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Children and young people's preferences and needs when using health technology to self-manage a long-term condition: a scoping review

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ABSTRACT

Background The use of patient-facing health technologies to manage long-term conditions (LTCs) is increasing; however, children and young people (CYP) may have preferences about health technologies which they interact or engage with, that influence their decision to use these technologies.

Aims To identify CYP's reported preferences about health technologies to self-manage LTCs.

Methods We undertook a scoping review, searching MEDLINE, PsycINFO and CINAHL in July 2021. Searches were limited to papers published between January 2015 and July 2021. We included any health technologies used to manage physical and mental LTCs. Qualitative content analysis of study data was undertaken to categorise data into themes and quantitative data were described and visually represented. We engaged CYP with LTCs to support the review design, interpretation of findings and development of recommendations.

Results 161 journal articles were included, describing preferences of CYP. Most included studies were undertaken in high-income countries. CYP's main preferences and needs were: design and functionality; privacy and sharing; customisation and personalisation of the technology; and interaction options within the technology.

Conclusions This review highlights important preferences and needs that CYP may have before using technologies to self-manage their LTC. These should be considered when developing technology for this population. Future research should involve CYP throughout the development of the technologies, from identifying their unmet needs through to final design, development, evaluation and implementation of the intervention.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Healthcare is increasingly incorporating technology to support children and young people (CYP) to self-manage their long-term conditions (LTCs).
⇒ Involving CYP meaningfully in all stages of technology development and evaluation is necessary to ensure technologies are appropriate, but this does not always happen.
⇒ Our previous review identified key concerns that CYP with LTCs have when using technologies; labelling and identity; accessibility; privacy and reliability; and trustworthiness.

WHAT THIS STUDY ADDS

⇒ We have identified key preferences that CYP have about health technologies to self-manage LTCs.
⇒ Preferences included design and functionality; being able to balance privacy and sharing; the option to customise and personalise the technology; and interaction options within the technology.
⇒ It is important to understand the preferences of CYP to enable engagement with health technologies and enhance end-user experience and acceptability of new devices and digital platforms.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ We report the importance and process of meaningful involvement of CYP in a scoping review to support future teams undertaking reviews about topics that impact CYP.
⇒ When developing technologies for CYP to support them in managing their LTCs, CYP's preferences and needs should be considered to help increase CYP engagement with the technologies.
⇒ The co-produced recommendations provide clear guidance for technology developers about how to involve CYP; these also build on our previous published recommendations.

BACKGROUND

Healthcare is increasingly incorporating technology into patient care, using telehealth, artificial intelligence (AI), virtual reality (VR), devices and smartphone applications (apps). While technology is also being used by children and young people (CYP) and families, their preferences and what they find appealing about it remain unknown. Our previous

Table 1 Eligibility criteria for studies

Inclusion criteria	Exclusion criteria
Population: CYP with physical and/or mental LTCs aged up to and including 18 years (no lower age limit). LTCs were defined as 'those conditions for which there is currently no cure, and which are managed with drugs and other treatments'.[145] **Concept:** preferences that CYP have about health technologies and any positive elements that they look for when using health technology. Also, any information that CYP want or need to know before using health technology. **Context:** the focus was on health technologies that CYP engage with or use to manage LTCs. Health technologies included mobile/smartphone apps; virtual reality; telehealth/telemedicine; digital health; medical devices (digitised); gamification/health gaming; augmented reality; receiving health information via SMS (digital health education messages); wearables for monitoring and patient care; remote monitoring; consumer products (eg, FitBits); and social media including patient blogs. All settings (eg, home, hospital and clinic) and all countries were included. **Study design:** qualitative, surveys, questionnaires, feasibility, acceptability, user testing/usability and mixed methods (including any of these designs undertaken within trials), where data from those 18 years or younger could be extracted.	Studies were excluded if they: 1. Did not involve CYP with LTCs 2. Only explored parents' or clinicians' views, experiences, use or preferences about health technology without including CYP's views 3. Explored the use of health technology to manage acute conditions, diagnosis or for a one-off measurement 4. Involved students in a school setting using health technology rather than children or young people with an LTC 5. Included technologies to enhance mobility, senses or provide medications (eg, hearing aids, mobility aids, prostheses) 6. Exclusively included CYP aged over 18 years 7. Were published before 2015 (to ensure we only included technology that is relevant to current technology used) 8. Did not separate CYP's and adults' data within the study 9. Were conference abstracts or protocols 10. Were not written in English.

apps, applications; CYP, children and young people; LTCs, long-term conditions.

review[1] on CYP's concerns about health technology found many studies overlook CYP in designing, developing, evaluating and implementing health technologies. CYP who were involved in the previously reviewed studies expressed concerns about labelling and stigma, privacy and reliability, accessibility and trustworthiness.[1] The aim of this current review was to identify studies that included CYP's preferences about health technologies to self-manage long-term health conditions (LTCs), and to co-develop with CYP recommendations for technology developers and researchers in consultation with CYP as advisors.

METHODS

We undertook a scoping review in line with guidance by Khalil *et al 2016*, which updated the original scoping review guidance developed by Arksey and O'Malley by incorporating further guidance by Levac *et al* 2010 and the Joanna Briggs Institute.[2–5] We followed guidance to inform data analysis and charting.[6] Our protocol is available.[7]

Search strategy

We searched Ovid MEDLINE, PsycINFO and CINAHL (July 2021) using a strategy developed with an information specialist, modified for each database (online supplemental file 1). To ensure that the literature reviewed was relevant to current health technologies, searches were limited to papers published in January 2015–July 2021, reflecting the publication of two key documents in 2015.[8 9]

Eligibility

Table 1 outlines inclusion and exclusion criteria.

Study selection

Records were de-duplicated in EndNote and managed in Rayyan for title and abstract screening. Two searches were undertaken (2019 and 2021). Six reviewers (RJC, IK, KG-B, JML, VS, MP) screened in pairs, independently undertaking title and abstract screening for records in search 1. For search 2, records were categorised by Rayyan in terms of probability of relevance according to decisions made in screening for search 1. Studies with ≤30% probability of being relevant were excluded; those with 50% probability were single screened (JM-K) and those with ≥70% probability were double-screened (JM-K, IK). Full texts were screened independently in Covidence by two reviewers (JM-K, SE-Y, RJC, MK or JML). When uncertainty arose, articles were discussed until a consensus was reached.

Data extraction and analysis

Data were extracted by SB, JML, JMK, SE-Y, LPr, FS, LPo, AW, GW, MK, JB with FS checking 10% of studies. Data extracted included: lead author; publication year; country; study participant details (age, number, sex, ethnicity, LTC); study design; technology type; setting; retrospective/prospective use; preferences and needs; whether CYP were involved in the scoping/design of the technology; and quotations to support preferences.

Content analysis was undertaken[10] as recommended.[6] JM-K read through and coded extracted data (quotations and interpretation from the primary study authors) to categorise data into four overarching themes. Themes were reviewed by VS and discussed with the wider team.

Stakeholder consultation

We convened a Patient and Public Involvement (PPI) Advisory Group of 12 CYP with LTCs in England. Regular 60-minute online workshops, using Zoom and Miro, enabled CYP's contribution to the review's focus, interpretation of findings and co-development of recommendations. We met with the young people at key time points in the study. Five meetings were held at approximately 2-month intervals. Early sessions focused on developing PPI members' understanding of a review process, building skills in critiquing and discussing research findings through exploring recommendations of our previous review.[1] Workshops built upon understanding and ideas generated previously, with members empowered to work with facilitators to draft the review's recommendations. Attendees received a £20 thank-you voucher after each workshop; minutes were distributed to the entire PPI group for further mutual learning, particularly for those who missed a session due to illness or healthcare appointments.

RESULTS

Study selection

Electronic searches identified 22 063 unique records. Many excluded papers did not include preferences, did not separate CYP participant responses from those of adults or reported technology outside the review's scope. 161 papers were included

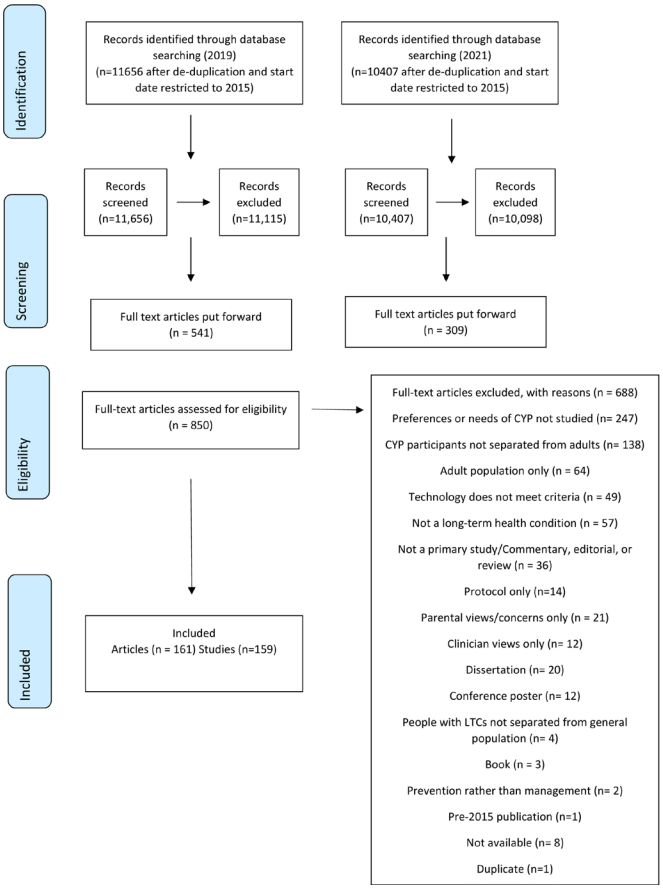

Figure 1 PRISMA flow chart. CYP, children and young people; LTCs, long-term conditions; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analysis.

(figure 1) representing 159 studies. Details of the 161 papers are provided (online supplemental file 2).

Characteristics of included studies

Studies were published between 2015 and 2021 (figure 2), undertaken in the USA (n=62), the UK (n=23), Canada (n=18), Australia (n=14), the Netherlands (n=7), Brazil (n=6), New Zealand (n=4), China (n=3), Denmark (n=3), Spain (n=3), Sweden (n=3), Finland (n=2) and Norway (n=2), and one study each in Korea, Estonia, France, Ireland, Japan, Korea, Nigeria, Greece and Turkey.

Studies included CYP with the following LTCs (online supplemental table 1): type 1 diabetes mellitus (n=22); mental health conditions including depression, anxiety, post-traumatic stress disorder, early-onset psychosis and unspecified mental health conditions requiring access to mental health services (n=26); cancer (n=20); asthma (n=17); obesity (n=7); juvenile idiopathic arthritis (n=6); attention deficit hyperactivity disorder (n=4); autism spectrum disorder/conditions (n=4); spina bifida (n=3); cerebral palsy (n=3); cystic fibrosis (n=3) and various other LTCs (n=44). Most studies focused on one LTC without reporting any comorbidities. One study included CYP with concurrent coeliac disease and type 1 diabetes,[11] another included CYP with mental health conditions and comorbid symptoms of insomnia and anxiety disorder,[12] and one study included CYP with autism spectrum disorder and depression[13] Studies included CYP aged 2–18 years; 62 studies included participants under 11 years.[11 14–74] Seven studies included children under 5 years, with parents, caregivers and specialists supporting their preferences.[23 30 33 34 75–77] 99 studies (58%) did not report ethnicity of CYP participants (figure 3A), and of the 133 studies that recorded sex, 65% recorded ≥50% female participants (figure 3B). Two studies included trans and gender-diverse CYP.[78 79]

Many studies were qualitative (n=74) or mixed methods (n=25). Study designs also included user testing (n=11), pilot/feasibility studies (n=28), co-design (n=9), surveys/questionnaires (n=7), randomised trials (n=2), and one each of participatory action research, single-site cohort and community-based participatory design. Technologies were categorised using a typology[80]: internet (eg, websites, forums) (n=10); social media (eg, Facebook, Instagram) (n=10); mobile health (mHealth, for example, mobile phone apps, text messaging, tablets) (n=72); telehealth (eg, video-conferencing, interactive online treatment programmes) (n=18); devices (eg, wearables) (n=5). An additional category was developed to capture immersive/machine-led technologies comprising gaming, AI and VR (n=18). 26 studies[17 22 43 48 50 52 62–64 81–97] involved a combination of technologies.

Preferences and needs expressed by CYP

Defining preferences was challenging; we excluded studies that only reported *satisfaction* or *level of acceptability*, to ensure an in-depth approach to understanding preferences. CYP provided detailed accounts of technology features they liked or preferred. Many preferences were similar across studies (online supplemental table 2). There were four overarching themes, summarised with quotations (online supplemental table 3). Many studies did not report the age and/or sex of the participant who reported the preference.

Design and functionality

CYP reported specific preferences about technology design and functionality. They preferred clearly laid out mobile apps and internet sources, divided into subsections, and well labelled.[20 22–24 37 61 98–104] Ease of use and convenience were important; preferring technology that was ready to use and CYP not needing to search for information.[20 22–24 52 59 77 89 95 99 101–103 105–109] Bright colours were appealing, making them 'feel good' when interacting with the technology.[64 100 110]

CYP expressed interest in using technologies that were present in their daily lives, for example, digital games accessed through smartphones, tablets and computers. Additionally, they valued apps that were accessible across different platforms/operating systems.[27 61 102] Some CYP found it easier to record information using technology.[52] They preferred a balance between technology simplicity and receiving appropriate information enabling them to engage with the technology.[61 102 111] CYP appreciated technology with clear and uncomplicated language, without 'doctory' words or jargon, but not 'too dumbed down'.[70 82 95 100 104 112] They also had preferences about images and multimedia, and for programmes and apps with age-appropriate and developmentally appropriate content incorporating images and media that were relatable.[30 66 69 95 100] Younger children's preferences included background music, visual graphics and manga (Japanese comic) animations.[30 34]

Privacy and sharing

CYP need to balance privacy and sharing when using technology. Most CYP preferred to use technology to interact with, and share, information.[19 20 25 39 52 78 94 99 101 111 113–118] They valued connecting

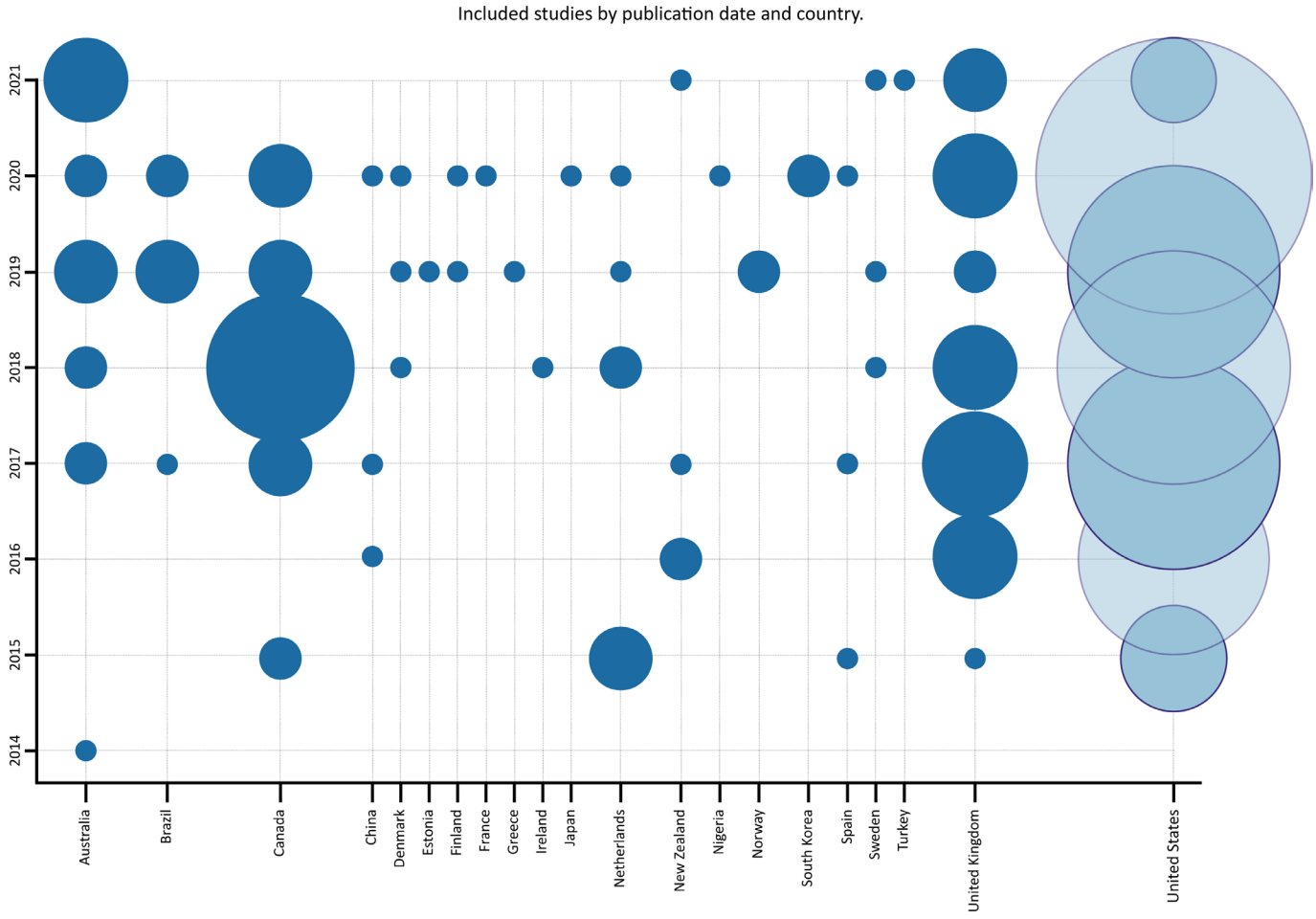

Figure 2 Included studies by publication date and country.

with others with similar conditions or experiences, reducing loneliness and isolation.[19 21 59 62 63 66 72 79 81 82 85 88 89 93–95 97 104 113 117–125] CYP with cystic fibrosis and type 1 diabetes benefited from chat rooms, breaking their isolation and helping them feel less alone.[63 99 104] Immediacy of communication with healthcare professionals and assessment via messaging or video was positive for CYP with asthma, facilitating timely and targeted intervention.[39] Some CYP preferred using technology to communicate, avoiding embarrassment and maintaining independence.[12 79 111 113 118 126 127] They expected security functions in healthcare technologies.[14 66 94 111 124 125 128 129] CYP appreciated technology enabling them autonomy and control over their information.[20 78 90 102 113 130]

Customisation and personalisation

The functionality to customise and personalise technologies was viewed as positive and important.[20 21 49 55 66 78 101 102 105 117 131 132] This included personalising frequency (eg, reminders, text messages), content (eg, asthma triggers relevant for the individual), when and how they used the technology, and tracking their conditions and symptoms.[49 72 77 78 87 88 91 98 105 116 133–140] Being able to set personal goals within the technologies was motivational, providing visual representation of their progress and incentive to achieve.[37 89 113 114 121 133 135] The preference to personalise the technology was reported by CYP with spina bifida, asthma, cancer, type 1 diabetes, depression, sickle cell anaemia and haemophilia.[20 49 78 102 105 117] Younger children's views were well represented; CYP aged 6–17 years appreciated creating their own personalised character.[20 68 87 141] CYP with LTCs with particularly complex medicine regimens, for example, asthma and cystic fibrosis, considered apps with medication reminder functions to be important.[96 98 99 101 142 143]

Interaction

Interaction preferences covered a range of features including gamification within the technology, for example, referring to the 'magical' experience of shooting balloons,[42] noting games within the technology 'provides a distraction and it calms me down'.[78] CYP of different ages valued games, such as goals to incentivise improving their health, providing motivation.[14 62 78 89 114 132] CYP valued incentives and rewards, including financial incentives.[14 54 60] Interestingly, while CYP valued the opportunity to interact with peers with the same condition or with healthcare professionals online, some valued interactive technologies which removed the need for them to speak, viewing communication online as 'less intimidating'.[12 19 20 117] One study reported the positive of visualising personal experiences using avatars lessened the need to talk.[131]

