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How 'The Daily Mile™' works in practice: A process evaluation in a UK primary school

Introduction

Physical inactivity is a leading cause of lifetime global mortality (World Health Organization, 2018). The World Health Organization recommend children perform at least 60 minutes of moderate-to-vigorous physical activity (MVPA) every day to benefit health and prevent non-communicable disease (World Health Organization, 2010). Unfortunately, 77% boys and 80% girls aged 5-15 years in England fail to achieve this (Health Survey for England, 2016). Due to their influence over large cohorts of children, schools are well placed to promote physical activity (Public Health England, 2015). Variations in implementer and participant behaviours, target populations, organisation levels, and outcomes make school-based physical activity interventions particularly complex (Craig et al., 2008).

'The Daily Mile' is a school-based physical activity intervention with increasing popularity in the UK. Developers describe the intervention as "simple and free and gets children out of the classroom for 15 minutes every day to run or jog, at their own pace, with their classmates, making them fitter, healthier, and more able to concentrate in the classroom"(The Daily Mile Foundation, 2019). Although emphasis of this intervention is on the time children are active, most able-bodied children travel a mile or more in 15 minutes (The Daily Mile Foundation, 2019). When study commenced in 2016, developers offered flexibility in delivery but encouraged teachers to follow a few core principles including 'keep it simple', carry out risk assessments, mark out laps, advise children it isn't a competition, include everyone, do it daily (seeing changes in weather conditions as a benefit) and connect with the classroom (The Daily Mile Foundation, 2016). Specific delivery roles remain flexible and schools choose approaches that suit their individual needs. No process evaluations or outcome studies of 'The Daily Mile' were published at the time this study was planned.

In 2013, Dobbins et al. (2013) and Langford et al. (2014) systematically reviewed papers relating to effectiveness of school-based physical activity interventions and found

evidence to suggest school-based programmes had small but clinically significant impact on proportions of children achieving recommended physical activity in school. Lai et al. (2014) also found an increase in average minutes of physical activity achieved each day. Dobbins et al. (2013) concluded that future researchers should apply standardised outcome measures and trial interventions over a minimum 12 weeks to establish population level sustainable change. It is well accepted that researchers examining complex physical activity interventions should also take steps to understand how they work in the 'real world' (Reis et al., 2016). Naylor et al (2015) systematically reviewed processes underpinning implementation of school-based physical activity interventions with the aim of determining links between implementation and health outcomes and factors influencing implementation. Unfortunately, lack of standardisation in implementation variables and outcome prevented authors drawing firm conclusions and re-enforced need for frameworks to guide process evaluation.

The purpose of this study was to examine key processes underpinning implementation of 'The Daily Mile' in a typical UK based primary school. Through enhanced understanding of standardised process variables including implementation factors, mechanisms of impact and context from the perspective of all organisation levels, health professionals, schools and policy-makers can better understand the outcomes and potential inequalities of 'The Daily Mile'.

Objectives:

Three key objectives were identified for this study;

To explore responses of students, parents, teaching staff and governors, following a 12-week implementation of 'The Daily Mile' and consider unexpected pathways or consequences, mediators and contextual factors affecting implementation
To determine what was delivered during implementation through analysis of rates of intervention fidelity, dose and reach
To identify the barriers and facilitators of sustainable implementation in preparation for further effectiveness and outcome evaluation studies

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Methods

This study applied a two phase multi-method design based on the MRC framework for process evaluation of complex interventions (Moore et al., 2014). This framework offers a standardised approach to design and conduct, enabling consistency in key process questions. Phase one ran from 19th September to 16th December 2016 and phase two from January to March 2017. The design considered aspects at three levels (individual, school/implementer and community), allowing data to be triangulated (Hesse-Biber,

2016). A logic model developed using 'theory of change' approach considered causal assumptions and guided method selection (De Silva et al., 2014). Full details of study protocol are published elsewhere (Harris et al., 2018)

Participants

The study was conducted in a sponsor-led UK primary academy in the East Midlands region of the UK hosting 277 children aged 2-11 years. This school is one of 1279 sponsor-led academies in the UK and reflects national average school size (Ioannou, 2018). Sponsor-led academies are state-funded independent schools who receive money directly from government but whose sponsors are responsible for improving performance. National curriculum is organised into blocks known as 'key stages'. Key stage one (KS1) runs from age 5-7 years and key stage two (KS2) from 8-11 years. The school is located in a rural region ranked 13906 out of a possible 32844 for indices of deprivation affecting children where 1 is most deprived and 32844 least deprived (Department for Education, 2017). Samples for both phases were selected according to criteria in table 1.

