

Long term effectiveness of behaviour change interventions in children: A systematic review and meta-analysis

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Background

- Given the dramatic rise in obesity in children over the last decade, it is essential to design interventions that are effective in changing obesity-related behaviour to prevent and manage childhood obesity in the long-term.
- Systematic reviews of interventions and clinical guidelines for preventing and managing obesity in children clearly indicate that successful interventions are multi-component and are aimed at changing both physical (or sedentary) activity and healthy eating (e.g., Kamath et al., 2008; NICE, 2006; Oude-Luttikhuis et al., 2009).
- Behaviour change is a burgeoning avenue of enquiry in this area: even small changes in behaviour that amount to a decrease in calorie intake of only 100Kcal per day can effectively prevent weight gain (Hill et al., 2003)
- However, there is little consensus about the **characteristics** and **active components** of interventions that are most effective and the long term impact of behaviour change interventions for childhood obesity has yet to be fully established.



Objective

To determine the long-term effectiveness of behaviour change interventions to change physical activity and/or eating behaviour for the prevention or management of childhood obesity

Aims

- To systematically review the literature investigating childhood obesity interventions
- To assess the effectiveness of these interventions in the prevention and management of childhood obesity
- To identify the active components used in behaviour change interventions using a taxonomy approach



Data sources

An electronic search was conducted of MEDLINE, EMBASE, PsycINFO, Cochrane library (Cochrane Central Register of Controlled Trials), HMIC (Health Management Information Consortium), AMED (Allied and Complementary Medicine Database), and CINAHL (*Cumulative Index to Nursing and Allied Health Literature*) for Randomised Controlled Trials published between January 1990 and December 2009. Grey literature and recommendations by experts were also explored.

Inclusion criteria

Eligible studies were Randomised Controlled Trials (RCTs) conducted with children (aged 2-18 years) that assessed the impact of an intervention using behaviour change techniques aiming to prevent or manage childhood obesity compared to a control group receiving either no intervention or usual care. To assess maintenance effects, only studies reporting a minimum of six months follow-up after the intervention was completed were included in this review. The primary outcome measure was Body Mass Index (BMI).

Studies reviewed

Of 4,309 titles and abstracts screened, full texts of 135 articles were assessed, of which 17 published articles, describing 15 behaviour change interventions were included in this review (7 management and 8 prevention trials).