CYP described how interacting with games and customising avatars helped them demonstrate their emotions and express their feelings.[26 87 131] For example, CYP liked the option to add inner voices and emotions to avatars to express their feelings and interpret situations.[131] Some CYP expressed how interaction with technology gave them greater confidence and better understanding about self-management, enabling independence.[21 43 130 131] Immersive technologies were described by some

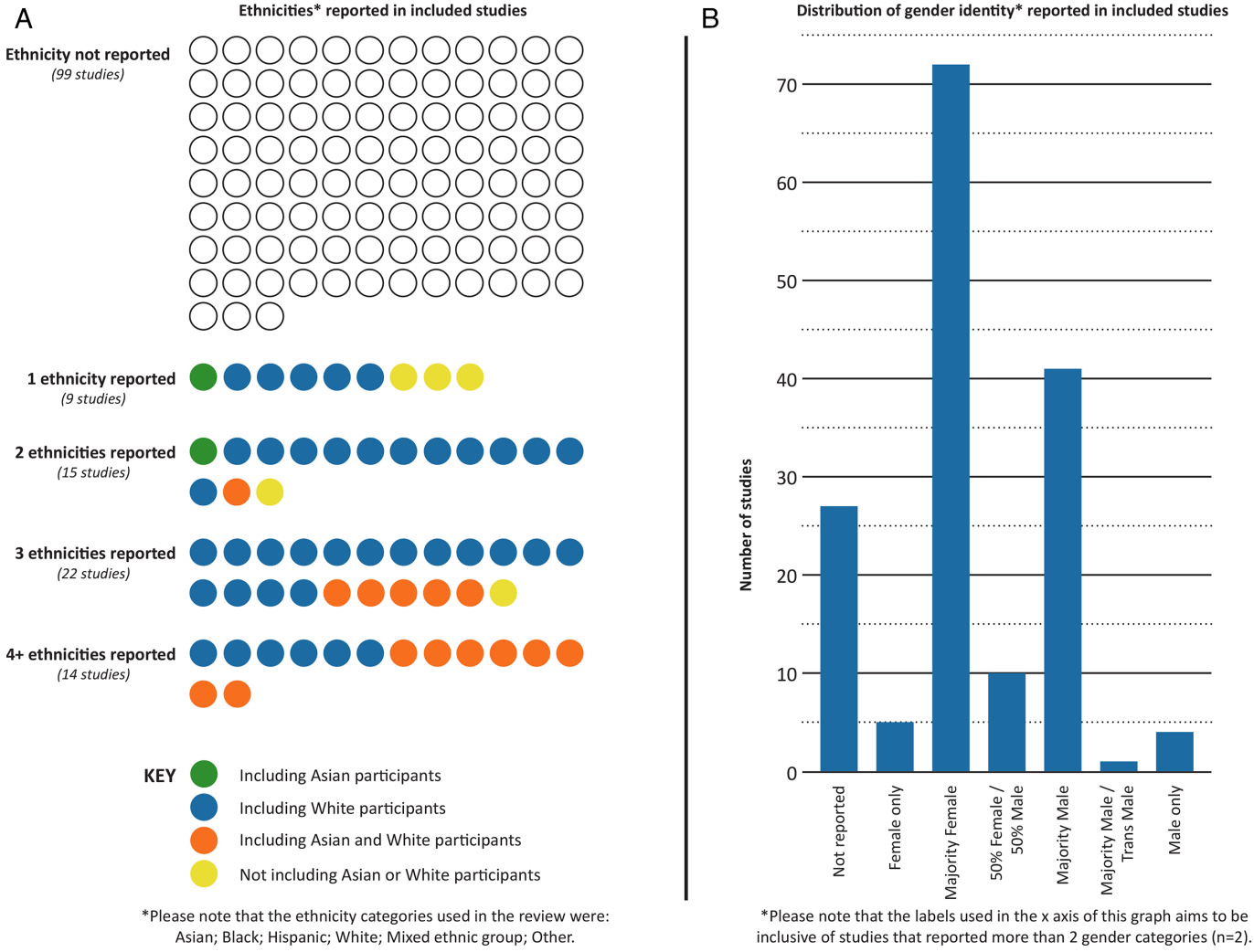

Figure 3 Ethnicities and distribution of gender identity reported in included studies.

as a distraction from what was happening around them,[64 78 144] with VR games an 'exciting distraction' from negative aspects of rehabilitation such as boredom and pain.[42]

Stakeholder consultation

PPI members believed that it was critical to value CYP's unique and expert opinions, separate from those of their parents, caregivers and healthcare professionals. This approach differs from studies excluded from this review that consider adults as proxies for CYP. PPI members contributed to the interpretation of findings, exploring early themes with quotations from CYP. They agreed with the initial findings presented, adding further depth to discussions of privacy, customisation and health technologies' potential impact(s) on the relationship between CYP and their parent/caregiver. The PPI members led the development of the recommendations based on their review of the data and findings. The recommendations were refined over several months between PPI members and the wider team, delivering the final set of recommendations (Box 1).

DISCUSSION

Main findings

This review highlights CYP's preferences and needs for technology to support them to self-manage LTCs, including design and functionality; privacy and information sharing; customisation and personalisation; and interaction. Included studies involved CYP aged 2–18 years, with 39% involving CYP under 11 years. Most studies were conducted in high-income countries, focusing on type 1 diabetes, mental health conditions, cancer and asthma. Studies predominantly recruited CYP with a specific LTC and therefore the views of CYP in these studies may not be representative of the wider CYP population with multimorbidity. Ethnic background was not consistently reported, and participants were predominantly female. Although CYP were reported as being involved in the scoping, design and/or evaluation of the technology in many studies (n=105), their involvement was not always defined and engagement methods were not clearly articulated.

Our findings in relation to the literature

There has been a marked increase in the number of studies involving CYP's use of health technologies to manage an LTC, compared with our previous review.[1] Nonetheless, in the current review, many studies focused on effectiveness of the health technology without asking CYP about their preferences and needs. No review has specifically explored CYP's preferences when using health technology to manage LTCs. Our review suggests a shift in the focus of technologies investigated with fewer studies focusing on internet sites, but with mHealth remaining the most studied technology.

Box 1 Recommendations

The following recommendations were derived from our findings and co-developed with CYP stakeholders (recommendations that CYP identified as most important are denoted with an asterisk).

The following recommendations were congruent with the recommendations made in our previous scoping review[1]:

1. Recognise the importance of CYP having their own, unique, expert opinion that is distinct from those of their parents/caregivers and healthcare professionals.*
2. Ensure any technology for use by CYP is age-appropriate and developmentally-appropriate (in terms of language and style).*
3. When designing and developing technology for CYP to manage LTCs, consider the value CYP place on customising/personalising aspects such as characters, reminders and when they choose to use the technology.*

The following recommendations are new and based on this review's findings:

4. When developing and testing technology for CYP, include research that captures in-depth, detailed understanding of what CYP think about the technology (rather than satisfaction or simple acceptability scales).*
5. When undertaking research about CYP's use of technology, consider whether your study participants represent the target end-users of the technology (for example, consider ethnic background, age and other characteristics of CYP participants). Report the characteristics clearly but do not use them to generalise results to specific populations unless appropriate.
6. Carefully consider the appearance of the technology as CYP have particular preferences including it being aesthetically pleasing and user-friendly.*
7. Consider that CYP need a balance between sharing information with peers, but not wanting to share with others (eg, their parents or other CYP). The option of sharing ultimately needs to rest with the individual and the option of anonymity may be preferred by some. Consider that some CYP may prefer the opportunity to interact through technology rather than verbally (eg, in appointments with clinicians).
8. Consider the positive value that CYP place on gamification aspects and incentives when using technology and include this as an option to encourage them to use the technology.

CYP, children and young people; LTCs, long-term conditions.

We developed a new category for this review to encapsulate newer immersive technologies of AI, VR and chatbots which were not included in our previous review; this category now represents approximately 13% of included studies. CYP's preferences appear consistent across all technologies and not specific to a particular technology. Preferences reported by CYP using the newer technologies however did focus on personalisation opportunities within the technology.

We identified a range of preferences and needs of CYP when using health technologies to self-manage an LTC. As in our previous review,[1] we found that CYP wanted to achieve a balance between sharing information with others, for example, CYP with the same LTC, while still ensuring their privacy was maintained and that the technology securely dealt with their information. This is an important consideration for technology developers and researchers and is highlighted in recommendation 7.

Interestingly, CYP reported that using technologies with chat functionality removed the pressure on them to speak (eg, at clinical appointments), which CYP appreciated.[20 39 126] CYP also wanted a balance between clear and colourful websites, with enough well-written and accessible information. Some CYP indicated that independence from parents and technology that was targeted solely at CYP was important.[113]

Strengths and limitations of the review

A strength of this review is its broad focus on technologies and LTCs. We used a recognised methodology,[2 6] ensuring rigour, and worked with CYP throughout the review. We co-developed recommendations based on the review's findings which are important for future development of health technologies for CYP with LTCs. The PPI group have led the focus and outputs of the review which has made the research meaningful and relevant to young people, and the recommendations represent their voice.

A limitation of the primary studies included was lack of diversity. Ethnicity was reported in less than half of studies and the most represented ethnic group was 'white', with Asian CYP particularly under-represented. Sex was not reported in all studies, but where sex was reported, more than half of studies recorded a majority of female participants. Sex was reported as male or female; and only two studies[78 79] reported preferences of trans and gender-diverse CYP. Many excluded studies only explored acceptability/satisfaction with the technology. Meaningful understanding of CYP's preferences is important as these will influence whether CYP use technologies.

Future research

Based on the findings from our review and the recommendations developed with our PPI members, we believe further research should focus on the co-development of a framework to support consistent and appropriate involvement of CYP when new health technology is designed, developed and tested.

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Children and health technology searches

Search, February 2019

Databases searched

Medline (Ovid)
PsycINFO (Ovid)
CINAHL Plus (Ebsco)

Limits: 2008 onwards, English language only
Study designs: qualitative, qualitative reviews, surveys, questionnaires, feasibility studies

Search strategies

MEDLINE(R) ALL
via Ovid http://ovidsp.ovid.com/
1946 to February 8th 2019
Searched on: 11th February 2019
Records retrieved: 10279

1 exp Child/ (1809524)
2 Adolescent/ (1911611)
3 (child$ or pediat$ or paediat$ or preschool$ or pre school$ or schoolchild$ or school age$ or schoolage$ or schoolboy$ or schoolgirl$).ti,ab. (1429725)
4 (girl or girls or boy or boys or kid or kids).ti,ab. (220552)
5 (adoles$ or preadolescen$ or puberty or prepuberty or pubescen$ or prepubescen$ or teen$ or youth$ or preteen$ or juvenil$).ti,ab. (400129)
6 (young adj (people$ or person or persons)).ti,ab. (27520)
7 or/1-6 (3441306)
8 Mobile Applications/ (3730)
9 Cell Phone/ (7646)
10 Smartphone/ (2586)
11 (mhealth or m-health or mobile health).ti,ab. (3518)
12 ((mobile$ or smartphone$ or smart-phone$ or iphone$ or i-phone$ or android or ipad$ or i-pad$ or tablet$) adj2 (app or apps or application$)).ti,ab. (6756)
13 ((portab$ or electronic$ or digital$) adj2 (app or apps or application$)).ti,ab. (3393)
14 ((Health or healthcare or medical or clinical or NHS) adj2 (app or apps)).ti,ab. (1000)
15 ((mobile$ or smartphone$ or smart-phone$) adj2 technolog$).ti,ab. (2762)
16 or/8-15 (22990)
17 7 and 16 (3808)
18 virtual reality/ (665)
19 Virtual Reality Exposure Therapy/ (450)
20 ((virtual or VR) adj3 (therap$ or treatment$ or intervention$ or health or healthcare or medic$)).ti,ab. (2476)
21 18 or 19 or 20 (3379)
22 7 and 21 (487)
23 exp Telemedicine/ (24268)
24 (ehealth or e-health or etherap$ or e-therap$).ti,ab. (4145)
25 (Telemedic$ or telehealth or telehealthcare or telecare or telemental or telemanagement or telerehabilitation or telepsychology or telepsychiatry or teletherapy or tele-medic$ or tele-health or

tele-healthcare or tele-care or tele-management or tele-mental or tele-rehabilitation or tele-psychology or tele-psychiatry or tele-therapy).ti,ab. (14912)
26 23 or 24 or 25 (31961)
27 7 and 26 (3728)
28 ((digital$ or digitis$ or digitiz$) adj3 (health or service$ or deliver$ or care or healthcare or intervention$ or therap$ or treatment$)).ti,ab. (4167)
29 7 and 28 (491)
30 ((digital$ or digitis$ or digitiz$) adj3 (device$ or technolog$ or tool$)).ti,ab. (4562)
31 (electronic$ adj3 (device$ or technolog$ or tool$)).ti,ab. (12919)
32 (technolog$ adj2 device$).ti,ab. (1958)
33 30 or 31 or 32 (19266)
34 7 and 33 (1516)
35 gamification.ti,ab. (283)
36 ((game$ or gaming or videogam$) adj3 (therap$ or treatment$ or intervention$ or health or healthcare or medic$)).ti,ab. (1516)
37 exergam$.ti,ab. (439)
38 (serious adj (game$ or gaming)).ti,ab. (459)
39 (gamified adj2 (app or apps or application$)).ti,ab. (17)
40 ((game$ or gaming or videogam$) adj2 (app or apps or application$)).ti,ab. (194)
41 35 or 36 or 37 or 38 or 39 or 40 (2641)
42 7 and 41 (851)
43 Augment$ realit$.ti,ab. (1352)
44 real world space$.ti,ab. (7)
45 AR device$.ti,ab. (17)
46 43 or 44 or 45 (1361)
47 7 and 46 (58)
48 exp Wearable Electronic Devices/ (9155)
49 wearable$.ti,ab. (8026)
50 ((fitness or activit$) adj2 track$).ti,ab. (1158)
51 (smartwatch$ or smart-watch$).ti,ab. (227)
52 pedometer$.ti,ab. (2385)
53 fitbit$.ti,ab. (378)
54 48 or 49 or 50 or 51 or 52 or 53 (19985)
55 7 and 54 (3727)
56 Telemetry/ (9437)
57 Remote Sensing Technology/ (2350)
58 telemetr$.ti,ab. (8066)
59 (telemonitor$ or tele-monitor$).ti,ab. (1385)
60 ((remote$ or mobile$ or electronic$) adj2 monitor$).ti,ab. (5440)
61 (remote$ adj2 (sensing or sensor or sensors or biosensor$ or technolog$)).ti,ab. (6717)
62 exp Monitoring, Physiologic/ (162870)
63 remote$.ti,ab. (66708)
64 62 and 63 (3339)
65 ((wireless$ or wifi or wi-fi) adj3 monitor$).ti,ab. (826)
66 ((wireless$ or wifi or wi-fi) adj3 (sensing or sensor or sensors or biosensor$)).ti,ab. (2935)
67 Wireless Technology/ (2996)
68 56 or 57 or 58 or 59 or 60 or 61 or 64 or 65 or 66 or 67 (32986)
69 7 and 68 (2321)
70 Text Messaging/ (2135)
71 (text messag$ or texting or short message$ or SMS or digital$ messag$ or instant messag$).ti,ab. (8435)

72 70 or 71 (8861)
73 7 and 72 (2292)
74 Social Media/ (5446)
75 social media$.ti,ab. (7227)
76 (twitter$ or tweet or tweets or tweeting or Facebook or Instagram or YouTube).ti,ab. (5780)
77 74 or 75 or 76 (12336)
78 7 and 77 (2673)
79 Blogging/ (899)
80 (Blog or blogs or blogging or weblog$).ti,ab. (1563)
81 79 or 80 (2042)
82 7 and 81 (298)
83 Therapy, Computer-Assisted/ (6426)
84 user-computer interface/ (35277)
85 (computer$ adj3 (therap$ or intervention$ or treatment$)).ti,ab. (3712)
86 83 or 84 or 85 (43944)
87 7 and 86 (4062)
88 Biomedical Enhancement/ (567)
89 Medical Informatics/ (10929)
90 Medical Informatics Applications/ (2387)
91 Automation/ (16848)
92 (technolog$ adj2 (health or healthcare or medical)).ti,ab. (19194)
93 88 or 89 or 90 or 91 or 92 (48268)
94 7 and 93 (3207)
95 17 or 22 or 27 or 29 or 34 or 42 or 47 or 55 or 69 or 73 or 78 or 82 or 87 or 94 (25721)
96 exp qualitative research/ (44025)
97 Interview/ (28345)
98 Focus Groups/ (26084)
99 Qualitative.mp. (212724)
100 Interview$.mp. (352028)
101 Experience$.mp. (970820)
102 Focus group$.ti,ab. (39514)
103 (accept$ or attitude$ or barrier$ or belief$ or believ$ or concern$ or experienc$ or facilitator$ or opinion$ or perceiv$ or perception$ or preference$ or view or views or viewpoint$).ti,ab. (2995696)
104 Feasibility Studies/ (60978)
105 feasibility.ti,ab. (159011)
106 "Surveys and Questionnaires"/ (417680)
107 (survey$ or questionnaire$).ti,ab. (927022)
108 (mixed method$ or multimethod$ or multi-method$ or multi method$).mp. (19142)
109 (evidence synthes$ or realist synthes$).ti,ab. (3677)
110 (meta-synthes$ or metasynthes$).ti,ab. (989)
111 (meta-ethnograph$ or metaethnograph$).ti,ab. (463)
112 (meta-study or metastudy).ti,ab. (87)
113 realist review$.ti,ab. (253)
114 or/96-113 (4001371)
115 95 and 114 (13068)
116 exp animals/ not humans/ (4545687)
117 115 not 116 (13021)
118 limit 117 to english language (12530)
119 limit 118 to yr="2008 -Current" (10290)

PsycINFO
via Ovid http://ovidsp.ovid.com/
2002 to February Week 1 2019
Searched on: 11th February 2019
Records retrieved: 6968

1 childhood birth 12 yrs.ag. (282987)
2 preschool age 2 5 yrs.ag. (72332)
3 school age 6 12 yrs.ag. (168442)
4 adolescence 13 17 yrs.ag. (257965)
5 or/1-4 (422059)
6 pediatrics/ (21301)
7 (child$ or pediat$ or paediat$ or preschool$ or pre school$ or schoolchild$ or school age$ or schoolage$ or schoolboy$ or schoolgirl$).ti,ab. (381131)
8 (girl or girls or boy or boys or kid or kids).ti,ab. (56002)
9 (adoles$ or preadolescen$ or puberty or prepuberty or pubescen$ or prepubescen$ or teen$ or youth$ or preteen$ or juvenil$).ti,ab. (202921)
10 (young adj (people$ or person or persons)).ti,ab. (23865)
11 6 or 7 or 8 or 9 or 10 (519844)
12 5 or 11 (634745)
13 mobile devices/ (2155)
14 cellular phones/ (4208)
15 (mhealth or m-health or mobile health).ti,ab. (714)
16 ((mobile$ or smartphone$ or smart-phone$ or iphone$ or i-phone$ or android or ipad$ or i-pad$ or tablet$) adj2 (app or apps or application$)).ti,ab. (2258)
17 ((portab$ or electronic$ or digital$) adj2 (app or apps or application$)).ti,ab. (228)
18 ((Health or healthcare or medical or clinical or NHS) adj2 (app or apps)).ti,ab. (189)
19 ((mobile$ or smartphone$ or smart-phone$) adj2 technolog$).ti,ab. (1926)
20 13 or 14 or 15 or 16 or 17 or 18 or 19 (8682)
21 12 and 20 (2083)
22 virtual reality/ (6907)
23 ((virtual or VR) adj3 (therap$ or treatment$ or intervention$ or health or healthcare or medic$)).ti,ab. (1099)
24 22 or 23 (7296)
25 12 and 24 (1008)
26 telemedicine/ (4597)
27 (ehealth or e-health or etherap$ or e-therap$).ti,ab. (1225)
28 (Telemedic$ or telehealth or telehealthcare or telecare or telemental or telemanagement or telerehabilitation or telepsychology or telepsychiatry or teletherapy or tele-medic$ or tele-health or tele-healthcare or tele-care or tele-management or tele-mental or tele-rehabilitation or tele-psychology or tele-psychiatry or tele-therapy).ti,ab. (3070)
29 26 or 27 or 28 (6091)
30 12 and 29 (1001)
31 ((digital$ or digitis$ or digitiz$) adj3 (health or service$ or deliver$ or care or healthcare or intervention$ or therap$ or treatment$)).ti,ab. (716)
32 12 and 31 (164)
33 exp medical therapeutic devices/ (5157)
34 (digital$ or digitis$ or digitiz$ or electronic$ or technolog$).ti,ab. (115782)
35 33 and 34 (726)
36 ((digital$ or digitis$ or digitiz$) adj3 (device$ or technolog$ or tool$)).ti,ab. (3025)
37 (electronic$ adj3 (device$ or technolog$ or tool$)).ti,ab. (1414)