The procedures followed were in accordance with the ethical standards of University of Leeds, School of Healthcare Research Ethics Committee (SHREC) (date of approval 27th May 2016 ref: HREC15-055).

Phase One

Purposive samples of students represented differing stages of physiological and psychosocial development and curriculum phases. Teachers self-enrolled to participate recruiting their associated classes. Specific steps were taken to address ethical issues in the approach of child and adult participants and informed assent and consent to participate. Full details can be found in the study protocol (Harris et al., 2018).

Phase Two

Maximum variance sub-samples of students participating in phase one were approached to represent different behaviour and physical activity characteristics in phase two focus groups. Parents of selected students and teachers implementing the intervention, school principal and school governors were also approached to participate in phase two.

Data collection

A summary of methods used to meet study objectives is available within supplementary materials or full details are found in study protocol (Harris et al., 2018).

Phase 1

In phase one, time series data was collected daily using implementer self-report logs to record student participation and adherence to 15 minute duration (dose and reach). To reduce potential social desirability bias, logs were triangulated with structured observation, perceived exertion and focus group discussions. The children's OMNI perceived exertion scale was presented to students by implementers (teachers) immediately following activity at weeks 1, 4, 8 and 12 as per validated protocol (Rice et al., 2015). This reflected potential contextual (i.e. weather and curriculum) and individual level change (i.e. cardio-respiratory fitness). Children's OMNI offers strong reliability and good face and concurrent validity with maximal oxygen consumption and heart rate when used with children aged 6-13 years during running and walking activities (Rice et al., 2010). A pre-determined observation schedule was adapted for 'The Daily Mile' from System for Observing Fitness Instruction Time (SOFIT) and administered by one observer, JH, in week 12. JH completed SOFIT training package assessing accuracy against blinded 'gold standard' as per protocol (McKenzie, 2012). Dual observation was not feasible within the scope of this study. SOFIT uses direct observation to consider physical activity in context and was selected due to good reliability and validity, reduced burden to participants, and reduced risk of data loss due to technical difficulties compared to other activity measures in youth (Rachele et al., 2012). Observation schedule included physical activity engagement (validated ages 8-11 years), student behaviour, and teacher interaction, in-class and out-of-class promotion of physical activity (McKenzie, 2012). In-class promotion included prompting students to initiate or increase engagement in the activity, praise or reinforce of physical activity designed to increase or maintain responses in the future. Out-of-class promotion included prompts to initiate or increase engagement in activity outside 'The Daily Mile' environment or praising / reinforcing these behaviours beyong the class environment.

Phase 2

Qualitative focus groups were facilitated in phase two at individual (student), implementer (teacher) and community (parent/principal/governor) levels. A 'draw and talk' task-based methods allowed younger children to answer questions with a drawing then elucidate responses (Darbyshire et al., 2005). Pre-determined, piloted topic guides navigated key discussion topics and identified appropriate language, prompts and cues (Liamputtong, 2011).

Four focus groups were conducted, each with a defined subset of key stakeholders;

Focus group one- Key stage one students
Focus group two - Key stage two students
Focus group three - Parents/carers
Focus group four - Teaching staff, principal& governors

All focus groups took place in school and were moderated and audio-recorded by JH. Summaries were discussed and field-notes written at conclusion.

Data analysis

Classroom logs were analysed and reported using means and standard deviation. Perceived exertions as medians and interquartile ranges. Categorical summary scores from SOFIT reported minutes and proportion of total intervention period from which percentage MVPA, energy expenditure rate (EER) and total energy expenditure (TEE) were estimated. TEE was calculated using methods derived from McKenzie et al. (1991). Context variables were reported in relation to physical activity levels.

Focus group transcripts were categorised and coded thematically using Framework following principles advocated by Ritchie et al. (2003)and Gale et al. (2013). A conceptual framework was developed by JH as topics emerged inductively. Topics were categorised and hierarchies developed according to research objectives. During analysis, GM and LM operated as independent reviewers for data comparison and coding structure offering multiple perspectives and seeking out disconfirming information. Any differences were resolved by consensus. Thematic charts were developed and negative cases noted. Despite some interaction linking quantitative to qualitative analysis, data were integrated theoretically at interpretation as described by Moran-Ellis et al. (2006).

