

Systematic review of the effectiveness and cost-effectiveness of weight management schemes for the under fives: a short report

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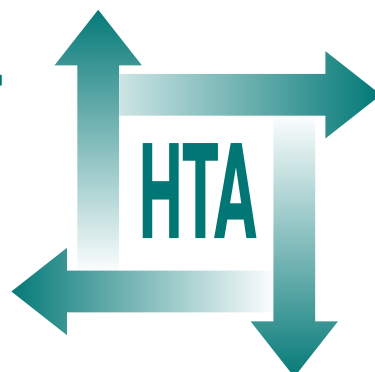


Executive summary

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Executive summary

Background

Overweight and obesity in the UK are increasing. A systematic review has indicated that the roots of adult obesity lie in the preschool years where the problems of overweight and obesity are escalating.

The prevalence of childhood obesity in England has risen between 1995 and 2007 for children aged 2–15 years, from 11% to 17% for boys and from 12% to 16% for girls. Overall, in the UK, 10% of preschool children are obese, with a quarter of children aged 2–5 years being either overweight or obese. Recent data from the National Child Measurement Programme show that in 2006–7, 22.9% of children in reception classes were overweight or obese. These figures reflect almost a doubling of obese 4–5 year olds since 1990 and a 30% increase in those overweight in this age group, using the ≥ 85 th and ≥ 95 th percentile respectively.

Objectives

The objective of this systematic review is to search for and review studies from OECD (Organisation for Economic Co-operation and Development) countries of the effectiveness and cost-effectiveness of weight management schemes for the under fives.

Interventions

The interventions considered are weight management schemes and interventions designed to maintain appropriate weight and or achieve weight loss. The schemes include those aimed at universal prevention, targeted prevention, weight loss, management of weight gain and treatment of those already overweight or obese.

Comparators

These include normal practice or non-diet or exercise interventions, e.g. educational programmes about safety in the home.

Population

The population for this assessment are the under fives in OECD countries; this is to ensure that study findings would be transferable to the UK context.

Outcome measures

The main outcome measures are those of body mass index (BMI) and weight. Each clinical effectiveness study must include at least one measure of adiposity. Other outcome measures are: health outcomes, quality of life, objective measures of health behaviour such as accelerometry (not self-reported outcomes) and cost-effectiveness. Self-report outcomes are excluded as they may be under or over reported by participants.

Study design

Study designs included are randomised controlled trials (RCTs) and other non-randomised controlled designs. This was to assure that only high quality studies with minimal bias and confounding were included.

Methods

Data sources

A systematic review of existing cost- and clinical effectiveness studies was undertaken and run on 13 electronic databases: MEDLINE [Ovid], MEDLINE In-Process [Ovid], EMBASE [Ovid], CAB [Ovid], Health Management Information Consortium [Ovid], The Cochrane Database of Systematic Reviews, Cochrane Register of Controlled Trials, Science Citation Index Expanded [Web of Science], Conference Proceedings Citation Index [The Web of Science], Database of Abstract Reviews [CRD; Centre for Reviews and Dissemination], HTA [CRD], PsycINFO [Ebsco], NHS CRD. These databases were searched from 1990 to February 2009 to identify relevant published literature on weight management programmes in the under

fives. Supplementary internet searches were additionally conducted.

Study selection

Relevant clinical effectiveness studies were identified in two stages. Titles and abstracts returned by the search strategy were examined independently by three researchers (MB, KWy and JL) and screened for possible inclusion. Disagreements were resolved by discussion. Full texts of the identified studies were obtained. Three researchers (MB, KWy and JL) examined these independently for inclusion or exclusion, and disagreements were again resolved by discussion.

Data extraction

Data were extracted by MB and checked by KWy and JL.

Data synthesis

Due to the heterogeneity of the studies, no data synthesis was possible.

Results

Number and quality of effectiveness studies

The systematic review of electronic databases for clinical effectiveness studies produced 1874 titles and abstracts, of which 1841 were judged not to meet our inclusion criteria and were excluded.

Thirty-three papers were reviewed to see if they met the inclusion criteria. In addition 17 further papers were retrieved from references, giving 50 papers in all that underwent paper level review. From these, 28 papers were excluded. This left 22 articles included in this systematic review, 16 of these were systematic reviews or meta-analyses and six were RCT papers (reporting on three trials).

Summary of results

One of the RCTs was from the UK (Reilly and colleagues, 2006; $n = 545$). They measured the effects of a physical activity intervention for children in nurseries (30 minutes, three times a week for 24 weeks), combined with home-based health education for their parents; this was compared to usual care. The main outcome measure was BMI; secondary measures were weight and physical activity (measured by accelerometry).

At the 12-month follow-up, no statistically significant differences were found between the groups on any measure. However, a trend, favouring the intervention, was found for BMI and weight.

