A systematic review of the effectiveness of physical education and school sport interventions targeting physical activity, movement skills and enjoyment of physical activity

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CRD summary
The authors concluded the most effective strategies to increase children’s levels of physical activity and improve movement skills in physical education and schools sports were direct instruction teaching methods and providing teachers with professional development. Difficulty in determining the level of evidence for the elements of interventions reported in the authors’ conclusions makes their reliability unclear.

Authors' objectives
To evaluate the effectiveness of physical education in promoting participation in and enjoyment of physical activity and movement skill proficiency in children and adolescents.

Searching
ERIC, Sports Discus, A+ Education, Science Direct and PsycINFO were searched from 1990 to June 2010 for articles published in English. Search terms were reported. Reference lists of retrieved articles were scanned. Experts in the field were contacted for additional articles.

Study selection
Controlled studies that evaluated curriculum-based physical education and school sports (PESS) interventions to promote physical activity, increase movement skill proficiency and enjoyment of physical activity in children and adolescents were eligible for inclusion. Studies had to include participants with a mean age between five and 18 years and report movement skill proficiency, physical activity participation or enjoyment of physical activity in a school setting.

The content of interventions varied considerably. Measurement instruments for outcomes varied between studies and included accelerometry, pedometers, direct observation and self-reported measures. Control groups were usual school curriculum or another intervention. Some studies included only boys or girls but most included mixed samples. Most studies were conducted in primary schools; some were in secondary schools. Delivery methods varied between studies and included delivery by teachers or specialist physical education teachers. Most studies reported data immediately post intervention (range eight weeks to three years). Most studies were conducted in USA; others were conducted in Australia, Canada and Europe (including UK). Studies were published between 1993 and 2010.

Three independent reviewers selected studies for inclusion. Disagreements were resolved through discussion.

Assessment of study quality
Study quality was assessed using a 10-item quality assessment scale. Criteria included reporting of baseline characteristics, randomisation procedures, use of validated measures, drop-outs, blinding, follow-up, use of intention to treat analysis, reporting of confounders, summary results and use of a power calculation. A study was rated as high quality if it scored 5 or more for a controlled trial or scored 6 or more for a randomised controlled trial (RCT).

Three reviewers independently assessed study quality.

Data extraction
Data on physical activity participation, movement skill proficiency and enjoyment of physical activity were extracted.

The authors did not state how many reviewers extracted data.

Methods of synthesis
Differences between intervention and control groups were examined by tabulating data from each study and vote counting how many showed a beneficial effect of physical education and school sports.
Results of the review
Twenty-three studies (range 38 to 25,000 participants) were included in the review. Six out of 13 RCTs and two out of 10 controlled trials were deemed high quality. Only three studies reported follow-up (range eight to 19 months).

Physical activity participation (19 studies): Fifteen studies reported increased physical activity participation after physical education and school sports and 13 of these studies reported statistically significant findings post intervention. Two studies that reported follow-up measures reported continued effectiveness but only one study found statistically significant differences at post intervention and follow-up.

Movement skill proficiency (four studies): All four studies reported statistically significant improvements in movement skill proficiency post physical education and school sports intervention. One study that reported follow-up at six and 12 months found no significant differences between groups.

Enjoyment of physical activity (seven studies): Three studies reported improved enjoyment post physical education and school sports intervention but only one reported statistically significant findings. One study reported follow-up and found significant differences continued at six and 12 months follow-up but only among boys (both time points). Four studies reported no intervention effects.

Authors’ conclusions
Direct instruction teaching methods and providing teachers with sufficient and ongoing professional development in using physical education instruction methods were the most effective strategies to increase children’s levels of physical activity and improve movement skills in physical education and schools sports.

CRD commentary
The review question was clear. Inclusion criteria were broadly defined. Several relevant sources were searched. The limitation to studies in English may mean that some data were missed. A quality assessment was undertaken and results for individual studies were reported. Appropriate methods to reduce reviewer error and bias were reported for study selection and quality assessment; it was unclear whether similar methods were used for data extraction.

A narrative synthesis was appropriate given the wide variation between studies in terms of interventions, outcomes and settings. However, the results were broadly reported and the authors totalled the number of studies with significant effects, which did not take into account differences between studies (such as sample sizes) or give an indication of the size of effects.

It was difficult to determine the level of evidence for the elements of interventions reported in the authors’ conclusions so the reliability of the conclusions is unclear.

Implications of the review for practice and research
Practice: The authors stated that given the number of effective physical activity interventions adopting cross-curricular approaches, it may be pertinent for education and health decision makers to view physical activity in schools across the whole school community and curriculum. Professional development for teachers should be included in physical education and school sports programmes.

Research: The authors stated a need for further robust research with longer term follow-up. Future research was required on secondary school physical education and school sports and into the contribution that positive experiences may make towards effectiveness. More research was needed outside USA.

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