Results

Phase One

75 students (mean age 7 years 8 months) participated in phase one implemented by four teachers and two teaching assistants. Principal and school governors provided external oversight of the intervention but were not directly involved. See table 2.

In July 2016, 74/74 (100%) students were recruited. One additional student joined the school in September 2016 and was recruited to KS2 cohort. Another two students joined recruited classes during trial period but did not participate.

Reach and dose.

Students were in education for 59 days over 12 weeks. KS1 teachers did ‘The Daily Mile’ on 54/59 (91.5%) days. On average, 95.8% students received the intervention over 54 days. KS2 teachers delivered ‘The Daily Mile’ on 51/59 (86.4%) days. 94.6% students received the intervention on those 51 days. Of the 54 days participating in ‘The Daily Mile’, 95.7% KS1 students completed the recommended 15 minutes. Over 51 days, 92.7% KS2 students completed the recommended 15mins. Data collection logs did not

discriminate between different reasons for non-participation (i.e. absence, illness/injury, behaviour). See table 2.

Fidelity

KS1 students rated median perceived exertions after 'The Daily Mile' at level '10' in weeks one and four (IQR 2.5-10.0), '5.5' in week eight (IQR 0.5-10.0) and '8' in week twelve (IQR 2.0-10.0). KS2 students rated median perceived exertion at '2' in week one (IQR 1.0-4.0), '2' in week four (IQR 0.0-3.5), '1' in week eight (IQR 0.0-4.0) and '2' in week twelve (IQR 1.0-8.0). This suggests younger students perceived their exertion rates to be moderate to high but older students reported lower exertion on average. All students perceived reduced exertion rates in week 8 but rose again in week 12.

Based on the SOFIT data, KS1 students spent 100% of their 'Daily Mile' in MVPA. Average EER was 0.11 (SD 0.023) kcal/kg/min and TEE per intervention per child was 1.69 kcal/kg. The maximum time spent performing MVPA occurred when students interacted with peers and teachers promoted activity. KS1 teachers spent 66% of 'The Daily Mile' promoting activity.

KS2 students spent 13 minutes of 'The Daily Mile' (88.1%) at MVPA. EER was 0.11 kcal/kg/min (SD 0.30) and TEE 1.58 kcal/kg per 'Daily Mile' per child. KS2 students exhibited highest proportions of MVPA during peer interaction and when teachers promoted MVPA. KS2 teachers spent 52% of 'The Daily Mile' promoting activity.

Phase two

Eighteen participants representing KS1 and KS2 students (individual level), teachers (implementer level), parents and governors (community level) were recruited to phase two. Focus group / interview characteristics are detailed in table 3.

Three themes emerged:

Embedding 'The Daily Mile' into practice,
Creating the right physical environment
Building relationships & promoting a supportive climate

An overview of themes, seven sub-themes and twenty-five categories are detailed within supplementary material. T1, T2,T3 & T4 refer to teacher participants, PG to parent-governor, P1 & P2 to parent participants, S2, S3, S8 & S9 to student participants and R refers to the researcher.

Theme 1: Embedding 'The Daily Mile' into practice.

Teacher overload and competing demands.

Teachers and governors expressed concern that physical activity interventions introduced within the existing curriculum might impact heavy workloads. Although they perceived 'The Daily Mile' to have potential benefit for students, competing demands were considered a barrier to successful implementation;

T2: As a profession I think we all feel under pressure to.. to achieve academically with our children and therefore, even though we know, in our hearts that it's the right thing to do the.. the.. the downward pressure of what these children have to able to do in terms of testing and achievement and progress….puts ... puts a restraint on the things…
T4:..every minute counts..
(Teachers, 112-117)

PG: I think that that is one of the issues .. there is so much to be taught.. by one or two people in a classroom that it could be perceived as an extra, added burden.
(Governor 161-164)

One appeal to teachers was the adaptability of 'The Daily Mile' and opportunity to control delivery in response to personal teaching practices. However, one staff member found ambiguity in expectations and delivery criteria unnerving.

Blending with school routine.

