

The Daily Mile: What factors are associated with its implementation success?

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Abstract

Background: Despite the known benefits of a physically active lifestyle, there are few examples of interventions that have been successfully implemented at a population level over a long period of time. One such example is The Daily Mile, a school based physical activity initiative, where a teacher takes their class out daily during class time for a short bout of ambulatory activity. At one school, this activity appears has been sustained over a long period (6 years), has the whole school participating and is now incorporated into its daily routine. The aim of this paper was to understand how The Daily Mile was implemented in primary schools and to assess factors associated with its successful implementation. **Methods:** Semi-structured interviews with school staff who had a significant role in implementing The Daily Mile were conducted at four primary schools in central Scotland. Interviews were digitally recorded and transcribed verbatim. Data were analysed using thematic analysis and descriptive analysis and interpretation of data undertaken. Details regarding the school grounds and facilities were also noted during the interviews. **Results:** Having simple core intervention components, flexible delivery that supports teacher autonomy and being adaptable to suit the specific primary school context appear to be key aspects of The Daily Mile that are related to its implementation success. Other factors relating to how The Daily Mile was developed, trialled and rolled out might also have contributed towards its successful implementation. **Conclusion:** The Daily Mile appears to have several factors which may relate to its implementation success. These are important considerations for others looking to implement The Daily Mile effectively in their primary school or in other contexts.

1 Introduction

2 Physical inactivity is a global issue with both adults and children in many countries not
3 active enough to benefit their health. [1] Physical inactivity is related to negative health
4 outcomes including cardiovascular disease, diabetes, obesity, and depression, with regular
5 physical activity beneficial in both the prevention and treatment of many conditions. [2]
6 However, despite the known benefits of a physically active lifestyle how to increase activity
7 at a population level remains a key question. Many interventions are developed in a
8 research context, appear to work in controlled conditions but do not translate well into
9 less controlled, real life situations. [3, 4] Implementation evaluations are rarely conducted
10 alongside these interventions and therefore a challenge remains in understanding how to
11 translate and scale up seemingly effective interventions. [4]

12

13 An alternative approach to developing an intervention in a research context is instead to
14 evaluate existing interventions that are developed by those already working within
15 complex, real life contexts. One such example of an intervention developed in a real life
16 context is The Daily Mile. Originally conceived by a primary school in central Scotland in
17 2012, The Daily Mile was developed to address a perceived lack of fitness in primary school
18 children (children aged five to twelve). The Daily Mile was seen as a pragmatic solution to
19 this issue and was developed without specific reference to psychological theories of
20 motivation or behaviour change or implementation frameworks or concepts. The
21 intervention consists of teachers leading their class in an outdoor walk, jog or run for
22 approximately 15 minutes every day during class time. As the approximate distance
23 covered within this time was around a mile, the endeavour was named 'The Daily Mile'.

24 The Daily Mile appears to be addressing its objectives with preliminary pilot data
25 suggesting that it may improve fitness, physical activity, body composition and have
26 positive changes on classroom behaviour. [5]

27
28 At this first school, The Daily Mile has been sustained over a long period (6 years), has the
29 whole school participating and is now incorporated into its daily routine. The Daily Mile has
30 therefore gained much attention in the media and from other schools wishing to adopt this
31 approach. In Scotland, the Government have issued a statement saying that they “are
32 encouraging all schools to consider implementing the scheme (The Daily Mile) or develop
33 their own physical activity initiatives” and supported the idea of a Daily Mile Nation in their
34 2016 manifesto. [6] Subsequently, this intervention has been scaled-up with over 770
35 primary schools in Scotland and 3600 worldwide registered as implementing The Daily
36 Mile. [7] Based on this widespread roll-out and adoption it could be suggested that The
37 Daily Mile is an implementation success.

38
39 To date, there is no evidence to support why The Daily Mile might be an implementation
40 success and what others wishing to adopt the initiative should consider. Whilst numerous
41 systematic reviews report on the outcomes of interventions to promote physical activity in
42 school settings, few have looked at implementation considerations.[4, 8-12] Naylor et al.
43 (2015) conducted a systematic review to assess factors that may influence the
44 implementation of school based physical activity interventions in six to 18 year olds.[8]
45 They reported time constraints as the most commonly noted factor linked to
46 implementation, with interventions that competed for too much time in the curriculum or
47 that were very time intensive to deliver being less successfully implemented. Other factors

48 noted in this review as being associated with implementation success included a
49 supportive school environment, perceived appropriateness of the intervention and
50 teachers self-efficacy to deliver the intervention. However, the extent to which these or
51 other factors are evidenced within the implementation of The Daily Mile have not yet been
52 explored.

