Meta-analysis of school-based childhood obesity interventions in the UK and US

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CRD summary
This review concluded that school-based childhood obesity interventions aimed at the general population did not seem to modify body mass index. Although the authors' conclusions were in line with the evidence presented, uncertainties about the strength of the evidence combined with methodological weaknesses suggest that the review should be used with caution.

Authors' objectives
To assess the effect of school-based interventions to prevent childhood obesity.

Searching
The authors searched MEDLINE and CINAHL for studies published in English in peer-reviewed journals between 2000 and 2007. Search terms were reported. Research articles cited in three previous reviews were retrieved.

Study selection
To be eligible for the review, studies had to evaluate a school-based intervention for the prevention of obesity targeting the general population of children. Studies had to report change in body mass index (BMI) as an outcome. Inclusion criteria for study designs were not reported, but all the included studies had a no-intervention control group. Studies had to be conducted in USA or UK (most included studies were in USA).

Interventions in included studies were diverse and included education, physical activity, playground markings, provision of fruit, diet, provision of filtered water, "new moves" and reduction of carbonated drink intake. Intervention duration ranged from three months to three years. Follow-up duration ranged from three to 12 months (one study had annual follow-ups, but it was not reported how many of these were done). Baseline BMI ranged from approximately 17.5 to 26.5.

The authors did not state how studies were selected for the review.

Assessment of study quality
The authors stated that they assessed study quality based on characteristics such as sample size, design (quasi-experimental or experimental), type and duration of intervention, post-intervention follow-up period and outcome measures. They did not state how many reviewers performed the assessment.

Data extraction
Mean BMI values at baseline and follow-up in the intervention and control groups were extracted together with standard deviations and used to calculate the mean difference and 95% confidence interval (CI). Mean differences were extracted where reported. Data were extracted by one reviewer.

Methods of synthesis
Studies were pooled by meta-analysis. Results of both fixed-effect and random-effects analyses were reported. Statistical heterogeneity was assessed using Cochran's Q statistic. A sensitivity analysis was performed by excluding each study in turn and reanalysing the remaining studies using a random-effects model.

Results of the review
Five studies (2,181 participants) were included in the meta-analysis. Differences in BMI between intervention and control groups were not statistically significant (pooled weighted mean difference 0.06, 95% CI -0.29 to 0.16) for the fixed-effect model and 0.17 (95% CI -0.38 to 0.72) for the random-effects model). Statistical heterogeneity was significant. Sensitivity analysis did not produce any statistically significant findings. Results for outcomes other than BMI were reported.
Authors' conclusions
School-based childhood obesity interventions did not seem to modify BMI.

CRD commentary
The review had clear inclusion criteria for participants, interventions and outcome. Inclusion criteria for study design were not reported, but all the included studies had a control group. The authors searched two relevant databases and used previous reviews as a source of references. However, limiting the search to published articles in English meant that relevant studies may have been missed and increased potential for publication and language biases. The assessment of study quality was limited and did not fully assess risk of bias, made the reliability of the included studies and the synthesis derived from them uncertain. Methods used for study selection and quality assessment were not reported and data extraction was performed by one reviewer; hence, the risk of reviewer errors and bias affecting the review was uncertain. The meta-analysis involved pooling clinically and statistically heterogeneous studies, which suggested that the use of meta-analysis was probably inappropriate and the results may not be meaningful. As noted by the authors, outcomes other than BMI might have allowed a fuller assessment of the effectiveness of the interventions.

Although the authors' conclusions were in line with the evidence presented, uncertainties about the strength of the evidence combined with methodological weaknesses suggest that the review findings should be used with caution.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that it would be desirable to repeat the meta-analysis using different outcome measures, such as physical activity, fruit and vegetable intake, soft drink intake and sedentary behaviour.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.