not required on all hot taps in a house for two reasons: the greatest risk of a scald is in the bath, and water above bathing temperature may be needed for washing dishes in the kitchen.

Research has shown that TMVs work as designed and are acceptable to families, although there is a short learning process to get the bath temperature correct, simply because you don't have to run as much cold water into the bath as you normally would.

Prevention activities

Some general prevention principles and advice are set out in Sections A and C.

In Section B, there are two activities that are specifically related to preventing scalds:

- How far does a hot drink spread? (Activity 8).
- How long does a hot drink stay hot? (Activity 9).

In addition, other, more general activities in Section B are relevant to many types of accidents, including preventing scalds:

- Exploring child development (Activity 1).
- Checking home safety (Activity 3).
- Designing an unsafe kitchen (Activity 5).
- Home safety equipment – what do families need? (Activity 6).

Possible outcome measures

Using A&E attendances or hospital admissions to measure the impact of a local prevention programme, for example centred on a small geographical area such as a housing estate or the families using a local facility such as a children's centre, is unlikely to produce meaningful results. Alternative outcome measures relating to scalds prevention programmes could include changes in knowledge of and practices, such as not carrying a hot drink and the baby at the same time, using the rear hobs on the cooker or moving the kettle to the back of the worktop.

Products that change colour when hot

Mugs, bath plugs and bath thermometers that change colour when hot are available. These are thermochromic products. However, you need to consider whether these promote safety or could cause injuries.

When hot, a pattern or words, such as "danger – hot" may appear on the outside of the mug, or the mug may change from one colour to another.

The problem is that children may be attracted by such changes and want to play with the product, putting themselves at risk.

While a baby or toddler may not be capable of filling such a mug with a hot liquid, an older child may do so. If a younger sibling is around, they could be injured.

Similarly, bath plugs that change colour when the water is too hot may fascinate young children. They may try to run hot water into the bath to make the plug change colour with potentially serious consequences.

Colour-changing bath thermometers, perhaps in the shape of a fish, may look to a child like a toy. Changing colour might make them attractive to children. Why such a tool looks like a toy is a mystery. All that is needed to check bath water temperature is the inside of an adult's wrist, knowing that the water should feel neither cool nor hot.

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DOI: 10.3310/pgfar05140

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FIRE-RELATED INJURIES

Why focus on fire-related injuries?

House fires kill and seriously injure children and adults. While it is often the smoke that kills people, burns are very serious injuries, often requiring prolonged treatment while the child continues to grow.

House fires cause massive disruption to the family. The house is likely to become uninhabitable for a long time. It will require redecoration, furniture will need replacement and rooms such as the kitchen may need to be re-equipped. If the family home is not insured, the costs can be prohibitive.

Even though statistics may say that fire deaths in your area are very low, the next major fire may happen in your town.

While ownership of a working smoke alarm is high in families of pre-school children living in disadvantaged areas, many families lack fire prevention bedtime routines and fire escape plans.

Why are babies and young children at particular risk?

Just as with other types of accidents, fire-related injuries are related to the exploratory behaviour and increasing mobility of babies and young children.

The developmental aspects that relate to these accidents include:

- gross motor skills – while they may be able to crawl, walk, run and climb, they may not be able to escape if there is a fire.
- fine motor skills – these are developing but may be imprecise so if they have the opportunity to play with matches and lighters they may inadvertently set fire to their surroundings.
- exploratory behaviour – they like to investigate everything around them. Flames from matches and lighters may be appealing to children.
- cognitive behaviour – although they are learning, they have little understanding of the consequences of their actions. It is also a time when they copy adult behaviour and that of older siblings. They may also hide from danger rather than attempt to escape.

What research tells us about fire-related injuries and their prevention

As part of the *Keeping Children Safe at Home* programme, data was collected on smoke alarm ownership and whether or not families had escape plans, the scientific literature was reviewed to examine how best and most cost-effectively to increase smoke alarm ownership and to increase the proportion of families with fire escape plans. The research findings are presented in the boxes at the beginning of Activities 10 and 11.

