

Health Policy Research Program Summary of Research Results

Title:	Effectiveness of Physical Activity Enhancement and Obesity Prevention Programs in Children and Youth
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Summary

The purpose of this systematic literature review is to provide some national policy direction related to the effectiveness of interventions for promoting healthy weight, preventing overweight/obesity and increasing physical activity among school-aged children and youth.

Although the reported rates of childhood obesity/overweight in Canada vary, they are high. Over the past 15 years, obesity rates in children have doubled. Similar trends have been noted in Australia and the United States. Although not all obese/overweight children become obese adults, many do. As well, many thin children become obese/overweight adults. Adult obesity is implicated in a number of chronic illnesses. The costs of obesity to the health care system, other systems and the individual's quality of life are substantial. Providing preventive strategies to all children could reduce child and adult obesity/overweight.

Few population frameworks to guide the interventions to reduce obesity/overweight have been suggested. Canada and Australia have proposed similar models to address this issue. The models suggest there are 3 broad variables involved: biology/genetics, behavioural, and environmental influences. As well, there are macro and micro level factors within the variables. Much of the work to date has focused on the micro factors, primarily on education. Although there are limitations, schools are good settings for population-based interventions directed at children and youth, their families and the community.

This review consists of several components. An overall comprehensive literature search for primary studies between January 1985 and June 2003 was carried out. The literature was divided into five topics: improving nutritional intake, reducing physical inactivity, increasing physical activity, multi-faceted interventions including improving nutrition, increasing physical activity and impacting the school environment, and school environmental interventions. Over 1,100 articles were retrieved. All articles were reviewed for relevance using standardized criteria. Those that were relevant (n=425) were then assessed for methodological quality. All relevant studies are reported in the tables. Only those with strong methodological rigour are described in the text. One should exercise caution when viewing the results of the weaker studies as they have several threats to internal and external validity.

Both Randomized Controlled Trials (RCTs) and cohort studies were included. The RCTs were, in general, stronger than the cohort studies. The most frequent limitations of the RCTs included potential selection bias, lack of blinding of outcome assessors, lack of sample size calculation, and inappropriate analysis in that many investigators allocated students by school and then analyzed outcomes by individual. As well, many investigators did not report the consistency of the intervention or the amount of the intervention received by study participants. Few studies provided any long-term follow-up to assess whether positive impacts were sustained. The other difficulty is that when studies reported statistically significant differences in outcomes, the actual differences were small and their clinical significance was unknown.

Although the theory underlying many interventions was not implicitly stated, it appeared that many were based on either social cognitive or ecological theory. A few studies were found that used the environmental/systems-based approach. Although none of these studies met the relevance criteria for this review, some examples of work in this area are included in the environmental section as illustrations of possible future work.

Few studies reported the effect of culture, socioeconomic status and individual level of risk on outcomes. In attempting to identify factors contributing to obesity/overweight in children and youth, several investigators have noted the differences in rates based on cultural differences and on socioeconomic status. Of these factors, socioeconomic status may be the most important.

Many of the studies involved elementary school children. About one-third focused on adolescents. The effectiveness of parental involvement had mixed results. One study demonstrated that teacher preparation positively impacted on the amount of physical activity students engaged in during physical education classes. However, classroom teachers led most of the interventions.

The results of the review are that positive outcomes are modest at best and many results are inconsistent between studies. Based on this review of the literature, the following are recommendations for policy, program delivery and research.

Policy and Program Delivery

- Increasing physical activity during school could be accomplished by addressing the balance of aerobic activity and skill development in physical education classes and by increasing the number of physical education classes, particularly in secondary school.
- The skill and motivation of teachers to comply with model programs needs to be addressed. Regular teachers who are leading physical education classes need access/mentoring from specialists to maximize the amount of physical activity that students receive during classes.
- Since multi-faceted programs are more effective than others, the resources for planning, implementing, monitoring and evaluating these programs should be made available.
- Organizations mandated to fund research in the areas of obesity/overweight prevention should be discouraged from funding projects that do not take the identified methodological limitations into account.
- Governments, the private sector and others need to work together to provide more rigorous evaluation of environment/systems based interventions.

Research

- Research studies must make the theoretical basis explicit. Combinations of theories should be encouraged.
- Strategies to reduce selection bias, improve blinding of outcome assessors, present sample size calculations, reduce analysis errors, monitor the fidelity of the intervention and report the amount of the program received by participants need to be included in future research plans/protocols.
- All analysis (and sample size calculations) should include subgroup analysis of at least gender, socioeconomic status and culture to determine their impact on programs.
- Long-term follow-up of successful programs is necessary to determine the sustainability of positive changes.

- Clinicians and researchers need to work together to determine a clinically significant difference in both improving nutrition and increasing physical activity.
- Qualitative methods could improve understanding of the barriers to improving nutrition and increasing physical activity for children, their families and the community.

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- **The print version of the full report can be obtained in the language of submission from the Health Canada Library through inter-library loan.**
- **An electronic version of the report in the language of submission is available upon request from Health Canada by e-mailing rmddinfo@hc-sc.gc.ca.**

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