38 (technolog$ adj2 device$).ti,ab. (540)
39 35 or 36 or 37 or 38 (5547)
40 12 and 39 (1476)
41 gamification.ti,ab. (334)
42 ((game$ or gaming or videogam$) adj3 (therap$ or treatment$ or intervention$ or health or healthcare or medic$)).ti,ab. (891)
43 exergam$.ti,ab. (238)
44 (serious adj (game$ or gaming)).ti,ab. (543)
45 (gamified adj2 (app or apps or application$)).ti,ab. (16)
46 ((game$ or gaming or videogam$) adj2 (app or apps or application$)).ti,ab. (210)
47 41 or 42 or 43 or 44 or 45 or 46 (2047)
48 12 and 47 (708)
49 Augment$ realit$.ti,ab. (518)
50 real world space$.ti,ab. (6)
51 AR device$.ti,ab. (7)
52 49 or 50 or 51 (524)
53 12 and 52 (112)
54 wearable$.ti,ab. (773)
55 ((fitness or activit$) adj2 track$).ti,ab. (305)
56 (smartwatch$ or smart-watch$).ti,ab. (54)
57 pedometer$.ti,ab. (753)
58 fitbit$.ti,ab. (91)
59 54 or 55 or 56 or 57 or 58 (1861)
60 12 and 59 (401)
61 telemetry/ (98)
62 telemetr$.ti,ab. (676)
63 (telemonitor$ or tele-monitor$).ti,ab. (159)
64 ((remote$ or mobile$ or electronic$) adj2 monitor$).ti,ab. (839)
65 (remote$ adj2 (sensing or sensor or sensors or biosensor$ or technolog$)).ti,ab. (278)
66 exp monitoring/ (11444)
67 remote$.ti,ab. (8129)
68 66 and 67 (139)
69 ((wireless$ or wifi or wi-fi) adj3 monitor$).ti,ab. (46)
70 ((wireless$ or wifi or wi-fi) adj3 (sensing or sensor or sensors or biosensor$)).ti,ab. (163)
71 61 or 62 or 63 or 64 or 65 or 68 or 69 or 70 (2156)
72 12 and 71 (282)
73 text messaging/ (723)
74 (text messag$ or texting or short message$ or SMS or digital$ messag$ or instant messag$).ti,ab. (3820)
75 73 or 74 (3917)
76 12 and 75 (1222)
77 exp social media/ (11686)
78 social media$.ti,ab. (8331)
79 (twitter$ or tweet or tweets or Facebook).ti,ab. (5895)
80 77 or 78 or 79 (16221)
81 12 and 80 (3307)
82 blog/ (416)
83 (Blog or blogs or blogging or weblog$).ti,ab. (2921)
84 82 or 83 (2986)
85 12 and 84 (523)
86 computer assisted therapy/ (978)

87 (computer$ adj3 (therap$ or intervention$ or treatment$)).ti,ab. (1642)
88 86 or 87 (2324)
89 12 and 88 (605)
90 computer applications/ (4570)
91 automation/ (1375)
92 (technolog$ adj2 (health or healthcare or medical)).ti,ab. (2755)
93 90 or 91 or 92 (8631)
94 12 and 93 (1068)
95 21 or 25 or 30 or 32 or 40 or 48 or 53 or 60 or 72 or 76 or 81 or 85 or 89 or 94 (11934)
96 qualitative research/ (7731)
97 interviews/ (4954)
98 interviewing/ (1632)
99 experience$.mp. (438785)
100 interview$.mp. (287976)
101 qualitative$.mp,md. (256517)
102 Focus group$.ti,ab. (29135)
103 (accept$ or attitude$ or barrier$ or belief$ or believ$ or concern$ or experienc$ or facilitator$ or opinion$ or perceiv$ or perception$ or preference$ or view or views or viewpoint$).ti,ab. (1062112)
104 feasibility.ti,ab. (16513)
105 exp surveys/ (5509)
106 exp questionnaires/ (10863)
107 (survey$ or questionnaire$).ti,ab. (342254)
108 (mixed method$ or multimethod$ or multi-method$ or multi method$).mp. (24452)
109 (evidence synthes$ or realist synthes$).ti,ab. (611)
110 (meta-synthes$ or metasynthes$).ti,ab,md. (784)
111 (meta-ethnograph$ or metaethnograph$).ti,ab. (266)
112 (meta-study or metastudy).ti,ab. (72)
113 realist review$.ti,ab. (56)
114 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 104 or 105 or 106 or 107 or 108 or 109 or 110 or 111 or 112 or 113 (1386188)
115 95 and 114 (8010)
116 limit 115 to (english language and yr="2008 -Current") (6968)

Cumulative Index to Nursing & Allied Health (CINAHL Plus)
via EBSCO https://www.ebscohost.com/
Inception to 8th February 2019
Searched on: 11th February 2019
Records retrieved: 7073

S1	(MH "Child+")	566,309
S2	(MH "Adolescence+")	447,771
S3	TI (child* or pediat* or paediat* or preschool* or pre school* or schoolchild* or school age* or schoolage* or schoolboy* or schoolgirl*) OR AB (child* or pediat* or paediat* or preschool* or pre school* or schoolchild* or school age* or schoolage* or schoolboy* or schoolgirl*)	456,968

S4	TI (girl or girls or boy or boys or kid or kids) OR AB (girl or girls or boy or boys or kid or kids)	54,870
S5	TI (adoles* or preadolescen* or puberty or prepuberty or pubescen* or prepubescen* or teen* or youth* or preteen* or juvenil*) OR AB (adoles* or preadolescen* or puberty or prepuberty or pubescen* or prepubescen* or teen* or youth* or preteen* or juvenil*)	154,735
S6	TI (young N1 (people* or person or persons)) OR AB (young N1 (people* or person or persons))	16,397
S7	S1 OR S2 OR S3 OR S4 OR S5 OR S6	995,486
S8	(MH "Mobile Applications")	4,780
S9	(MH "Cellular Phone")	1,489
S10	(MH "Smartphone")	1,821
S11	TI (mhealth or m-health or "mobile health") OR AB (mhealth or m-health or "mobile health")	1,886
S12	TI (((mobile* or smartphone* or smart-phone* or iphone* or i-phone* or android or ipad* or i-pad* or tablet*) N2 (app or apps or application*))) OR AB (((mobile* or smartphone* or smart-phone* or iphone* or i-phone* or android or ipad* or i-pad* or tablet*) N2 (app or apps or application*)))	4,457
S13	TI (((portab* or electronic* or digital*) N2 (app or apps or application*))) OR AB (((portab* or electronic* or digital*) N2 (app or apps or application*)))	559
S14	TI (((health or healthcare or medical or clinical or NHS) N2 (app or apps))) OR AB (((health or healthcare or medical or clinical or NHS) N2 (app or apps)))	861
S15	TI (((mobile* or smartphone* or smart-phone*) N2 technolog*)) OR AB (((mobile* or smartphone* or smart-phone*) N2 technolog*))	1,819
S16	S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15	12,343
S17	S7 AND S16	1,238
S18	(MH "Virtual Reality")	3,703
S19	(MH "Virtual Reality Exposure Therapy")	39
S20	TI (((virtual or VR) N3 (therap* or treatment* or intervention* or health or healthcare or medic*))) OR AB (((virtual or VR) N3 (therap* or treatment* or intervention* or health or healthcare or medic*)))	1,547

S21	S18 OR S19 OR S20	4,842
S22	S7 AND S21	651
S23	(MH "Telehealth+")	18,252
S24	TI (ehealth or e-health or etherap* or e-therap*) OR AB (ehealth or e-health or etherap* or e-therap*)	2,811
S25	TI (Telemedic* or telehealth or telehealthcare or telecare or telemental or telemanagement or telerehabilitation or telepsychology or telepsychiatry or teletherapy or tele-medic* or tele-health or tele-healthcare or tele-care or tele-management or tele-mental or tele-rehabilitation or tele-psychology or tele-psychiatry or tele-therapy) OR AB (Telemedic* or telehealth or telehealthcare or telecare or telemental or telemanagement or telerehabilitation or telepsychology or telepsychiatry or teletherapy or tele-medic* or tele-health or tele-healthcare or tele-care or tele-management or tele-mental or tele-rehabilitation or tele-psychology or tele-psychiatry or tele-therapy)	7,901
S26	S23 OR S24 OR S25	22,015
S27	S7 AND S26	2,484
S28	TI (((digital* or digitis* or digitiz*) N3 (health or service* or deliver* or care or healthcare or intervention* or therap* or treatment*))) OR AB (((digital* or digitis* or digitiz*) N3 (health or service* or deliver* or care or healthcare or intervention* or therap* or treatment*)))	2,153
S29	S7 AND S28	258
S30	TI (((digital* or digitis* or digitiz*) N3 (device* or technolog* or tool*))) OR AB (((digital* or digitis* or digitiz*) N3 (device* or technolog* or tool*)))	2,161
S31	TI ((electronic* N3 (device* or technolog* or tool*))) OR AB ((electronic* N3 (device* or technolog* or tool*)))	3,247
S32	TI (technolog* N2 device*) OR AB (technolog* N2 device*)	960
S33	S30 OR S31 OR S32	6,280
S34	S7 AND S33	944
S35	TI gamification OR AB gamification	221
S36	TI (((game* or gaming or videogam*) N3 (therap* or treatment* or intervention* or health or healthcare or medic*))) OR AB (((game* or gaming or videogam*) N3 (therap* or treatment* or intervention* or health or healthcare or medic*)))	991

S37	TI exergam* OR AB exergam*	232
S38	TI ((serious N1 (game* or gaming))) OR AB ((serious N1 (game* or gaming)))	263
S39	TI ((gamified N2 (app or apps or application*))) OR AB ((gamified N2 (app or apps or application*)))	22
S40	TI (((game* or gaming or videogam*) N2 (app or apps or application*))) OR AB (((game* or gaming or videogam*) N2 (app or apps or application*)))	140
S41	S35 OR S36 OR S37 OR S38 OR S39 OR S40	1,716
S42	S7 AND S41	530
S43	TI Augment* N1 realit* OR AB Augment* N1 realit*	456
S44	TI real world space* OR AB real world space*	11
S45	TI ("AR device" or "AR devices") OR AB ("AR device" or "AR devices")	5
S46	S43 OR S44 OR S45	467
S47	S7 AND S46	41
S48	(MH "Wearable Sensors+")	3,838
S49	TI wearable* OR AB wearable*	1,873
S50	TI (((fitness or activit*) N2 track*)) OR AB (((fitness or activit*) N2 track*))	591
S51	TI (smartwatch* or smart-watch*) OR AB (smartwatch* or smart-watch*)	112
S52	TI pedometer* OR AB pedometer*	1,394
S53	TI fitbit* OR AB fitbit*	237
S54	S48 OR S49 OR S50 OR S51 OR S52 OR S53	6,671
S55	S7 AND S54	1,434
S56	(MH "Telemetry")	1,768
S57	(MH "Biosensors")	271
S58	TI telemetr* OR AB telemetr*	1,448

S59	TI ((telemonitor* or tele-monitor*)) OR AB ((telemonitor* or tele-monitor*))	681
S60	TI (((remote* or mobile* or electronic*) N2 monitor*)) OR AB (((remote* or mobile* or electronic*) N2 monitor*))	2,311
S61	TI ((remote* N2 (sensing or sensor or sensors or biosensor* or technolog*))) OR AB ((remote* N2 (sensing or sensor or sensors or biosensor* or technolog*)))	365
S62	(MH "Monitoring, Physiologic+")	86,894
S63	TI remote* OR AB remote*	12,176
S64	S62 AND S63	864
S65	TI (((wireless* or wifi or wi-fi) N3 monitor*)) OR AB (((wireless* or wifi or wi-fi) N3 monitor*))	262
S66	TI (((wireless* or wifi or wi-fi) N3 (sensing or sensor or sensors or biosensor*))) OR AB (((wireless* or wifi or wi-fi) N3 (sensing or sensor or sensors or biosensor*)))	261
S67	(MH "Wireless Communications")	10,236
S68	(S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S64 OR S65 OR S66 OR S67)	16,551
S69	S7 AND S68	1,869
S70	(MH "Text Messaging")	1,986
S71	(MH "Instant Messaging")	189
S72	TI ((text N1 messag* or texting or short N1 message* or SMS or digital* N1 messag* or instant N1 messag*)) OR AB ((text N1 messag* or texting or short N1 message* or SMS or digital* N1 messag* or instant N1 messag*))	3,574
S73	S70 OR S71 OR S72	4,472
S74	S7 AND S73	1,335
S75	(MH "Social Media")	10,206
S76	TI social N1 media* OR AB social N1 media*	7,706
S77	TI (twitter* or tweet or tweets or tweeting or Facebook or Instagram or YouTube) OR AB (twitter* or tweet or tweets or tweeting or Facebook or Instagram or YouTube)	6,105

S78	S75 OR S76 OR S77	17,001
S79	S7 AND S78	2,796
S80	(MH "Blogs")	2,820
S81	TI (Blog or blogs or blogging or weblog*) OR AB (Blog or blogs or blogging or weblog*)	2,110
S82	S80 OR S81	4,032
S83	S7 AND S82	300
S84	(MH "Therapy, Computer Assisted")	4,961
S85	(MH "User-Computer Interface")	9,081
S86	TI ((computer* N3 (therap* or intervention* or treatment*))) OR ((computer* N3 (therap* or intervention* or treatment*)))	6,929
S87	S84 OR S85 OR S86	15,646
S88	S7 AND S87	2,117
S89	(MH "Biomedical Enhancement")	38
S90	(MH "Medical Informatics")	3,880
S91	(MH "Health Informatics")	3,230
S92	(MH "Automation")	5,033
S93	TI ((technolog* N2 (health or healthcare or medical))) OR AB ((technolog* N2 (health or healthcare or medical)))	11,637
S94	S89 OR S90 OR S91 OR S92 OR S93	22,849
S95	S7 AND S94	1,593
S96	S17 OR S22 OR S27 OR S29 OR S34 OR S42 OR S47 OR S55 OR S69 OR S74 OR S79 OR S83 OR S88 OR S95	15,324
S97	(MH "Qualitative Studies")	93,665
S98	(MH "Interviews+")	192,311
S99	(MH "Focus Groups")	37,283

S100	TI qualitative OR AB qualitative	97,263
S101	TI interview* OR AB interview*	168,461
S102	TI experience* OR AB experience*	323,915
S103	TI Focus N1 group* OR AB Focus N1 group*	27,632
S104	TI ((accept* or attitude* or barrier* or belief* or believ* or concern* or experienc* or facilitat* or opinion* or perceiv* or percept* or preference* or view or views or viewpoint*)) OR AB ((accept* or attitude* or barrier* or belief* or believ* or concern* or experienc* or facilitat* or opinion* or perceiv* or percept* or preference* or view or views or viewpoint*))	871,898
S105	(MH "Pilot Studies")	66,935
S106	TI feasibility OR AB feasibility	36,553
S107	(MH "Surveys") OR (MH "Survey Research")	143,259
S108	(MH "Questionnaires+")	345,320
S109	TI ((survey* or questionnaire*)) OR AB ((survey* or questionnaire*))	347,156
S110	(MH "Multimethod Studies")	11,788
S111	TI ((mixed N1 method* or multimethod* or multi-method*)) OR AB ((mixed N1 method* or multimethod* or multi-method*))	13,905
S112	(MH "Meta Synthesis")	1,326
S113	TI (evidence N1 synthes* or realist N1 synthes*) OR AB (evidence N1 synthes* or realist N1 synthes*)	2,437
S114	TI (meta-synthes* or metasynthes*) OR AB (meta-synthes* or metasynthes*)	875
S115	TI (meta-ethnograph* or metaethnograph*) OR AB (meta-ethnograph* or metaethnograph*)	355
S116	TI (meta-study or metastudy) OR AB (meta-study or metastudy)	69
S117	TI realist N1 review* OR AB realist N1 review*	176
S118	S97 OR S98 OR S99 OR S100 OR S101 OR S102 OR S103 OR S104 OR S105 OR S106 OR S107 OR S108 OR S109 OR S110 OR S111 OR S112 OR S113 OR S114 OR S115 OR S116 OR S117	1,370,237

S119	S96 AND S118	8,110
S120	S96 AND S118 Limiters - Published Date: 20080101-20191231; English Language	7,073

Updated search July 2021

Databases searched

MEDLINE (Ovid)
PsycINFO (Ovid)
CINAHL Plus (Ebsco)

Limits: 2011 onwards, English language only
Study designs: qualitative, qualitative reviews, surveys, questionnaires, feasibility studies

Original search strategies were checked and updated with any further relevant subject headings introduced into MEDLINE, PsycINFO or CINAHL since February 2019. Search results were imported into the original EndNote library and deduplicated against records from searches undertaken in February 2019.