The other two RCTs were from the USA. The larger trial, Hip-Hop Jr (2002–6, $n = 778$), investigated the effects of a combined preschool and home intervention in African American and Latino communities. Nutrition education and physical activity programmes were aimed at under fives in preschool (20 minutes of nutrition education plus 20 minutes of moderate to vigorous exercise, three times a week for 14 weeks). The home component consisted of related health education and homework for the parents, who received a small financial reward on completion (US\$5). The 1- and 2-year results for the African American sites showed a significantly slower rate of increase in BMI than for results at baseline, for the intervention group than for the control group [mean (standard deviation), year 1: intervention: 16.6 (2.1) kg/m², control: 17.4 (3.1) kg/m², $p = 0.002$; year 2: intervention: 17.1 (2.5) kg/m², control: 17.9 (9.3) kg/m², $p = 0.008$]. However, in the Latino communities no such differences were found. This may have been due to the intervention being delivered more effectively by the staff, or the low level of cultural integration reported in this population, which may have hindered engagement with the research.

The second trial from the USA was much smaller (Harvey-Berino and Rourke, 2003; $n = 40$). This was a home-based parental education programme in Native American communities in the USA and Canada. The intervention consisted of a parental skills course for parents to improve their children's diet and physical activity. This was compared with a course providing skills to improve child behaviour. Follow-up was at 16 weeks and showed no significant differences between groups in BMI.

Speculative reasons for the success of the Hip-Hop Jr trial in affecting BMI increase include:

- Possibly a more effective delivery of the intervention by the Hip-Hop Jr preschool staff.
- The effect of the greater involvement of parents by actively engaging them with homework in the Hip-Hop Jr study than in Reilly and colleagues may have provided sufficient reinforcement of the preschool component to render the intervention effective.

- Targeting of nutrition education directly at the children may have engaged them more fully in this aspect of the intervention.
- The financial rewarding of mothers in Hip-Hop Jr for completing homework may have been an incentive to stay in the study and engage with its messages.
- The Latino sites in Hip-Hop Jr may have failed to show a positive impact from the intervention because the parents had low cultural integration.
- Although Reilly and colleagues' intervention activity time was longer, it may not have been so intense.
- There may not have been as great a difference between the activity levels of the control group and the intervention group in Reilly and colleagues' trial.

Summary of cost-effectiveness results

Titles and abstracts returned by the cost-effectiveness searches were examined independently by MB and RT and screened for possible inclusion.

The searches returned 595 titles and abstracts; none of these met our inclusion criteria.

Conclusions

Implications for health care

Controlled trial evidence of weight management schemes and interventions aimed at the prevention of obesity for the under fives is scarce. No controlled trials addressing the issue of treating obesity or evidence of cost-effectiveness studies in this population were found. What evidence exists from prevention studies, is difficult to draw clear conclusions from as, apart from the Hip-Hop Jr trial (African American sites), the interventions showed no statistically significant differences in BMI and weight between the intervention and control groups (although there was some evidence of positive trends for BMI and weight). It should also be noted that these conclusions are based on only three dissimilar studies, two in low-income ethnic minority groups, in different contexts and settings, thereby making the drawing of firm conclusions difficult. A closer inspection of included studies shows that there may be elements that future interventions should include:

- effective training of the staff delivering the intervention
- cultural sensitivity
- sustained moderate to vigorous physical activity and nutritional advice components for children
- active engagement of parents/carers in reinforcing the messages to the children combined with education about healthy diets and exercise.

Suggested research priorities

The lack of evidence on which to base service commissioning indicates that research is urgently needed, in particular:

- Further well-designed UK-based RCTs of weight management schemes aimed at the prevention of obesity, which combine with cost-effectiveness studies targeted at preschool children (under fives) with long-term follow-up (> 12 months).
- Well-designed UK-based RCTs of weight management schemes that address the issue of treatment of overweight and obesity in the under fives, which combine with cost-effectiveness studies targeted at preschool children (under fives) with long-term follow-up (> 12 months).

These RCTs should specifically consider:

1. Elements of interventions:
 - Effective training of the staff delivering the intervention.
 - Cultural sensitivity.
 - Sustained moderate to vigorous physical activity and nutritional advice components for children.
 - Active engagement of parents/carers in reinforcing the messages to the children combined with education about healthy diets and exercise.
2. Outcomes
 - Body density, skinfold thickness, waist circumference, BMI, weight, physical activity, health behaviour and cost outcomes.
3. Process
 - Studies should also have a qualitative component to investigate the barriers and facilitators to successful engagement

of children, parents and preschool staff in weight management interventions.

Questions of interest include:

- Parental views of the intervention; do they believe there is an overweight problem for under fives? Do they believe the intervention will 'work'? What are the best ways of engaging parents fully?
- What are nursery/preschool staff attitudes to the intervention? Do they view it as an imposition or a help? How does the intervention fit in with the curriculum? Does it put pressure on the staff?

- Do the children enjoy taking part in intervention activities?

Publication

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NIHR Health Technology Assessment programme

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The views expressed in this publication are those of the authors and not necessarily those of the HTA programme or the Department of Health.

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