53

54 The aim of this paper was therefore to understand how The Daily Mile was implemented in
55 primary schools and to assess factors associated with its successful implementation.

56 **Methods**

57 **Recruitment**

58 The current study was part of a broader research project investigating the benefits of
59 taking part in The Daily Mile. [5] Four state primary schools in central Scotland were
60 identified through this existing research project and with key contacts at these school
61 informed about the study. Two of the schools were thought to be implementing The Daily
62 Mile successfully with the other two thought to have found implementation more
63 challenging. One of the schools was the primary school where The Daily Mile was first
64 developed. The key contacts then suggested a representative who played a significant role
65 in The Daily Mile implementation who were then invited to participate in the study. These
66 individuals often gained the perspective of their colleagues prior to interview and provided
67 an overview of The Daily Mile at their school. In addition, the head teacher who conceived
68 The Daily Mile at the original primary school (now retired) was contacted through the
69 broader research project and invited to take part in the study. Interviews took place from

70 December 2015 till March 2016. All interviewees provided informed consent and ethical
71 approval was obtained from the University of Stirling, School of Sport Research Ethics
72 Committee (reference number 760). Approval was also obtained from the Director of
73 Children, Young People and Education at Stirling Council, Scotland.

74

75 Interviews

76 Qualitative interviews were selected as the most appropriate method to address the
77 research questions and initial theories were developed around which elements of The
78 Daily Mile were related to successful implementation.[13] Three semi-structured interview
79 schedules were then developed. One for the retired head teacher who initiated The Daily
80 Mile, one for the schools who reported currently having The Daily Mile and one for schools
81 for whom implementation had proved more challenging. The schedules were developed to
82 address the key research questions but contained some variation depending on whether
83 the implementation of The Daily Mile had been considered successful or not. Questions
84 included; what is a typical day at their school; why they started The Daily Mile; how it was
85 implemented at the school; what barriers they faced; and its perceived benefits. Initial
86 interview schedules were developed by GR and reviewed and edited by TG. GR conducted
87 all interviews and kept detailed field notes pertaining to the schools context (e.g., details
88 about the school grounds, number of children, number of classes, school postcode). Initial
89 analytical thoughts were written up after each interview as is standard practice in
90 qualitative interviews.[13, 14]

91

92 Descriptive data

93 Postcodes of the schools were used to assess deprivation and rurality. Deprivation was
94 assessed using the Scottish Index of Multiple Deprivation (SIMD). [15] The SIMD assesses
95 levels of income, employment, health, education, geographic access, housing and crime in
96 postcode areas, which are then categorised into quintiles from the highest areas of
97 deprivation (SIMD 1) to the lowest (SIMD 5). Rurality was assessed with The Scottish
98 Government Six Fold Urban Rural Classification. [16] The six classifications are: large urban
99 areas (settlements of 125,000 or more people), other urban areas (settlements of 10,000
100 to 124,999 people), accessible small town (settlements of 3,000 to 9,999 people within 30
101 minutes' drive of a settlement of 10,000 or more), remote small town (settlements of
102 3,000 to 9,999 people with a drive time of over 30 minutes' to a settlement of 10,000 or
103 more), accessible rural town (areas with a population of less than 3,000 people, and within
104 a 30 minute drive time of a settlement of 10,000 or more) and remote rural (areas with a
105 population of less than 3,000 people, and with a drive time of over 30 minutes' to a
106 settlement of 10,000 or more).

107

108 Data analysis

109 Interview discussions were digitally recorded and transcribed verbatim and field notes
110 written up after each interview. Throughout the data collection process, data were
111 analysed using the constant-comparative technique.[17] GR reviewed and compared
112 interview transcripts and field notes after each interview which enabled the identification
113 of emergent themes for exploration in following interviews. Subsequent data
114 management and analysis was approached using thematic analysis.[18] Familiarisation

115 with data enabled construction of first level coding informed by 1) the research questions
116 underpinning the study, 2) topics and issues introduced by researchers during the
117 interviews and 3) recurring themes emerging from interviews discussions.[19] In order to
118 ensure consistency and rigor, double coding was carried by TG.[19] In addition, all codes
119 were reviewed and verified by an independent researcher who was not part of the
120 research team. Descriptive analysis and interpretation of qualitative data were then
121 undertaken. Due to the number of schools involved in the study, quantitative data
122 (number of children and classes at each school) are presented as raw data in text.

123 Results

124 A brief description of the participants and schools involved in the study is provided at the
125 outset of the results. The subsequent section highlights the overarching themes from the
126 qualitative data.

