

Evaluation of implementation and effect of primary school based intervention to reduce risk factors for obesity

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Abstract

Objectives To implement a school based health promotion programme aimed at reducing risk factors for obesity and to evaluate the implementation process and its effect on the school.

Design Data from 10 schools participating in a group randomised controlled crossover trial were pooled and analysed.

Setting 10 primary schools in Leeds.

Participants 634 children (350 boys and 284 girls) aged 7-11 years.

Main outcome measures Response rates to questionnaires, teachers' evaluation of training and input, success of school action plans, content of school meals, and children's knowledge of healthy living and self reported behaviour.

Results All 10 schools participated throughout the study. 76 (89%) of the action points determined by schools in their school action plans were achieved, along with positive changes in school meals. A high level of support for nutrition education and promotion of physical activity was expressed by both teachers and parents. 410 (64%) parents responded to the questionnaire concerning changes they would like to see implemented in school. 19 out of 20 teachers attended the training, and all reported satisfaction with the training, resources, and support. Intervention children showed a higher score for knowledge, attitudes, and self reported behaviour for healthy eating and physical activity.

Conclusion This programme was successfully implemented and produced changes at school level that tackled risk factors for obesity.

Introduction

The prevalence of childhood obesity is increasing throughout the world.¹ Within the United Kingdom, estimates of obesity range from 6% in preschool children² to 17% by age 15.^{3,4} Schools provide an opportunity for preventing and treating obesity.⁴⁻⁶

Despite major resources being deployed towards encouraging health promotion in schools in the United Kingdom, no rigorously designed intervention studies of programmes targeting obesity have taken place.⁷ Health promotion programmes are unlikely to be successful if the programme is of poor quality or has not been efficiently implemented.⁸ This paper

describes and evaluates the implementation of a health promotion programme in primary schools to prevent risk factors for obesity. The outcome measures relating to weight, diet, and activity, which we evaluated by a randomised controlled trial, are reported separately.⁹

Participants and methods

Intervention programme

The active programme promoting lifestyle education in school (APPLES) was designed as a multidisciplinary, multiagency programme using a population approach that was underpinned by the Health Promoting Schools philosophy.¹⁰ This philosophy aims to link the school with family and community and focuses on the whole school ethos, including its policies, management style, and attitudes of staff, so that consistent health messages are given and received.

The programme targeted the whole school community including parents, teachers, catering staff, and the school environment. It was designed to take place over one academic year and was based on the concept of school action plans, which were to be developed by the individual schools on the basis of their perceived needs. The programme was intended to influence dietary and physical activity behaviour and not simply knowledge in the school children.

The team provided training for teachers and some resources, and the project manager also provided input and contacted the schools regularly throughout the year to give support. The underlying approach was to be non-prescriptive and to ensure ownership of the programme by the schools.

Participants

Ten state primary schools in Leeds were enrolled into the project.⁹ Children in years 4 and 5 (8-10 year olds) received the programme. In 1996, the schools were randomised to receive the programme or serve as controls for that year. To evaluate the implementation and effect of the programme, we pooled data from the 10 schools.

Design and development of intervention

To inform the design and development of the intervention, questionnaires were administered to all school staff, including secretarial and catering staff, and parents of year 4 and 5 pupils. The responses from these questionnaires were used by schools to develop

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the school action plans. The progress towards these targets was monitored by regular staff meetings and surveys of packed lunches, breaktime snacks, and playground activities.

Changes regarding school meals were discussed with the local education authority catering organisation, which agreed that the team would work directly with the catering staff in schools. Meals were monitored by discussions with staff, collection of monthly menus, and observation of lunches on offer. We assessed whether quality had improved over the year.

An anonymous questionnaire was administered to teachers at the end of the intervention to evaluate the quality of the teachers' training, the usefulness and appropriateness of the resources, and the adequacy of support offered and to ascertain whether the programme had had an effect in the schools. We also collected information on support taken up by the schools over the year.

Results

We received questionnaires from 124 school staff before the intervention (62 teachers, 13 non-teaching assistants, 23 special needs assistants, 17 catering staff, and 9 administrative staff). The questionnaire administered by pupil post was completed by 410 (64%) of parents; response rates ranged from 39% to 85% between schools. Table 1 shows the responses of parents and staff to questions relating to the importance and relative responsibility of home and school in engendering a healthy lifestyle in children. Table 2 shows the changes in the school environment that parents hoped to see and the information they felt would be useful.

Table 1 Numbers (percentages) of school staff and parents who agreed with statements regarding educating children about healthy lifestyle

	School staff (n=124)	Parents (n=410)
It is important for schools to take a major role in promoting the health of children	109 (88)	377 (92)
There should be an emphasis on teaching about balanced eating and physical activity in school	117 (94)	385 (94)
Schools should have a food policy	83 (67)	287 (70)
The family alone should not be responsible for their child's food habits and physical activity	120 (97)	328 (80)
Schools should be responsible for encouraging physical activity	108 (87)	390 (95)
A child's diet affects its health	113 (91)	373 (91)
A child's diet affects its health in adulthood	109 (88)	349 (85)

Table 2 Summary of changes and information requested by parents when surveyed about the sort of input they felt was required in school