Research that was not part of the *Keeping Children Safe at Home* programme shows that children in the most disadvantaged families are over 37 times more likely to die in a house fire than the most affluent. Why? There are many reasons; for example:

- They may live in older houses.
- They may live in overcrowded conditions.
- They may have old furniture that does not meet current flammability requirements and that may give off very toxic smoke when it burns.
- They may have older electrical appliances that may be more likely to be faulty
- Smoking is more common in disadvantaged families

Young children are particularly high risk because:

- They tend to hide from danger, rather than try and escape.
- Even if they are old enough to help themselves, they may not know what to do when the smoke alarm goes off.
- If they are babies, they are completely dependent on adults for help.
- They do not always wake when the alarm sounds.

However, although there some very high risk groups, fire safety is important for everyone.

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DOI: 10.3310/pgfar05140

Local data on fire-related injuries

Data on fire-related injuries may be available from local fire and rescue services and the sources outlined in Section A.

Typical accident scenarios

Many characteristics relating to child behaviour and comprehension and parental actions and inactions can lead to fire-related injuries:

- Cigarettes that have not been extinguished properly.
- Chip pans that have been left unsupervised and/or are too full.
- Faulty electrical wiring.
- Children playing with matches and lighters. The combination of the fact that children are attracted by flames and that they try and copy adult behaviour can be fatal.
- Candles and tea lights.
- Clothes and furnishings that are too close to fires and heaters.

Some of these causes can be exacerbated by the consumption of excess alcohol. A classic scenario is for an adult to return home from the pub, perhaps drunk and tired, light a cigarette and fall asleep in a chair. The cigarette falls and sets light to the chair. Instead of lighting a cigarette, the adult may put on the chip pan to make a snack but then fall asleep. The chip pan catches light causing a house fire.

Are cigarette lighters child-resistant?

It is a requirement that most lighters on the market are resistant to operation by young children.

The tests used to examine the safety performance of these lighters is very similar to those used for child-resistant closures for medicines and some household chemicals. A large panel of children aged between 42 and 51 months are asked to operate the lighter without and then following instruction. If more than 85 percent of the children cannot operate the lighter it is deemed to be child-resistant.

However, this means that up to 15 percent in this age range may be able to operate them. Older children may have an even higher success rate.

The consequences of fire-related injuries

Even relatively minor burns can have long-term effects as they can result in scarring. They can be distressing for the family and the child, causes disruption to normal routines, may need care to be found for siblings while the affected child is taken to and is in hospital, can require time off work with financial consequences, etc.

Extensive and/or deep burns can require long-term and repeated treatment and lead to extensive scarring. This can have psychological effects in adulthood and may impact on life chances.

Injuries are only part of the story. A fire can mean that the family may have to move out of their home, at least temporarily, with all the inconvenience this means. They may lose their possessions, especially treasured one such as the baby photos, their clothes, documents, etc. The house may well need redecoration but there can still be a smell of burning that pervades everything in the home.

General prevention methods

The general methods of injuries from preventing house fires include:

- Prevent the fire from happening in the first place.
- Make sure that if the fire does occur the family can escape – this can reduce the risk of injury or ensure that their severity is minimised.

There is good evidence that certain prevention programmes can make a real difference. Using these programmes means that you are working as effectively as possible. The programmes that are known to work include:

- The correct fitting and maintenance of smoke alarms.
- The development and practising by families of fire escape plans.

Other activities are equally important but have not been fully evaluated.

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Prevention activities

Some general prevention principles and advice are set out in Sections A and C.

In Section B, two activities relate specifically to preventing fire-related injuries:

- The importance of smoke alarms (Activity 10).
- A family fire escape plan (Activity 11).

In addition, other, more general activities in this section are relevant to preventing accidents in general, including injuries from house fires:

- Exploring child development (Activity 1).
- What is appealing to children but may harm them? (Activity 2).
- Checking home safety (Activity 3).
- Where are your harmful products? (Activity 4).
- Designing an unsafe kitchen (Activity 5).
- Home safety equipment – what do families need? (Activity 6).

