



Public Health
England



Loughborough
University

Protecting and improving the nation's health

Active mile briefing: evidence and policy summary

A briefing for public health teams,
commissioners, schools, headteachers
and teachers

Annex A: the evidence for active mile initiatives

The evidence for active mile initiatives

This annex provides information on the evidence for active mile initiatives. The evidence was drawn upon to create the following resources:

[Active mile briefing: evidence and policy summary](#)

[Active mile briefing: implementation guide](#)

[Active mile briefing: practice examples](#)

Active mile initiatives have become highly popular and there are a number of anecdotal claims about their benefits. Whilst there is much evidence surrounding the health benefits of physical activity for children and young people ¹ there are limited peer-reviewed high-quality evaluations and/or research which has focussed specifically on the effectiveness and cost effectiveness of active mile initiatives.

The evidence included within this review were identified via a literature search which was completed to answer the following question:

What is the evidence base for active mile initiatives in schools for physical activity and health outcomes?

Main concepts were identified which included the following keywords and combination of search terms using Boolean and truncation searching:

- school physical activity
- implementation
- running
- jogging
- walk/run
- primary school
- physical activity
- MVPA (Moderate to vigorous physical activity)
- school based health promotion
- school based intervention

The search included Pubmed, Zetoc, Web of Science and Google scholar databases between 1 Jan 2009 and 1 Dec 2019.

In addition, searches were conducted using citation chaining as well as manual searches of journals that are specifically related to the topic and additional information was provided by the expert steering group members, many of whom are currently conducting research in this area.

All forms of empirical evidence were included which had come from published, peer-reviewed research. As such it should be noted that some of the evidence may be specific to one type of active mile initiative and not another.

To accurately represent the evidence and be able to present it in a succinct way, a rating system was applied to the evidence base using 2 commonly used criteria: the strength of the evidence (based on study design) and the consistency of the evidence. The overall score was calculated as an average of the scores for the 2 criteria, see Tables 1-4. A summary of the strength of the association between participation in an active mile initiative and each outcome based on the rating system is provided in Table 5.

Table 1. Strength (quality) of the evidence

Coding	Reasoning
Level 1	Supporting evidence is based on qualitative or quantitative study designs that are non-randomised, controlled, cohort based, cross sectional, survey or descriptive/exploratory in nature
Level 2	Supporting evidence is based on mixed method designs and/or randomised controlled trials with small sample sizes showing statistically non-significant trends
Level 3	Supporting evidence is based on randomised controlled trials with follow up or systematic reviews/meta-analyses of randomised controlled trials

Table 2. Consistency of the evidence

Coding	Reasoning
1	Insufficient evidence
2	Inconsistent and equivocal evidence
3	Consistent evidence across studies

Table 3. Overall score of the evidence

Average Score	Coding
2-3	Blue
1-2	Teal
0-1	Grey

Table 4. Summary of the rating of the evidence based surrounding active mile initiatives

Outcome	Strength of the evidence	Consistency of the evidence	Overall score	Rating
EDUCATIONAL				
Cognition and academic performance	2	1	1.5	Teal
On task behaviour	1	2	1.5	Teal
PHYSIOLOGICAL				
Fitness	1	2	1.5	Teal
Weight status	2	1	1.5	Teal
Body composition	1	1	1	Grey
PSYCHOLOGICAL				
Self-esteem and attitude	1	3	2	Teal
Affective wellbeing	1	1	1	Grey
SOCIAL				
Positive friendships and peer relationships	1	3	2	Teal
Teacher/pupil rapport	1	3	2	Teal
BEHAVOURAL				
Physical activity	1	3	2	Teal
Sporting performance	1	1	1	Grey
Sedentary time	1	1	1	Grey
OTHER				
Cost-effectiveness	2	1	1.5	Teal

The evidence base surrounding active mile initiatives is evolving, and further research is needed to be able to draw firm conclusions, but the current evidence is summarised below and in Table 5.

Educational outcomes

Cognition and academic performance

Two studies have examined cognition and academic performance, one was rated as a level 1 study ² and one was rated as a level 2 study ³.

Booth et al's (2020) study on 5,463 pupils from 332 schools found some support for a small beneficial effect of 15 minutes of self-paced outdoor activity on pupils' cognition ² however, Morris et al's (2019) high quality randomised controlled trial found no effect on executive functions ³. These 2 studies used very different designs, protocols and measures and therefore further research is needed to be able to draw firm conclusions.

On task behaviour

One study, rated as level 1, has examined on task behaviour ⁴. Stylianou et al's (2016) quasi-experimental study conducted with 2 schools in the US found significant improvements in on-task behaviour on days children attended a before-school active mile initiative ⁴.

Perceived changes in pupils' attention and concentration have been reported by both teachers and pupils in 4 qualitative/mixed method studies (all rated as level 1) ⁵⁻⁸ however the findings are equivocal. Marchant et al (2020) and Malden and Doi (2019) reported mixed findings while Harris et al (2019) and Ryde et al (2018) reported a positive association. Thus, the overall association remains unclear.

