

# A systematic review to determine the effectiveness of interventions designed to prevent overweight and obesity in pre-adolescent girls

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## CRD summary

The authors concluded that there was potential for interventions aimed at pre-adolescent girls to reduce the risk factors associated with childhood overweight and obesity. The sustainability of intervention effects was unclear. The extent to which this conclusion can be relied upon is uncertain due to potential methodological weaknesses in the review process.

## Authors' objectives

To evaluate the effectiveness of interventions to prevent overweight and obesity in pre-adolescent girls.

## Searching

MEDLINE, SPORTDiscus, PsycINFO, Web of Science, Biological Sciences and Physical Education Index were searched for articles published in English between 1990 and February 2010. Search terms were reported.

## Study selection

Eligible studies were randomised controlled trials (RCTs), controlled pre- and post-test and non-controlled studies of primary prevention interventions to modify attitudes, knowledge and behaviour related to physical activity, eating and body mass index or other indices of fat mass in girls aged between seven and eleven years. Interventions had to last at least three months in a community, family or school setting or any combination of these. Results had to be presented separately for girls.

Studies were conducted worldwide, with two located in the United Kingdom. Most interventions were set in schools and most studies included a combination of physical activity and nutrition components, delivered by many different mechanisms. Intervention duration was at least 12 months in most studies. A variety of outcomes was measured in relation to the inclusion criteria. Measurements additionally included psychological and educational impacts. A small number of studies presented results from one aspect of a multi-component study. The upper age range of included participants exceeded eleven years (up to 15 years) in approximately one third of included studies.

Studies were selected by one reviewer, in consultation with two other reviewers.

## Assessment of study quality

Study quality was assessed with an adapted version of the Appraisal Tool for Quantitative Research (Effective Public Health Practice Project), covering selection bias, study design, confounders, data collection methods, withdrawals/dropouts, intervention integrity and analyses. Components were scored as strong, moderate, or weak and an overall rating was assigned to each study.

The authors did not state how many reviewers were involved in the quality assessment of studies.

## Data extraction

Data were extracted to enable the calculation of odds ratios (ORs) which were converted to Cohen's D effect sizes and interpreted as follows: (below 0.2 = no effect; 0.2 to 0.5 = small; 0.5 to 0.8 = medium; and above 0.8 = large).

The authors did not state how many reviewers extracted the data.

## Methods of synthesis

Results were presented as a narrative synthesis, and were summarised in terms of strength of effect size and percentage of measures. Further detailed results were presented according to effects on overweight and obesity indicators; and physical activity and nutrition behaviours. A separate analysis was conducted for studies focusing solely on girls.

## Results of the review

Thirty studies were included. There were four cluster RCTs, 14 RCTs, 11 controlled trials and one cohort pre-post trial. The quality of studies was considered largely strong (15 studies) or moderate (11 studies). Strengths included blinding (where this was possible) and intervention integrity (assurance that the intervention was delivered according to plan). The treatment of randomisation in cluster RCTs was conducted appropriately. Weaknesses included lack of control group and absence of reporting on withdrawals.

In the 21 studies with available effect size measures, sixty-six effect sizes were reported as being less than 0.2 (no

effect); 56 were small; 16 were medium; and two were large. The percentage of effect sizes falling into each of the categories by outcome type were: physical outcomes (no effect 57.7%; small 36.5%; medium 5.8%; large 0%); objective physical activity outcomes (no effect 33.3%; small 42.8%; medium 23.8%; large 0%); self-reported physical activity measures (no effect 60%; small 30%; medium 10%; large 0%); nutritional outcomes (no effect 43.7%; small 45.8%; medium 10.4%; large 0%); and knowledge and attitude outcomes (no effect 22.2%; small 33.3%; medium 22.2%; large 22.2%).

Nine studies evaluated interventions targeted solely at girls, which produced mixed results with regard to physical, nutritional and behavioural outcomes.

Further details were reported in the paper.

### **Authors' conclusions**

There was potential for interventions aimed at pre-adolescent girls to reduce the risk factors associated with childhood overweight and obesity. The sustainability of intervention effects was unclear.

### **CRD commentary**

The review question was clear, and inclusion criteria were broad but potentially replicable. Included studies demonstrated some disparity with the inclusion criteria in terms of participant age and outcomes. This had implications for the reliability and generalisability of the review. Relevant data sources were searched, but language and publication biases could not be ruled out. Consequently, possible studies of interest might have been overlooked. The review process appeared to be conducted with minimal effort to avoid error and bias in the selection of studies; the remainder of the process was unclear in this regard.

Individual study quality scores were not presented, but the authors made some attempt to highlight particular methodological strengths and weaknesses. Study details were presented, and the chosen method of synthesis seemed appropriate due to substantial clinical heterogeneity. The authors' conclusion reflected the evidence presented, but the extent to which this could be relied upon was unclear due to the various potential methodological limitations outlined above.

### **Implications of the review for practice and research**

Practice: The authors stated that it was difficult to arrive at a simple recommendation for best practice. Potentially successful interventions might have included reducing sedentary behaviours and modifying school food provision, with longer-term follow-up. Interventions should take account of cultural, age and gender characteristics across a broad range of social settings.

Research: The authors did not state any implications for research.

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