



EXECUTIVE SUMMARY



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EPPI-Centre

Children and Physical Activity: A Systematic Review of Barriers and Facilitators



**Evidence for Policy and Practice
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A searchable database which includes the studies reviewed in this report will be available on the EPPI-Centre website (<http://eppi.ioe.ac.uk>).

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Background and aims

Physical activity promotion is high on the public health policy agenda in the UK. Evidence regarding increased prevalence of obesity amongst children in the UK is mounting. Available data on levels of physical activity amongst children and young people suggest that levels begin to decline as children reach their teenage years. Promoting physical activity amongst children is considered to be particularly important as it may help to prevent this decline and encourage life-long physical activity habits. There is some evidence to suggest that material and social context affect children's participation in physical activity, with lower levels of physical activity and higher levels of sedentary activity reported amongst groups considered to be 'socially excluded'. However little is known about how different social factors such as gender, social class and ethnicity interact, and about where and how to intervene successfully.

This report describes a systematic review aiming to survey what is known about the barriers to, and facilitators of, physical activity amongst children aged four to 10. It is the first of two concerned with children aged four to 10 years; the second will focus on healthy eating. Both these reviews bring together the findings of 'qualitative' as well as 'quantitative' research, a task which is rarely attempted within a systematic review.

Methods

The review was restricted to studies focused on children aged four to 10 years, and to those studies published in the English language. Literature searches of multiple sources were undertaken to identify relevant research. We sought evaluations of interventions to promote physical activity amongst children ('outcome evaluations') carried out in any country from around the world. We also sought 'non-intervention' research aiming to describe factors relating to children's physical activity participation in the UK; evaluations looking at the processes involved in implementing interventions to promote physical activity ('process evaluations'); and previous systematic reviews.

We carried out the review in two stages: a mapping and quality screening exercise which described the characteristics of all the relevant research we identified; and an in-depth review synthesizing the findings of a particular sub-set of studies. The narrower focus of the in-depth review, chosen in consultation with user groups, was on the barriers to, and facilitators of, children's participation in physical activity outside physical education (PE) lessons at school.

Findings

The searches produced a substantial amount of potentially relevant literature – 360 full text reports were retrieved after screening 8231 titles and abstracts. After

screening full reports, 149 met our inclusion criteria and were available within the relevant time frame. These described a total of 90 separate studies. Six of these were existing reviews. None of these six reviews duplicated the work described here: not one focused solely on children aged four to 10 years; their methodological quality was variable, and none made any systematic attempts to integrate the findings from both 'qualitative' and 'quantitative' research.

Just over two-thirds (69) of the 90 studies reported interventions. Schools were the most frequent sites for interventions, followed by homes and the community. Teachers, parents and health professionals provided the interventions. Most of the interventions focused on information provision and/or education, but many involved participation in physical activities alongside education in the classroom. Several interventions aimed to enhance children's learning about the health benefits of physical activity using bio-feedback techniques. Modifying children's environments was an infrequent intervention component. A trial design was the most commonly used evaluation strategy, even in the UK. Fifty-one of the 66 outcome evaluations used this approach, and 27 of these were randomised controlled trials (RCTs). All four outcome evaluations carried out in the UK used a trial design.

All of the 15 UK 'non-intervention' studies identified used a cross-sectional design, examining factors relating to children's participation in physical activity at one point in time. Their reporting of methods was highly variable. For example, no studies clearly described the ethnicity of the children in their sample and only four gave information about their socio-economic background.

Whilst there has been a substantial amount of evaluation activity related to promoting children's physical activity, little of this has been conducted in the UK. Other types of research in the UK on this topic and age group are similarly scarce. Only 22 of the 90 studies focused on groups of children at risk of social exclusion, and none of these studies were conducted in the UK.

Twenty-one of the 66 outcome evaluations met the criteria for in-depth review (aimed to promote physical activity beyond the PE lesson; measured relevant outcomes; and employed a trial design). The most common reasons why studies did not meet the in-depth criteria were a failure to employ a control or comparison group or a failure to measure relevant outcomes. Most of the 21 studies ($n = 14$) were conducted in the USA, with four in the UK and one each in Ireland, Greece and the Netherlands.

We judged five of the 21 outcome evaluations to be methodologically sound. All were conducted in the USA. The most common problem with those studies judged not to be sound was a failure to provide data describing the study groups prior to intervention.