127

128 Participants and schools

129 Six participants from four primary schools took part in the study. Participant's included
130 three current head teachers, one teacher, one classroom assistant and the retired head
131 teacher who conceived the original Daily Mile. All participants were female and confirmed
132 they played a significant role in either the initial implementation or the current delivery of
133 The Daily Mile. School size varied with schools having 170, 334, 360 and 540 children. The
134 number of classes at each school also varied with schools having 7, 12, 13 or 16 classes.
135 Three schools were classified as being within "other urban areas" and one as within an
136 "accessible small town". Two schools were in areas of high deprivation (SIMD 1) and two
137 were in areas of low deprivation (SIMD 5). During the interview process it transpired that

138 one school that was thought to have difficulties implementing The Daily Mile was actually
139 implementing it as expected, therefore, three of the four schools were reported to be
140 currently delivering The Daily Mile and had done so for between three months to six years.

141

142 Themes

143 Intervention development, trialling and roll out

144 The Daily Mile began in one class in a large operational primary school in Central Scotland.
145 It was described as having started as a result of a conversation between a teacher and an
146 external activity facilitator about the children's lack of fitness. This perceived lack of fitness
147 was confirmed with physical education staff, and working with their teacher, one class
148 tested their fitness by seeing how far they could run without needing to stop. The teacher
149 described how she then spoke with the children who acknowledged that there was a
150 problem with their fitness and together they came up with a four week program to get
151 outside and walk, jog or run for 15 minutes every day. After the four weeks the children
152 and teacher noticed a change in the distance they could run.

153

154 *"...he said, the children are not fit, and I, you know, I knew they weren't fit, so I spoke to*
155 *the, the gym teacher and said "am I, are we right, are the children not fit?," and she said*
156 *"the children are exhausted by the warm-up in PE, and they have to recover from the little*
157 *warm-up that we do, and they can't access PE properly, yes they're unfit." [P6]*

158

159 The participant noted that this story and perceived change was communicated with other
160 teachers who were encouraged and supported by the school to do something similar with

161 their class if they chose to. She describes how concerns teachers might have about how
162 The Daily Mile would work were discussed collectively and problem solved. The Daily Mile
163 slowly began to spread throughout the school and by the summer that same year, all
164 classes were involved.

165

166 The participant described how the idea of The Daily Mile and the anecdotal results were
167 then communicated with other schools in the area, largely through herself who became an
168 advocate for the initiative. She noted that the media also reported the story and it received
169 a great level of publicity nationally. Other schools then began to implement their own Daily
170 Mile. In the schools interviewed for this study the head teachers and whole school decided
171 to support the initiative and typically every class took part. As with the original Daily Mile,
172 after the decision was taken by these schools to implement The Daily Mile, participants
173 reported consultations between teaching colleagues as to how The Daily Mile could work
174 in their context.

175

176 *"... so I think the drivers are the team – the leadership team – the children ... and the*
177 *teachers, you know it's, it's working altogether ..."* [P3]

178

179 **Simple core intervention components**

180 Three core intervention components were identified relating to the type, duration and
181 frequency of the activity with the simplicity of these and suitability to the primary school
182 context likely to be related to its implementation success.

183

184 According to participants, primary schools predominantly chose to implement walking,
185 jogging or running as the type of activity, as per the original Daily Mile concept.

186

187 *"...it catered for all abilities ... the ones that maybe are a bit slower, 'cause you'll, you'll get*
188 *out there and some o' the kids will just run, run round and they'll, they want to know how*
189 *many laps they can do, and whereas you've got other ones that are happy just to walk ..."*

190 [P4].

191

192 At one school the participant reported there were concerns about a small and difficult
193 shaped playground and it was decided to change The Daily Mile into the Daily Skip, with
194 the view that *"the children were having that physical activity, getting similar kinds of*
195 *benefits but it was within a confined space"* [P2]. Skipping was chosen over walking as it
196 could be completed in the small playground at the school and would keep the children
197 visible and on site unlike The Daily Mile which would have to be completed offsite. The
198 participant reported that The Daily Skip proved very challenging for a number of reasons
199 including the choice and cost of equipment (different lengths needed, children preferring
200 different types of ropes), the logistics of managing the skipping ropes (distribution, drying
201 ropes when wet), and the skill required to skip. They highlighted how these challenges
202 which move away from the original simple design, plus other demands from within the
203 curriculum meant that The Daily Skip was only happening sporadically, if at all.