These activities can be supported by providing awareness-raising resources. These may have limited value in isolation but can provide valuable reminders of the safety messages.

Possible outcome measures

Using A&E attendances or hospital admissions to measure the impact of a local prevention programme, for example centred on a small geographical area such as a housing estate or the families using a local facility such as a children's centre, is unlikely to produce meaningful results. Alternative outcome measures relating to fire safety practices could include having working smoke alarms on each floor, having a family escape plan, or storing matches and lighters safely.

Where to get specialist advice and help

Many fire and rescue services (FRS) have staff whose role is to promote fire prevention. You should find out what your local FRS will do for you, but it probably includes all or most of the following:

- Fitting free smoke alarms in homes, especially those with vulnerable families (children and older people, people with disabilities including hearing and sight problems).
- Giving advice to families whose smoke alarms keep going off inadvertently.
- Testing and, if necessary, replacing smoke alarms that are reaching the end of their normal life.
- Undertaking fire safety check in family homes. Linked with this, they will give advice to families.
- Speaking to groups of children and/or parents on fire safety in whatever settings are available, including children's centres.
- Training others who have the opportunity to pass on fire safety messages.
- Providing leaflets and other resources for families.

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DOI: 10.3310/pgfar05140

PLANNING, IMPLEMENTING AND EVALUATING ACTIVITIES

This section covers the issues that you need to consider when identifying the needs for appropriate projects, deciding what to do, how to do it, and how to measure the impact of your work.

Decide what injury topic(s) you are going to cover.

What are the key injury issues? Find local injury data if possible. National injury data will also provide helpful guidance.

What are the concerns of parents? Even this can be regarded as a useful prevention activity as it reveals their fears, shares prevention experiences and allows any myths to be addressed. Could be a discussion, simple questionnaire or just ticking a list on a notice board.

Look for alternative measures, such as injuries associated with deprivation, ownership of safety equipment, attitudes towards and knowledge of safety issues, etc.

Identify evidence-based activities that can address the topics.

Use this Injury Prevention Briefing for evidence. Seek expert advice if necessary. If your area has an injury prevention coordinator, this is the best starting point. In the absence of a coordinator, fire prevention personnel at the local fire and rescue service (FRS), and the local authority public health and/or road safety departments may be able to help, depending on what programme you have in mind.

Decide whether it is practical to run such activities.

Think about local policies and priorities, cost, resources (leaflets, handouts, posters, videos, safety equipment, etc), time, staffing issues, potential partners and their programmes, how the activities can be integrated into other programmes (e.g. scald prevention during a cooking class, fire safety during smoking cessation sessions), etc.

If practical, work with parents and other agencies to develop the programme in detail.

Work up a detailed plan – what you and others are going to do at each stage.

Remember that you may need to adapt it as it progresses as parents and others raise queries or suggestions.

Decide how you are going to evaluate the activity before you start it.

If you can arrange and afford it, ask an external agency to undertake the evaluation. Students undertaking courses at a local college may be looking for projects and may be able to undertake the evaluation without costs. Your local public health department is likely to be a good source of guidance.

Pilot the activity.

If necessary, amend the activity in the light of your pilot.

Carry out the "before" part of the evaluation

Collect baseline data, such as injuries, ownership of safety equipment, attitudes towards and knowledge of safety issues, etc.

Roll out the activity.

Monitor the activity as it progresses.

Note what you actually did and spent, and the timeline for the work. This may differ from what you planned to do, spend, etc.

Undertake any "after" evaluation elements if appropriate.

Collect the same measures as in the "before" part of the evaluation.

Draft a short report

Disseminate this to interested parties so that others can learn from your experience and use it when reporting to Ofsted, your funders, etc. Your families may like to see at least a summary of your report.

Celebrate your successes!

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THE PRINCIPLES OF AND APPROACHES TO PREVENTION

Primary, secondary and tertiary prevention

When we think about preventing unintentional injuries it is important to remember that "accidents", or potential injury-causing events, may or may not result in an injury. A child may fall down stairs but escape without suffering an injury. An event has happened, but no injury has resulted.