Search strategies

MEDLINE(R) ALL
via Ovid http://ovidsp.ovid.com/
1946 to 2nd July 21
Searched on: 6th July 2021
Records retrieved: 16337

1 exp Child/ (1985318)
2 Adolescent/ (2104213)
3 (child$ or pediat$ or paediat$ or preschool$ or pre school$ or schoolchild$ or school age$ or schoolage$ or schoolboy$ or schoolgirl$).ti,ab. (1640453)
4 (girl or girls or boy or boys or kid or kids).ti,ab. (248572)
5 (adolescen$ or preadolescen$ or puberty or prepuberty or pubescen$ or prepubescen$ or teen$ or youth$ or preteen$ or juvenil$).ti,ab. (472863)
6 (young adj (people$ or person or persons)).ti,ab. (33723)
7 or/1-6 (3826224)
8 Mobile Applications/ (8101)
9 Cell Phone/ (9142)
10 Smartphone/ (6172)
11 (mhealth or m-health or mobile health).ti,ab. (6381)
12 ((mobile$ or smartphone$ or smart-phone$ or iphone$ or i-phone$ or android or ipad$ or i-pad$ or tablet$) adj2 (app or apps or application$)).ti,ab. (12642)
13 ((portab$ or electronic$ or digital$ or communicat$) adj2 (app or apps or application$)).ti,ab. (5732)
14 ((Health or healthcare or medical or clinical or NHS) adj2 (app or apps)).ti,ab. (2027)
15 ((mobile$ or smartphone$ or smart-phone$) adj2 technolog$).ti,ab. (4169)
16 or/8-15 (37781)
17 7 and 16 (6456)

18 virtual reality/ (3036)
19 Virtual Reality Exposure Therapy/ (708)
20 ((virtual or VR) adj3 (therap$ or treatment$ or intervention$ or health or healthcare or medic$)).ti,ab. (3921)
21 18 or 19 or 20 (7036)
22 7 and 21 (1093)
23 exp Telemedicine/ (35346)
24 (ehealth or e-health or etherap$ or e-therap$).ti,ab. (5834)
25 (Telemedic$ or telehealth or telehealthcare or telecare or telemental or telemanagement or telerehabilitation or telepsychology or telepsychiatry or teletherapy or tele-medic$ or tele-health or tele-healthcare or tele-care or tele-management or tele-mental or tele-rehabilitation or tele-psychology or tele-psychiatry or tele-therapy).ti,ab. (22948)
26 23 or 24 or 25 (47539)
27 7 and 26 (6155)
28 ((digital$ or digitis$ or digitiz$) adj3 (health or service$ or deliver$ or care or healthcare or intervention$ or therap$ or treatment$)).ti,ab. (7797)
29 7 and 28 (1033)
30 Digital Technology/ (195)
31 ((digital$ or digitis$ or digitiz$) adj3 (device$ or technolog$ or tool$)).ti,ab. (8074)
32 (electronic$ adj3 (device$ or technolog$ or tool$)).ti,ab. (17890)
33 (technolog$ adj2 device$).ti,ab. (2581)
34 30 or 31 or 32 or 33 (28337)
35 7 and 34 (2419)
36 gamification.ti,ab. (653)
37 ((game$ or gaming or videogam$) adj3 (therap$ or treatment$ or intervention$ or health or healthcare or medic$)).ti,ab. (2074)
38 exergam$.ti,ab. (754)
39 (serious adj (game$ or gaming)).ti,ab. (812)
40 (gamified adj2 (app or apps or application$)).ti,ab. (42)
41 ((game$ or gaming or videogam$) adj2 (app or apps or application$)).ti,ab. (288)
42 36 or 37 or 38 or 39 or 40 or 41 (4130)
43 7 and 42 (1285)
44 augmented reality/ (415)
45 Augment$ realit$.ti,ab. (2489)
46 real world space$.ti,ab. (9)
47 AR device$.ti,ab. (47)
48 44 or 45 or 46 or 47 (2569)
49 7 and 48 (149)
50 exp Wearable Electronic Devices/ (14094)
51 wearable$.ti,ab. (15360)
52 ((fitness or activit$) adj2 track$).ti,ab. (1945)
53 (smartwatch$ or smart-watch$).ti,ab. (602)
54 pedometer$.ti,ab. (2777)
55 fitbit$.ti,ab. (791)
56 50 or 51 or 52 or 53 or 54 or 55 (30634)
57 7 and 56 (4861)
58 Telemetry/ (9936)
59 Remote Sensing Technology/ (3286)
60 telemetr$.ti,ab. (9075)
61 (telemonitor$ or tele-monitor$).ti,ab. (1838)
62 ((remote$ or mobile$ or electronic$) adj2 monitor$).ti,ab. (7443)

63 (remote$ adj2 (sensing or sensor or sensors or biosensor$ or technolog$)).ti,ab. (9437)
64 exp Monitoring, Physiologic/ (182501)
65 remote$.ti,ab. (84498)
66 64 and 65 (4477)
67 ((wireless$ or wifi or wi-fi) adj3 monitor$).ti,ab. (1053)
68 ((wireless$ or wifi or wi-fi) adj3 (sensing or sensor or sensors or biosensor$)).ti,ab. (4073)
69 Wireless Technology/ (3877)
70 58 or 59 or 60 or 61 or 62 or 63 or 66 or 67 or 68 or 69 (41513)
71 7 and 70 (2816)
72 Text Messaging/ (3549)
73 (text messag$ or texting or short message$ or SMS or digital$ messag$ or instant messag$).ti,ab. (11556)
74 72 or 73 (12377)
75 7 and 74 (3320)
76 Social Media/ (10542)
77 social media$.ti,ab. (15620)
78 (twitter$ or tweet or tweets or tweeting or Facebook or Instagram or YouTube).ti,ab. (10377)
79 76 or 77 or 78 (24209)
80 7 and 79 (5440)
81 Blogging/ (1028)
82 (Blog or blogs or blogging or weblog$).ti,ab. (1983)
83 81 or 82 (2497)
84 7 and 83 (378)
85 Therapy, Computer-Assisted/ (6911)
86 user-computer interface/ (38290)
87 (computer$ adj3 (therap$ or intervention$ or treatment$)).ti,ab. (4202)
88 85 or 86 or 87 (47856)
89 7 and 88 (4547)
90 Biomedical Enhancement/ (643)
91 Medical Informatics/ (12387)
92 Medical Informatics Applications/ (2535)
93 Automation/ (18996)
94 (technolog$ adj2 (health or healthcare or medical)).ti,ab. (23971)
95 90 or 91 or 92 or 93 or 94 (56560)
96 7 and 95 (4003)
97 17 or 22 or 27 or 29 or 35 or 43 or 49 or 57 or 71 or 75 or 80 or 84 or 89 or 96 (37193)
98 exp qualitative research/ (64884)
99 Interview/ (29761)
100 Focus Groups/ (32333)
101 Qualitative.mp. (276240)
102 Interview$.mp. (420533)
103 Experience$.mp. (1162899)
104 Focus group$.ti,ab. (51939)
105 (accept$ or attitude$ or barrier$ or belief$ or believ$ or concern$ or experienc$ or facilitator$ or opinion$ or perceiv$ or perception$ or preference$ or view or views or viewpoint$).ti,ab. (3558551)
106 Feasibility Studies/ (74057)
107 feasibility.ti,ab. (201168)
108 "Surveys and Questionnaires"/ (500406)
109 (survey$ or questionnaire$).ti,ab. (1134967)
110 (mixed method$ or multimethod$ or multi-method$ or multi method$).mp. (31544)

111 (evidence synthes$ or realist synthes$).ti,ab. (5561)
112 (meta-synthes$ or metasynthes$).ti,ab. (1450)
113 (meta-ethnograph$ or metaethnograph$).ti,ab. (654)
114 (meta-study or metastudy).ti,ab. (117)
115 realist review$.ti,ab. (426)
116 or/98-115 (4752606)
117 97 and 116 (20482)
118 exp animals/ not humans/ (4855957)
119 117 not 118 (20419)
120 limit 119 to english language (19831)
121 limit 120 to yr="2011 -Current" (16337)

PsycINFO
via Ovid http://ovidsp.ovid.com/
1806 to June Week 4 2021
Searched on: 6th July 2021
Records retrieved: 10337

1 childhood birth 12 yrs.ag. (561187)
2 preschool age 2 5 yrs.ag. (138523)
3 school age 6 12 yrs.ag. (317520)
4 adolescence 13 17 yrs.ag. (458248)
5 or/1-4 (819883)
6 pediatrics/ (27027)
7 (child$ or pediat$ or paediat$ or preschool$ or pre school$ or schoolchild$ or school age$ or schoolage$ or schoolboy$ or schoolgirl$).ti,ab. (736076)
8 (girl or girls or boy or boys or kid or kids).ti,ab. (109682)
9 (adolescen$ or preadolescen$ or puberty or prepuberty or pubescen$ or prepubescen$ or teen$ or youth$ or preteen$ or juvenil$).ti,ab. (342011)
10 (young adj (people$ or person or persons)).ti,ab. (33956)
11 6 or 7 or 8 or 9 or 10 (983024)
12 5 or 11 (1214733)
13 exp mobile devices/ (8942)
14 mobile applications/ or mobile technology/ or mobile health/ or mobile assessment/ or mobile learning/ or "smartphone use"/ (3520)
15 (mhealth or m-health or mobile health).ti,ab. (1213)
16 ((mobile$ or smartphone$ or smart-phone$ or iphone$ or i-phone$ or android or ipad$ or i-pad$ or tablet$) adj2 (app or apps or application$)).ti,ab. (3842)
17 ((portab$ or electronic$ or digital$ or communicat$) adj2 (app or apps or application$)).ti,ab. (774)
18 ((Health or healthcare or medical or clinical or NHS) adj2 (app or apps)).ti,ab. (377)
19 ((mobile$ or smartphone$ or smart-phone$) adj2 technolog$).ti,ab. (2556)
20 13 or 14 or 15 or 16 or 17 or 18 or 19 (14361)
21 12 and 20 (3573)
22 virtual reality/ (9217)
23 ((virtual or VR) adj3 (therap$ or treatment$ or intervention$ or health or healthcare or medic$)).ti,ab. (1589)
24 22 or 23 (9827)
25 12 and 24 (1395)
26 exp telemedicine/ (9868)
27 (ehealth or e-health or etherap$ or e-therap$).ti,ab. (1670)

28 (Telemedic$ or telehealth or telehealthcare or telecare or telemental or telemanagement or telerehabilitation or telepsychology or telepsychiatry or teletherapy or tele-medic$ or tele-health or tele-healthcare or tele-care or tele-management or tele-mental or tele-rehabilitation or tele-psychology or tele-psychiatry or tele-therapy).ti,ab. (4444)
29 26 or 27 or 28 (11874)
30 12 and 29 (2157)
31 digital interventions/ (620)
32 ((digital$ or digitis$ or digitiz$) adj3 (health or service$ or deliver$ or care or healthcare or intervention$ or therap$ or treatment$)).ti,ab. (1472)
33 31 or 32 (1967)
34 12 and 33 (436)
35 exp medical therapeutic devices/ (8911)
36 (digital$ or digitis$ or digitiz$ or electronic$ or technolog$).ti,ab. (164720)
37 35 and 36 (1223)
38 digital technology/ (761)
39 ((digital$ or digitis$ or digitiz$) adj3 (device$ or technolog$ or tool$)).ti,ab. (4544)
40 (electronic$ adj3 (device$ or technolog$ or tool$)).ti,ab. (2096)
41 (technolog$ adj2 device$).ti,ab. (788)
42 37 or 38 or 39 or 40 or 41 (8802)
43 12 and 42 (2315)
44 digital gaming/ (2285)
45 gamification.ti,ab. (630)
46 ((game$ or gaming or videogam$) adj3 (therap$ or treatment$ or intervention$ or health or healthcare or medic$)).ti,ab. (1341)
47 exergam$.ti,ab. (330)
48 (serious adj (game$ or gaming)).ti,ab. (750)
49 (gamified adj2 (app or apps or application$)).ti,ab. (31)
50 ((game$ or gaming or videogam$) adj2 (app or apps or application$)).ti,ab. (309)
51 44 or 45 or 46 or 47 or 48 or 49 or 50 (5144)
52 12 and 51 (1693)
53 augmented reality/ (621)
54 Augment$ realit$.ti,ab. (915)
55 real world space$.ti,ab. (8)
56 AR device$.ti,ab. (12)
57 53 or 54 or 55 or 56 (960)
58 12 and 57 (210)
59 wearable devices/ (344)
60 wearable$.ti,ab. (1413)
61 ((fitness or activit$) adj2 track$).ti,ab. (541)
62 (smartwatch$ or smart-watch$).ti,ab. (128)
63 pedometer$.ti,ab. (885)
64 fitbit$.ti,ab. (203)
65 59 or 60 or 61 or 62 or 63 or 64 (2985)
66 12 and 65 (570)
67 telemetry/ (176)
68 telemetr$.ti,ab. (1046)
69 (telemonitor$ or tele-monitor$).ti,ab. (204)
70 ((remote$ or mobile$ or electronic$) adj2 monitor$).ti,ab. (1184)
71 (remote$ adj2 (sensing or sensor or sensors or biosensor$ or technolog$)).ti,ab. (398)
72 exp monitoring/ (17175)
73 remote$.ti,ab. (13250)

74 72 and 73 (184)
75 wireless technologies/ (568)
76 ((wireless$ or wifi or wi-fi) adj3 monitor$).ti,ab. (65)
77 ((wireless$ or wifi or wi-fi) adj3 (sensing or sensor or sensors or biosensor$)).ti,ab. (209)
78 67 or 68 or 69 or 70 or 71 or 74 or 75 or 76 or 77 (3569)
79 12 and 78 (451)
80 text messaging/ (1151)
81 (text messag$ or texting or short message$ or SMS or digital$ messag$ or instant messag$).ti,ab. (5083)
82 80 or 81 (5231)
83 12 and 82 (1586)
84 exp social media/ (16787)
85 social media$.ti,ab. (13698)
86 (twitter$ or tweet or tweets or Facebook).ti,ab. (8281)
87 84 or 85 or 86 (23817)
88 12 and 87 (5104)
89 blog/ (609)
90 (Blog or blogs or blogging or weblog$).ti,ab. (3335)
91 89 or 90 (3451)
92 12 and 91 (607)
93 computer assisted therapy/ (1150)
94 (computer$ adj3 (therap$ or intervention$ or treatment$)).ti,ab. (2323)
95 93 or 94 (3134)
96 12 and 95 (830)
97 computer applications/ (11599)
98 automation/ (2562)
99 (technolog$ adj2 (health or healthcare or medical)).ti,ab. (3809)
100 97 or 98 or 99 (17814)
101 12 and 100 (2080)
102 21 or 25 or 30 or 34 or 43 or 52 or 58 or 66 or 79 or 83 or 88 or 92 or 96 or 101 (19562)
103 qualitative research/ (9791)
104 exp qualitative methods/ or qualitative measures/ (17606)
105 interviews/ or focus group interview/ or semi-structured interview/ (12015)
106 interviewing/ (3654)
107 experience$.mp. (718906)
108 interview$.mp. (435749)
109 qualitative$.mp,md. (343275)
110 Focus group$.ti,ab. (38771)
111 (accept$ or attitude$ or barrier$ or belief$ or believ$ or concern$ or experienc$ or facilitator$ or opinion$ or perceiv$ or perception$ or preference$ or view or views or viewpoint$).ti,ab. (1847079)
112 feasibility.ti,ab. (24502)
113 exp surveys/ (12242)
114 exp questionnaires/ (21868)
115 (survey$ or questionnaire$).ti,ab. (561960)
116 mixed methods research/ (641)
117 (mixed method$ or multimethod$ or multi-method$ or multi method$).mp. (34300)
118 (evidence synthes$ or realist synthes$).ti,ab. (842)
119 (meta-synthes$ or metasynthes$).ti,ab,md. (1297)
120 (meta-ethnograph$ or metaethnograph$).ti,ab. (408)
121 (meta-study or metastudy).ti,ab. (98)

122 realist review$.ti,ab. (85)
123 or/103-122 (2367554)
124 102 and 123 (12978)
125 limit 124 to (english language and yr="2011 -Current") (10037)

Cumulative Index to Nursing & Allied Health (CINAHL Plus)
via Ebsco https://www.ebscohost.com/
Inception to 2nd July 2021
Searched on: 6th July 2021
Records retrieved: 11644

S1	(MH "Child+")	700,706
S2	(MH "Adolescence+")	554,474
S3	TI (child* or pediat* or paediat* or preschool* or pre school* or schoolchild* or school age* or schoolage* or schoolboy* or schoolgirl*) OR AB (child* or pediat* or paediat* or preschool* or pre school* or schoolchild* or school age* or schoolage* or schoolboy* or schoolgirl*)	603,148
S4	TI (girl or girls or boy or boys or kid or kids) OR AB (girl or girls or boy or boys or kid or kids)	75,846
S5	TI (adoles* or preadolescen* or puberty or prepuberty or pubescen* or prepubescen* or teen* or youth* or preteen* or juvenil*) OR AB (adoles* or preadolescen* or puberty or prepuberty or pubescen* or prepubescen* or teen* or youth* or preteen* or juvenil*)	203,813
S6	TI (young N1 (people* or person or persons)) OR AB (young N1 (people* or person or persons))	22,850
S7	S1 OR S2 OR S3 OR S4 OR S5 OR S6	1,261,927
S8	(MH "Mobile Applications")	9,164
S9	(MH "Cellular Phone")	2,024
S10	(MH "Smartphone")	3,211
S11	TI (mhealth or m-health or "mobile health") OR AB (mhealth or m-health or "mobile health")	3,379
S12	TI (((mobile* or smartphone* or smart-phone* or iphone* or i-phone* or android or ipad* or i-pad* or tablet*) N2 (app or apps or application*))) OR AB (((mobile* or smartphone* or smart-phone* or iphone* or i-phone* or android or ipad* or i-pad* or tablet*) N2 (app or apps or application*)))	8,101
S13	TI (((portab* or electronic* or digital*) N2 (app or apps or application*))) OR AB (((portab* or electronic* or digital*) N2 (app or apps or application*)))	941
S14	TI (((health or healthcare or medical or clinical or NHS) N2 (app or apps))) OR AB (((health or healthcare or medical or clinical or NHS) N2 (app or apps)))	1,516

S15	TI (((mobile* or smartphone* or smart-phone*) N2 technolog*)) OR AB (((mobile* or smartphone* or smart-phone*) N2 technolog*))	2,784
S16	S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15	21,170
S17	S7 AND S16	3,792
S18	(MH "Virtual Reality")	5,683
S19	(MH "Virtual Reality Exposure Therapy")	112
S20	TI (((virtual or VR) N3 (therap* or treatment* or intervention* or health or healthcare or medic*))) OR AB (((virtual or VR) N3 (therap* or treatment* or intervention* or health or healthcare or medic*)))	3,546
S21	S18 OR S19 OR S20	8,596
S22	S7 AND S21	1,234
S23	(MH "Telehealth+")	28,347
S24	TI (ehealth or e-health or etherap* or e-therap*) OR AB (ehealth or e-health or etherap* or e-therap*)	4,019
S25	TI (Telemedic* or telehealth or telehealthcare or telecare or telemental or telemanagement or telerehabilitation or telepsychology or telepsychiatry or teletherapy or tele-medic* or tele-health or tele-healthcare or tele-care or tele-management or tele-mental or tele-rehabilitation or tele-psychology or tele-psychiatry or tele-therapy) OR AB (Telemedic* or telehealth or telehealthcare or telecare or telemental or telemanagement or telerehabilitation or telepsychology or telepsychiatry or teletherapy or tele-medic* or tele-health or tele-healthcare or tele-care or tele-management or tele-mental or tele-rehabilitation or tele-psychology or tele-psychiatry or tele-therapy)	12,817
S26	S23 OR S24 OR S25	34,190
S27	S7 AND S26	4,161
S28	TI (((digital* or digitis* or digitiz*) N3 (health or service* or deliver* or care or healthcare or intervention* or therap* or treatment*))) OR AB (((digital* or digitis* or digitiz*) N3 (health or service* or deliver* or care or healthcare or intervention* or therap* or treatment*)))	4,501
S29	S7 AND S28	593
S30	TI (((digital* or digitis* or digitiz*) N3 (device* or technolog* or tool*))) OR AB (((digital* or digitis* or digitiz*) N3 (device* or technolog* or tool*)))	3,999
S31	TI ((electronic* N3 (device* or technolog* or tool*))) OR AB ((electronic* N3 (device* or technolog* or tool*)))	4,750
S32	TI (technolog* N2 device*) OR AB (technolog* N2 device*)	1,416
S33	S30 OR S31 OR S32	10,002