Teachers, governors, parents and students accepted the benefits of physical activity interventions such as 'The Daily Mile';

T2: As a profession, I think we understand the importance of exercise, I think we see the links between exercise and their achievements in the classroom
(Teachers 111-112)

PG: learning is about learning to be an all-round citizen and how to look after yourself as well as how to read and how to write.. it's the whole person that the school should be addressing
(Governor, 140-144)

Teaching staff felt self-enrolment in the intervention ensured commitment in delivery. They highlighted concern regarding potential impact of mandatory implementation on benefits to students;

T4: …and if the children know the teacher doesn't believe in it, then do we get the full value out of it? 'Cause you'd still get some that enjoyed it, but, they're not going to get

all of the benefits of why it's good to do it and the health benefits and re-energising the brain because then they know.. they can read the teachers so much.
(Teachers 477-480)

Ability to deliver 'The Daily Mile' flexibly and autonomously was important to teachers. Parents and teachers felt children received most benefit when the intervention was responsive to student need and classroom behaviour. Teachers described new opportunities for students to engage in their natural environment during 'The Daily Mile'. Examples included opportunity to describe new sensations, sounds and smells on route. Both teachers and students subjectively perceived improvement in attention on return to class. When construction work commenced on the school site and mud prevented teachers from delivering 'The Daily Mile' in a responsive manner, parents and teachers expressed frustration;

T2: I was frustrated because I had to plan it … so I couldn't just say "right, we're gonna go and do it now". That really, yeah,… annoyed me.."
(Teachers 396-397)

P2: Just bolted on .. it just lost it's … lost what it was for..
(Parents 321)

A period of adjustment was considered necessary by staff and students to adapt to the new intervention. It was recognised that some children behaved or interacted differently when physically active which led to instances of low-level disruption during early implementation;

T2: If it's been part of the school culture for years then they probably wouldn't be still taking the opportunity to mess about during it but it's just… the novelty..
(Teachers 454-456)

Theme 2: Creating the right physical environment.

Outdoor space

Many of the barriers to teacher engagement and parent support for 'The Daily Mile' were focused on physical aspects of the school environment. Limited availability of tarmacked surfaces due to construction work during the trial period meant students completed 'The Daily Mile' on grass. In winter months, school leaders recommended students change into wellington boots to access the field.

Timing of delivery and changing footwear

Change in footwear meant 'The Daily Mile' took longer than the allocated 15 minutes, particularly with younger children. This led to some interventions being planned before or after playtime and lunch breaks when children were already wearing appropriate footwear. Had 'The Daily Mile' been launched in spring or summer, teachers felt children might have had the opportunity to adapt to being outdoors without need for weatherproof clothing;

T2: But I think if it had been an ideal scenario, if it had been summer, and we hadn't have had the building work and the field didn't turn into somewhere like the Somme.. and we didn't have the time changing the wellies and their footwear, if we could have literally opened the door and gone out, done it for 15 minutes and come back in… I think it would have been brilliant.
(Teachers, 147-152)

Theme 3: Building relationships and promoting a supportive climate

Stigmatisation

Although many students reflected on happy experiences when participating in 'The Daily Mile', a small minority described name-calling and stigmatisation during the activity. Other children also recognised that some of their peers were teased for being slow or unfit. Although such behaviour was often transitory, these feelings were pertinent to those involved;

S9: I didn't expect people to tease for being slow
R: Ok .. ok… did anyone else feel teased because they were slower?
S8: No
S9: Yes.. I did
R: How did that make you feel [S9]?
S9: It made me feel really upset… until… I was faster than them.. and I feeled really good then
(KS1 students, 355-360)

Building resilience

Building resilience to new and often challenging situations was considered a strong mediator for change within this intervention and valued by both staff and governors;

PG1: I think it is of particular importance of life in general, in being able to build resilience for different situations.
(Governor, 29-30)

T4: you want to develop the child, the whole child, and their health and their physical strength and their resilience

(Teachers, 494-495)

One unexpected consequence of 'The Daily Mile' was the relationships enabled between students, peers and teachers. Perceptions of social cohesion were expressed by students and teachers;

T2: just chatting to the children it was brilliant
T4: Well that was what you said wasn't it? ….
T1:… it was amazing socially..
T4: .. there was that opportunity to find out things that maybe you wouldn't have found out in the classroom but while you're walking with different children, it was giving you the insight into other things…
(Teachers, 223-227)

Although some children expressed a preference to run alone, many described chatting or playing imaginary games with friends during 'The Daily Mile'. Students of all ages valued support and encouragement during 'The Daily Mile'. Older children were particularly keen for teachers to model physical activity rather than observe;

S3: because the teachers were doing it and, if they were doing it, why should I walk when I want to run but I didn't have the confidence.. but when the teachers did it I started to run more than I did at first
(KS2 student, 101-110)

Although not explored in the context of this trial, one governor was keen to explore ways in which wider community members could be involved in delivery of 'The Daily Mile' in order to model physical activity and strengthen community links.