204

205 *"So at first it, obviously it's [skipping] quite an expensive thing as well, because again you*
206 *need skipping ropes, and because every class has kind of been encouraged to do it when it*

207 *suits them, you know you needed multiple sets of them ...and when you're out skipping in*
208 *the rain with skipping ropes they get wet, they get sodden, they get dirty, they get harder*
209 *to manipulate and to move, particularly for the younger children, because my class, some*
210 *of them are, in fact the biggest majority can't actually skip, they can't rotate the rope round*
211 *and skip continuously the way that other classes can, so we're kinda skipping over a rope*
212 *and it's, it's just difficult 'cause you're skipping into puddles, you're skipping in wetness... so*
213 *there's been lots of things that have proved very difficult ..."* [P2]

214

215 The duration of the activity at all schools was 15 minutes. One participant noted that
216 although it is called the Daily *Mile* the intervention is actually time (15 minutes door to
217 door) not distance based. It was said that if the children were running then they achieved
218 approximately one mile during this time. This amount of time was also perceived as being
219 short enough not to interfere too much with the school day. During the interview process,
220 one of the schools who was thought not to be completing The Daily Mile, described their
221 "unsuccessful" attempts at implementing it within their context. Through this description
222 it emerged that they were in fact delivering The Daily Mile but were not aware they were.
223 Specifically, the participant discussed how the school initially had the children completing
224 an actual mile. However, they then noted that for reasons of time (it took too long for
225 some children to complete an actual mile) and motivation (a mile was a long way for some
226 children), it was felt that the activity was not suitable for long term engagement and was
227 not incorporated into the school's routine. Subsequent to this, the school adapted their
228 approach to 15 minutes of activity (which is what The Daily Mile was intended to be) and
229 this was reported to be more feasible. The Daily Mile continues to be completed at this
230 school in this way highlighting the importance of the short duration of The Daily Mile.

231

232 *“...it shouldn’t take any longer than about 15 minutes in total, ‘cause otherwise we’re*
233 *looking at quite a chunk of time in their learning...it isn’t a mile that’s measured out, it’s a*
234 *time period, it’s how far you can go within that period of time.” [P1]*

235

236 Other factors that increased the time taken to complete The Daily Mile were also reported
237 to be considerations for implementation. Whilst The Daily Mile was described as not
238 requiring any specific equipment or kit, one participant reported that some children liked
239 to change their shoes before completing The Daily Mile and that sometimes jackets were
240 necessary if it was cold or wet. At this school the jackets were kept in the classrooms and
241 therefore the participant suggested that changing was not seen as an issue as these could
242 be accessed quickly.

243

244 *“Some of the children like to change into trainers, and you know we give them that couple*
245 *of minutes just, they know quickly that it’s part of the routine, they don’t need to come and*
246 *ask, they just go and do it.” [P3].*

247

248 However, in another school the participant described how the cloakrooms were away from
249 the classroom and if jackets and shoe changes were needed then this added to the time
250 taken for The Daily Mile. Whilst this participant did not note that this had an immediate
251 effect on implementation and it didn’t affect all classes, it was an issue raised by teachers.

252

253

254 The frequency of The Daily Mile was typically less than five times per week and rarely
255 occurred on a daily bases. While participants stated that the school and their colleagues
256 had aspirations for The Daily Mile to occur every day, it typically took place on days with no
257 scheduled physical education. The Daily Mile was therefore reported by participants to be
258 occurring at least three times a week with days when there was already a scheduled
259 activity such as physical education typically when it did not occur.

260

261 *...“so it's to make sure that they're getting some physical activity built in tae their day on*
262 *the days that there's no physical education ...so that would be three times' a week”.* [P4]

263

264 **Flexible delivery that supports teacher autonomy**

265 All participants reported that The Daily Mile occurred during school time. However, they
266 noted that the individual classroom teachers decided when in the day to take the children
267 out allowing for teacher autonomy. Participants suggested that The Daily Mile was either
268 timetabled in by the teacher to suit their plan for the day or taken at a point in the day
269 when the children were flagging. One participant noted that availability of staff was an
270 additional consideration as to when The Daily Mile occurred during the day. They
271 commented that classes with children who had additional support needs often waited for a
272 classroom assistant to be present in order to undertake The Daily Mile. It was noted that
273 there were some teachers who choose to tag The Daily Mile onto an existing break
274 because the children were already outside and in their outdoor attire resulting in less
275 disruption over the day.

