

Preventing childhood obesity through lifestyle change interventions

A briefing paper for commissioners

November 2009

Introduction

This briefing paper aims to support commissioners by providing a brief guide to current best available evidence on effective obesity prevention interventions for children and young people. For the purpose of this paper 'effective' is defined as interventions that can demonstrate positive lifestyle changes that can help children and young people to maintain a healthy weight. A parallel paper is available on effective **treatment** interventions.

This paper is concerned with services available for the prevention of obesity among children and young people (aged 2-18 years) and covers any service that explicitly sets out to manage or maintain a healthy body weight. This includes services focusing on diet, physical activity, or both in combination, and covers a range of approaches: including interventions conducted with individuals on a one-to one basis or in groups, and within a variety of settings.

This paper has been commissioned to support: *Healthy Weight, Healthy Lives: One Year On*,¹ theme three: effective services for those at risk; and should be used in conjunction with *Healthy Weight, Healthy Lives: Child weight management programme and training providers framework*² and *Healthy Weight, Healthy Lives: Commissioning weight management services for children and young people*.³ The evidence presented has been extracted from the most recent guidance documents and systematic reviews. This paper does not address 'upstream' long-term policy or environmental approaches to preventing weight gain in the population, such as changes to the built environment,^a within this paper. There is a growing evidence base on the effectiveness of these approaches and, for example, recent National Institute for Health and Clinical Excellence (NICE) guidance has been published that summarises evidence on the environment and physical activity.⁴

Background

Latest data from the 2007/08 National Child Measurement Programme (NCMP) have shown that in England, 13.0% of 4-5 year olds, and 14.3% of 10-11 year olds are overweight.^b In addition, 9.6% of 4-5 year olds, and 18.3% of 10-11 years are obese.^{c,5} From 2008/09, Primary Care Trusts have been asked to start routinely feeding back NCMP results to parents⁶ (although this is not yet mandatory). The Foresight report⁷ predicted that by 2050, up to 55% of boys and 70% of girls could be overweight or obese,^d thus

^a These exclusion criteria are consistent with those that NOO used for the Standard Evaluation Framework. For more information see www.noo.org.uk/SEF

^b Overweight is defined using the population monitoring definitions of a BMI between the 85th and 94th centile of the UK1990 Growth Reference (UK90).

^c Obesity is defined using the population monitoring definition of a BMI $\geq 95^{\text{th}}$ centile of the UK90 Growth Reference.

^d A recent report from the National Heart Forum using updated data suggests that the projected prevalence of obesity in 2020 may be lower than previously anticipated. See: McPherson K, Brown M, Marsh T and Byatt T. Obesity Recent Trends in Children Aged 2-11 and 12-19. London, National Heart Forum. <http://www.heartforum.org.uk/>

emphasising the urgent need for effective prevention interventions, building on current best practice and best available evidence.⁸

The Foresight report referred to obesity as a “complex web of societal and biological factors that have, in recent decades, exposed our inherent human vulnerability to weight gain”. The report presented an obesity system map with energy balance at its centre. Around this, over 100 variables directly or indirectly influence energy balance, which can be broadly categorised into biology, food consumption and environment, physical activity and activity environment, individual psychology and societal influences.

The most recent, rigorous, and systematic reviews of the evidence for preventing childhood obesity have been undertaken by NICE⁹ and the Cochrane Collaboration.¹⁰ The data from these reviews have been extracted for this paper and are shown in Appendices 1 and 2. Further current information on the prevention and surveillance of childhood obesity can be found in the NHS Evidence: 2009 Annual Evidence Update.¹¹ The Cochrane review focuses solely on high quality data from Randomised Controlled Trials (RCTs). NICE reviews acknowledge that a strict focus only on RCTs may produce insufficient evidence of effectiveness, and in many cases may be inappropriate for the types of interventions being considered. Evidence from NICE is therefore extracted from a variety of sources, with the evidence weighted according to its quality.

The recommendations from both sources show that there is sufficient evidence to justify well-targeted action on obesity. The evidence base tends to lack detail on the effectiveness of specific approaches or individual programmes, with the result that guidance tends to be somewhat general in nature. For example, both evidence reviews identify the huge variation in study design and a general lack of evidence from: UK studies; vulnerable and minority groups; standard service settings; studies with long (more than one year) follow up; and studies that include robust cost effectiveness data.

As it is essential that we continue to tackle childhood obesity, this paper has been produced to provide a summary of best available evidence upon which to commission new interventions. The National Obesity Observatory (NOO) recommends that all new programmes, for which evidence of effectiveness does not already exist, are thoroughly evaluated to ensure the gaps identified by NICE and Cochrane are filled, resulting in a stronger evidence base, and improvements to future commissioning. Guidance on evaluation is available in the NOO Standard Evaluation Framework.