Equally there may be more effective ways of preventing an injury from occurring than by preventing the event itself. For example, a child car seat will not stop a crash from happening but will reduce the potential for severe injury.

In terms of prevention we can prevent injuries by preventing the event from which the injury results or by reducing the chance of an injury occurring as a result of such an event. It is helpful to think about trying to prevent the event and the injury separately. The types of preventive activity we can undertake can be grouped into three different levels:

Primary prevention

Primary prevention is aimed at trying to prevent the occurrence of the accident from which an injury can result. It includes activities such as using a stair gate to prevent a child falling down stairs; drink driving legislation to reduce the risk of road traffic injury or fitness training to reduce the risk of sport injury.

Secondary prevention

Secondary prevention aims not at preventing the event that may cause injury, but at reducing the risk of injury once the event has occurred. A smoke alarm will not prevent a house fire from occurring, but will give the occupants more time to escape from the house, so reducing their chance of being injured. Cycle helmets work not by preventing the fall from the cycle, but once the fall has occurred the helmet reduces the risk of head and brain injury.

Tertiary prevention

Tertiary prevention comes into play once the event has occurred and an injury has resulted. It is aimed at minimising the consequences of an injury. Providing appropriate treatment following an injury may reduce the adverse effects and long-term consequences of that injury. For example, if as a child has suffered a burn, this injury could be exacerbated by incorrect treatment and conversely the long-term outcome can be improved by appropriate, immediate first aid.

Rehabilitation is also part of tertiary prevention. This aims to maximise physical, psychological and occupational function and quality of life following an injury.

Opportunities for prevention – the Es

Injury prevention practitioners come from many disciplines, have a wide range of experiences and skills and have very different opportunities within their working environment to undertake injury prevention at the three levels described above. When planning an injury prevention programme and deciding the level(s) of injury prevention the programme will encompass, practitioners need to consider their experience and skills in undertaking injury prevention at the various levels, the opportunities present for injury prevention within the scope and remit of their work and the possibilities they have for collaboration with other agencies that may be able to undertake prevention at other levels. It is important to remember that it may be more effective to undertake a range of activities aimed at preventing an injury covering more than one level.

Within each of these levels of prevention there are a range of approaches that can be used to prevent injuries. These include:

- Education and awareness-raising.
- Empowerment.
- Environmental modification and engineering.
- Enforcement.

The approaches are outlined below with examples and information about the local practitioners that may be involved in each approach. It is important for injury prevention practitioners to be aware of the roles of other individuals, agencies and organisations in injury prevention. For many injury prevention programmes full effectiveness is best achieved through collaboration with other agencies.

DOI: 10.3310/pgfar05140

Education and awareness-raising

The educational approach to injury prevention aims to provide people with information about the risk of injuries and how to prevent them. This can make people aware of the problem, enable them to understand how and why injuries happen and how they may be prevented so that they can make an informed choice about what action they will take to reduce their risk of injury. It involves exploring an individual's attitudes and beliefs about injuries and injury prevention, and providing information to enable an individual to examine their own attitudes and beliefs.

Public awareness campaigns and training can be considered sub-sets of educational approaches. Awareness campaigns highlight an issue as a cause for concern and training involves the teaching of certain specific skills, e.g. bicycle skills training.

An underlying concept of this approach is that it is the individuals' right to choose their action, and their responsibility to do so. Giving parents information about the type of injuries that occur to children in the home and the types of safety equipment available that can help to reduce the risk of such injuries would be an example of such an approach. One of the potential drawbacks of this approach is that if we assume that when presented with the same information everybody has an equal opportunity to make a "safe" choice, we may well be wrong. For example, choosing whether or not to buy and install a stair gate may be a very different choice for different families.