Physiological outcomes

Cardiorespiratory fitness

Of the 4 quantitative/mixed method studies which have examined cardiorespiratory fitness, 3 were rated as level 1 ^{5,9,10} with one level 2 study ¹¹.

Chesham et al (2018), Brustio et al (2019) and Marchant et al's (2020) studies, all conducted with small samples of pupils from 2, 5 and 6 schools respectively, showed an improvement in children's fitness ^{5,9,10}. Breheny et al's (2020) recent high-quality randomised controlled trial involving 40 schools showing no effect ¹¹. These collective findings should be interpreted with caution due to design differences between the studies (including different sample sizes, fitness measures and durations and frequency of the active mile initiative).

Perceived increases in children's fitness have been reported by both teachers and pupils in 4 qualitative studies ^{5,12-14}, all rated as level 1, however the overall association remains unclear.

Weight status

One study has examined weight status which was rated as a level 2 study ¹¹. Breheny et al's (2020) randomised controlled trial involving 40 schools found a small but non-significant reduction in weight status ¹¹.

Body composition

One, level 1 study has examined body composition ⁹.

Chesham et al's (2018) quasi-experimental study based on pupils from 2 schools found improvement in relation to children's body composition measured using skinfold assessment ⁹.

Psychological outcomes

Self-esteem and attitudes

Two studies have focused on pupils' perceptions of participating in active mile initiatives, both were rated as level 1 ^{5,13}.

Both Chalkley et al (2020) and Marchant et al's (2020) studies reported feelings of happiness and improvements in self-esteem as well as attitudes to physical activity among pupils during/after participating in an active mile initiative ^{5,13}.

Behavioural outcomes

Physical activity

Five studies have examined pupils' physical activity, either during the active mile initiative ^{3,7} or as a result of participation ^{5,9,13}, all were rated as level 1 studies apart from one randomised controlled trial rated as level 2.

Evidence shows that active mile initiatives are able to provide a meaningful structured bout of physical activity. Chesham et al's (2018) cross sectional study demonstrated an increase in pupils' MVPA by ~9 minutes ⁹.

Morris et al's (2020) randomised controlled trial found that children accumulated between 5-15 minutes of MVPA during one active mile session ³. Similarly, observations of children participating in an active mile initiative have suggested that a high percentage of children engaged in MVPA during this time ⁷.

Chalkley et al (2020) and Marchant et al (2020) qualitative studies' have shown some support for active mile initiatives to promote physical activity outside of the school setting ^{5,13}. However, this is yet to be supported by more objective measures of physical activity.

Sporting performance

Two studies have reported on pupils' sporting performance as an outcome of participation in an active mile initiative ^{5,13}, both rated as level 1 studies.

Chalkley et al (2020) and Marchant et al (2020) reported that both pupils and teachers have attributed improvements in sporting achievements as a result of participating in active mile initiatives ^{5,13}.

Sedentary time

One study has examined children's sedentary time ⁹, rated as a level 1 study.

Chesham et al's (2018) study reported a reduction in children's sedentary time (decrease in ~18 minutes/day) during an active mile initiative ⁹.

Social outcomes

Teacher/pupil rapport

Of the 3 studies which have reported teacher/pupil rapport as an outcome ^{6,12,14}, all were rated as level 1 studies.

Chalkley et al (2018), Malden and Doi (2019) and Hanckel et al's (2019) studies reported increased teacher and pupil rapport ^{6,12,14}.

Friendships and positive peer relationships

Five studies reported friendships and positive peer relationships as an outcome ^{7,12-15}, all were rated as level 1 studies.

The most consistent finding from the research is the benefit to pupils of spending time with friends and building and strengthening peer relationships

Other outcomes

Cost-effectiveness

One level 2 study has examined cost-effectiveness of an active mile initiative ¹¹.


Brehehy et al's (2020) randomised controlled trial has shown support for active mile initiatives as a cost-effective strategy ¹¹. Any staff costs associated with the supervision of children while participating are offset by the improvement in children's quality of life, particularly among girls.