S34	S7 AND S33	1,577
S35	TI gamification OR AB gamification	385
S36	TI (((game* or gaming or videogam*) N3 (therap* or treatment* or intervention* or health or healthcare or medic*))) OR AB (((game* or gaming or videogam*) N3 (therap* or treatment* or intervention* or health or healthcare or medic*)))	1,445
S37	TI exergam* OR AB exergam*	388
S38	TI ((serious N1 (game* or gaming))) OR AB ((serious N1 (game* or gaming)))	437
S39	TI ((gamified N2 (app or apps or application*))) OR AB ((gamified N2 (app or apps or application*)))	36
S40	TI (((game* or gaming or videogam*) N2 (app or apps or application*))) OR AB (((game* or gaming or videogam*) N2 (app or apps or application*)))	222
S41	S35 OR S36 OR S37 OR S38 OR S39 OR S40	2,650
S42	S7 AND S41	800
S43	TI Augment* N1 realit* OR AB Augment* N1 realit*	806
S44	TI real world space* OR AB real world space*	17
S45	TI ("AR device" or "AR devices") OR AB ("AR device" or "AR devices")	12
S46	S43 OR S44 OR S45	823
S47	S7 AND S46	83
S48	(MH "Wearable Sensors+")	5,867
S49	TI wearable* OR AB wearable*	3,282
S50	TI (((fitness or activit*) N2 track*)) OR AB (((fitness or activit*) N2 track*))	1,001
S51	TI (smartwatch* or smart-watch*) OR AB (smartwatch* or smart-watch*)	260
S52	TI pedometer* OR AB pedometer*	1,706
S53	TI fitbit* OR AB fitbit*	414
S54	S48 OR S49 OR S50 OR S51 OR S52 OR S53	10,226
S55	S7 AND S54	2,201
S56	(MH "Telemetry")	2,114
S57	(MH "Biosensors")	370
S58	TI telemetr* OR AB telemetr*	1,792

S59	TI ((telemonitor* or tele-monitor*)) OR AB ((telemonitor* or tele-monitor*))	932
S60	TI (((remote* or mobile* or electronic*) N2 monitor*)) OR AB (((remote* or mobile* or electronic*) N2 monitor*))	3,372
S61	TI ((remote* N2 (sensing or sensor or sensors or biosensor* or technolog*))) OR AB ((remote* N2 (sensing or sensor or sensors or biosensor* or technolog*)))	601
S62	(MH "Monitoring, Physiologic+")	108,554
S63	TI remote* OR AB remote*	18,146
S64	S62 AND S63	1,294
S65	TI (((wireless* or wifi or wi-fi) N3 monitor*)) OR AB (((wireless* or wifi or wi-fi) N3 monitor*))	356
S66	TI (((wireless* or wifi or wi-fi) N3 (sensing or sensor or sensors or biosensor*))) OR AB (((wireless* or wifi or wi-fi) N3 (sensing or sensor or sensors or biosensor*)))	350
S67	(MH "Wireless Communications")	12,118
S68	(S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S64 OR S65 OR S66 OR S67)	20,670
S69	S7 AND S68	2,375
S70	(MH "Text Messaging")	3,303
S71	(MH "Instant Messaging")	306
S72	TI ((text N1 messag* or texting or short N1 message* or SMS or digital* N1 messag* or instant N1 messag*)) OR AB ((text N1 messag* or texting or short N1 message* or SMS or digital* N1 messag* or instant N1 messag*))	5,369
S73	S70 OR S71 OR S72	6,881
S74	S7 AND S73	2,082
S75	(MH "Social Media")	16,812
S76	TI social N1 media* OR AB social N1 media*	13,700
S77	TI (twitter* or tweet or tweets or Facebook) OR AB (twitter* or tweet or tweets or Facebook)	8,618
S78	S75 OR S76 OR S77	27,545
S79	S7 AND S78	5,020
S80	(MH "Blogs")	3,665
S81	TI (Blog or blogs or blogging or weblog*) OR AB (Blog or blogs or blogging or weblog*)	3,120

S82	S80 OR S81	5,468
S83	S7 AND S82	492
S84	(MH "Therapy, Computer Assisted")	5,416
S85	(MH "User-Computer Interface")	10,791
S86	TI ((computer* N3 (therap* or intervention* or treatment*))) OR ((computer* N3 (therap* or intervention* or treatment*)))	7,797
S87	S84 OR S85 OR S86	18,202
S88	S7 AND S87	2,495
S89	(MH "Biomedical Enhancement")	78
S90	(MH "Medical Informatics")	5,169
S91	(MH "Health Informatics")	4,261
S92	(MH "Automation")	6,458
S93	TI ((technolog* N2 (health or healthcare or medical))) OR AB ((technolog* N2 (health or healthcare or medical)))	16,268
S94	S89 OR S90 OR S91 OR S92 OR S93	30,740
S95	S7 AND S94	2,235
S96	S17 OR S22 OR S27 OR S29 OR S34 OR S42 OR S47 OR S55 OR S69 OR S74 OR S79 OR S83 OR S88 OR S95	24,422
S97	(MH "Qualitative Studies")	122,525
S98	(MH "Interviews+")	230,898
S99	(MH "Focus Groups")	45,869
S100	TI qualitative OR AB qualitative	137,572
S101	TI interview* OR AB interview*	228,677
S102	TI experience* OR AB experience*	446,745
S103	TI Focus N1 group* OR AB Focus N1 group*	38,132
S104	TI ((accept* or attitude* or barrier* or belief* or believ* or concern* or experienc* or facilitat* or opinion* or perceiv* or percept* or preference* or view or views or viewpoint*)) OR AB ((accept* or attitude* or barrier* or belief* or believ* or concern* or experienc* or facilitat* or opinion* or perceiv* or percept* or preference* or view or views or viewpoint*))	1,188,293
S105	(MH "Pilot Studies")	83,728
S106	TI feasibility OR AB feasibility	51,274
S107	(MH "Surveys") OR (MH "Survey Research")	169,036

S108	(MH "Questionnaires+")	436,157
S109	TI ((survey* or questionnaire*)) OR AB ((survey* or questionnaire*))	471,556
S110	(MH "Multimethod Studies")	16,838
S111	TI ((mixed N1 method* or multimethod* or multi-method*)) OR AB ((mixed N1 method* or multimethod* or multi-method*))	22,060
S112	(MH "Meta Synthesis")	1,739
S113	TI (evidence N1 synthes* or realist N1 synthes*) OR AB (evidence N1 synthes* or realist N1 synthes*)	3,815
S114	TI (meta-synthes* or metasynthes*) OR AB (meta-synthes* or metasynthes*)	1,328
S115	TI (meta-ethnograph* or metaethnograph*) OR AB (meta-ethnograph* or metaethnograph*)	525
S116	TI (meta-study or metastudy) OR AB (meta-study or metastudy)	95
S117	TI realist N1 review* OR AB realist N1 review*	271
S118	S97 OR S98 OR S99 OR S100 OR S101 OR S102 OR S103 OR S104 OR S105 OR S106 OR S107 OR S108 OR S109 OR S110 OR S111 OR S112 OR S113 OR S114 OR S115 OR S116 OR S117	1,815,672
S119	S96 AND S118	13,684
S120	S96 AND S118 Limiters - Published Date: 20110101-20211231; English Language	11,644

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Supplementary Table 1: Summary of included studies (n=159)

Lead author and year study published	Study design	Type of technology and brief description	Country of study	Mean age (SD) years (overall mean age)	Study participants within age range (total sample size)	Study participants female (%)	Ethnicity	Study participants: LTC	CYP involved in the scoping/ design/ evaluation of the technology?
Abraham 2019	Qualitative (interviews) plus questionnaires	mHealth (smartphone app).	USA	NR	8	75	100% non-white Hispanic	At least one chronic condition e.g., malignancy, diabetes, asthma, chronic immuno-suppression.	Yes
Alfonsi 2020	Mixed methods	mHealth (smartphone app; iSpy).	Canada	13.98	22	50	NR	Type 1 diabetes.	No
Ammerlaan 2015	Pilot or feasibility study	Website and online portal.	The Netherlands	NR	NR	NR	NR	Juvenile idiopathic arthritis	Yes
Anderson 2018	Pilot or feasibility study	mHealth (smartphone app).	USA	13 (3.3)	32	50	100% black	Sickle cell disease	Yes
Andersen 2020	Qualitative (focus group discussions)	mHealth (smartphone app).	Denmark	NR	16	NR	NR	Type 1 diabetes.	Yes
Anttila 2020	Mixed Methods	Internet (web-based support system).	Finland	16	70	74	NR	Psychiatric patients based on symptoms of depression and anxiety.	Yes
Aschbrenner 2019	Mixed methods	mHealth (smart	USA	15.2 (1.5)	121	59	83% White	Mental health conditions.	NR

		phones) Social media.					9% Hispanic 7% Asian 1% Black		
Badawy 2016	Survey/ questionnaire	mHealth (smartphone app).	USA	15.3 (2.8)	60 (80)	51	94% Black 1% Hispanic 5% Mixed ethnicity	Sickle cell disease	No
Beaudry 2019	Pilot or feasibility study	mHealth (text messaging).	USA	15.7	13	NR	NR	Chronic conditions (recruited from paediatric inflammatory bowel disease, heart disease and type 1 diabetes clinics).	Yes
Belsky 2021	Qualitative (individual interviews)	mHealth (smartphone app).	USA	NR	NR	45	86% White 14% Black	Leukaemia, lymphoma, solid cancers, CNS cancers.	Yes
Beneitez 2020	Qualitative (interviews and focus groups)	Internet and Social media (Facebook, WhatsApp, Blogs, Moodle)	Spain	13.93 & 15.43*	31	78.57 & 85.71	NR	Juvenile idiopathic arthritis	No
Bergner 2018	Mixed methods	mHealth (text messaging).	USA	14.8 (1.5)	NR	52	87.5% White 12.5% Other	Type 1 diabetes	Yes
Bevan Jones 2020	Mixed methods	Digital psychosocial intervention	UK	16.5 (1.78)	36	74	95% White 5% Other	Depression or at elevated risk of depression.	No

		and mHealth (App).							
Birnie 2018	Usability/ user testing	Virtual Reality.	Canada	NR	17	29	59% White 22% Asian 17% Hispanic	Cancer.	Yes
Boggiss 2021	Qualitative (focus group discussions)	mHealth (smartphone apps) and Chatbots.	New Zealand	14.8 (1.4)	16	69	63% NZ European 25% Samoan 6% German 6% Asian	Type 1 diabetes.	No
Bradford 2015	Qualitative (joint interviews)	mHealth (tablet/e-tool).	Australia	NR	77 (129)	61	NR	Mental health.	Yes
Breakey 2018	Qualitative (individual interviews)	Social media (Skype).	Canada	14.91 (2.57)	23	0	64% White 12% Asian 9% Black 9% Other	Haemophilia.	Yes
Brigden 2018	Qualitative (individual interviews)	Online resources. Social media. Websites.	UK	14.89 (1.9)	9	67	100% white	Chronic fatigue syndrome, Myalgic encephalomyelitis	No
Browne 2020	Pilot or Feasibility study	mHealth (smartphone app).	UK	13.3 (2.7)	12	67	NR	Obesity.	Yes
Bul 2015	Pilot or feasibility study	Serious game.	The Netherlands	9.4 (NR)	42	NR	NR	ADHD.	No
Cai 2017	Qualitative	mHealth	UK	NR	25 (29)	64	NR	Juvenile Idiopathic	Yes

	(interviews and focus group discussions)	(smartphone app).						Arthritis	
Caltenco 2016	Co-design	Wearable (audio bracelet).	China	NR	21	NR	NR	Visual impairment	Yes
Carey 2018	Qualitative (interviews) plus questionnaires	Social media.	USA	17.5	29	75.90	86% White 10.3% Hispanic 3.4% Black	Depression or suicidal.	No
Carlsson 2021	Qualitative (individual interviews)	mHealth (smartphone app).	Sweden	NR	16	50	NR	Cancer, diabetes, heart diseases, haematological diseases, HIV infections and neurological disease.	Yes
Caron 2017	Qualitative (focus group discussions)	Social media.	USA	18 (NR)	3 (7)	100	NR	Cerebral palsy	No
Carpenter 2016	Qualitative (individual interviews)	mHealth (smartphone app).	USA	14.7 (1.6)	20	45	45% White 40% Black 15% Other	Asthma	No
Castel 2018	Qualitative (focus groups) plus questionnaires	Video game.	USA	14.7 (NR)	7 (12)	57%	NR	HIV.	Yes
Chan 2017	Survey/ questionnaire	Device (for inhaler).	USA	NR	220	NR	NR	Asthma.	Yes

Chapman 2016	Pilot or feasibility study	mHealth (smartphone app). Video game.	UK	14.7 (0.86)	11	63.6	100% White	Anxiety, depression.	Yes
Chen 2017	Pilot or feasibility study	mHealth (text messaging).	USA	NR	6	NR	NR	Depression and autism.	Yes
Choi 2020	Mixed methods	mHealth Integrative Education Programme (IEP) and self-management improvement app.	Korea	*Experiment 2 - 10.75 (1.55), Experiment 1 - 11.08 (1.83), Control - 10.82 (1.66)	35 (59)	50/41.7/63.6	NR	Spina bifida.	Yes
Clark 2018	Qualitative (interviews and focus group discussions)	Computerised mental health treatment/ support.	Australia	15.17 (1.91)	8	NR	NR	Clinical anxiety.	No
Clark 2018	Pilot or feasibility study	mHealth (text messaging).	Ireland	NR	27	52	NR	Phenylketonuria (PKU)	No
Cliffe 2020	Pilot or feasibility study	Internet (web-based CBT).	UK	15.6 (1.21)	39	72	NR	Mental health conditions with comorbid symptoms of insomnia: anxiety disorder, depressive disorder, mixed anxiety and	NR

								depressive disorder, eating disorder, post traumatic stress disorder, autism spectrum disorder.	
Connan 2019	Mixed methods	Internet (website e-learning module).	Canada	13.5 (4.5)	18 (33)	55	NR	Coeliac disease and type 1 diabetes.	Yes
Connelly 2020	Single site prospective cohort study, survey	mHealth (self-reporting app) and devices (sensor band).	USA	14 (2.1)	30	83.3	67% White 20% Hispanic 10% Black 3% Mixed ethnic group	Migraine.	Yes
Constantin 2017	Co-design of a technology	Digital intervention game.	UK	NR	15	33	NR	Autism Spectrum Disorder, Intellectual Disabilities.	Yes
Conte 2020	Usability/ user testing	mHealth (smartphone app).	Brazil	NR	25	NR	NR	Delay in the neuropsychomotor development.	No
Cook 2019	Mixed methods	Internet (web-based application).	Canada	NR (Median 13.2)	90	40	NR	Cancer.	Yes
Cooke 2021	Qualitative (interviews) plus questionnaires	mHealth (smartphone app).	Australia	NR	5	80	NR	Chronic pain (including chronic headache, back, abdominal, and limb pain).	Yes
Crossen 2020	Mixed methods	Telemedicine (video visits).	USA	NR	36	NR	NR	Type 1 diabetes.	Yes

Cushing 2016	Pilot or feasibility study	mHealth (smartphone app).	USA	14.1	7	71.4	57.1% Hispanic 14.3% Black 14.3% White 14.3% Mixed ethnic group	Asthma.	Yes
Davidson 2019	Pilot or feasibility study	mHealth (smartphone /tablet app).	USA	11.5	27	63	67% White 30% Black 4% Other	Post-traumatic stress disorder.	Yes
Davis 2017	Co-design of a technology	mHealth (smartphone app).	Australia	18	12 (20)	60	NR	Asthma.	No
Davis 2021	Qualitative (individual interviews)	Internet (website).	USA	13.3 (1.9)	60	36.7	38.3% Black 30% Native American 11.7% Hispanic 10% White 6.7% Mixed ethnic group 3.3% Other	Attention deficit hyperactivity disorder / Attention deficit disorder, asthma, anxiety or depression, diabetes, high blood pressure, epilepsy, eczema, chest pain, obesity, autism.	Yes
Davis 2021	Mixed	mHealth	Australia	NR	9 (12)	42	NR	Asthma.	No

	methods	(smartphone app).		(19.75)					
de Matos Serafim 2019	Mixed methods	Digital game.	Brazil	NR	21 (27)	NR	NR	Type 1 diabetes.	Yes
Dominguez 2017	Qualitative (interviews) plus questionnaires	Social media and Internet.	Spain	NR	9 (20)	89	NR	Cancer.	No
Douma 2019	Pilot or feasibility study	Internet (web-based chat intervention)	The Netherlands	15.1	29	62.1	NR	Bowel disease, cystic fibrosis, rheumatological disease, metabolic disease, heart disease and 'other'.	NR
Dozieres-Puyravel 2020	Survey/ questionnaire	mHealth (smartphone app).	France	NR	17 (36)	58.8	NR	Epilepsy.	Yes
Dulli 2020	Qualitative (interviews) plus questionnaires	Social media.	Nigeria	*21	301 (349)	87.7	NR	HIV.	Yes
Dunford 2020	Qualitative (interviews and focus groups)	Internet (website or tablet computer).	UK	NR	16	NR	NR	Acquired brain injury.	No
Eaton 2020	Qualitative (interviews) plus questionnaires	mHealth (text message-based reminder system, with motivational messages, to	USA	*17 (3.22)	NR (18)	NR	NR	Chronic kidney disease.	Yes

		take antihypertensive medication).							
Erickson 2018	Qualitative (interviews) plus questionnaires	mHealth (smartphone app).	USA	*20.9 (4.92)	85 (across whole age range of 15-29 years)	46	72% White 21% Hispanic 12% Black 1% Asian	Cancer.	No
Falconer 2019	Mixed methods (Two case summaries)	Avatar-based virtual reality	UK	13.5	2	0	NR	Case summary liver transplant, experienced trauma related to surgery, presenting with acute anxiety and post traumatic flashbacks. Case summary: suicidal thoughts, presented with non-specific suicidal ideation.	No
Fedele 2020	Qualitative (joint interviews)	mHealth (App) and Device (to monitor inhaler use).	USA	Uni of Florida 15 (1.04) Uni of Kansas 15.7(0.95)	23	60.9	56.5% White 30.4% Mixed ethnic group 13% Black	Asthma.	Yes
Francis 2020	Mixed methods	mHealth (smartphone app).	Australia	NR	22	50	NR	Cystic fibrosis.	Yes

Fuemmeler 2020	Pilot or feasibility study	mHealth (smartphone app).	USA	14.8 (1.97)	15 1 (16 - 1)	40	87% White 13% Other	Cancer.	Yes
Gao 2020	Qualitative (interviews and focus groups)	mHealth (smartphone app).	China	NR	15	53.3	NR	Pneumonia, leukaemia, retinoblastoma, non-Hodgkin's lymphoma.	Yes
Garrido 2019	Qualitative (focus group discussions)	mHealth (smartphone app).	Australia	NR	23	65.2	NR	Depression.	Yes
Ghanouni 2020	Qualitative (interviews and focus groups)	Video game.	Canada	14.1 (1.9)	4 (26)	0	NR	Autism spectrum disorder.	No
Gibson 2016	Qualitative (individual interviews)	mHealth (smartphone app).	New Zealand	16 (NR)	63	71.5	NR	Mental health.	No
Grande 2019	Pilot or feasibility study	mHealth (smartphone app).	Sweden	12.3 (2.3)	15	46.7	NR	Juvenile idiopathic arthritis.	Yes
Grasaas 2019	Mixed methods	mHealth (smartphone app).	Norway	NR	13	NR	NR	Chronic pain.	Yes
Grove 2021	Co-design of a technology	Chatbot artificial intelligence.	Australia	*16.8 (questionnaires) 16.2 (interviews)	70	57	NR	Mental health conditions	Yes
Hamari 2019	Randomized Controlled	Active video games.	Finland	7.8	36	72.2	NR	Cancer - acute lymphocytic	Yes

	Trial, with activity diary and questionnaire							lymphoma, Wilm's tumour, Burkitt's lymphoma, non-Hodgkin's lymphoma, Hodgkin's lymphoma and other neoplasms.	
Han 2015	Qualitative (interviews) plus questionnaires	mHealth (text messaging).	New Zealand	13.7 (NR)	30	57	77% White 20% Hispanic 3% Asian	Type 1 diabetes mellitus.	Yes
Herbert 2016	Pilot or feasibility study	mHealth (text messaging).	USA	15.13 (1.14)	23	61	75% White 21% Black 4% Hispanic	Type 1 diabetes mellitus.	No
Holmberg 2018	Qualitative (individual interviews)	Social media and internet.	Sweden	NR (median = 15)	20	45	NR	Obesity.	No
Holtz 2017	Co-design of a technology	mHealth (smartphone app).	USA	11.6 (NR)	5	20	NR	Type 1 diabetes mellitus.	Yes
Holtz 2019	Usability/ user testing	mHealth (smartphone app).	USA	NR	10	50	NR	Type 1 diabetes.	No
Howard 2017	Usability/ user testing	Smart track device.	UK	13.4 (NR)	7	29	NR	Asthma.	Yes
Hronis 2019	Mixed methods	Internet (online CBT programme).	Australia	NR	21	100	NR	Intellectual disability.	No
Huby 2016	Qualitative	Web-based	UK	NR	26	36	42% Asian	Chronic kidney	Yes