276

277

278 *“The Daily Mile sometimes will be timetabled there, sometimes it will not and the teachers*
279 *will just go out when they feel ...so it will vary day by day and even if it is up there for it to*
280 *happen like halfway between break time and lunchtime, there's obviously that flexibility if*
281 *something else is going on in the class, they might continue with that or if the teacher feels*
282 *‘och, we need a bit of a break now, let's go out.’ [P3]*

283
284 *“...if they're out for their playtime it's easier for teachers to say you've got your outdoor*
285 *stuff on, we'll just go and do our Daily Mile, but if they've already had fifteen minutes of*
286 *running around on a lunchbreak I really want them to come in, settle, do a bit of learning,*
287 *go out and come back to their learning to see if it really has the impact, 'cause for me it's*
288 *about impact on learning ...” [P6]*

289
290 **Adaptable to suit the specific primary school context**

291 Whilst participants described situations where changing core intervention components
292 might have a negative effect on implementation, many aspects of The Daily Mile were
293 reported to be adapted to make it work in their context. These were said to be largely
294 related to the route and to suit the individual schools physical environment. However,
295 even within this adaptability, participants would often describe a balance between
296 adapting the Daily Mile to suit their context and making significant changes that might
297 again negatively influence implementation.

298

299 Managing the usage of the route of an aspect of implementation that was adapted
300 between schools. Two participants discussed that, due to space in the playground, there
301 was need to schedule when specific year groups were able to go out (i.e. years 1-3 in the

302 afternoon and the other classes in the morning). One participant noted that colleagues
303 whose classrooms overlook the playground would look out the window and see whether
304 the playground was clear before choosing to take their class out. Another said that there
305 was a set direction to follow and when classes went out, they just joined into the flow.
306 However, the exact time the classes go out within these periods was still at the discretion
307 of the teachers retaining their autonomy.

308

309 *“...if they're out for their playtime it's easier for teachers to say you've got your outdoor*
310 *stuff on, we'll just go and do our Daily Mile, but if they've already had fifteen minutes of*
311 *running around on a lunchbreak I really want them to come in, settle, do a bit of learning,*
312 *go out and come back to their learning to see if it really has the impact, 'cause for me it's*
313 *about impact on learning ...” [P6]*

314

315 The surface for the route was reported to be different between schools and even changed
316 within schools due to the weather or for construction but participants suggested this did
317 not affect implementation. For example, one participant reported that their school had an
318 all-weather track as the route for The Daily Mile and due to construction work, the route
319 temporarily changed to tarmac for a short period. During this time The Daily Mile still
320 continued. Another participant noted that teachers would sometimes switch to using a
321 grass area when it was dry. However, most described grass as being too wet, slippery or
322 muddy to use for The Daily Mile.

323

324 *“... the grass is probably the least favourable option to run on [slight laugh] ...em, you*
325 *know, at the moment we're running on the tarmacked area and that's absolutely fine, it*
326 *works really well, the children move from one running surface to another and they've never*
327 *bothered at all.” [P3]*

328

329 Participants reported that the number of laps was adapted by schools to suit their
330 playgrounds. Using laps was said to be linked to many important aspects of The Daily Mile
331 including having no winners or losers, children counting laps to see their progression and
332 being able to gather all children in quickly at the end. At one school with a small
333 playground, there was a split level with stairs, narrow alleyways and ramps connecting the
334 different areas. The participant from this school described the large number of laps that
335 would have to be completed as *“almost like a prison sentence”* with children having to run
336 around in circles in a confined area. In general, fewer laps were reported as more
337 favourable.

338

339 *“We wouldn't have the breadth and space to actually make that [laps] workable; it would*
340 *be OK at the back playground but it would be very boring I think for the children, 'cause*
341 *they'd be walking in lines: back, forward, back, forward, and they would have to do that,*
342 *what, I mean I don't know the maths, but I don't know how, they would have to do that,*
343 *you know probably a, a good hundred times [slight laugh] or something...” [P2]*

344

345 The idea of balancing adaption whilst ensuring The Daily Mile integrity was also highlighted
346 when participants discussed teachers taking part and the visibility of the children. Teachers

347 taking part in The Daily Mile with the children was seen as favourable by most participants
348 and occurred at the original school. They reported that teachers often used it as a time to
349 connect with the children in a non-formal, classroom setting. However, visibility of the
350 children whilst completing The Daily Mile was reported as more of a priority, with having
351 the children out of sight a barrier to implementing The Daily Mile for the participant from
352 the school which had a fragmented playground. In such circumstances when visibility was
353 comprised participants' suggested that teacher's participation was sacrificed with teachers
354 often choosing to remain in a fixed position to be able to keep sight of the children.

355

356 *"They [the teachers] can join in, some do, but if they're needing to see the children at all*
357 *points then they can't...it depends on individual classes and you know the teachers, but the*
358 *teachers would generally stand where they can see the whole class."* [P3]

359

360 Participants described a similar notion in relation to keeping The Daily Mile onsite. At
361 three schools, including the original school, participants reported that their routes were
362 onsite. One participant discussed that their school had considered using an offsite location
363 for The Daily Mile, however, they explained that this was not considered workable as it
364 would add a level of logistics that was not feasible, such as needing more adults (teachers,
365 classroom assistants or parents) to marshal the route. They also suggested a risk
366 assessment would need to be carried out daily to ensure that nothing had altered on the
367 route.

