

What interventions are effective to prevent obesity in children?

Evidence from a recent systematic review

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- Childhood obesity causes social, psychological and health problems.
- It is linked to obesity and poor health outcomes later in life.
- Many countries (including more recently, middle- and low-income countries) see increasing rates of overweight and obesity in children & adolescents.
- Public health sector & governments needs to take action to prevent childhood obesity and to address its underlying determinants.
- The efficacy & safety of interventions to prevent obesity remains poorly understood.



Public health questions

- Do interventions to prevent obesity in children work ?
 - Do they reduce BMI or the prevalence of obesity / overweight ?
 - Do they lead to positive changes in behaviours related to diet or physical activity ?
- What works for whom, why and for what cost ?

Interventions for preventing obesity in children (Review)

Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, Armstrong R, Prosser L, Summerbell CD

Updated Cochrane review:

Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, Armstrong R, Prosser L, Summerbell CD.

Interventions for preventing obesity in children.

Cochrane Database of Systematic Reviews 2011, Issue 12. Art. No.: CD001871. DOI:10.1002/14651858.CD001871.pub3



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<http://www.thecochranelibrary.com>



Methods of Cochrane Review

- **Systematic search** in electronic databases incl. CENTRAL, MEDLINE, EMBASE, PsycINFO and CINAHL and 'grey literature' (latest search in March 2010)
- **Data extraction** by two researchers independently
- **Assessment of methodological quality (risk of bias)**
- **Meta-analysis** of data on BMI reduction: means and standard deviations (SDs) used to calculate standardised mean differences (SMDs) between groups
- **Outcomes:** measures of adiposity, behaviour, impact on equity and adverse/unintended effects, maintenance/sustainability of effects
- Extraction of **implementation information:**
 - theoretical basis of the study
 - process evaluations conducted ?
 - reporting of resources and other factors needed for implementation
 - specific strategies to address disadvantage or diversity ?



Included studies (PICOS)

- **Participants / Population:** Children / adolescents < 18 years. Studies with already obese children were eligible, if obesity was not a requirement for study inclusion.
- **Intervention:** Interventions/policies/programs for the **prevention** of childhood obesity that were in place for at least 12 weeks.
Excluded: studies on treatment of childhood obesity
- **Comparison:** Usual care or another active comparison
- **Outcomes:** Weight and height, relative fat content, BMI, ponderal index, skin-fold thickness, prevalence of overweight and obesity.
- **Study design: Controlled study design** (with or without randomisation). If studies were randomised at a cluster level, a minimum of 6 clusters was required.

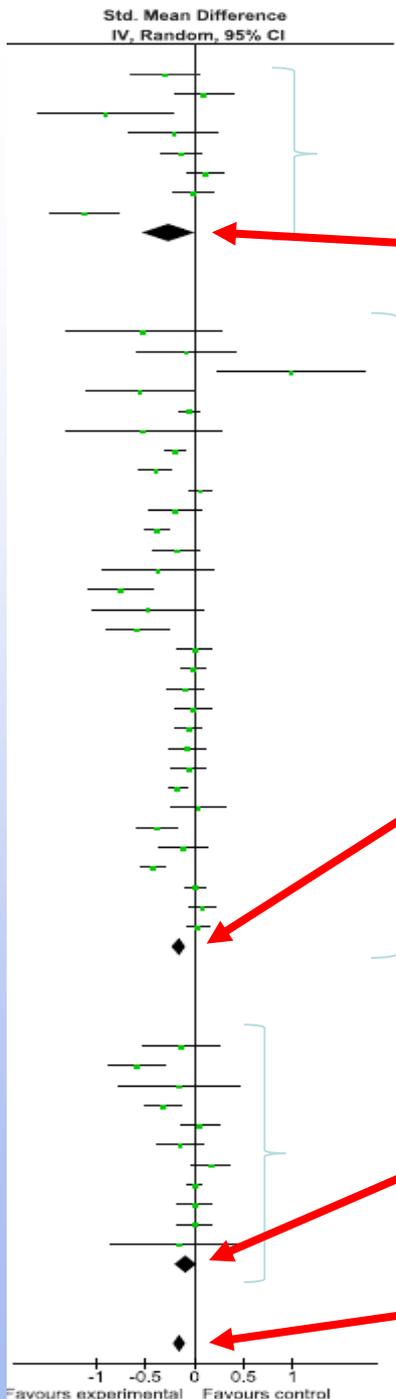
Results (1)

- 55 included studies; additional 36 studies compared to review version of 2005
- 39 studies targeted children aged 6-12 years
- Length of implementation of interventions:
 - 41 studies: \leq 12 months
 - 7 studies: 1-2 years
 - 7 studies: $>$ 2 years
- Setting:
 - 50 studies in high-income countries
 - 4 studies in upper-middle-income countries (Brazil, Chile, Mexico)
 - 1 in lower middle-income country (Thailand)



Results (2)

- Meta-analysis included 37 studies with 27.946 children in three age groups (0-5, 6-12, 13-18 years)
- Overall, interventions were effective at reducing obesity, but not all of them
- High level of observed heterogeneity in all three age groups could not be explained by study characteristics
- Only 8 studies reported on adverse effects; no evidence of adverse outcomes (e.g. unhealthy dieting practices, increased prevalence of underweight, body image sensitivities)
- Health inequalities were examined in few studies, but interventions did not appear to increase these.



0-5 years

-0.26 kg/m²
(95% CI: -0.53 to 0.00)

Results (3)



6-12 years

-0.15 kg/m²
(95% CI -0.23 to -0.08)



13-18 years

-0.09 kg/m²
(95% CI -0.20 to 0.03)

Overall: -0.15kg/m²
(95% CI: -0.21 to -0.09)

Forest plot:
Random effects meta-analysis of data from 37 studies (27.946 children)
Standardised mean difference in BMI / zBMI

Promising policies and strategies:

- school curriculum including healthy eating, physical activity and body image
- increased sessions for physical activity during school week
- improvements in nutritional quality of food supply in schools
- environments and cultural practices that support children eating healthier foods and being active during day
- support for teachers and other staff to implement health promotion strategies and activities (e.g. professional development, capacity building activities)
- parent support and home activities that encourage children to be more active, eat more nutritious foods and spend less time in front of computer screens

Are the interventions 'effective'?

- Effect sizes may be small for individuals, but significant on a population scale.
- Reduction by 0.15 BMI points was found among nearly 15,500 children in the intervention groups, which could be enough to shift a child from the overweight/obese category.
- Impact is clinically significant given the reach of these interventions.
- Implemented programs and policies must be sustained and continually evaluated.



Conclusions (1): current findings

- Evidence supports beneficial effects of child obesity prevention programmes on BMI
- Most evidence in children aged 6-12
- Unexplained heterogeneity; findings must be interpreted with caution.
- A broad range of programme components were used in these studies; not possible to distinguish which components contributed most to the beneficial effects



Conclusions (2): future research

- Study and evaluation designs need to be strengthened
- Better reporting of process and implementation factors, longer term outcomes, potential harms and costs
- How can effective intervention components be embedded within health, education and care systems to achieve sustainable effects ?

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