The small number of sound studies and the diversity of the interventions evaluated in these made it difficult to detect any clear patterns related to intervention effectiveness. Two interventions attempted to change children's level of sedentary behaviour; three aimed to increase levels of participation in physical activity; all interventions involved parents, but to varying degrees; and all but one involved a school-based element.

The two studies evaluating interventions to decrease sedentary behaviour focused on reducing media use such as TV viewing and use of video games. Both of these are suggestive of positive effects on physical activity, on TV and video-related sedentary activity, or on both, but caution is needed in their interpretation. The first was a pilot study of a counselling and behavioural intervention aimed at reducing TV viewing among African American children aged seven to 12; the intervention was judged to be effective in increasing organised physical activity levels, but as a small pilot study it lacked sufficient statistical power reliably to show any effect. The second intervention study aimed at decreasing media use examined the effectiveness of school-based curriculum with a home component, and found this to be effective for a number of outcomes, including in reducing TV viewing time and video-game playing and the frequency of meals eaten in front of the TV. There was no evidence of an effect of this intervention on reported physical activity levels; the study may not have had sufficient power to detect such an effect.

The third sound outcome evaluation, the Child and Adolescent Trial for Cardiovascular Health ('CATCH'), evaluated a school-based intervention aiming to change children's eating habits, physical activity patterns and smoking uptake. The intervention involved health-related curricula taught by classroom teachers and changes to school meals and PE lessons. Half the intervention schools also had a home activity component. Vigorous physical activity was significantly higher in the intervention group. However, since results were not presented separately for the 'school only' and 'school and home' CATCH intervention groups, it was not clear what additional effect, if any, the components of CATCH involving families may have had on children's outcomes.

The fourth sound outcome evaluation detected positive effects on knowledge only. The 'Eat Well and Keep Moving' intervention evaluated the impact on children's diets, health-related knowledge, TV viewing and physical activity of a low cost, sustainable, school-based diet and physical activity programme among nine-year-old school children from low-income families. Intervention components included classroom education; home-based activities; and provision of low-cost facilities for parents. Although the intervention increased knowledge of physically healthy activities, there was no evidence of effect on behavioural measures.

The fifth sound outcome evaluation, the 'Know Your Body' programme, was a five-year school-based intervention aiming to promote nutrition and physical activity and prevent smoking amongst children aged nine years old living in the Bronx district of New York. The intervention included teacher-led classroom education, parental involvement activities, and risk factor examination. It was effective for increasing health knowledge only. There was no evidence that the bio-feedback of risk factors, which was a key part of the programme, was an effective approach, and it was considered to have created considerable disruption of regular school activities.

These five studies show that interventions can lead to positive changes. Education and provision of equipment for monitoring and reducing TV, video-tape and video-game use appear to be promising population-based approaches to promoting children's physical activity, as do multi-component interventions set in schools, homes and the wider community. However, it is not clear whether the latter type of intervention can be effective in changing behaviour, as the two studies testing this approach demonstrated changes in children's knowledge only

In-depth review: results from studies examining children's views

Studies of children's views about physical activity appear to be rare. The five studies we identified were difficult to find: four were identified only through searches on specialist health promotion registers and one was found through contact with the author.

All five studies examined children's views on what stopped them taking part in physical activity. These studies highlighted a total of 20 distinct but interrelated barriers. The 20 barriers clustered around three underlying themes: ***preferences and priorities*** (e.g. a preference for doing other things, a lack of spare time); ***family life and parental support*** (e.g. parents' lack of current participation in, or enthusiasm for, sports and exercise); ***restricted access to opportunities for participation*** in sport or exercise (e.g. cost, particularly for children from families with a low income; distance, particular for children from rural areas; lack of means for safe travel; lack of facilities) and participating in unstructured forms of physical activity (e.g. busy traffic; threat of crime; threat of intimidation by older children; and neglect of local play areas).