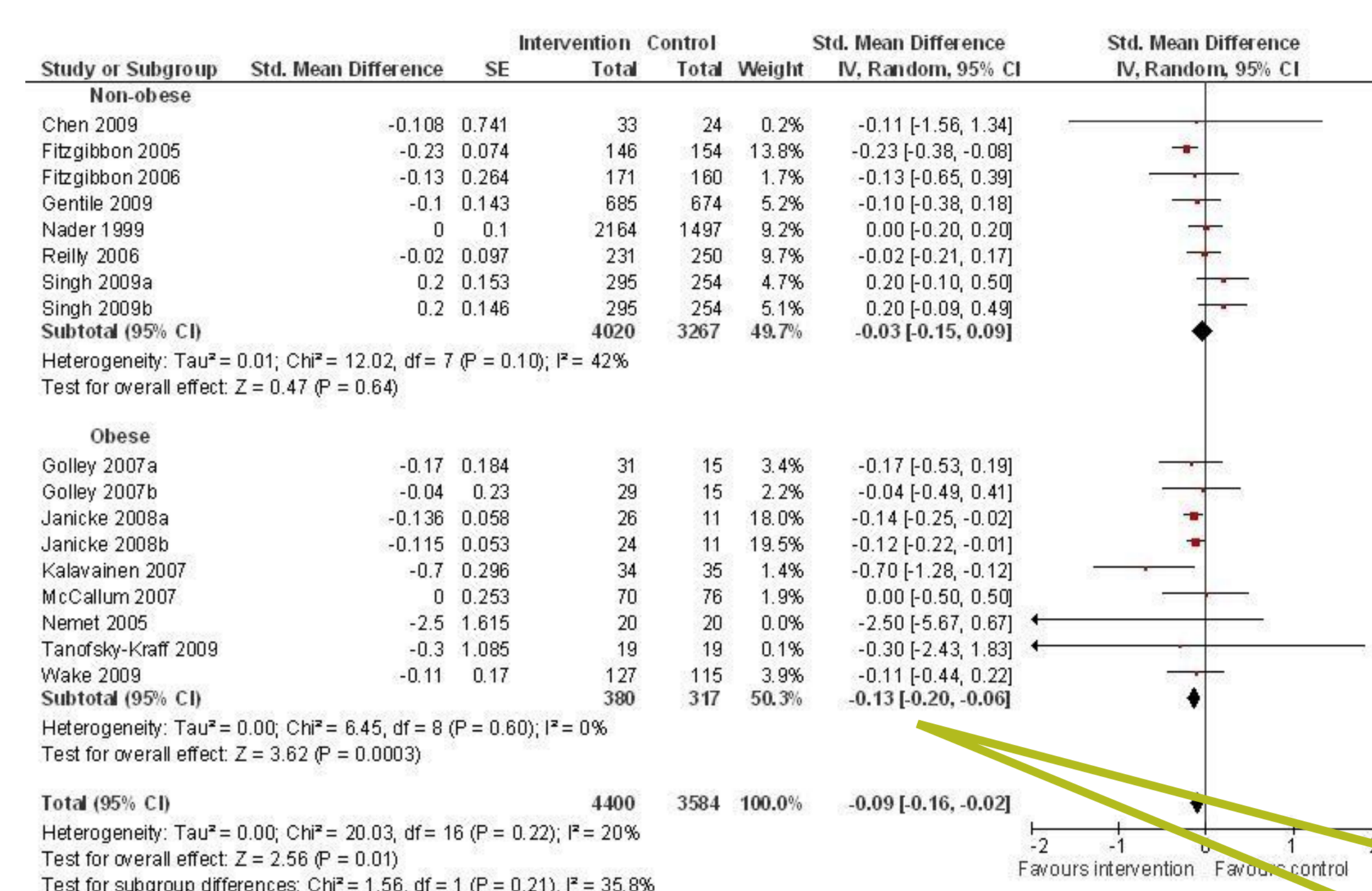
Coding

Study characteristics, participant information and intervention information were extracted from studies. Additionally, two reviewers independently coded the description of each intervention according to a 40-item behaviour change taxonomy scheme (CALO-RE: Michie et al., in press) and agreed on the inclusion of behaviour change techniques.

Analysis

BMI at baseline and follow-up in intervention and control groups was recorded. The effects of each intervention were summarised as the standardised difference in the mean value of BMI between the intervention and control groups, together with 95% confidence intervals (CI), at follow-up. Studies were pooled using a random effects model, due to the heterogeneity of interventions and control groups, using the generic inverse variance method.