368

369 *"...we thought well can we take it outside of the school?, obviously we've got a local walk*
370 *...and we could work out a mile route round about that, but to police that, it's all different*
371 *gradients, it's all, obviously different areas, and for us to do that every day we'd have to*
372 *have people, we'd have to have parents and staff out monitoring each different part*
373 *because it's out in the community, and also you would have to be doing Risk Assessments*
374 *every day, thinking about needles, dogs' dirt, whatever it might be, but you know obviously*
375 *there would be a lot of different factors to take into consideration, and we didn't feel that*
376 *that was going to be a viable option because the whole point of The Daily Mile as far as we*
377 *were concerned was that it was done at a time that best suited a class teacher..." [P2]*

378

379 In addition to adaptations related to the physical environment, adaptations to suit
380 children's clothing were also noted by participants. A participant from a more affluent
381 school noted that girls especially wore shoes which might not be suitable for running
382 (ballet style pumps or shoes without shoelaces). In this situation they reported that the
383 activity intensity was adapted and the children were encouraged to walk and not run.

384

385 *"...if children are wearing, you know, shoes like this then we would encourage them to, to*
386 *walk fast, if they've got nothing else to change into, so it's that fast kind of you know,*
387 *walking rather than running, where something might flop off their feet, you know..." [P3]*

388

389 Continuing The Daily Mile beyond implementation

390 Participants noted other factors during discussions which may not have been directly
391 related to its initial implementation but could influence the longer term continuation of
392 The Daily Mile within primary schools.

393

394 All participants mentioned The Daily Mile in reference to a busy curriculum. Participants
395 noted that activities such as physical education, school plays and concerts were potential
396 competition to The Daily Mile within the schools timetable. Some participants therefore
397 reported that The Daily Mile was, on occasion, linked to the curriculum (e.g. maths) or to
398 external events (e.g. Olympics, Commonwealth Games) as a way to not only enhance
399 learning but to keep The Daily Mile current and relevant. It was reported that the original
400 intention The Daily Mile was not that it be used to rehearse times tables for example as it
401 should allow kids to turn off and enjoy being outside and that this concept should be
402 maintained.

403

404 *"...they (the children) get excited about doing it if the teachers have come up with some*
405 *ideas with the children about using the running, The Daily Mile to actually be part of their*
406 *maths, or to be part of their topic work, so there's all that, you know, giving it a focus for a*
407 *wee while, and that's not every single day of the year, that will maybe be for a part of the*
408 *year and that's just to kind of give it a little boost, add some focus to us, and they enjoy*
409 *that, yeah they enjoy it if they think they're running 'The Daily Nile' or doing different things*
410 *like that, sort of tying it in with their, their class work"* [P3]

411

412 Participants also discussed monitoring classes' participation in The Daily Mile to ensure it
413 was actually occurring. The original Daily Mile was not monitored formally and
414 participants suggested that over monitoring may hamper its success. This thought was
415 reiterated by others who suggested that any monitoring should be light touch. One
416 participant noted how their school informally monitored The Daily Mile through feedback
417 from children and parents and general awareness of the head teacher of what was
418 occurring at their school. Another reported that pupil councils or class representatives
419 often provided feedback to the head teacher of when and how often The Daily Mile was
420 occurring. However, this participant also suggested that too much deliberate enquiry
421 about The Daily Mile via the children could damage teacher-pupil relationships and the
422 need to ensure monitoring its usage didn't have other unanticipated negative effects.

423

424 *"...in a school this size it would be very difficult to monitor, you know, and make sure*
425 *everybody's doing it ... kinda thing ... you know, how do you monitor when somebody's got*
426 *the freedom tae do it at any point in their day and on the days that they're not having*
427 *physical education you know, what do you do, do you then turn the children in tae tell-tales*
428 *and then what does that do tae the relationship between the children and the teacher? As*
429 *far as I'm concerned you know, healthy, happy schools are about good relationships and*
430 *you don't want to be doing that, do you?" [P4]*

431

432 Although not directly referred to as inequalities by participants, some points raised related
433 to disparities between pupils and how this could affect The Daily Mile. For example, the
434 issue of appropriate footwear and clothing was raised by one participant whose school was
435 in an area of high deprivation. They reported that the children would quite often come to

436 school in clothing that was not appropriate for taking part in basic school activities making
437 participation in The Daily Mile difficult. They said that some had shoes with holes in them
438 or didn't bring a jacket into school. They also suggest that poor footwear and lack of wet-
439 weather clothing played into the schools decision as to whether to go out for The Daily
440 Mile in wet conditions.