	(individual interviews)	application.					58% White	disease.	
Husted 2018	Qualitative (individual interviews)	mHealth (smartphone app).	Denmark	Overall 18 (2.6)	NR (20)	55	NR	Type 1 diabetes mellitus.	Yes
Iio 2020	Qualitative (individual interviews)	mHealth (smartphone app).	Japan	NR	27	33	NR	Asthma.	Yes
Jaser 2020	Pilot or feasibility study	Device (an actigraph - sleep measuring device).	USA	15.3 (1.35)	38	54	74% White 10% Black 8% Hispanic 8% Mixed ethnic group	Type 1 diabetes.	No
Jensen 2016	Qualitative (interviews) plus questionnaires	mHealth (smartphone app and text messages).	USA	14.29 Years (1.12)	16	75	56% White 25% Hispanic 19% Other	Obesity.	Yes
Jibb 2017	Usability/ user testing	mHealth (smartphone app).	Canada	14.8 (2)	16	56	NR	Cancer.	Yes
Jibb 2018	Pilot or feasibility study	mHealth (smartphone app).	Canada	NR	20	NR	NR	Cancer.	Yes
Jones 2018	Qualitative (individual interviews)	Online support groups.	UK	17 (NR)	16 (21)	53	NR	Allergies.	No
Kaushal 2019	Pilot or feasibility	mHealth (text	USA	13.4	20	30	50% White	Type 1 diabetes.	NR

	study	messaging).					30% Other 20% Black		
Kelly 2019	Mixed methods –	Telehealth.	USA	15.2 (NR)	33	67	76% White 18% Mixed ethnic group 3% Black 3% Asian	Transplant recipients.	Yes
Khan 2021	Pilot or feasibility study	Internet (web-based) behavioural intervention.	UK	12 (7.2)	112 (in intervention arm) 112 (in control arm); 224 in total - quants baseline; and usage stats). 20 children included in interviews (intervention)	20	90% White 10% Other	Tics.	No
Klassen 2018	Pilot or feasibility study	Wearable sensor, mHealth (smartphone app).	The Netherlands	13.9 (NR)	21	52	NR	Type 1 diabetes.	Yes
Knibbe 2018	Qualitative (focus group discussions)	Social technologies (Social media, mHealth,	Canada	NR	8	62.5	NR	Cerebral palsy.	No

		website, games).							
Knoblock-Hahn 2016	Qualitative (focus group discussions)	mHealth (apps), internet, social media.	USA	NR	48	69	NR	Overweight and obesity.	Yes
Koster 2015	Qualitative (focus group discussions)	mHealth (apps), internet, social media.	The Netherlands	NR	21	52	86% Dutch	Asthma.	Yes
Lai 2020	Mixed methods	Virtual reality.	USA	NR	2	50	100% White	Spina bifida.	Yes
Lam 2015	Qualitative (focus group discussions)	Social media, robotics and gaming.	Canada	11 (NR)	7	14	NR	Cerebral palsy and acute brain injury (ABI).	Yes
Le Marne 2018	Pilot or feasibility study	mHealth (smartphone app).	Australia	14.49 (1.38)	51	53	NR	Epilepsy.	Yes
LeRouge 2016	Community-based participatory design (focus groups and user testing)	Computer-based intervention.	USA	NR	70	NR	NR	Overweight.	Yes
LeRouge 2020	Usability/user testing	mHealth (consumer Health Technology (CHT) social support tool).	USA	NR	48	NR	NR	Obesity.	Yes
Ledderer 2019	Qualitative (joint	mHealth (smartphone	Denmark	NR	5	40	NR	Type 1 diabetes.	Yes

	interviews)	app).							
Linder 2021	Qualitative (individual interviews)	mHealth (smartphone app).	USA	8	20	35	85% White 15% Hispanic	Cancer.	NR
McPherson 2019	Qualitative (focus group discussions)	mHealth (smartphone app).	Canada	NR (median = 12)	7	43	NR	Obesity.	No
Mendoza 2017	Pilot or feasibility study	Fit-Bit and Facebook virtual support group.	USA	16.6 (1.5)	60	59.3	71.2% White 11.9% Hispanic 6.8% Other 3.4% Black	Cancer (e.g. leukaemia, CNS, lymphoma, solid tumours).	Yes
Modi 2017	Qualitative (focus groups) and subsequent user testing	Internet (web-based program, Epilepsy journey).	USA	14.3 (1.29) and 15.9 (1.29)	11	73	82% White 9% Black 9% Hispanic	Epilepsy.	Yes
Modi 2019	Survey/ questionnaire	Internet (web-based program, Epilepsy Journey, to improve executive function behaviours in adolescents with	USA	15.3 (1.3)	31	56	NR	Epilepsy diagnosis and executive function deficits.	NR

		epilepsy).							
Moola 2018	Qualitative (individual interviews)	Social media (e.g. Facebook, Facetime, Instagram, chat rooms).	Canada	NR	4 (9)	100	NR	Cystic fibrosis.	No
Morrow 2018	Co-design plus qualitative	mHealth (smartphone app) and wearable sensor.	Australia	11.1 (2.5)	39	35.9	NR	Anxiety.	Yes
Morton 2017	Pilot or feasibility study	mHealth (text messaging).	UK	12 (NR)	17	NR	NR	Cystic fibrosis.	Yes
Nani 2019	Qualitative (individual interviews)	Digital interactive games - Xbox Kinect.	Greece	NR	6	67	100% Greek	Cancer.	No
Nass 2019	Survey/ questionnaire	Social media (a self-care encouragement group on Facebook® for CYP with Type 1 diabetes).	Brazil	NR	NR (35)	NR	NR	Type 1 diabetes.	NR
Newton 2020	Qualitative (interviews) plus questionnaires	mHealth (smartphone app).	Canada	14 (1.5)	8 (12)	100	NR	Anxiety.	Yes
Nicholas 2017	Qualitative	Internet.	Canada	NR	13 (24)	46	77%	Complex condition	No

	(individual interviews)						White 23% Other	including juvenile arthritis, chronic kidney disease, and cancer.	
Nichols 2020	Qualitative (joint interviews)	mHealth (smartphone app).	USA	10.89 (2.73)	19	37	84% Black 11% Mixed ethnic group 5% White	Asthma.	Yes
Nieto 2015	Qualitative (interviews) plus questionnaires	Internet (website).	Spain	11	9	44.4	NR	Persistent abdominal pain.	Yes
Nightingale 2017	Qualitative interviews (individual and joint)	mHealth (smartphone app).	UK	NR	17	47	76% White 24% Other	Chronic kidney disease (CKD).	Yes
O'Bree 2021	Pilot or feasibility study	Entourage - Moderated Online Social Therapy (MOST)	Australia	*19.8	NR (68)	48.5 (3 participants non-binary)	NR	Social anxiety disorder.	No
Park 2020	Mixed methods	Social media (Facebook-based intervention program).	Korea	15.2 (5.3), 16.7 (1.1)	23	44	NR	Childhood cancer.	Yes
Pelosi 2019	Exploratory descriptive quantitative study	Six interactive games from Nintendo Wii.	Brazil	NR	13	NR	NR	Down's syndrome.	No

Perry 2017	Randomized clinical trial	mHealth (smartphone app).	USA	15.4 (NR)	34	62	62% Black 35% White 3% Other	Asthma.	No
Phelan 2021	Qualitative (interviews) plus questionnaires	Head-Mounted Display VR (HMD-VR) experience (games-based rehabilitation activities.	UK	11.4 (2.65)	10	60	NR	Children with upper limb injuries requiring rehabilitative care (burns and fractures).	Yes
Powell 2019	Qualitative (individual interviews)	All types.	UK	NR	7 (21)	28.6	NR	Attention deficit hyperactivity disorder.	Yes
Radovic 2017	Qualitative (individual interviews)	Social media.	USA	16 (2.3)	23	78	NR	Depression.	Yes
Ramsey 2018	Qualitative (individual interviews)	Health technology (including social media, messaging).	USA	NR	20	50	50% Black 45% White 5% Hispanic	Asthma.	No
Raval 2017	Qualitative (individual interviews)	mHealth (smartphone app).	USA	NR	2	NR	NR	Colorectal conditions.	No
Rensburg 2015	Qualitative (individual interviews)	Social media.	USA	NR	19 (20)	74	79% White 16% Hispanic 5% Mixed ethnic	Psychiatric illness (ADHD, major depressive disorder, PTSD, anxiety, mood disorders not-specified).	No

							group		
Roberts 2016 Roberts 2018 Roberts 2019 **	User testing with individual interviews Mixed methods Qualitative (individual interviews)	mHealth (smartphone app).	USA	14.7 (1.6)	20	45	40% Black 45% White 13% Other	Asthma.	Yes
Ruggiero 2015	Qualitative (interviews and focus group discussions)	mHealth (tablet based).	USA	13 (NR)	24 (45)	65	86% Black 14% White	Post-Traumatic Stress Disorder or Trauma History	Yes
Sage 2017	Co-design of a technology	mHealth (smartphone app).	USA	14.2 (2.5)	8	50	50% White 38% Black 12% Hispanic	Asthma.	Yes
Santana 2020	Usability/user testing	mHealth (smartphone app).	Brazil	NR	7	42.80	NR	Chronic kidney disease.	Yes
Santesteban-Echarri 2017	Qualitative (interviews and focus group discussions)	Social media.	Australia	18.5 (2.1)	42	NR	NR	Major depressive disorder.	Yes
Schmidt 2020	Usability/user testing	mHealth (smartphone app).	USA	13.7	6	50	90% White 10% Black	Mild traumatic brain injury.	No
Schneider 2016	Qualitative (individual interviews)	mHealth (smartphone app).	USA	NR	16	NR	NR	Asthma.	Yes
Schneider 2020	Pilot or feasibility	mHealth (smartphone	USA	14.4 (1.6)	20	55	55% Black 30%	Asthma.	Yes

	study	app).					White 15% White		
Schoenfelder 2017	Qualitative (interviews) plus questionnaires	FitBit Flex Wristband and Facebook Group.	USA	15.5 (1.4)	11	54	10% Black 80% White 10% Mixed ethnic group	ADHD.	Yes
Sezgin 2018	Co-design plus qualitative	mHealth (smartphone app).	USA	NR	13	54	NR	Chronic conditions included at least one of the following diseases: T1D, cystic fibrosis (CF), epilepsy, and attention deficit hyperactivity disorder (ADHD).	Yes
Shellmer 2016	Usability/ user testing	mHealth (smartphone app).	USA	9 (NR)	7 (16)	57	86% White 14% Hispanic	Solid organ transplant recipient	Yes
Simons 2016	Qualitative (focus group discussions)	mHealth (smartphone app).	UK	NR	8	12.5	87.5% White 12.5% Other	ADHD	Yes
Singleton 2016	Qualitative (individual interviews)	Internet and social network sites.	UK	NR	12	NR	NR	Mental illness	No
Sinisterra 2020	Qualitative (focus group	mHealth (smartphone	USA	14.25 (1.4)	8 (30)	37.5	37.5% White,	Type 1 diabetes.	Yes

	discussions)	app).					non-Hispanic		
Sinoo 2018	Survey/questionnaire	Avatar and physical robot.	The Netherlands	9.1 (1.1)	21	37	NR	Type 1 diabetes.	NR
Smelror 2019	Pilot or feasibility study	mHealth (smartphone app).	Norway	*17.7 (1.6)	3	NR	NR	Early-onset psychosis.	No
Sparapani 2017	Qualitative (focus group discussions)	Video games.	Brazil	9.8	19	74	NR	Type 1 diabetes	Yes
Stiles-Shields 2019	Usability/user testing	mHealth (smartphone app).	USA	*18.11 (4.55)	29	59	72% White 13.8% Hispanic 6.9% Black 6.9% Asian	Spina bifida.	No
Stinson 2015	Qualitative (semi structured, audio-taped interviews and observation) 'Formative usability testing' at one point.	Internet (a bilingual, English and French, Internet-based self-management program for adolescents with cancer and their parents).	Canada	NR	22	40	NR	Cancer.	Yes
Strauss 2019	Qualitative (focus group	Video and computer	Australia	15.6	14	7 (Male/trans	NR	Mental health conditions	Yes

	discussions)	game.				64%; Agender/non-binary 21%, Bi-gender7%)			
Tark 2019	Qualitative (individual interviews)	mHealth (smartphone app).	Estonia	9.1 (1.5)	9	44	NR	Cancer (central nervous system tumour, leukaemia and others).	Yes
Terlouw 2020	Qualitative (interviews and focus groups)	Digital, Game-Like Intervention.	The Netherlands	NR	8 (21)	25	NR	Autism spectrum disorder.	Yes
Teufel 2018	Qualitative (interviews) plus questionnaires	mHealth (smartphone app); Inhaler monitoring device.	USA	NR	14	64	93% Black 7% Other	Asthma.	Yes
Thabrew 2016	Qualitative (focus group discussions)	eHealth interventions (online treatment programme).	New Zealand	NR	22	45	73% White 17% Mixed ethnic group 10% Asian	Various - CF, Crohn's, diabetes, epilepsy, JIA, chronic migraines, Wilson's disease, thalassaemia, bronchiectasis.	Yes
Tindall 2021	Qualitative (interviews and focus groups)	Computer - behavioural activation programme.	UK	*Community sample: 13.8 (0.83); Service use sample: 15.2	18	67	88% White 12% Black	Depression.	Yes

				(1.09)					
Tsimicalis 2017	Qualitative (individual interviews)	Computer program - Sisom (interactive assessment and communication tool)	Canada	8.8 (2.53)	10	60	NR	Cancer.	Yes
Tsimicalis 2018	Mixed methods	Computer program.	Canada	8.2 (1.86)	34	56	50% White 17.6% Mixed ethnic group 11.7% Middle Eastern 8.8% Black 8.8% Asian	Cancer.	Yes
Vaala 2018	Survey/ questionnaire	Social media.	USA	14.52 (1.69)	134	56	84.3% White 10.4% Black 5.2% Hispanic 1.5% Asian	Type 1 diabetes.	Yes
Vaughn 2021	Longitudinal mixed methods	Wearable device (Apple watch	USA	NR	20	55	33% Black 15% Hispanic	Cancer.	Yes

		series 1) and mHealth (smartphone app).							
Vaughn 2020	Qualitative (interviews) plus questionnaires	mHealth (smartphone app).	USA	14.6	6 (36)	83	67% Black 17% Hispanic 17% Mixed ethnic group	Cancer or undergoing blood and marrow transplantation.	Yes
Waite-Jones 2018	Qualitative (interviews and focus group discussions)	mHealth (smartphone app).	UK	NR	8	75	NR	Juvenile arthritis	Yes
Waite-Jones 2018	Qualitative (interviews and focus group discussions)	mHealth (smartphone app).	UK	NR	9	78	NR	Juvenile arthritis	Yes
Wang 2017	Usability/ user testing	mHealth (smartphone app).	China	NR	10	50	NR	Cancer.	No
White 2018	Pilot or feasibility study	Device.	Canada	NR	20	10	80% White 10% Black 5& Asian 5% Hispanic	Autism.	No
Whiteley 2018	Mixed methods	mHealth (smartphone app).	USA	22 (NR)	(NR) 20	40	50% Black 30% White	HIV.	Yes

							10% Hispanic		
Whiteside 2019	Pilot or feasibility study	Internet and mHealth (web portal and smartphone app).	USA	12.63 (2.8)	6	100	NR	Anxiety.	No
Williamson 2015	Mixed methods	Internet (online intervention) .	UK	*Study 1 - 15.68 (1.89), Study 2 Phase 1 - 14.5 , S2 Phase 2 - 14.5	41 (98)	54	NR	Anxiety due to visible difference (disfigurement).	Yes
Wysocki 2016	Co-design plus qualitative	Website.	USA	NR	36	NR	NR	Type 1 diabetes.	Yes
Yi-Frazier 2015	Photovoice (participatory action research)	Social media and mHealth (smartphone app).	USA	16.4 (1.6)	20	65	90% White 10% Hispanic	Type 1 diabetes.	Yes
Yildirim 2021	Mixed methods	Serious games.	Turkey	8.6 (1.13)	23 (33)	20	NR	Specific learning difficulties.	Yes

* Study only reported sub-group age detail rather than study sample overall
** Three papers with the same participants

CAMHS: Child and adolescent mental health service
CBT: Cognitive behaviour therapy
CHT: Consumer health technology
CNS: Central nervous system
CYP: Children and young people

ED: Emergency department
F2F: Face to face
HIV: Human immunodeficiency virus
HMD-VR: Head-mounted display virtual reality
IEP: Integrative education program
LTC: Long-term condition
MOST: Moderated online social therapy
NR: Not reported
NZ: New Zealand
SD: Standard deviation
UK: United Kingdom
USA: United States of America
VR: Virtual reality

Supplementary Table 2: Summary of preferences about health technology raised by CYP (n=159)

Lead author and date	Age range (years)*	Study participants: LTC	Type of technology and brief description	Setting (where technology was studied)	Use of technology (prospective/ retrospective/ hypothetical)	Preferences
Abraham 2019	7-17	At least one long-term condition e.g. malignancy, diabetes, asthma, chronic immuno-suppression.	mHealth (smartphone app).	Pharmacy clinic and home	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Rewards and incentives ● Colours ● Interactive and customisable graphics/design ● Security function on app
Alfonsi 2020	10-17	Type 1 diabetes.	mHealth (smartphone app; iSpy).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use/usability ● Photos ● Speed of image recognition
Ammerlaan 2015	17-18 (17-22)	Juvenile idiopathic arthritis.	Website and online portal	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Content is understandable ● Videos (relating to others)
Anderson 2018	7-18	Sickle cell Disease	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Gamification ● Interaction (chat function) ● Reminders ● Rewards (ability to earn points)
Andersen 2020	9-13	Type 1 diabetes.	mHealth (smartphone app).	NR	Prospective (exploratory use - hypothetical)	● Transportable device ● Accessible information ● Customisable content (e.g. select foods as favourites) ● Security/alarm