The educational approach can be used for individuals in an attempt to change their safety behaviour. It can also be used with whole communities to increase knowledge about injuries and effective methods of injury prevention, increase confidence and skills in undertaking injury prevention and create a climate of opinion within a community within which preventive activities are acceptable. Remember, a community is a formal or informal network of people who are linked together due to, for example, where they live, the work they do, their ethnic or religious background and through their links have the capacity to respond collectively. Thus, educational approaches need to address needs both within and outside your organisation. There is a growing body of research suggesting that workers from all disciplines and professions have had insufficient training in injury prevention and that they have considerable need for further educational input.

Education should also be aimed at local and national policy- and decision-makers who legislate or create standards and regulations, or who commission environmental changes or preventive services.

Empowerment

Empowerment involves facilitating or enabling people to undertake injury prevention for themselves. This may be through gaining confidence, skills, or knowledge and putting these into practice; by helping parents to access safety equipment through low cost schemes; or by enabling parents to persuade landlords to make repairs to their homes. Health service staff, educational services, road safety officers, children's centre staff and voluntary organisations are probably the agencies most commonly involved in this type of injury prevention.

Environmental modification and engineering

This involves the design of the environment itself, the design of products and the introduction of safety devices. For example, the design and implementation of traffic calming schemes can reduce the risk of road traffic injuries, the use of safety glazing in windows and doors near children's play areas can reduce the risk of lacerations, separating cyclists from motor vehicles by the installation of cycle ways can reduce cyclist injuries, and the use of energy-absorbing surfaces in playgrounds can reduce the risk of injury from falling. Local authority staff are commonly involved in this type of work e.g. road safety officers, planners, engineers, transport, leisure and housing department staff. Housing associations, architects, builders and designers may also be involved.

Changes to the design and manufacture of products can:

- reduce the risk of an injury occurring by, for example, the manufacture and fitting of air bags in cars.
- reduce access to a hazard through the design and introduction of child-resistant closures for medicines.
- reduce the severity of the injury such as by changing the design of pen caps to reduce the risk of fatal suffocation if a cap is inhaled.

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The use of safety equipment is often a key aspect of our approach to unintentional injury prevention, even among the under 5s, for example, the use of a cycle helmet can protect the head if the child falls from its bike, the use of safety seats in cars, and safety gates and smoke detectors in the home.

Enforcement

The enforcement approach involves the use of standards, regulations or legislation to enforce safer behaviour, safer environments or safer products to reduce the risk of injury. Although not related to the under 5s, examples include seat belt legislation that has been associated with increased seat belt wearing rates and reductions in motor vehicle occupant injuries; and cycle helmet legislation in Australia has been associated with a reduction in head injuries amongst cyclists. The British Standards Institution produces standards for a range of nursery equipment and children's products including playpens, push chairs and buggies, child car seats, stair gates, fireguards, cots, high chairs, two-wheeled bikes, cycle helmets and smoke detectors.

These standards, laws and regulations do not necessarily mean that injuries will not occur. They aim to reduce the potential for injury and may need to be combined with adequate enforcement and other approaches that promote safe behaviour. Those who have an enforcement role in terms of injury prevention include:

- police.
- fire and rescue services.
- local authority departments including environmental health, trading standards and social services.

While enforcement may appear to rely on what we all regard as laws and regulations emanating from parliament or the council, there can be "legislation" at a more domestic level. The rule in a children's centre that hot drinks must not be taken into an area where there are children is such an example. Good legislation is that which is readily accepted by the public, makes good sense and requires little, if any, enforcement. Involving families in the development of rules can improve their chances of being followed.

Active and passive prevention

Protection that is provided without an individual needing to do anything or not having to take repeated action is called passive prevention. Permanent changes to the environment or to products usually provide such protection against injury. For example, the fitting of a thermostat to control hot tap water temperature stops an individual having to remember to always use cold water in the bath first and to test the temperature. Smoke alarms wired in to the electrical supply of the house do not require batteries to be changed.

Injury prevention measures that requires individuals to change their behaviour or to take action repeatedly are known as active measures. There are times when all of us would forget to undertake preventive actions, for example, when we are tired or stressed, or something unexpected happens. Passive protection is more likely to be effective, as it does not require us to take any action, and hence should work under such circumstances.