441

442 A key consideration noted by all those with The Daily Mile was that of the benefit teachers
443 perceived from their class taking part which could contribute towards continuation of The
444 Daily Mile. A sense that the children were re-energised and rejuvenated was noted by all as
445 a perceived benefit of The Daily Mile. This emerged at all schools regardless of when in the
446 day The Daily Mile was undertaken. At one school the participant mentioned that some
447 children, typically those who had existing behavioural concerns, could become over
448 stimulated as a result of taking part in The Daily Mile and took time to calm down once
449 back in the classroom. However, on the whole, positive effects were most commonly
450 reported even among children who were already perceived as being physically active. For
451 example, in one school the participant suggested that many of the children were taking
452 part in sporting activities and clubs outside of school hours. For these children, The Daily
453 Mile was still reported to provide an instant boost in energy and improve concentration
454 specifically during school hours. The desirability of these immediate benefits may reinforce
455 teacher's motivation to continue making time for The Daily Mile.

456

457 *"...it [The Daily Mile] can be a good energiser, so some of them [teachers] have said that*
458 *the opportunity to get out and get moving and what have you, can be really good for*
459 *energising and then re-focusing children ..."*[P4]

460

461 Discussion

462 The Daily Mile was developed at an operational primary school in central Scotland as a
463 pragmatic solution to deal with the perceived lack of fitness of children. The aim of this
464 paper was to understand how The Daily Mile was being implemented in primary schools
465 and to assess potential factors associated with its successful implementation. From a
466 sample of four primary schools, there are several potential factors relating to how The
467 Daily Mile was develop, trialled and rolled out, its core intervention components and other
468 factors relating to its delivery that could have positively influenced its implementation.

469

470 Whilst The Daily Mile was developed without reference to specific psychological theories
471 or implementation frameworks and concepts, many of the intervention components and
472 how it was delivered have come from a deep understanding of the primary school system
473 and what would work in this context. The key factors related to its successful
474 implementation as identified in this study are therefore largely reflected in
475 implementation literature and include the simplicity of the core intervention components
476 and adaptability of other intervention components to suit the specific primary school
477 context [20]. Its core intervention components are intuitively simple with regards to
478 duration, type of activity, and frequency and these are likely to be key to its success.

479 Where The Daily Mile was interpreted as a literal mile and took more than 15 minutes, or it
480 was decided to implement a more complex activity such as skipping, there were difficulties
481 in implementation and the initiative was not sustained. Other intervention components
482 such as the specifics of the route including its surface and how the route was managed

483 were, with reason, adapted to suit each school context. The ability to adapt aspects of The
484 Daily Mile are likely to have contributed positively towards its transferability to other
485 primary schools, although as with the core components it appears to be important to
486 retain the integrity of The Daily Mile where possible. This flexibility to adapt certain aspects
487 of the intervention to suit the different primary schools context has also reported as an
488 important component of other school based physical activity interventions. The Kids
489 Marathon was a primary school-based participation challenge that gives children the
490 opportunity to complete a marathon over a whole school year by running laps of a course
491 1-2 times per week in their lunchtimes. In their evaluation, Chalkley et al. suggest that
492 contextual factors influenced how the Kids Marathon was implemented in different
493 schools [21]. Schools may wish to consider what impact that changing the original, simple
494 format may have on implementation and to assess variables within their own school
495 context (access to jackets, how to manage the route, teachers taking part) to ensure that
496 any adaptations do not have a negative effect on implementation.

497

498 Flexibility of delivery was highlighted as a key component in The Daily Mile's successful
499 implementation with relation to supporting teachers' autonomy. Teachers were also
500 largely engaged in the initiation of The Daily Mile at their school with their concerns
501 addressed prior to implementation. The ability to control the daily delivery of The Daily
502 Mile might reduce its burden on teacher's already busy scheduled day with their
503 engagement from the outset potentially creating a sense of ownership over the initiative.
504 Teachers support for physical activity initiatives in schools and autonomy of delivery has
505 previously been reported as important to implementation and sustaining interventions [22,
506 23]. In Scotland, The Daily Mile is being supported by the Government and subsequently

507 many schools are keen to implement it in their setting. However, it is essential that those
508 who will be involved in The Daily Mile (teachers and children) are involved in its initiation
509 in order to keep what was an essentially a 'bottom up' approach going.