Four of the five studies also examined children's views about what helped them to take part in physical activity. A total of 14 distinct, but interrelated, facilitators were identified. Again, these clustered around particular themes: ***aspects of physical activity that children value*** (e.g. a choice of sporting and exercise opportunities; physical activity as a means to having fun and spending time with friends; for those children already engaged in high levels of sport, a sense of belonging to a team, enjoyment of competitiveness, and feelings of achievement); ***family life and parental support*** (e.g. a supportive, encouraging and inspiring family; provision of practical support by parents; the opportunity to do things with other family members); ***greater access to opportunities for participating in physical activity*** (e.g. owning a car; having a garden). Children and parents also identified five ideas for promoting physical activity, all of which emphasised the need to change children's local environments: better provision of youth clubs; cleaning up park spaces and play areas; providing better cycle paths; schools to provide more extra-curricular opportunities; and making school facilities more accessible outside of school lessons.

Our critical appraisal of these studies suggests that researchers need to develop the methods they use and report on them with greater clarity. Methods of analysis were particularly poorly described or absent and it was difficult for the reviewers to be confident that the study findings were really rooted in the children's perspectives. All but one of the studies failed to involve children actively in the design or conduct of the study.

Synthesis across study types

Our synthesis across intervention studies and studies of children's views found some important matches, but there were also significant mismatches between what children say influences their participation in physical activity and the barriers and facilitators addressed in soundly evaluated interventions. A major gap was the lack of soundly evaluated interventions addressing barriers identified in children's local environments.

Some aspects of children's views reflecting their **preferences, priorities and valued aspects of physical activity** do appear to have been built upon in interventions soundly evaluated and shown to be effective. Interventions which aimed to reduce the amount of time children spent watching TV or playing computer games in order to make more time available for physical activity were successful. Other interventions that match children's views, which have been developed but not yet adequately evaluated, include the provision of a tailored fitness module which matches children's activity preferences and the provision of opportunities to participate in simple activities in school-break times. Interventions emphasising the social, physical and mental benefits of physical activity valued by children need to be newly developed and evaluated.

In terms of children's views relating to **aspects of family life and parental support**, all the soundly evaluated interventions included a parental involvement component. These build on children's views that parental enthusiasm and support are important. However, none of the evaluations measured the impact of the interventions on parents themselves.

None of the soundly evaluated interventions built on children's views relating to **access to opportunities for participating** in physical activity. However, some interventions of this type have been developed, although they are still awaiting a sufficiently robust evaluation of their effectiveness. These include an intervention to provide free transportation to sports facilities; a UK study offering children free introductory sessions at local authority clubs and facilities; the provision of information about free opportunities for physical activity; making school facilities for physical activity available outside school hours; and another UK study evaluating a low-cost modification designed to improve the school playground. Interventions which need to be newly developed and evaluated include initiatives to clean up park spaces; reducing crime and the threat of crime in children's local environments; reducing busy traffic and improving cycle paths; and improving the provision of youth clubs as safe place for children to be active in all weathers.

Conclusions

This review found few evaluated health promotion interventions which address physical activity beyond the PE lesson, and even fewer that have been rigorously evaluated. Whilst children have clear views on the barriers to, and facilitators of, their participation in physical activity, their views rarely informed the development of interventions. There is little research to guide promoting physical activity amongst socially excluded children in the UK. Poor reporting of sample characteristics within studies compounds this problem.

Gaps between children's views and soundly evaluated interventions were most noticeable in relation to issues identified by children of restricted access to opportunities for physical activity (e.g. busy traffic, poor quality of playgrounds, and the need for local, easily accessible facilities).

In terms of recommendations for effective interventions, the following have been demonstrated to be effective in one or more studies: education and provision of equipment for monitoring TV or video-game use; engaging parents in supporting and encouraging their children's physical activity and providing opportunities for family participation; and multi-component, multi-site interventions using a combination of

education in the classroom, improvements in school PE, and home-based activities. However, the small number of sound evaluations found means that conclusions about effectiveness can only be tentative. It is not yet clear whether these types of interventions will always result in positive behavioural changes, which components are essential for success, or the extent to which they are appropriate for children in a UK context.

Approaches which appear to take into account the views of children in the UK, but which require further evaluation and development include those which: provide children with a diverse range of physical activities to choose from; emphasise the aspects of participating in physical activity that children value (e.g. opportunities to spend time with friends); provide free or low-cost transportation and reduce costs; and those which aim to provide a safer local environment in which children can actively travel and play.

Future evaluations need to involve researchers, practitioners, children and their parents working in partnership, and employ rigorous evaluation methods. Reporting of studies needs to include clear details of methods to facilitate replication. In order to assess whether interventions can reduce inequalities in children's participation in physical activity, it is particularly important that studies report sample characteristics.