Anttila 2020	15-17	Psychiatric patients based on symptoms of depression or anxiety.	Internet (web-based support system).	Psychiatric clinic	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Colours ● Cartoon characters ● Ease of use ● Flexibility (work through at own pace)
Aschbrenner 2019	13-18	Mental health conditions (anxiety disorders, bipolar disorders, psychotic disorders).	mHealth (smart phones) and Social media.	NR	Prospective (exploratory use - hypothetical)	● Customisable/ personalisation ● Rewards ● Relating/sharing with others ● Privacy and moderation
Badawy 2016	12-17 (12-22)	Sickle cell disease	mHealth (smartphone app)	NR	Prospective (exploratory use - hypothetical)	● Reminders ● Personalisation (Avatar customisation) ● Ease of use ● Being able to track their condition/health
Beaudry 2019	14-17	Long-term conditions (recruited from paediatric inflammatory bowel disease, cardiology and type 1 diabetes clinics).	mHealth (text messaging)	Healthcare organisation	Retrospective (actual/genuine use; not in a clinic only) – longer term (> 1 week)	● Ease of use ● Friendly ● Frequency of texts
Belsky 2021	15-18*	Leukaemia, lymphoma, Solid cancers, central nervous system cancers.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) – longer term (> 1 week)	● User-friendly ● Reminder function ● Large images ● Customisable (add in own medications)
Beneitez 2020	10 – 18 (interviews);8 – 14 (focus groups)	Juvenile idiopathic arthritis.	Internet and social media (Facebook, WhatsApp, Moodle, Blog)	Hospital/clinic	Prospective (exploratory use – hypothetical)	● Familiar/comfortable technology ● Chat function
Bergner 2018	13-17	Type 1 diabetes.	Text messaging	Home	Retrospective (actual/genuine use;	● Tracking their health

					not in a clinic only) - longer term (> 1 week)	
Bevan Jones 2020	14-18*	Depression or at elevated risk of depression.	Digital psychosocial intervention and app	Home	Retrospective (actual/genuine use; not in a clinic only) – longer term (> 1 week)	● Interactive(quizzes) ● Personalisation/ customisable ● Images ● Jargon-free ● Layout ● Personal stories/relating to others ● Ease of use
Birnie 2018	7-18	Cancer.	Virtual reality	Hospital	Retrospective (actual/genuine use; not in a clinic only) – longer term (> 1 week)	● Interaction ● Personalisation (number of characters, colours) ● Notifications
Boggiss 2021	13-17	Type 1 diabetes.	mHealth (smartphone apps) and Chatbots	NR	Prospective (exploratory use – hypothetical)	● Access (non-Wifi) ● Personal stories ● Easy to use ● Age-appropriate ● Confidential/private
Bradford 2015	12-18 (12-25)	Mental health (non-specific).	mHealth (Tablet/ e-tool)	NR	Prospective (exploratory use – hypothetical)	● Sharing with others (opportunity to communicate potentially embarrassing things through typing where body language is not visible).
Breakey 2018	12 – 18*	Haemophilia.	Social media (Skype)	NR	Prospective (exploratory use – hypothetical)	● Transportable ● Flexibility (to schedule sessions) ● Personalisation

						• Relating to others/ others' stories
Brigden 2018	12-17	Chronic fatigue syndrome, Myalgic encephalomyelitis	Online resources, social media, websites	NR	Prospective (exploratory use – hypothetical)	• Trustworthy/reliable • Sharing with others with same condition • No jargon/ user-friendly content
Browne 2020	9-16	Obesity.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) – longer term (> 1 week)	• Self-monitoring • Device features (watch)
Bul 2015	8-11	ADHD.	Serious game	Home	Retrospective (actual/genuine use; not in a clinic only) – longer term (> 1 week)	• Personalisation (travel to different plants; characters)
Cai 2017	10-18 (10-23)	Juvenile Idiopathic Arthritis.	Mobile app	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Tracking their symptoms • Ease of use • Rewards • Design - colours, easy to read fonts, pictures
Caltenco 2016	2-16	Visual impairment.	Wearable (audio bracelet)	During focus group	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Retrospective (testing the technology, such as usability testing but not in real life setting)
Carey 2018	9-18*	Depression or suicidal.	Social media	Emergency department (ED) of a hospital	Retrospective (actual/genuine use; not in a clinic only) – longer term (> 1 week)	• Sharing with/relating to others (who understand)
Carlsson 2021	6 – 13	Cancer, diabetes, heart diseases, haematological	mHealth (smartphone app)	Healthcare organisation –	Retrospective (actual/genuine use;	• Ease of use • Encouraged their voice

		diseases, HIV infections and neurological disease.		three outpatient units (oncology, neurology, counselling) and one inpatient unit (counselling)	not in a clinic only) – longer term (> 1 week)	● Animation (fun and interesting) ● Personalisation (of avatar character) ● Use – clicking rather than speaking ● Flexibility (of when/where to use)
Caron 2017	14-18 (14-21)	Cerebral palsy.	Social media	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Sharing with others ● Interaction
Carpenter 2018	12-17	Asthma.	mHealth (smartphone app)	Home/school	Retrospective (actual/genuine use; not in a clinic only) - short-term (≤ 1 week)	● Reminders ● Quizzes ● Sharing with others (ability to choose who they shared their data with) ● Tracking triggers and symptoms
Castel 2018	13-16 (13-24)	HIV.	Video game	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Gamification (challenges) ● Personalisation (of game to suit interests) ● Rewards
Chan 2017	6-15	Asthma.	Device (for inhaler)	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Personalisation (ringtone e.g. Simpsons) ● Reminders
Chapman 2016	13-16	Anxiety, depression	mHealth (smartphone app) and video game	NR	Retrospective (actual/genuine use; not in a clinic only) -	● Gamification

					longer term (> 1 week)	
Chen 2017	NR (adolescents)	Depression and autism	mHealth (text messaging)	NR	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Customisation (number of messages) ● Interaction with clinician
Choi 2020	7-12	Spina bifida.	mHealth Integrative Education Program (IEP) and self-management improvement app.	NR	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Sharing with others ● Ability to track their condition easily/quickly
Clark 2018	12-18	Anxiety	Computerised mental health treatment/support	In interview/focus group	Prospective (exploratory use – hypothetical)	● Privacy/security ● Trustworthy (e.g. logos) ● Sharing with others (controlling this) ● Content - videos of others with same condition
Clark 2018	1.5 - 14	Phenylketonuria (PKU)	mHealth (text messages)	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Customisation (reminders) ● Flexibility (when to receive reminders)
Cliffe 2020	14-17	Mental health conditions with comorbid symptoms of insomnia: anxiety disorder, depressive disorder, mixed anxiety and depressive disorder, eating disorder, post traumatic stress disorder, autism spectrum disorder.	Internet (web-based CBT)	Child and adolescent mental health service (CAMHS)	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Personalisation ● Accessibility/convenience ● Don't need to speak - easier ● Flexibility (use when you want)

Connan 2019	9-18	Coeliac disease and type 1 diabetes.	Internet (website, e-learning module)	Paediatric hospital	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Colours • Ease of use • Structure • Interactivity • Cartoons/animations (not too serious)
Connelly 2020	10.3-17.8	Migraine.	mHealth (self-reporting app) and devices (Sensor bands)	Continuous activities throughout the day	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Ease of use
Constantin 2017	11-15	Autism Spectrum Disorder, Intellectual Disabilities.	Digital intervention, game	NR	Prospective (exploratory use – hypothetical)	• Rewards • Personalisation (of messages and animations)
Conte 2020	3 - 9	Delay in the neuropsychomotor development.	mHealth (smartphone app).	Association of Parents and Friends of Exceptional People (Charity)	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Ease of use
Cook 2019	8-18	Cancer.	Internet (web-based application).	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Ease of use • Layout - horizontal score bars • Colours (multi)
Cooke 2021	11 - 14	Chronic pain (including chronic headache, back, abdominal, and limb pain).	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - short-term (<1 week)	• Tracking/diary • Sharing experiences/relating to others • Ability to track their condition
Crossen 2020	8-17	Type 1 diabetes.	Telemedicine (video visits)	Home	Retrospective (actual/genuine use; not in a clinic only) -	• Sharing data • Frequency (of changes between visits)

					longer term (> 1 week)	
Cushing 2016	11-18	Asthma.	mHealth (smartphone app)	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Rewards ● Tracking (visual) of their medication adherence
Davidson 2019	5 - 16	Post-Traumatic Stress Disorder.	mHealth (smartphone/ tablet app).	Community mental health clinics, Children advocacy centres	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Can express themselves ● Interactive - spinning wheel ● Games
Davis 2017	15-18 (15-24)	Asthma.	mHealth (smartphone app)	NR	Retrospective (actual/genuine use; not in a clinic only) - short-term (≤ 1 week)	● Interaction (with others with same condition) ● Design - colours and fonts ● Goal setting ● Reminders
Davis 2021	11-17	Attention deficit hyperactivity disorder / Attention deficit disorder, asthma, anxiety or depression, diabetes, high blood pressure, epilepsy, eczema, chest pain, obesity, autism.	Internet (website)	Online	Prospective (exploratory use - hypothetical)	● Interactive (questions, chat box, video call) ● Chat option ● Informative - prompts to ask clinicians
Davis 2021	15-18*	Asthma.	mHealth (smartphone app).	Home	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Ease of use ● Visual design - colours, layout ● Flexibility (of functionality; setting goals and reminders)
De Matos 2019	10-18*	Type 1 diabetes.	Digital Game.	Reference centre for care of	Retrospective (testing the technology, such	● Visual design - size of images

				patients with type 1 diabetes.	as usability testing but not in real life setting)	• Content
Dominguez 2017	14-18 (14-29)	Cancer.	Social media and internet	Interviews	Prospective (exploratory use – hypothetical)	• Content - not overly negative • Trustworthy • Videos instead of text
Douma 2019	12.3-18.9	Bowel disease, cystic fibrosis, rheumatological disease, metabolic disease, heart disease and 'other'.	Internet (web-based chat intervention).	Healthcare setting	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Ease of use • Content - understandable • Interaction (chat room) • Sharing with others
Dozieres-Puyravel 2020	10-18	Epilepsy.	mHealth (smartphone app).	NR	Prospective (exploratory use - hypothetical)	• Flexibility (Reminders-medication) • Content (customisable)- Planner for appointments and contact outside of clinic times
Dulli 2020	15 – 18*	HIV.	Social media	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Ease of use • Interaction (riddles) • Privacy (secret groups) • Flexibility (of when to interact)
Dunford 2020	6 - 18	Acquired brain injury.	Internet (website or a tablet computer)	Home and hired venue	Prospective (exploratory use - hypothetical)	• Familiar/comfortable technology • Chat function
Eaton 2020	11-18*	Chronic kidney disease.	mHealth (text message-based reminder system, with motivational messages, to take antihypertensive medication).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Content (reminders) • Language used in messages - and variation

Erickson 2018	15-18*	Cancer.	mHealth (smartphone app).	Healthcare organisation - when attending chemotherapy	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Visual design
Falconer 2019	12-15	Case summary: Liver transplant, experienced trauma related to surgery, presenting with acute anxiety and post traumatic flashbacks. Case summary: suicidal thoughts, presented with non-specific suicidal ideation.	Avatar-based virtual reality	Child and adolescent mental health service (CAMHS)	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Visual ● Personalisation (add voices and emotions to avatars) ● Use meant less talking
Fedele 2020	13-17	Asthma.	mHealth (digital Intervention) and interactive device to monitor inhaler use	NR	Prospective (exploratory use - hypothetical)	● Personalisation (of notifications; reminders; tracking their condition) ● Interactive videos
Francis 2020	12-17	Cystic fibrosis.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Interaction (virtual buddy; chat room) ● Reminders ● Content - contact details of counselling
Fuemmeler 2020	12-17	Cancer.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Gamification ● Rewards
Gao 2020	5-7 years	Pneumonia, Leukaemia, Retinoblastoma, Non-	mHealth (smartphone app).	NR	Retrospective (testing the technology, such	● Ease of use ● Music

		Hodgkin's lymphoma.			as usability testing but not in real life setting)	● Fun/engaging ● Age-appropriate
Garrido 2019	13 – 18*	Depression.	mHealth (smartphone app).	University	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Personalisation - characters and content ● Design - colourful, minimal ● Focus on one feature (e.g. meditation) ● Content - language ● Flexibility (optional aspects) ● Functionality (Android and Apple)
Ghanouni 2020	8 - 17	Autism Spectrum Disorder.	Video game	NR	Prospective (exploratory use - hypothetical)	● Personalisation/ customisation ● Flexibility within technology (to achieve goals). ● Relating to others
Gibson 2016	13-18	Mental health (non-specific participants all accessing mental health services).	mHealth (smartphone app).	NR	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Independence (not involving parents) ● Flexibility
Grande 2019	5-15	Juvenile idiopathic arthritis.	mHealth (smartphone app).	NR	Prospective (exploratory use - hypothetical)	● Reminders/diary function
Grasaas 2019	16-18	Chronic pain.	mHealth (smartphone app).	Laboratory and home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Daily check in ● Personalisation - goal setting ● Sharing with others

Grove 2021	15-17	Mental health conditions (stress, depression, anxiety).	Chatbot artificial intelligence.	Secondary school	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Personalisation of content (technology responds according to mood) ● Interactive ● Relating to others
Hamari 2019	3-16	Cancer - Acute lymphocytic lymphoma, Wilm's tumour, Burkitt lymphoma, Non-Hodgkin's lymphoma, Hodgkin's lymphoma and other neoplasms.	Active video games.	Hospital and home	Retrospective (actual/genuine use; not in a clinic only) - short-term (< 1 week)	● Gamification
Han 2015	10-17	Type 1 diabetes.	mHealth (text messages).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Remove repetition
Herbert 2016	13-17	Type 1 diabetes.	mHealth (text messages).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Personalisation (text message content and timing) ● Sharing with others
Holmberg 2018	13-16	Obesity.	Social media and internet.	NR	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Sharing with others with same condition
Holtz 2017	10-13	Type 1 diabetes.	mHealth (smartphone app).	NR	Prospective (exploratory use – hypothetical)	● Rewards ● Interactivity ● Customisation (foods, messages)
Holtz 2019	11 - 15	Type 1 diabetes.	mHealth (smartphone app).	NR	Retrospective (testing the technology, such	● Ease of use ● Content (understandable)

					as usability testing but not in real life setting)	
Howard 2017	11-16	Asthma.	Smart track device.	Healthcare organisation	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Customisation (reminders - sounds) ● Sharing with others (data and communication) ● Design - Colours
Hronis 2019	12-18	Intellectual disability.	Internet (online CBT program).	Healthcare setting	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Design - Characters in video ● Gamification
Huby 2016	5-17	Chronic kidney disease.	Web-based application.	Interview	Prospective (exploratory use – hypothetical)	● Functionality (platforms, devices) ● Content - clear and accurate; include videos ● Design - colours ● Gamification
Husted 2018	15-18 (15-23)	Type 1 diabetes.	mHealth (smartphone app).	Outpatient clinics	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Sharing with others/relating to others (chat function) ● Content - easy to understand ● Quizzes
Iio 2020	2-12	Asthma.	mHealth (smartphone app).	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Quiz (gamification/interaction) ● Design - font size ● Ease of use ● Colours
Jaser 2020	13 - 17	Type 1 diabetes.	Device (an actigraph -sleep measuring device).	Home	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Ability to track symptoms

Jensen 2016	13-17	Obesity.	mHealth (smartphone app and text messages).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Flexibility (iPhone could be used at any time) ● Motivational messages ● Tracking their health
Jibb 2017	12-18	Cancer.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Content is informative
Jibb 2018	12-18	Cancer.	mHealth (smartphone app).	Everyday life	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Design - colour, font, videos ● Easy to understand language ● Gamification ● Flexibility (of when to use) ● Tracking of pain
Jones 2018	12-18 (12-21)	Allergies.	Online support groups.	NR	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Sharing and connecting with others with same condition ● Privacy ● Videos
Kaushal 2019	10-17	Type 1 diabetes.	mHealth (text message system).	Healthcare setting	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Text messages (interaction) ● Frequency (reminders)
Kelly 2019	13-17	Transplant recipients.	Telehealth.	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Sharing with others with same condition

Khan 2021	9-16	Tics.	Internet (web-based behavioural intervention).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Age-appropriate (two versions)
Klassen 2018	12-18	Type 1 diabetes.	Wearable sensor, mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Messages
Knibbe 2018	12-18	Cerebral palsy.	Social technologies (social media, mHealth, websites, games).	During focus groups	Prospective (exploratory use – hypothetical)	• Content - videos, photos • Gamification • Option for private messaging • Sharing with others who are similar
Knoblock-Hahn 2016	12-17	Overweight and obesity.	Various health technologies (mHealth, internet, social media).	During focus groups	Prospective (exploratory use – hypothetical)	• Customisation (e.g. Avatars could be 'fatter' or skinnier' depending on food intake) • Tracking food consumed versus amount needed; and exercise • Sharing with others (ability to choose, e.g. avoid sharing with parents) • Rewards (e.g. badges, medals, points)
Koster 2015	12-16	Asthma.	Various technology (internet, social media, mHealth apps).	During focus groups	Prospective (exploratory use – hypothetical)	• Reminders • Gamification (for younger children) • Sharing with others • Videos

Lai 2020	12 - 13	Spina bifida.	Virtual reality.	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Gamification ● Ability to track condition
Lam 2015	6-16	Cerebral palsy and acute brain injury (ABI).	Social media, robotics and gaming.	During focus groups	Prospective (exploratory use – hypothetical)	● Sharing/ connecting with others ● Gamification
Le Marne 2018	Up to and including 18	Epilepsy.	mHealth (smartphone app).	Everyday life	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Reminders
LeRouge 2016	Up to and including 17	Overweight and obesity.	Computer-based interventions.	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Customisation (Avatar characters) ● Flexibility (when it can be used)
LeRouge 2020	12-17	Obesity.	mHealth (Consumer Health Technology (CHT) social support tool app).	Healthcare setting	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Layout ● Content (customisable) ● Ability to track condition ● Flexibility (in terms of use) ● Sharing with others/relating to others
Ledderer 2019	14-16	Type 1 diabetes.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Colours ● Layout
Linder 2021	6-12	Cancer.	mHealth (smartphone app).	Healthcare setting	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Rewards and incentives ● Content (customisable)

McPherson 2019	12-17	Disabilities.	mHealth (smartphone app).	NR	Prospective (exploratory use – hypothetical)	● Customisation ● Support for communication with clinicians
Mendoza 2017	14-18	Cancer (e.g. leukaemia, CNS, lymphoma, solid tumours).	Fit-Bit and Facebook virtual support group.	Everyday use	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Ease of use ● Personalisation (goals) ● Connecting with others
Modi 2017	13-17	Epilepsy.	Internet (web-based program, Epilepsy journey).	During research sessions	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Reminders ● Interaction ● Design - font
Modi 2019	13 - 17	Epilepsy diagnosis and executive function deficits.	Internet (web-based program, Epilepsy Journey, to improve executive function behaviours in adolescents with epilepsy).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Interactivity ● Customisable (design - characters, content)
Moola 2018	10-17 (10-24)	Cystic fibrosis.	Social media (e.g. Facebook, Facetime, Instagram, chat rooms).	In interviews	Prospective (exploratory use – hypothetical)	● Sharing and connecting with others with same condition
Morrow 2018	7-17	Anxiety.	Mobile app, wearable sensor.	Healthcare organisation	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Design - bright colours ● Audio and visual distractions
Morton 2017	5-16	Cystic fibrosis.	mHealth (text messages).	Home	Retrospective (actual/genuine use; not in a clinic only) -	● Regularity of reminders

					longer term (> 1 week)	
Nani 2019	5 - 9	Cancer.	Digital interactive games - Xbox Kinect.	Hostel of the Association of Friends of Children with Cancer "Storgi"	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Gamification (competition)
Nass 2019	16 – 18*	Type 1 diabetes.	Social media (a self-care encouragement group on Facebook® for CYP with Type 1 diabetes).	Home	Prospective (exploratory use - hypothetical)	• Interaction with others • Videos • Relating to others/sharing
Newton 2020	13-18	Anxiety.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Layout • Bright colours • Interaction (chat function) • Frequency of notifications (customisable) • Rewards • Ease of use
Nicholas 2017	11-17	Diagnosed ongoing and complex conditions including juvenile arthritis, chronic kidney disease, and cancer.	Internet.	Hospital	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Sharing and connecting with others
Nichols 2020	8-17	Asthma.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Reminders • Interaction (messaging or video)
Nieto 2015	9-14	Persistent abdominal pain.	Internet (website).	NR	Retrospective (testing the technology, such	• Content (Comics and use of vignettes)

					as usability testing but not in real life setting)	
Nightingale 2017	5-18	Chronic kidney disease.	mHealth (smartphone app).	During interviews	Prospective (exploratory use – hypothetical)	● Accessibility (app versus website) ● Developmentally-appropriate content ● Interaction ● Trustworthy/reliable ● Personalisation (recording personal health information) ● Gamification (for younger children) ● Moderated forum - sharing
O'Bree 2021	14 – 18*	Social Anxiety Disorder.	Entourage - Moderated Online Social Therapy (MOST).	Early-intervention centres	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Accessibility ● Content (comics) ● Access when and where it suits (flexibility)
Park 2020	13-18	Childhood cancer.	Social media (Facebook-based intervention program).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Content ● Multimedia ● Sharing information - successful stories and self-management
Pelosi 2019	10-13	Down's syndrome.	Six interactive games from Nintendo Wii.	Occupational therapy service	Prospective (exploratory use - hypothetical)	● Ease of use ● Gamification
Perry 2017	12-17	Asthma.	mHealth (smartphone app).	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Reminders ● Push notifications (asthma tips and education)