Commissioning Overview

Given the prevalence of obesity and seriousness of associated co-morbidities, commissioning of child weight management services should be given a high priority. It is important for commissioners to be aware of the multifaceted nature of obesity and the challenges of defining effective interventions. It may, for example, be difficult to demonstrate the effectiveness of a specific intervention within a short timescale given the complex interplay of different environmental, biological and social determinants. Although this may result in only small changes at individual level the public health impacts at population level may be significant.

The following therefore provides a summary of the current best available evidence, and should be used as a foundation for the commissioning of new interventions.

NICE and Cochrane evidence:^{9,10}

Intervention content:

- Programmes should be multi-component interventions, ideally addressing diet and physical activity together, as previous studies have shown that interventions that target both activity and diet together, rather than in isolation, are likely to be more effective. The emphasis should be on encouraging positive changes in behaviour that can be maintained over the long term. It may be beneficial if the components of the intervention are marketed in a way that is tailored to known behaviours of the target population.
- Programmes should involve family and peer support where possible, using behavioural programmes aimed at changing diet and physical activity patterns. Previous studies have shown that interventions involving parents, carers, siblings or peers with similar weight issues could prove more successful than those that target individuals alone. Parents and carers should be encouraged to take responsibility for lifestyle choices in children and young people. The programmes should be age appropriate, accounting appropriately for the level of maturity of the child and acknowledging the differing preferences of child and adolescent populations. Most of the evidence in this field is from school-age children so in some cases may not apply directly to very young children.
- Programmes should consider the influence of age, sex, socio-economic status, ethnicity and the whole school environment. Interventions should be tailored to the target population; different approaches will be required for different populations. New programmes should be developed in consultation with the target population wherever possible.
- Programmes should be based on a strong theoretical framework, with clear underpinning logic models.^e

^e A logic model outlines the steps underpinning the theoretical basis for the intervention. Discussing and agreeing a logic model is a critical stage in a project's development because it reveals what needs to be measured at each stage of the project (see section 2.8 SEF www.noo.org.uk/sef).

Outcome measures:

- Goals should be set that are achievable and sustainable over the long term. Maintaining a healthy weight is a lifelong target therefore it is important that interventions encourage behaviour changes that are likely to be sustained in the long term.
- All programmes should assess long term outcome measures (at least one year; preferably longer). This is important in order to assess sustainability of the programme outcomes, particularly given that much of the current evidence is based on findings from short term studies (under one year: with the majority of studies lasting just 12 weeks). However it is still important to assess some short-term indicators in order to assess progress within commissioning timetables.
- Because children are still growing it is not possible to recommend a suitable effect size (i.e. the extent to which weight loss or weight maintenance can be expected from an effective intervention). The success of interventions targeting children should be assessed in the context of the target population. Interventions targeting overweight children may aim to support children and young people to 'grow into their weight' (maintain their weight over time as they grow taller) rather than lose weight. Interventions aiming to prevent obesity among healthy weight children will aim to support children in maintaining their healthy weight status (which may of course involve gaining weight as they grow). It is therefore important to examine changes in measures such as BMI centile or z score^f rather than just focusing on weight loss per se. It is also important to look at any changes in the context of quality of life and behaviour change indicators.
- All programmes should evaluate cost effectiveness and sustainability. Currently there is insufficient evidence to compare the cost effectiveness of different programmes. Tools to estimate the local prevalence of, and costs associated with, obesity can be found in section D of *Healthy Weight, Healthy Lives: a toolkit of developing local strategies*.¹²

Additional NOO recommendations:

- All programmes should be thoroughly evaluated. Good quality evaluations will strengthen the evidence base and support effective commissioning in the future. The Department of Health recommends that interventions are evaluated using the NOO Standard Evaluation Framework for weight management interventions: www.noo.org.uk/sef
- Programmes should align with government messages such as '5 A DAY' and the recommendation for 60 minutes of daily moderate-vigorous activity among children.
- Programmes should aim to be enjoyable, engaging and easy for the target audience to access.

^f A BMI z score or Standard Deviation score indicates how far a child's score is above or below the mean BMI value for their age group and sex, expressed in terms of the number of standard deviations from the mean.

- Given the limited robust effectiveness data currently available, it may be beneficial, where financially viable, to examine innovative approaches and programmes, as long as these are based on a clear theoretical framework, and are well evaluated.