Results



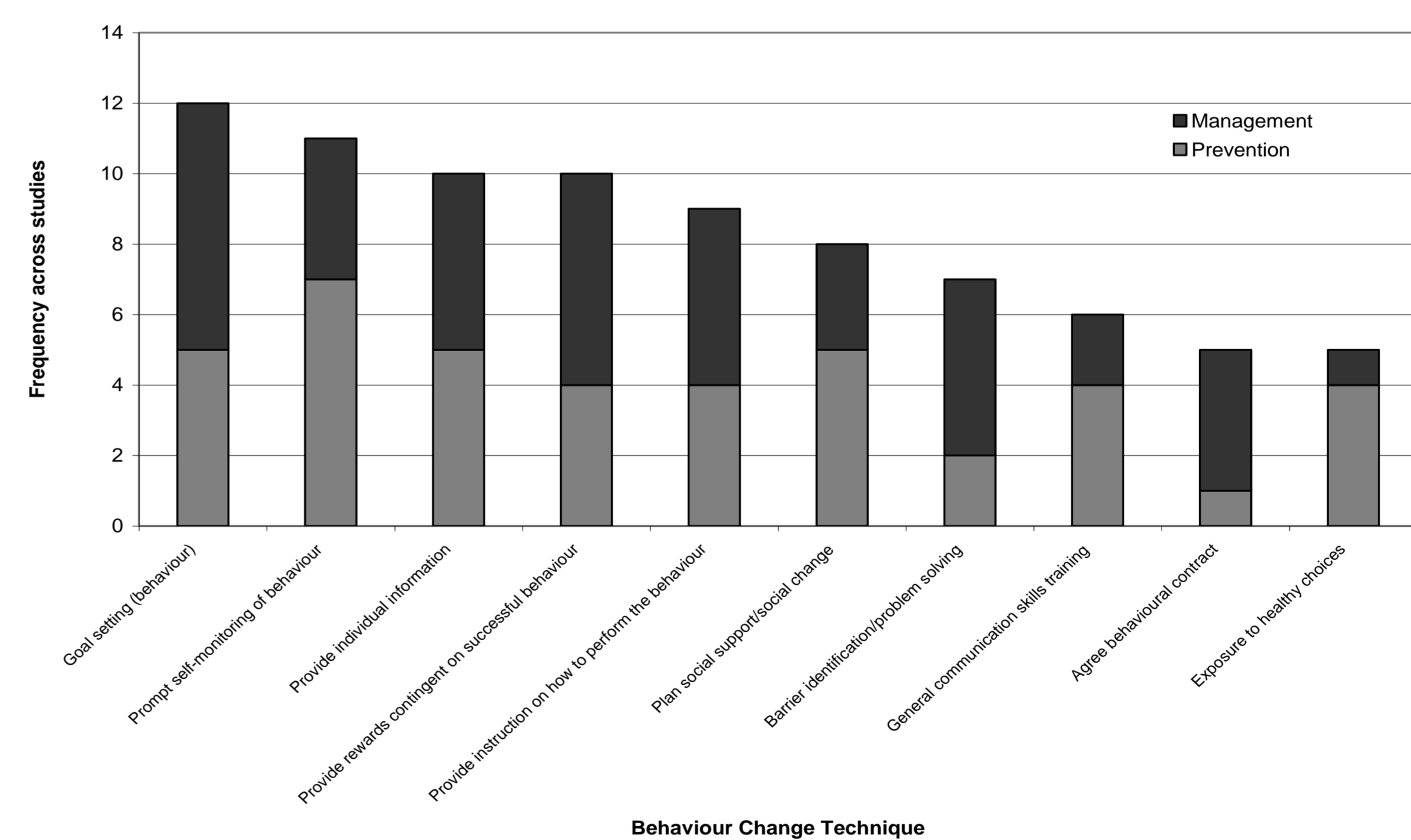
Results showed that behaviour change interventions have a small but significant effect on the long-term management of childhood obesity, though results were less conclusive in relation to prevention trials. Family interventions were more effective than interventions targeting only children.

.13 difference in effect size between control & intervention children can be related to reduced risk in health outcomes

Behaviour change techniques

Using a taxonomy to define behaviour change

techniques, we were able to identify the most common techniques used in interventions (see Table below). Subgroup analyses suggested that targeting parents and children in interventions is more effective than targeting children alone, and interventions that include **prompting self monitoring of behaviour** or **providing rewards contingent on successful behaviour** may be beneficial components of future interventions.



Conclusions

- Interventions for long-term management and prevention of childhood obesity that target families rather than children alone, use self monitoring and provide rewards show promise
- There is clear value in identifying behaviour change techniques in such trials, although the task is inherently difficult due to reporting inconsistencies and differences in terminology and language
- Our experience supports emerging efforts for improving reporting of trials and developing a common language in order to implement a science of behaviour change

References

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