Phelan 2021	9 - 16	Children with upper limb injuries requiring rehabilitative care (burns and fractures).	Head-Mounted Display VR (HMD-VR) experience (games-based rehabilitation activities).	Healthcare organisation.	Prospective (exploratory use - hypothetical)	• Gamification
Powell 2019	8 - 11	Attention deficit hyperactivity disorder.	All types.	NR	Prospective (exploratory use - hypothetical)	• Rewards • Personalisation (of reward) • Interaction
Radovic 2017	NR	Depression.	Social media.	During interviews.	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Sharing and connecting with others • Moderator presence
Ramsey 2018	NR (adolescents)	Asthma.	Health technology (including social media, messaging).	Interviews	Prospective (exploratory use - hypothetical)	• Tracking symptoms and treatment • Personalisation (reminders and way to 'snooze'; sounds for reminders, frequency of reminders) • Sharing with others (choosing how)
Raval 2017	3-16	Colorectal conditions.	mHealth (smartphone app).	During interviews	Prospective (exploratory use - hypothetical)	• Ease of use • Personalisation of content • Tracking treatment and information
Rensburg 2015	14-18 (14-19)	Psychiatric illness (ADHD, major depressive disorder, PTSD, anxiety, mood disorders not-specified)	Social media.	During interviews	Prospective (exploratory use - hypothetical)	• Interaction • Sharing with others with same condition • Ability to write rather than speak
Roberts 2016 Roberts 2018	12-17	Asthma.	mHealth (smartphone app.	Everyday use	Retrospective (actual/genuine use;	• Privacy/security • Interaction with others who have condition

Roberts 2019 **					not in a clinic only) - short-term (≤ 1 week) Prospective (exploratory use - hypothetical)	● Ability to share information with clinicians ● Ease of use, layout, charts ● Interaction ● Customisation (symptoms, triggers) ● Design - font, pictures, interface ● Gamification ● Rewards ● Reminders
Ruggiero 2015	8-16	PTSD or trauma history	mHealth (tablet-based e-workbook).	NR	Prospective (exploratory use – hypothetical)	● Content - videos
Sage 2017	11-18	Asthma.	mHealth (smartphone app).	During interviews	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Design - colours, clear and professional ● Gamification (e.g. quiz, badges) ● Tracking triggers, symptoms, medications ● Visual charting of individual progress
Santana 2020	10 - 14	Chronic kidney disease.	mHealth (smartphone app).	Haemodialysis Centre	Retrospective (testing the technology, such as usability testing but not in real life setting)	● Ease of use ● Colours ● Gamification
Santesteban-Echarri 2017	15-18 (15-25)	Major depressive disorder.	Social media.	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Design - engaging layout ● Sharing and connecting with others ● Moderation
Schmidt 2020	11 - 18	Mild traumatic brain injury.	mHealth (smartphone app).	NR	Retrospective (testing the technology, such	● Ease of use ● Content - Videos

					as usability testing but not in real life setting)	● Rewards/incentives ● Design - minimalist
Schneider 2016	13-18	Asthma.	mHealth (smartphone app).	Everyday life	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Design - visual, bold colours ● Customisation (changing Avatar appearance) ● Interaction ● Gamification ● Sharing with others (choosing who and doing this via text)
Schneider 2020	12-17	Asthma.	mHealth (smartphone app).	Everyday life	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Customisation (reminder frequency and timing) ● Tracking goals and symptoms ● Rewards
Schoenfelder 2017	14-18	Attention deficit hyperactivity disorder (ADHD).	FitBit Flex Wristband and Facebook Group.	Home	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	● Tracking symptoms
Sezgin 2018	13-18	Chronic conditions included at least one of the following diseases: T1D, cystic fibrosis (CF), epilepsy, and attention deficit hyperactivity disorder (ADHD).	mHealth (smartphone app).	NR	Prospective (exploratory use – hypothetical)	● Content - easy to understand
Shellmer 2016	11-18	Solid organ transplant recipient.	mHealth (smartphone app).	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	● ease of use ● Simplicity of content in reminders

Simons 2016	12-13	Attention deficit hyperactivity disorder (ADHD).	mHealth (smartphone app).	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Personalisation (feedback) • Reliable information
Singleton 2016	13-18	Mental illness (non-specific).	Internet and social network sites.	NR	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Privacy
Sinisterra 2020	13 - 16	Type 1 diabetes.	mHealth (smartphone app).	Paediatric Hospital	Prospective (exploratory use - hypothetical)	• Communicate data before appointments
Sinoo 2018	8-11	Type 1 diabetes.	Avatar and physical robot.	4-day diabetes camp	Retrospective (actual/genuine use; not in a clinic only) - short-term (< 1 week)	• Content (characters) • Interaction
Smelror 2019	NR	Early-onset psychosis.	mHealth (smartphone app).	Psychiatric unit & home	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Ease of use • Layout - visual scales • Personalisation (adding notes)
Sparapani 2017	7-12	Type 1 diabetes.	Video games.	During interviews.	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Interaction • Gamification • Rewards • Personalisation (characters' form and clothes)
Stiles-Shields 2019	13-18*	Spina bifida.	mHealth (smartphone app).	Young Men's Christian Association-based summer camp	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Ease of use
Stinson 2015	12-18	Cancer.	Internet (a bilingual, English and French,	NR	Prospective (exploratory use - hypothetical)	• Design - bright colours; graffiti background) • Jargon-free

			Internet-based self-management program for adolescents with cancer and their parents).			• Age-appropriate (can use independently of parents) • Personalisation - Reflects their experiences • Content - accurate
Strauss 2019	11-18	Mental health of transgender and gender diverse persons.	Video and computer game.	Health care organisation (LGBTIQ+ drop-in space + Telethon Kids Institute)	Prospective (exploratory use - hypothetical)	• Privacy • Support (e.g. to online therapy) • Interaction (messaging with others who are similar to them • Sharing with others/relating to others • Tracking (mood)
Tark 2019	7 - 12	Cancer (central nervous system tumour, leukaemia and others).	mHealth (smartphone app).	NR	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Visual and characters (design) • Trustworthy/accurate
Terlouw 2020	8 - 12	Autism spectrum disorder.	Digital, Game-Like Intervention.	Home	Prospective (exploratory use - hypothetical)	• Gamification • Interaction with others within technology
Teufel 2018	8-16	Asthma.	mHealth (smartphone app; Bluetooth inhaler monitoring).	Health care organisation	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Privacy (login) • Ease of use • Design
Thabrew 2016	7-18	Various - CF, Crohn's, diabetes, epilepsy, JIA, chronic migraines, Wilson's disease, thalassaemia, bronchiectasis.	Online treatment programme (eHealth interventions).	During focus groups	Prospective (exploratory use - hypothetical)	• Design - easy to read • Personalisation (characters) • Interaction

						• Developmentally - appropriate
Tindall 2021	13-15 (community) ; 13-16 (service sample)	Depression.	Computerised behavioural activation programme.	Health care setting	Prospective (exploratory use - hypothetical)	• Age-appropriate (can be used independently of parents) • Flexibility/Frequency (can decide how often) • Privacy • Gamification (not childish) • Ease of use
Tsimicalis 2017	6-12	Cancer.	Computer program - Sisom (interactive assessment and communication tool).	During interviews	Prospective (exploratory use - hypothetical)	• Jargon-free
Tsimicalis 2018	6-12	Cancer.	Computer program.	Hospital	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Gamification • Customisation (of characters) • Flexibility of when/where to use technology • Design - images and animations
Vaala 2018	12-17	Type 1 diabetes.	Social media.	Prospective	Prospective (exploratory use - hypothetical)	• Sharing with others
Vaughn 2021	8-17	Cancer.	Wearable device (Apple watch series 1) and mHealth (smartphone app).	Healthcare setting	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Ease of use • Tracking (recording symptoms; monitoring sleep) • Visual design - emojis • Design - colours
Vaughn 2020	10-17	Cancer or undergoing blood and marrow	mHealth (smartphone app).	hospital	Retrospective (testing the technology, such	• Gamification

		transplantation.			as usability testing but not in real life setting)	• Personalisation (choice of pictures/avatars) • Rewards
Waite-Jones 2018	10-17	Juvenile arthritis.	mHealth (smartphone app).	During interviews	Prospective (exploratory use – hypothetical)	• Connection with others with same condition
Waite-Jones 2018	10-17	Juvenile arthritis.	mHealth (smartphone app).	During focus groups	Prospective (exploratory use – hypothetical)	• Personalisation • Sharing information (choosing how) • Rewards • Security • Tracking condition • Clear information
Wang 2017	8-13	Cancer.	mHealth (smartphone app).	Healthcare organisation	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Cartoon style characters
White 2018	9-12	Autism.	Device.	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Videos
Whiteley 2018	(18) 18-26	Type 1 diabetes.	mHealth (smartphone app).	HIV clinic	Prospective (exploratory use – hypothetical)	• Text message reminders • Gamification
Whiteside 2019	8-17	Anxiety.	Internet and mHealth (web portal and smartphone app).	home	Prospective (exploratory use - hypothetical)	• Ease of use • Privacy (more secure) • Reminders • Customisation
Williamson 2015	12-18 (12-19)	Anxiety due to visible difference (disfigurement).	Internet (online intervention).	Mixed - Health care organisation and home	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Age-appropriate • Privacy/security • Interaction • Content - multimedia • Sharing with others

						• Flexibility of when and where to access
Wysocki 2016	NR	Type 1 diabetes.	Website.	NR	Prospective (exploratory use - hypothetical)	• Interaction (e.g. quizzes) • Content - videos, visual aids • Ease of use
Yi-Frazier 2015	14-18	Type 1 diabetes.	Social media and mHealth (smartphone app).	NR	Retrospective (actual/genuine use; not in a clinic only) - longer term (> 1 week)	• Sharing and connecting with others with same condition
Yildirim 2021	7-11	Specific learning difficulties.	Serious games.	NR	Retrospective (testing the technology, such as usability testing but not in real life setting)	• Rewards • Gamification with feedback

mhealth: mobile health; NR: not reported; CYP, children and young people.

*Age range of total sample exceeded 18 years, but reviewers were able to isolate data pertaining only to CYP whose age range met our inclusion criteria.

** Three papers with the same participants.

Supplementary Table 3: Quotations to illustrate identified themes (preferences)

Themes	Preference detail/sub-themes
Design and functionality	**Colours (bright)** *"The colors were great, and the fact that the colors would fade [so] you could clearly see [which ones you've completed]."* (details not stated). [11] *"I think it looks good-instead of like dark colors making it sad they're all like bright and it sort of makes you feel good when you come into this website"* (Anglophone teen). [100] **Layout (uncluttered/minimalist)** *"There's a very specific aesthetic that I enjoy and it's that very clean, simplistic, almost IKEA-ish look."* (Female, age not stated). [102] *"They were divided into sections and that had like subsections and stuff so it was really easy to find".* [100] *"When it's very clear how to do things, that's what's best. Anything that requires extra thought, like if the buttons are too small so you have to squint to read them or zoom in or something or there's way too many buttons or something. Usually that's the stuff that's most annoying."* (Male, age not stated). [102] **Images and animation/multimedia** *"I think the illustrations are very good it's not a chore to go and look at the website...It's not that it's childish, but...it's less serious, I think it's easier to use."* (Female, 16 years). [95] "*…Also having all of the medicines with photo and all the different names it could be called. I think I would better understand the reasons for taking my medications and not forget them if I were forced to load them into the app myself."* (18 years). [142] *"I had been advised when to use insulin, but I only followed all the steps after watching your video and understand why each step."* (17 years). *"I enjoyed looking at the videos... If it was on a bad day they made me feel better...they were quite funny."* (Female, 12 years). [99]

	"Images aiding understanding: "I really liked the pictures because it shows you, when you tap something, if you don't know it then it shows you what it is." (8 years). [49] **Ease of use** *"I thought the app was pretty well made and easy to use... everything was labelled well... you didn't have to search for anything."* (Female, 17 years). [99] *"This app is very convenient and easy to understand."* (Female, 7 years). [30] *"I liked that [the app] was simple. There weren't a lot of buttons and pages and options. It was just straight forward: Here's all your stuff. Here's how to go there. It is a great way to organize your thoughts and just try to deal with it...it's so easy. It was easier to record stuff than if I were to write it on a piece of paper.... "* (Child, details not stated). [52] *"Making sure the app is very user friendly with large pictures of their medications*." (18 years). [142] **Jargon-free** *"It's not too complicated, so teenagers can understand it and relate to it...There's no ridiculously big words and [it's not too] scientific. It's a good style of writing to keep teenagers reading."* (Female, 17 years). [95] *"It gets the point across with-out too many "doctory words""* (English-speaking teen). [100] *"I think it was really accurate because so far I've done most of the basic things like a biopsy and stuff and when I read it it's exactly like what others have told me and stuff; there's nothing that doesn't make sense or anything."* (Anglophone teen). [100]
Privacy and sharing	**Security function/login** *"I like the security passcode. I feel like it would be safer."* (Male, 11 years). [14] **Relating to others/others' stories** *"Definitely just someone to talk to about hemophilia would awesome because you can just talk to them about things in your life that are affected by hemophilia...you can relate to them because they've gone through what you've been through*." (14 years, male). [117]

	"There were other people going through the same experience' (Male, 15 years) and they could 'get advice from people who had been through it." (Female, 16 years). [113] *"This website really connects to how we feel during chemotherapy because I mean like even if you have a lot of friends it's not like everyday you get to see a friend who has cancer and stuff like that so sometimes you can feel a bit alone and even if you explain it to someone it's not something that they'll understand. So I really like how the website understands how we're supposed to feel and we're not alone and stuff like that."* (participant details not stated). [94] *"I do like the personal stories because then you feel like you're not the only person that's going through a hard time. You can maybe relate as well*." (Male, 16 years). [95] *"I was able to make friends with children who are in a similar situation, and I realized that there were friends who experienced more difficult circumstances."* (Child, details not stated). [21] *"I like the idea of having videos from other real diabetics explaining things [coping tools] because everyone will go through like diabetic burn out... and the ability to see that they've got so far even though its there would be cool."* (Female, 16 years). [81] On chatroom: *"I don't personally [talk to other people with CF] but that's because growing up there was always that cross contamination policy. You couldn't meet anyone because you'd cross contaminate and make them sick. I think the idea of an online feature for people is really clever because it gets around that and breaks that isolation."* (Female, 16 years). [99] **Independence to use without parents (age-appropriate)** *"It's important to maintain independence ... because people with visible differences are very used to the hospital or parents being in control, that's what makes this program different."* (Female, 17 years). [113]
Customisation/ personalisation	**Frequency and content of notifications/reminders/texts** *"It was more kind of a reminder for me, you know, I know I needed to take it, and it kind of made it taking your medicine a little bit fun. I could keep up with which ones I took and which ones I ain't already took yet."* (Male, 16 years). [132] *"I think putting information and expecting it to work for everyone is a bad idea. Personalised is always best because what works for this person may definitely not work for this person as well."* (Female, age not stated). [102]

	"The trigger feature allows users to preselect and add custom asthma triggers. It was more kind of a reminder for me, you know, I know I needed to take it, and it kind of made it taking your medicine a little bit fun. I could keep up with which ones I took and which ones I ain't already took yet." (Male, 16 years). [132] **Flexibility (to schedule and use when desired)** *"I think it should really be whatever you want to talk about because if it is structured, then it's more like a robot interaction...but if you personalize it you make it more free-flowing then...it accomplishes more".* [11] *"I think it's nice to have apps that don't require you spending a lot of time on them in one go. You can just dip in and out of them for two or three minutes at a time."* (Female, age not stated). [102] *"...you could do it in peace and quiet (complete Sisom) and it wasn't just to answer quickly but you could think it through and didn't need to be super-involved. You didn't need to be pressed to answer"* (Male, age not stated). [20] **Design (e.g. characters)** *"I liked that we can choose weird skin colors to make our avatar"* (10 years) *"It's cool! We can even make an extra-terrestrial!"* (11-years). [49] *"It's fun to click on it. It's always fun with a tablet. Then you've got something to do. Something happens. And you can create your own person. I think that's fun."* (Female, age not stated). [20] *"If you have a game where you play as like different characters, umm or like a character you can identify with, like, when I, dysphorically [was dysphoric], I used to play as male characters in games and then when I switched to like playing as female characters it was all a lot more validating."* (Agender, 16 years). [78] *"the app could personalise depending on your age because I know that, like a 12-year-old with diabetes is very different to like someone my age and how its controlled and managed'" (Female, 17 years).* [81]

	Ability to track their condition/symptoms *"The flexibility of the app, allowing you to monitor your asthma as closely as you want. I think it is well set up and easy to use."* (Male, 18 years). [101] *"The fact that you could add like inner voices and emotions greatly helped how to, like, how my mood reflected every time I met with [the clinician]"* (Male, age not stated). [131] *"If you guys had a little model, body model, and people could add, say, a pin where their pain is. And on the pin you add the pain scale, and they could type a little note on how often."* (15 years)". [14] *"Just being able to take a step back and look at how I've been logging my moods, like umm, if I can tell like my anxiety has been like severe over the past month or two months, being able to sit back and just go 'ok, what's happened over this period of time, can I actually change this? If not, how are ways that I can cope with this?"* (Male, 17 years). [78]
Interaction	**Gamification** *"I just found them both really good. I really enjoyed them ... I liked shooting the balloons ... because it's like ... it was quite magical, and how they exploded into lots of colour" "It was quite fun, but they were difficult. And it made me enjoy them a bit more that they were difficult"* (Female, 10 years). [42] *"It's a distraction from the surroundings and what's happening around you, for me at least, so if something's not going well playing a game provides a distraction and it calms me down because I forget about what's happening around me."* (Male, 15 years). [78] *''Having lots of different ways [in the game] to do something is interesting, like, a lot of different unique ways to accomplish effectively the same goal."* (Male, age not stated). [31] *"I liked this one ['Affective Modulation' chapter] because I got to spin the wheel and act the feeling...I really liked that one! I also liked the card game ['What Do You Know?'] because they helped me get my feelings out."* (Child, age and gender not stated). [26]

	Rewards and incentives *"I think, like, in a way having a goal to work towards is something that helps as well because if you're striving for something, then having that goal or reward like the levelling up system it gives you more of an incentive to move towards that."* (Male,15 years). [78] *"I like the one that you can like, earn rewards for that. I feel like it would just keep you more motivated to use it."* (11 years, gender not stated)*; "I think the reward one, just because it gives us something to look forward to."* (15 years, gender not stated). [14] **Removes the need to speak** *"For some people are perhaps afraid for things and don't want to say things directly. Then they can click on the thing they're afraid of. It's easier to click than to talk. It feels good to avoid talking."* (Female, age not stated). [20] *"Made it a little less intimidating cos you're not talking to someone."* (Young person, age not stated). [12] *"I could get like [the clinician] to see how things were for me, to make him understand what it's like... sort of how you're thinking and feeling and things that are going on, without you having to, yeah, think of the words and verbalize it"* (Male, age not stated). [131] *"I'm able to say what I want but avoid talking, that's how I feel about it ...Because sometimes it can be, it can be hard to say it ...sometimes you don't want to say exactly what you're thinking."* (Ellie). [20]

*Age and terminology (e.g., adolescent and child) as reported by primary study