A series of case studies that support these recommendations is being compiled on the National Obesity Observatory website. If you would like more information or to submit a case study please contact: info@noo.org.uk

References

1. Healthy Weight, Healthy Lives: One Year On (2009) London: Department of Health.
2. Healthy Weight, Healthy Lives: Child weight management programme and training providers framework (2009) London: Department of Health.
3. Healthy Weight, Healthy Lives: Commissioning weight management services for children and young people (2008) London: Department of Health.
4. Physical activity and the environment (2008) London: NICE
5. National Child Measurement Programme 2007/08 school year headline results (2009). Leeds: NHS Information Centre for Health and Social Care.
6. The National Child Measurement Programme: Guidance for PCTs: 2008/09 school year (2008) London: Department of Health.
7. Foresight - Tackling Obesity - Future Choices (2007) London: Foresight
8. Aicken C, Arai L, Roberts H (2008) Schemes to promote healthy weight among obese and overweight children in England. Report. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
9. Obesity: Guidance on the prevention, identification, assessment and management of overweight and obesity in adults (2006) London: NICE
10. Summerbell CD, Waters E, Edmunds L, Kelly SAM, Brown T, Campbell KJ (2005) Intervention for prevention obesity in children. *Cochrane Database of Systematic Reviews 2005 Issue 3*
11. NHS Evidence: 2009 Annual Evidence Update - Obesity - Childhood obesity: surveillance and prevention <http://www.library.nhs.uk/PUBLICHEALTH/>
12. Healthy Weight, Healthy Lives: A toolkit for developing local strategies (2008) London: Department of Health

Links to all listed references can be found on www.noo.org.uk/resources

Appendix 1

Summary of evidence from NICE (2006)⁹ - Prevention of childhood obesity

Full evidence summaries are also available in *Healthy Weight, Healthy Lives: A toolkit for developing local strategies*.¹²

- Limited data suggest that the following factors are linked to weight gain: having an obese parent(s); energy dense diets and not eating breakfast; and decreased physical activity levels. Data on snacking and TV viewing were inconsistent.
- Well-conducted non-RCT studies demonstrated that food promotion can affect children's food preferences, purchase behaviour and consumption.
- Non analytical studies demonstrated that parents often do not recognise that their child is overweight, yet they provide an important role model for promoting healthy lifestyle behaviours in their offspring.
- Well conducted cohort studies showed that individuals who habitually eat healthy diets and are physically active are more likely to maintain their weight long term.
- High quality systematic reviews provided evidence to suggest that: family based diet and activity interventions can be effective; improved pre school meals can reduce dietary fat and improve weight outcome; effectiveness of interventions tend to be positively enhanced by behaviour change techniques; interventions should be tailored for lower socio-economic groups; 2-5 years of age is a key time to establish good nutrition habits with parental involvement; interventions with favourable diet and physical activity outcomes may not always impact on weight outcomes.
- High quality systematic reviews and well conducted non RCT studies demonstrated that: school based multi-component interventions addressing various aspects of healthy living may help improve physical activity and dietary behaviours; and school based initiatives to improve meal provisions and fruit and vegetable intake can be effective, particularly in children with low baseline fruit and vegetable intake.
- Limited evidence from the UK demonstrated a link between reduced sugar soft drink consumption and reduced obesity levels.
- Young people's views on barriers and facilitators suggest that interventions should: involve family and peers; provide choice and access to low cost healthy foods and different activities; address personal barriers to healthy eating; and increase confidence, motivation and knowledge relating to physical activity.

Appendix 2

Cochrane prevention recommendations (2005)¹⁰

- Most of the 22 studies reviewed (the majority of which were short term) identified no significant impact on obesity status, but did identify some improvements to dietary intake and/or levels of physical activity.
- Intensity and expense of intervention were not determinants of success of the intervention.
- Levers of engagement and enjoyment were found to be important factors.
- Interventions that used a whole school approach appeared to have the most success.
- Interventions that were underpinned by a theoretical model appeared to have the most success.
- Interventions that considered the school environment, and involved families and the wider community, appeared to have the most success.

Reader Information

Title	Preventing childhood obesity through lifestyle change interventions. A briefing paper for commissioners
Author(s)	Louisa Ells Nick Cavill
Reviewer(s)	Donna Sager: Service Director, Stockport PCT Lesley Manning: Public Health Practitioner, Bucks PCT Claire Spence: Obesity Lead, Stockton PCT Cam Todd: Obesity Lead, Public Health Development Manager, Portsmouth Margaret O'Dwyer: Commissioner, Salford PCT Kate King: Health Improvement Principal, Oxfordshire PCT
Publication date	November 2009
Target audience	Obesity service / intervention commissioners Obesity/ physical activity/ nutrition professionals in: central government; regional government; local authorities; Primary Care Trusts; Strategic Health Authorities. Public Health Observatories Obesity and related academics
Description	This paper aims to support commissioners by summarising best available evidence on effective prevention interventions for children and young people who are overweight or obese. A parallel paper is available on effective <i>treatment</i> interventions.
How to cite	Ells LJ, Cavill N. Preventing childhood obesity through lifestyle change interventions. A briefing paper for commissioners. Oxford: National Obesity Observatory, 2009
Contact	National Obesity Observatory www.noo.org.uk info@noo.org.uk
Electronic location	http://www.noo.org.uk/NOO_pub/briefing_papers
Copyright	© National Obesity Observatory