Summary

Table 5. A summary of the strength of association between participation in an active mile initiative and each outcome

Educational	Physiological	Psychological	Social	Behavioural	Other
Cognition and academic performance	Fitness	Self-esteem and attitude	Friendships and positive peer relationships	Physical activity	Cost-effectiveness
On task behaviour	Weight status	Affective wellbeing	Teacher/pupil rapport	Sporting performance	
	Body composition			Sedentary time	

 Blue outcomes are those with consistent evidence from high quality studies

 Teal outcomes are those which have inconsistent evidence and/or evidence from a small number of studies

 Grey outcomes are those with insufficient evidence

References

1. Chalkley A, Milton K, Foster C. Change4Life Evidence Review: Rapid evidence review on the effect of physical activity participation among children aged 5-11 years. 2015;1-26. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/440747/Change4Life_Evidence_review_26062015.pdf
2. Booth JN, Chesham RA, Brooks NE, Gorely T, Moran CN. A citizen science study of short physical activity breaks at school: improvements in cognition and wellbeing with self-paced activity. *BMC Med* [Internet]. 2020 Dec 17;18(1):62. Available from: <https://bmcmmedicine.biomedcentral.com/articles/10.1186/s12916-020-01539-4>
3. Morris JL, Daly-Smith A, Archbold VS, Wilkins EL, McKenna J. The Daily Mile™ initiative: Exploring physical activity and the acute effects on executive function and academic performance in primary school children. *Psychol Sport Exerc* [Internet]. 2019 Nov;45(September):101583. Available from: <https://doi.org/10.1016/j.psychsport.2019.101583>
4. Stylianou M, Kulinna PH, van der Mars H, Mahar MT, Adams MA, Amazeen E. Before-school running/walking club: Effects on student on-task behavior. *Prev Med reports* [Internet]. 2016 Jun [cited 2017 Jan 5];3:196–202. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4929141&tool=pmcentrez&rendertype=abstract>
5. Marchant E, Todd C, Stratton G, Brophy S. The Daily Mile: Whole-school recommendations for implementation and sustainability. A mixed-methods study. Visram S, editor. *PLoS One* [Internet]. 2020 Feb 5;15(2):e0228149. Available from: <https://dx.plos.org/10.1371/journal.pone.0228149>
6. Malden S, Doi L. The Daily Mile: teachers' perspectives of the barriers and facilitators to the delivery of a school-based physical activity intervention. *BMJ Open* [Internet]. 2019;9(3):e027169. Available from: <http://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2018-027169>
7. Harris J, Milnes LJ, Mountain G. How 'The Daily Mile™' works in practice: A process evaluation in a UK primary school. *J Child Heal Care* [Internet]. 2019 Oct 9;136749351988004. Available from: <http://mc.manuscriptcentral.com/jchc>
8. Ryde GC, Booth JN, Brooks NE, Chesham RA, Moran CN, Gorely T. The Daily Mile: What factors are associated with its implementation success? Van Horn L, editor. *PLoS One* [Internet]. 2018 Oct 4;13(10):e0204988. Available from: <https://dx.plos.org/10.1371/journal.pone.0204988>
9. Chesham RA, Booth JN, Sweeney EL, Ryde GC, Gorely T, Brooks NE, et al. The Daily Mile makes primary school children more active, less sedentary and improves their fitness and body composition: a quasi-experimental pilot study. *BMC Med* [Internet]. 2018;(16):1–13. Available from: <https://doi.org/10.1186/s12916-018-1049-z>

10. Brustio, Mulasso, Marasso, Ruffa, Ballatore, Moisè, et al. The Daily Mile: 15 Minutes Running Improves the Physical Fitness of Italian Primary School Children. *Int J Environ Res Public Health* [Internet]. 2019 Oct 15;16(20):3921. Available from: <https://www.mdpi.com/1660-4601/16/20/3921>
11. Breheny K, Passmore S, Adab P, Martin J, Hemming K, Lancashire ER, et al. Effectiveness and cost-effectiveness of The Daily Mile on childhood weight outcomes and wellbeing: a cluster randomised controlled trial. *Int J Obes* [Internet]. 2020 Jan 28; Available from: <http://www.nature.com/articles/s41366-019-0511-0>
12. Chalkley AE, Routen AC, Harris JP, Cale LA, Gorely T, Sherar LB. A retrospective qualitative evaluation of barriers and facilitators to the implementation of a school-based running programme. *BMC Public Health* [Internet]. 2018;18:1189. Available from: <https://doi.org/10.1186/s12889-018-6078-1>
13. Chalkley AE, Routen AC, Harris JP, Cale LA, Gorely T, Sherar LB. “I Just Like the Feeling of It, Outside Being Active”: Pupils’ Experiences of a School-Based Running Program, a Qualitative Study. *J Sport Exerc Psychol* [Internet]. 2020 Feb 1;42(1):48–58. Available from: <https://journals.humankinetics.com/view/journals/jsep/42/1/article-p48.xml>
14. Hanckel B, Ruta D, Scott G, Peacock JL, Green J. The Daily Mile as a public health intervention: a rapid ethnographic assessment of uptake and implementation in South London, UK. *BMC Public Health* [Internet]. 2019 Dec 27;19(1):1167. Available from: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7511-9>
15. Brustio PR, Moisè P, Marasso D, Miglio F, Rainoldi A, Boccia G. Feasibility of implementing an outdoor walking break in Italian middle schools. *PLoS One* [Internet]. 2018;13(8):1–13. Available from: <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0202091&type=printable>