Active for Life Year 5: a cluster randomised controlled trial of a primary school-based intervention to increase levels of physical activity, decrease sedentary behaviour and improve diet

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Scientific summary

Active for Life Year 5 cluster RCT

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Scientific summary

Objectives

Our objectives were to investigate the effectiveness of a school-based intervention to (i) increase physical activity, reduce sedentary behaviour and increase fruit and vegetable consumption in children; (ii) affect pre-specified secondary outcomes [child-reported time spent screen viewing at the weekend and on weekdays, consumption of snacks, high-fat food and high-energy drinks, body mass index (BMI), waist circumference, general overweight/obesity and central overweight/obesity]; and (iii) influence pre-specified potential mediators. Additional objectives were to (iv) test the cost-effectiveness of the intervention; and (v) determine whether or not the intervention was delivered with a high level of fidelity and identify any barriers to its implementation in schools.

Methods

We undertook a cluster randomised controlled trial with follow-up at the immediate end of the intervention and 1 year later. The trial was undertaken in 60 primary schools in the south-west of England, with the school children who were involved in the trial being in school year 4 (aged 8–9 years) at recruitment, randomisation and baseline assessment, year 5 (aged 9–10 years) during the intervention and immediate follow-up and year 6 (aged 10–11 years) during the 1-year follow-up. The schools randomised to the Active for Life Year 5 (AFLY5) intervention received teacher training, lesson plans, resources and materials for 16 lessons, 10 parent-interactive homework assignments and written materials for school newsletters and parents. Control schools continued with their standard syllabus. The primary outcomes were accelerometer-assessed levels of physical activity and sedentary behaviour, and child-reported consumption of fruit and vegetables per day. Secondary outcomes included child-reported screen viewing; consumption of snacks, high-fat food and high-energy drinks; BMI; and waist circumference. Potential mediators were those that we anticipated could reflect the way in which the intervention might affect outcomes. In relation to this we selected mediators that were relevant to the theory that we used to inform the development of the intervention. These potential mediators were child-reported self-efficacy for physical activity and fruit and vegetable consumption, perceived parental logistic support and modelling for their child's physical activity, parental efforts to limit their child's sedentary behaviour, modelling of healthy fruit and vegetable consumption and a knowledge assessment. Details on the cost of the intervention, including from the perspective of the family, were collected. Focus groups and in-depth interviews with school heads, teachers, children and parents were used in the process evaluation to assess how the intervention was implemented.

Results

We recruited 60 schools with over 2221 children. At the immediate follow-up, no difference was found between children in intervention and control schools for any of the three primary outcomes. The intervention was effective on three of the nine secondary outcomes after accounting for multiple testing: children in intervention schools were found to report spending less time screen viewing at weekends [–21 minutes per day, 95% confidence interval (CI) –37 to –4 minutes per day], eating fewer servings of snacks per day (–0.22, 95% CI –0.38 to –0.05 servings of snacks per day) and drinking fewer servings of high-energy drinks per day (–0.26, 95% CI –0.43 to –0.10 servings of high-energy drinks per day) than children in control schools. The results remained consistent with these findings 1 year later.

The intervention increased children's perception of maternal efforts to limit the time they spent screen viewing at the weekend and children's knowledge about healthy physical activity and fruit and vegetable consumption, with these two mediators explaining approximately one-quarter of the effect of the intervention on screen viewing at the weekend. The intervention did not affect other mediators; for instance, it had no effect on child self-efficacy for changing physical activity or consumption of fruit and vegetables.

The cost of implementing the intervention from a school and provider perspective was £17.80 per child (£18,944.41 in total). Parents in the intervention arm had greater household expenditure in terms of food and out-of-school activities, although this result must be treated with caution because of the number of missing data; it could be a reflection of parents' increased awareness of the AFLY5 health messages.

Process evaluation showed that AFLY5 was implemented with a high degree of fidelity, with 95% of children in intervention schools receiving lessons, 77% of all the lessons being taught and 62% of the homework assignments delivered. Teachers supported the aims of AFLY5, but their views of the programme itself were mixed. They were likely to delegate the physical activity lessons to support staff; in addition, some felt that the teaching methods were dated and others felt that the intervention took too much time, when the primary focus of the national curriculum was on preparing children for academic assessments.

Limitations

Responses to parental questionnaires for the economic evaluation were low and we struggled to engage all teachers for the process evaluation. We did not have information on schools that refused to participate and the study was conducted in a defined geographical area in the south-west of England. Although the participating schools included a range of levels of socioeconomic deprivation, class sizes and both rural and urban settings, we cannot assume that these results generalise to all primary schools.

Conclusions

Active for Life Year 5 is not effective at increasing levels of physical activity, reducing sedentary behaviour and increasing fruit and vegetable consumption in primary school children, but may be effective in reducing time spent screen viewing at weekends and the consumption of snacks and high-energy drinks.

Future work

Our findings suggest that the AFLY5 intervention, an intervention that we considered to be of relatively low intensity and easy to fit into the school curriculum (on the basis of our prior feasibility and pilot work), is unlikely to have a major impact on promoting healthy levels of physical activity and healthy diets in primary school children. Effective health promotion in primary schools might require more substantial resources so that they can be delivered alongside the demands necessary for the school curriculum. It is also possible that broader interventions that include schools, but also families and whole communities, may be required to have important public health effects on these outcomes in children. However, further work, starting with appropriate systematic reviews, intervention development and feasibility testing and, ultimately, full randomised controlled trials, is required to make such conclusions. More generally, with respect to school-based interventions, our process evaluation results suggest that with rapidly changing teaching technologies, it may be necessary for funders and academics to consider how the time from feasibility and primary work through to full trial implementation can be shortened.

Trial registration

This trial is registered as ISRCTN50133740.

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