

Active Programme Promoting Lifestyle in Schools (United Kingdom-Research-based)

Section I: Summary

A health promotion and lifestyle education program called Active Programme Promoting Lifestyle in Schools (APPLES) was implemented in 10 primary schools in Leeds, United Kingdom as an obesity prevention strategy. The APPLES program took a community approach, linking the full school environment (teachers, staff, students) with family and community. Outcome measures included body mass index, diet, and physical activity, as well as children's knowledge of healthy living, self-reported behaviors, and evaluation by parents and teachers. While the program showed some success in impacting knowledge and attitudes about obesity, there did not appear to be a significant improvement in healthy behaviors or clinical risk factors.

Section II: Statement of Purpose

The APPLES program was based in part on the World Health Organization's Health Promoting Schools concept, a holistic, multidisciplinary, community-based approach to increase knowledge and change behaviors. Participants included children aged 8-10 from ten ethnically diverse primary schools in Leeds, UK. Five schools received the APPLES program intervention the first year while the other five schools served as a control group. The control schools received the program in the second year.

The program consisted of teacher training, modification of school meals, and the action plans developed by individual schools to promote healthy eating and physical activity over one school year, based on perceived needs. The program's professional team consisted of a project manager (dietician), a community pediatrician, an obesity physician, a health promotion specialist, a psychologist, and a nutritional epidemiologist.

Development of the action plans was based on questionnaires given to parents of 4th and 5th graders and all school staff, including secretarial and food service staff. The questionnaires sought opinions on the importance of nutrition education and physical activity and who the responsible party should be. Parents were also asked about changes they would like to see in the schools and what additional information they would like to have.

Staff held regular meetings and observations were made about contents of sack lunches, snacks, and physical activity. Food service staff were also engaged in the process - meals were monitored through staff discussions, collection of monthly menus, and observation of lunch offerings in order to determine any improvement in food quality over the year.

Support for the program was measured by response rates to the questionnaires, completion of daily diaries by the children, and survey data on growth, diet, and activity. Teachers also completed an anonymous questionnaire at the end of the year to assess the quality, usefulness, and appropriateness of the training, adequacy of support, and impact of the program.

The effect of the APPLES program intervention on individual behavior was assessed by several measures, including:

- Growth measures – height, weight, and calculated body mass index (BMI).
- Dietary information – consumption frequency of high fat and high sugar foods, and fruits and vegetables, as recorded by 24-hour recall and 3-day food diaries.
- Physical activity – frequency of physical activity in the last week and sedentary behavior (television, computer, etc.) in the last 24 hours.
- Psychological measures – three validated tools were used to measure self-perception, eating/dieting behavior, and satisfaction with body image.
- Focus groups – 80 focus groups (320 children) held at the end of the year to measure levels of knowledge/attitudes toward healthy lifestyle and self-reported changes in diet and activity.

Section III: Outcomes

A total of 636 children participated in the program evaluation (314 in the first year intervention, 322 in the control group). Over the year, 40 children left the program and 42 new children joined. Data were available for over 90% of students for most measures, indicating strong interest and participation. Completion rates for the 3-day food and physical activity diaries were 63% at baseline and 64% at the end of the study.

Teacher responses from the end of year anonymous survey indicated satisfaction with the training and its usefulness, a sense of support, and an increased awareness of healthy eating behaviors and exercise among students.

There was no difference in BMI between the intervention group and the control group as a whole at the end of the year, nor were there differences when only overweight or obese children were compared between groups. Other key outcomes were as follows:

- Diet - Intervention children had higher vegetable consumption than the control group (one third of a portion more per day) at the end of the year, as determined through 24-hour recall. (The 3-day food diary

- did not indicate a difference.) Obese intervention children showed a *lower* fruit intake than obese children in the control group.
- Physical activity - There was no significant difference in physical activity or sedentary behavior between the intervention and control groups. However, sedentary behavior *increased* by one third among overweight children in the intervention group compared to the control group.
 - Psychological measures - There was a small increase in the perception of “global self worth” among obese children in the intervention group.
 - Focus groups – Qualitative evidence from the focus groups indicated that children in the APPLES program had a greater understanding of the health benefits of diet and exercise and more complex ideas and vocabulary to discuss the topics. Compared to the control group, they also had higher levels of self-reported behavior change and better recollection of school topics and activities related to diet and physical activity.
 - School action plans - As a whole, the schools successfully implemented 89% of their action plan items and incorporated nutrition education into the curriculum, and made positive changes to the physical education curriculum.
 - School meals – Improvements were made in the quality and variety of school lunch menus, including more fruit, salad, and vegetarian options.

The APPLES program was successful in creating school-level change (curriculum, environment, attitudes) but this did not fully translate to improvements in individual behaviors or risk factors. The only significant behavioral improvement was the increase in vegetable consumption among children in the program. Creating significant and lasting lifestyle change takes time and outcomes could improve if the program were to continue beyond just the study year. Additional targeting of family and community might also improve success at the individual level by bringing in additional resources and support mechanisms.

Section IV: Additional Resources

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Sahota, Pinki, Mary C.J. Rudolph, Rachael Dixey, Andrew J. Hill, Julian H. Barth, and Janet Cade, Evaluation of implementation and effect of primary school based intervention to reduce risk factors for obesity, *British Medical Journal*, November 2001, Vol. 323:1027,
<http://bmj.com/cgi/content/full/323/7320/1027>.

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World Health Organization, "Health Promoting Schools," http://www.who.int/school_youth_health/gshi/hps/en/index.html.