510

511 In addition to the intervention components and delivery of The Daily Mile, other aspects of
512 how The Daily Mile was initiated also reflected in the implementation literature and whilst
513 the intervention itself was based on the teacher's implicit knowledge of what might work
514 in their context, these other aspects may have been more ad hoc. Implementation science
515 and specifically the Consolidated Framework for Implementation Research suggests that
516 having a credible and relatable intervention source, the ability to test an intervention on a
517 small scale prior to scaling up, and providing desired outcomes for the context are all
518 related to implementation success [20]. From the description of how The Daily Mile began
519 and was rolled out, many of these factors were addressed although as with many
520 interventions developed in real life contexts, this is unlikely to have been planned or
521 deliberate. The Daily Mile example could therefore be used as a model for future
522 interventions on how to develop and roll out a primary school based physical activity
523 intervention.

524

525 Other themes emerged from this study that might need to be considered for continuation
526 of The Daily Mile. As suggested within implementation development, trialling and roll out
527 of The Daily Mile, a supportive organisational environment was noted by all participants.
528 Previous research suggests similar findings with an unsupportive school environment said
529 to be related to poor implementation of school based physical activity interventions. [24,
530 25] For example, in a cross sectional survey of 720 principals and teachers in Canada

531 whose schools were taking part in a comprehensive school-based programme to promote
532 children health, including implementing 15 minutes of physical activity each day, schools
533 who reported greater institutionalisation were two times more likely to implement the
534 programme compared to those who reported lower levels of institutionalisation. [24] For
535 teachers, the acute benefit of refocusing and re-energising the children appeared to be of
536 particular importance and may contribute towards teachers continued delivery of The
537 Daily Mile. Similar findings were reported by Holt et al. (2013) who evaluated the effect of
538 a 20 minute physical activity policy in primary school children in the United States. [26] As
539 with the present study, teachers in this study also noted positive classroom behaviour
540 immediately after the physical activity had been implemented. Whilst longer term
541 outcomes such as improved fitness or weight loss might be desirable to schools and policy
542 makers, the acute effects provided by The Daily Mile may be more important to continued
543 participation as these provide immediate feedback to teachers as to why the activity is
544 worth including in their already busy day.

545

546 There are several limitations with this study including the small number of schools
547 interviewed and only selecting schools from one geographical area. Although two schools
548 were selected that were thought to be having challenges implementing The Daily Mile, due
549 to a misinterpretation of what The Daily Mile was (time not distance) one school was
550 found to be completing The Daily Mile as intended. This may have created a more biased
551 sample towards successful implementation. In addition, only the views of key teachers
552 involved in establishing The Daily Mile at their schools are reported. These individuals are
553 likely to be advocates of The Daily Mile and may have a more positive view than others of
554 the initiative. Given these limitations these results should be viewed as preliminary and

555 further research is needed. For example, future research should speak to more schools,
556 across different geographical areas and who have implemented The Daily Mile with varying
557 degrees of success. The key teachers from the present study would often report what they
558 observed and had heard from their children and colleagues. Whilst this provided a more
559 rounded view of The Daily Mile implementation, it is also necessary to understand
560 children's, teachers and parent's perceptions of The Daily Mile and specifically the
561 compulsory aspect. This research would likely produce further and deeper insights into the
562 implementation of The Daily Mile.

563

564 This study also provides insight into other potential future research relating to The Daily
565 Mile. For example, whilst factors that might be related to implementation of The Daily Mile
566 were identified through this study, without specifically testing each specific intervention
567 factor, the extent to which these truly influence implementation is unknown and could be
568 an area of future research. The Daily Mile was developed pragmatically without specific
569 reference to theory. Whilst it may not be appropriate to retrospectively attach specific
570 theories to The Daily Mile, future research may also wish to develop a program theory to
571 help explain the behaviour change observed in children at schools undertaking The Daily
572 Mile. This may also be applicable if looking at The Daily Mile in different contexts and
573 future research could address whether this format is transferable to different settings such
574 as educational institutions other than primary schools or the workplace.

575

576 Conclusion

577 The Daily Mile appears to have several factors which might be related to its
578 implementation success. This results from this study suggest that factors including having
579 simple core intervention components, flexible delivery that supports teacher autonomy
580 and being adaptable to suit the specific primary school context are likely to play important
581 roles in the implementation of The Daily Mile. This research also highlights several
582 considerations and areas of future research such as exploring exactly which of these
583 intervention factors effect implementation and what could effects its continuation in
584 schools. These are potentially important considerations for others looking to implement
585 The Daily Mile effectively in their primary school or in other settings.

586

587 Acknowledgments

588 We extend sincere thanks to all the teachers who took part in the present study. We would
589 also like to thank Stirling Council for their ongoing support of this research. Additional
590 thanks goes to our colleague Dr Amy Nimegeer from the University of Glasgow, Institute of
591 Health and Wellbeing for her assistance with data analysis and interpretation.

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