Teachers and governors perceived value in the introduction of non-competitive activities in school. Teachers encouraged self-competition when delivering 'The Daily Mile' but recognised some children were still motivated by competition with peers. Parents voiced concern regarding the sustainability of 'The Daily Mile' if students were discouraged from competing with one another and not offered other incentives or goals. They felt their children did not fully engage with the activity due to lack of purpose;

P1:..I thought that they had to go round so many times.. cause I had said to [child's name] "how many times?" but he said.. "well, just for the time"
P2: Yeah..
P1: So probably that might have been an incentive 'cause if you've got to do it 10 times.
(Parents, 269-276)

Building stamina

Although voiced by students in both focus groups, high levels of exertion were pertinent to younger students when reflecting on their experience of 'The Daily Mile'. This concurred with quantitative findings. Teachers and parents acknowledged overwhelming exertion in a minority of students, particularly during early implementation. Some teachers and older children reflected on stamina development over the trial period and recognised positive changes in health and well-being which they associated with 'The Daily Mile';

S2:.. it made me more active because now I've started going running on Sundays
R: Have you? And is that something that you started doing because of 'The Daily Mile' or is that something that you wanted to do anyway?
S2: It was because when I did 'The Daily Mile' it made me realise how unfit I was and I just didn't want to be like that
(KS2 student 71-81)

Teachers considered opportunities for students to be active and get outdoors valuable regardless of whether they walked, jogged or ran. Conversely, parents and governors expressed concern that children could opt out of running. They believed that the students most likely to benefit from increasing levels of vigorous physical activity may not be targeted by 'The Daily Mile'.

Discussion

Phase one findings suggest high doses of 'The Daily Mile' were achieved in this context over 12 weeks. The 'whole school' approach applied may offer significant benefit over 'opt-in' physical activities delivered outside curriculum. Teachers successfully implemented 'The Daily Mile' frequently and consistently to a large proportion of students despite contextual barriers. The 93% proportion of 'The Daily Mile' spent in MVPA is significantly higher than that reported in average primary school physical education sessions (Hollis et al., 2016). However, recent systematic reviews recognise that compensatory reductions in MVPA can occur elsewhere in the school day when school-based physical activity interventions are introduced (Love et al., 2018). 'The Daily Mile' has potential to increase the rate and duration of MVPA children achieve during the school day but further research is required to establish compensatory effects.

Exertion rates described by 'The Daily Mile' participants in this context did not always reflect findings from SOFIT. KS2 students reported lower average exertion than their KS1 counterparts despite high proportions of MVPA in both groups. Differences could relate to physiological, environmental or psychosocial factors or measurement error. Other studies have suggested primary school-aged children spend at least 50% of playtime engaged in MVPA (Ridgers et al., 2011) potentially resulting in greater

combined total energy expenditure in the KS1 children who performed 'The Daily Mile' after playtime. Higher levels of in-class promotion of physical activity in KS1 sessions might also explain higher exertion rates. Despite the OMNI exertion scale being a validated outcome for 6-13 year olds (Rice et al., 2010), some have argued other factors may influence pictorial exertion scales when applied in school settings (Yelling and Penney, 2003). Yelling and Penney (2003) suggested pressure to maintain an image of physical prowess affected scores provided by older children. Such pressures might offer an alternative explanation for lower exertion rates reported by KS2 students but physiological measures and compensatory effects were not examined in this study.

In common with Naylor et al. (2015), competing demands, teacher overload, availability of resources and stability in school routine were all raised as barriers to successful implementation. Findings supported appreciation of benefits of in-school physical activity but a preference to control delivery of 'The Daily Mile', adapt core processes and integrate it with normal daily routines, preferably during a stable period of practise. This concurs with findings from Naylor et al. (2015) who found local adaptability and contextual appropriateness facilitated implementation.

Limitations in school physical environment were a barrier to implementation and the main cause of adaptation in this context. This aligns with the concept of 'availability of resources' recognised in studies by Naylor et al. (2015) and Jago et al. (2015). Although construction work on the school site is unlikely to be a routine feature in primary schools across the UK, it is anticipated that variation in outdoor space might demand planning and preparation of suitable tracks prior to implementation. This would facilitate transitions between class and outdoor activity and ensure a safe environment for children to be active.

