A systematic review of controlled trials of interventions to prevent childhood obesity and overweight: a realistic synthesis of the evidence

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CRD summary
The authors concluded that compulsory aerobic physical activity has a decisive role in effective interventions for childhood obesity and overweight. There were limitations in the reporting of review methods, and a more cautious conclusion may have been appropriate since the conclusions were based on counts of the number of effective and ineffective studies associated with intervention characteristics.

Authors' objectives
To evaluate interventions to prevent obesity and overweight in children.

Searching
MEDLINE, EMBASE, CINAHL and PsycINFO were searched to April 2006; the search terms were not reported. In addition, the reference lists of included studies and reviews were screened.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and controlled trials with a minimum duration of 12 weeks were eligible for inclusion in the review.

Specific interventions included in the review
Studies that evaluated interventions to prevent overweight or obesity were eligible for inclusion in the review.

Participants included in the review
Studies that included non-overweight children with or without overweight or obese children (aged 0 to 18 years) were eligible for inclusion in the review.

Outcomes assessed in the review
Studies that assessed a measure of adiposity were eligible for inclusion in the review.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The validity of the studies was assessed and scored using the criteria described by Downs and Black. Two reviewers independently assessed validity and resolved any disagreements through discussion.

Data extraction
Two reviewers, blinded to the study results, independently classified studies as compulsory or voluntary aerobic physical activity or no physical activity. In addition, the studies were allocated an intensity score based on four criteria: explicit theory, pilot study or formative research; implementation of the intervention by researchers; compulsory as opposed to voluntary physical activity element; and multi-component intervention. Each element was awarded a score of one for each item met.

Methods of synthesis
How were the studies combined?
The number of studies reporting statistically significant decreases associated with the intervention (effective) or no difference between the interventions (ineffective) in terms of adiposity measures was reported.

How were differences between studies investigated?
Effective and ineffective interventions were compared in terms of the following characteristics: age group, ethnicity, gender, setting, components of the intervention, score for intervention intensity components, and quality score.

Results of the review
Twenty-eight studies were included: 23 RCTs (including 16 cluster RCTs) and 5 non-randomised controlled trials.

Eleven studies reported statistically significant decreases in adiposity measures associated with the intervention. Seventeen studies reported no difference between the interventions in adiposity measures.

Five studies that provided relatively compulsory, weekly, aerobic physical activity were effective; no such studies were ineffective.

There was no apparent association between the effectiveness and other criteria.

Authors' conclusions
Compulsory aerobic physical activity was shown to have a decisive role in effective interventions.

CRD commentary
The review addressed a clear question that was generally broadly defined in terms of the participants, intervention, outcomes and study design. Several relevant sources were searched but no attempts to minimise publication or language bias were reported. Methods were used to minimise reviewer error and bias in the assessment of validity and classification of interventions as compulsory or voluntary physical activity, but it is not clear whether similar steps were taken at the study selection stage and for the remainder of the data extraction. Validity was assessed, although only the composite score was presented; this makes it difficult to independently comment on the reliability of the evidence presented. In addition, it was not reported whether or not cluster RCTs had adjusted for correlation within clusters.

Adequate information about the included studies was presented in supplementary tables on the Public Health website (accessed 24/03/08; a subscription may be required for access). The narrative synthesis was appropriate in view of the diversity of the studies. The influence of various participant, intervention and study characteristics was assessed. However, the synthesis was limited to counting the numbers of effective and ineffective studies with each characteristic of interest. Hence, the conclusion regarding the decisive role of compulsory physical activity should perhaps be regarded more as hypotheses-generating rather than definitive.

Implications of the review for practice and research
Practice: The authors stated the need to review policies on physical education in schools to highlight the necessity to include compulsory moderate to vigorous aerobic activity in the curriculum.

Research: The authors stated the need to develop compulsory aerobic physical activity interventions that can be viewed as a voluntary chosen activity by children and sustained throughout life.

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