SOURCES OF SPECIALIST ADVICE AND INFORMATION

Detailed information about the *Keeping Children Safe at Home* programme can be found at http://www.nottingham.ac.uk/research/groups/injuryresearch/projects/kcs/index.aspx

Key voluntary organisations

Child Accident Prevention Trust (CAPT)
www.capt.org.uk
www.makingthelink.net
www.childsafetyweek.org.uk

CAPT's work stops children being killed, disabled or seriously injured in accidents - without wrapping them in cotton wool.

Royal Society for the Prevention of Accidents (RoSPA)
www.rospa.com

RoSPA promotes safety and the prevention of accidents at work, at leisure, on the road, in the home and through safety education.

Lullaby Trust (formerly the Foundation for the Study of Infant Deaths)
www.lullabytrust.org.uk

The Lullaby Trust provides specialist support for bereaved families and anyone affected by a sudden infant death. It also provides advice on safe sleeping for babies.

Government agencies

National Institute for Health and Care Excellence (NICE)
www.nice.org.uk

NICE produces public health guidance covering disease prevention, health improvement and health protection and has influenced policy and practice in the NHS and local government on many of the big issues in today's society including accident prevention. It also produces briefings for local government to help them in their public health roles.

Public Health England
https://www.gov.uk/government/organisations/public-health-england

Its mission is to protect and improve the nation's health and to address inequalities.

NHS Health Scotland
www.healthscotland.com
www.maternal-and-early-years.org.uk

Its commitment is to focus on the biggest health challenge facing Scotland – health inequalities.

Public Health Wales
www.publichealthwales.wales.nhs.uk

Its purpose is to protect and improve health and wellbeing and reduce health inequalities in Wales.

Sources of data

Office for National Statistics (ONS)
www.ons.gov.uk/ons/index.html

The website contains a variety of statistics including mortality statistics and population data.

Child and Maternal Health Information Network (ChiMat)
www.chimat.org.uk

It provides information and intelligence covering England to improve decision-making for high quality, cost effective services. Its work supports policy makers, commissioners, managers, regulators, and other health stakeholders working on children's, young people's and maternal health.

Local public health departments

These departments are part of your local council. They are likely to have local data on hospital admissions and deprivation. If they do not hold such data, they should know from where it is available. They may also be able to assist with the analysis of local data and programme evaluation.

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DOI: 10.3310/pgfar05140

PROGRAMME GRANTS FOR APPLIED RESEARCH 2017 VOL. 5 NO. 14

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Relevant local authority departments

Upper tier local councils (county councils, metropolitan boroughs and unitary authorities) have departments or teams that cover the following topics:

- Road safety (often part of transportation or highways).
- Environmental health – is responsible for housing fitness.
- Public health.
- Children's services, including local safeguarding children boards and responsibility for children's centres.
- Trading standards – responsible for the enforcement of product safety issues.

In 2015, responsibility for the commissioning of health visiting services in England moves from the NHS Commissioning Board to local authorities.

Other sources of information

Fire safety

Government publications

https://www.gov.uk/government/publications/fire-safety-in-the-home

https://www.gov.uk/government/publications/make-your-home-safe-from-fire

https://www.gov.uk/government/collections/fire-safety-guidance

Preventing carbon monoxide poisoning

CO awareness

http://covictim.org

Health and Safety Executive

www.hse.gov.uk/gas/domestic/co.htm

DOI: 10.3310/pgfar05140

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Keeping Children Safe at Home is a collaboration between the organisations shown below.
It aims to improve our understanding of children's accidents and make their prevention more effective.

For further information visit www.nottingham.ac.uk/injuryresearch

The University of Nottingham

Norfolk and Norwich University Hospitals NHS
NHS Foundation Trust

UWE BRISTOL University of the West of England

University of Leicester

Newcastle University

capt child accident prevention trust

Nottinghamshire Healthcare NHS
NHS Trust
Positive about integrated healthcare



EME
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This report presents independent research funded by the National Institute for Health Research (NIHR). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health

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