	No (%) of parents (n=410)
Changes suggested	
Promotion of healthier breaktime snacks with enforcement by school	160 (39)
Playground activities: organised games and balls, hoops, and skipping ropes to be made available	139 (34)
Healthier school meals (fewer chips and more fruit, vegetables, salads, pasta, jacket potatoes)	135 (33)
More games and sports and wider variety for all age groups	131 (32)
Ideas for healthier packed lunches	66 (16)
Joining in games and activities and tasting sessions in school	139 (34)
Parents offering skills (dance teachers, food tasting and cooking, sports coaching)	25 (6)
Information requested	
Material on healthy eating for children	160 (39)
Fun physical activity ideas	148 (36)
Main meal ideas	115 (28)
Breaktime snack ideas	66 (16)

Table 3 Number of schools that included health promotion activities in action plan

Activity	No of schools
Nutrition education incorporated into curriculum	10
Healthy eating class sessions delivered by dietician	10
Fit is fun programme incorporated into physical education lessons	10
Improved or updated health resources	10
Improved playground facilities	7
Policy changes regarding breaktime snacks	6
Healthy packed lunches	6
Displays or competitions	5
Invitation to outside agencies	5
Healthy tuckshops	4
Development of after school activities	3
Healthy assemblies	3
Other	7

Response rates

Data were available for over 90% of pupils for most measures, indicating excellent participation in the programme by schools and staff. Response rates for the three day diet and activity diaries were satisfactory and indicated a good level of commitment by both children and parents.

Support and training

Nineteen out of 20 teachers attended the training sessions. In anonymous questionnaires at the end of the intervention, all reported that they found the training useful, that the resources were useful and they would continue to use them, that support during the project was good, and that they had an increased awareness of healthy eating and physical activity among pupils.

The project manager offered a variety of ways that she could support the schools in implementing their action plans. All schools opted for direct input in the classroom, competitions, and involvement in a food awareness week.

School action plans

All schools elected to incorporate nutrition education into the curriculum, with additional sessions supplied by the project manager (table 3). They also included a "fit is fun" programme in physical education lessons and undertook to improve their health resources. In total, there were 85 action points with six to 14 points per school plan; 76 (89%) of these points were successfully achieved. Reasons for not achieving action points included shortage of time, staff sickness, and impending inspection by government teaching standards officers.

School meals

Given the emphasis on healthy eating, school meals were an important aspect of the assessment. Positive changes were seen in all schools.

Discussion

The evaluation of the implementation of this programme to reduce risk factors for obesity in children shows that the project was successful. Little information is available on effective programmes for prevention of obesity or their results.⁷ Although a healthy diet and exercise are probably unique components for such preventive programmes, currently there is no knowledge on how they should best be implemented.

What is already known on this topic

Prevention of obesity is an increasingly important aspect of health promotion

Few trials have investigated school based primary prevention programmes directed at obesity

What this study adds

The programme was successful in producing school level changes to tackle risk factors for obesity

High levels of participation indicated support from schools, staff, parents, and pupils

Positive changes were seen in school meals, tuck shops, and playground activities

Our programme used a population based approach underpinned by the Health Promoting Schools philosophy.¹⁰ The population approach ensured that all children including those at risk of developing obesity were included. As the prediction of adult obesity from childhood measures is poor,¹¹ a population approach should have more effect at the public health level than targeting children who are already obese. Furthermore, behavioural and environmental conditions that contribute to the development and maintenance of obesity might be modified. Given

the positive effects achieved in all 10 schools, we believe that our programme could be successful in other primary schools.

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Randomised controlled trial of primary school based intervention to reduce risk factors for obesity

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Abstract

Objective To assess if a school based intervention was effective in reducing risk factors for obesity.

Design Group randomised controlled trial.

Setting 10 primary schools in Leeds.

Participants 634 children aged 7-11 years.

Intervention Teacher training, modification of school meals, and the development of school action plans targeting the curriculum, physical education, tuck shops, and playground activities.

Main outcome measures Body mass index, diet, physical activity, and psychological state.

Results Vegetable consumption by 24 hour recall was higher in children in the intervention group than the control group (weighted mean difference 0.3 portions/day, 95% confidence interval 0.2 to 0.4), representing a difference equivalent to 50% of baseline consumption. Fruit consumption was lower in obese children in the intervention group (-1.0, -1.8 to -0.2) than those in the control group. The three day diary showed higher consumption of high sugar foods (0.8, 0.1 to 1.6) among overweight children in the intervention group than the control group. Sedentary behaviour was higher in overweight

children in the intervention group (0.3, 0.0 to 0.7). Global self worth was higher in obese children in the intervention group (0.3, 0.3 to 0.6). There was no difference in body mass index, other psychological measures, or dieting behaviour between the groups. Focus groups indicated higher levels of self reported behaviour change, understanding, and knowledge among children who had received the intervention. **Conclusion** Although it was successful in producing changes at school level, the programme had little effect on children's behaviour other than a modest increase in consumption of vegetables.

Introduction

School staff have access to large numbers of children in an environment that has the potential to support healthy behaviour and is favourable for the delivery of health promotion programmes.¹ Primary schools are particularly suitable for such programmes as children in this age group are responsive to health messages and behavioural changes may be maintained into adolescence and adulthood.²

Recent reports have indicated that over 17% of 11 year old children are obese and 30% overweight.³



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