Unexpected and key findings in this study include feelings of stigmatisation reported by some students and the forming or strengthening relationships during activity. Despite strong evidence for improved health outcomes with increased activity dose,, negative early experiences of physical activity have potential to shape lifelong attitudes to physical activity (Cardinal et al., 2013). Theory suggests pleasure/displeasure experienced during exercise and self-efficacy in physical activity s are strong determinant of sustained activity in children (Craggs et al., 2011; Tsunenori et al., 2018; Brand and Ekkekakis, 2018)) Issues raised by children in this study increase awareness of stigmatisation and displeasure in high intensity exercise and offer opportunities to overcome them. Relationships built during 'The Daily Mile' and self-selection of intensity could be argued to enable connectedness with school and family, peer support, social competence, self-efficacy and autonomy. Such protective factors are associated with development of resilience in school environments and sustained physical activity in youth (Morrison and Allen, 2007; Lee and Stewart, 2013; Craggs et al., 2011) 'The Daily Mile' also presented opportunity for activity modelling considered a strong driver of children's activity in other literature (Rodrigues et al., 2017). . Parents in this study were concerned about lack of competition or enforced running. It should be remembered that the intensity of a

child's physical activity will vary according to previous experience of exercise and fitness and some children will achieve accelerated heart rate and increased effort from brisk walking alone (World Health Organization, 2010). Schools may wish to consider external drivers to facilitate "a sense of purpose" (Morrison and Allen, 2007).

Implications for practice

Since completion of this study, core principles of 'The Daily Mile' have evolved to include advice to "have a firm and mud-free surface", "happen during curricular time, at least three times a week" and that "able-bodied children should aim to run or jog for the full 15 minutes with only occasional stops to catch their breath" (The Daily Mile Foundation, 2019).For 'The Daily Mile' to become embedded within the school curriculum steps should be taken to ensure it is not perceived as an 'added burden' to normal school activities but rather as an integral part of learning. This might involve voluntary enrolment of local implementation leads, multi-professional support networks and engagement with the wider community to drive change and implement according to intervention philosophy. As reflected in new principles, preparation of tracks suitable for all weather conditions is essential but launch dates should also reflect local needs.

Other considerations for educators and health-professionals include mechanisms to support students and teachers through the physical and emotional challenges associated with daily physical activity. Potential for stigmatisation should be recognised and steps taken to eliminate this at source. This might involve positive role-modelling by students, staff, and community members to offer social cohesion and opportunities to reflect on strategies to cooperate within a physical environment. Despite guidance from developers to run or jog, self-selected intensity and personal or group goal-setting rewarded with small incentives (house points / collective completion of virtual distance awards etc.) may facilitate a sense of purpose and further enable resilience and sustained behaviour.

Limitations

A purposive sample of one UK primary school may limit transferability to urban settings and schools outside the UK. However, the sample represented characteristics of a typical UK-based primary school and maximum variance sampling ensured depth and breadth of perspective (O'Reilly and Parker, 2013). Quantitative data in phase one failed to differentiate between student absence and non-participation for other reasons leading to potential underestimation of dose. Physiological measures of physical activity were not feasible within the scope of the study but may have offered explanation of unexpected difference in OMNI scores. The outcomes from this feasibility study will help inform future studies but, given the nature of this study, any causal assumptions or correlations cannot be inferred.

Conclusions

The aim of this study was to examine processes underlying implementation of 'The Daily Mile' in a typical UK based primary school and to consider how the intervention worked in practice. This was achieved though credible exploration of the responses of students, parents, teaching staff and governors following early implementation of The Daily Mile. Unexpected consequences relating to stigmatisation and the forming and strengthening of relationships were identified and self-selection of intensity and mirroring of modelled behaviour noted as mediators. Contextual factors relating to the physical environment within the school are also highlighted. Fidelity, dose and reach of The Daily Mile were determined through rigorous multi-methods. The Daily Mile has potential to be a valuable strategy to increase in-school MVPA in KS1 and KS2 children so long as compensatory reductions in total activity do not occur.

These findings contribute to knowledge on applied research in a UK primary school. Further studies are recommended to evaluate effectiveness of The Daily Mile in achieving a range of long-term health and education outcomes including total MVPA and implementer activity. Concurrent multi-site realist evaluation would allow deeper understanding of what works best, for whom and in what context (Pawson and Tilley, 1997). Recommendations for practice support decision makers in education and public health to enable more people to be physically active in their daily lives (World Health Organization, 2018)

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