Effectiveness of interventions to prevent obesity and obesity-related complications in children and adolescents

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Authors' objectives
To assess the effectiveness of interventions designed to prevent obesity or obesity-related complications in children and adolescents.

Searching
The Cochrane Controlled Trials Register was searched using the combined keywords 'obesity, children, and adolescents'. MEDLINE and CINAHL were searched using the keywords 'obesity, children, and adolescents' combined with 'obesity and interventions'.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion.

Specific interventions included in the review
Interventions aimed at preventing obesity or obesity-related health morbidities were eligible for inclusion. The included studies compared the following interventions: (1) dietary counselling with and without family therapy (6 sessions over 1 year); (2) school lessons (over a 6-month period) aimed at reducing television viewing time and no intervention; and (3) classroom-based interventions, individual risk-based interventions and control, each of 8 weeks' duration. The classroom interventions comprised information about heart-healthy food, the importance of exercise, the dangers of smoking, and methods to resist peer pressure plus an aerobically-orientated physical activity programme (3 times a week). The individual intervention was an aerobic physical activity class (3 times a week) plus nutrition classes (twice weekly). The control was the usual health and physical education programme.

Participants included in the review
Studies of children and adolescents were eligible for inclusion. The included studies were of obese school-aged children aged 10 to 11 years with a basal metabolic index (BMI) of greater than 23 kg/m²; third and fourth-graders from 2 public elementary schools; and children aged approximately 9 years with at least 2 cardiovascular risk factors.

Outcomes assessed in the review
The inclusion criteria were not defined in terms of the outcomes. The included studies assessed the following: BMI, subscapular or triceps skinfold thickness, physical fitness, duration of television viewing, food consumption, high-fat intake, vigorous activity, eating attitudes, knowledge, cholesterol, blood-pressure and body fat.

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

Assessment of study quality
Validity was not formally assessed, although some aspects of it were mentioned in the text.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. Information on the individual studies was presented in the text of the review.
Methods of synthesis
How were the studies combined?
A narrative synthesis was undertaken.

How were differences between studies investigated?
Differences between the studies were mentioned in the text of the review.

Results of the review
Three RCTs (712 children) were included in the review.

One RCT (44 obese school-age children plus 48 untreated controls) compared dietary counselling plus family therapy versus dietary counselling alone versus an untreated age-matched control. At the end of the treatment, it found that the BMI increased significantly less with dietary counselling plus family therapy than with dietary counselling alone; the increase in BMI was 0.66% versus 2.31% (p=0.042). At the 1-year follow-up, the BMI increased significantly less with dietary counselling plus family therapy than with no treatment (p=0.022). In addition, there was a significantly lower rate of progression to severe obesity with family therapy in comparison with no treatment: 5% versus 29% (p< 0.05). There was no significant difference between dietary counselling plus family therapy and dietary counselling alone, or between dietary counselling alone and untreated control.

The methodological problems of this RCT included: a lack of detail about the intervention; it was unclear how many family therapy sessions this group attended; only 10 of the 19 families in the dietician counselling group actually received dietary counselling; and the sample size was small.

One RCT (198 third- and fourth-year pupils) compared an intervention aimed at reducing television viewing conducted in one school with no intervention in a second school. Compared with no intervention, it found that the intervention significantly reduced the relative average BMI (-0.45 kg/m2) and triceps skinfold thickness (-1.47 mm), and it significantly reduced the reported television viewing and meals eaten in front of the television. There was no significant difference between the groups for vigorous physical activity, cardiovascular fitness or high-fat food intake.

The methodological problems of this RCT included: the intervention was only carried out in one of the 2 schools in the study, and any difference may not be due to the intervention but other factors; and the parents were largely white, married and female, and so the results may not be generalisable.

One RCT (422 children with at least two cardiovascular risk factors from 18 elementary schools) compared a classroom intervention, an individual risk-based intervention and the usual school programme. It found that both active interventions reduced cholesterol levels more than no intervention: -11.7 mg/dL with the classroom intervention versus -10.1 mg/dL with the individual intervention versus -2.3 mg/dL with no intervention (the statistical significance was not reported). There was no change in BMI with either of the interventions (no data presented). There was no statistically-significant difference between the treatment groups in terms of body fat, aerobic power or health knowledge.

The methodological problems included uncertainty about whether the interventions were delivered in a standardised format.

Authors’ conclusions
The authors’ conclusions appear to state that further well-designed RCTs are required of interventions to prevent and treat child and adolescent obesity. Future prevention studies should build upon prior prevention interventions with promising outcomes (e.g. the incorporation of physical activities, education and behavioural skills).

CRD commentary
The aims of the review were stated and the inclusion criteria were defined in terms of the intervention, participants and study design. Several relevant sources of published trials were searched, but the methods used to select the studies were not described. In addition, it was not stated whether any language restrictions had been applied. The lack of an attempt to locate unpublished material raises the possibility of publication bias. The included studies were limited to RCTs and
some aspects of validity were addressed in the text of the review, although no formal validity assessment was undertaken. Relevant information on the included studies was presented in the text, but the methods used to extract the data were not described. A narrative review was appropriate given the small number of studies identified, but the review focused predominantly on describing the individual studies rather than summarising the evidence.

The conclusions of the review were not clearly stated.

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

**Practice:** The authors state that the prevention and treatment of obesity should be a high priority for all paediatric health care workers, and that health care providers should be come more diligent at screening for and documenting obesity in the paediatric population. They state that once obesity is identified, successful strategies should be implemented to prevent obesity-related complications.

**Research:** The authors state that further well-designed RCTs of interventions to prevent and treat child and adolescent obesity are required. Such research interventions should incorporate physical activities, education and behavioural skills, as well as measures of motivation to change. In addition, they should consider intensity as well as sustainability; employ programmes that are reproducible and cost-effective; and provide incentives and implement culturally sensitive interventions.

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