

SYMPOSIUM / SYMPOSIUM

Think tank on school-aged children: nutrition and physical activity to prevent the rise in obesity

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Abstract: The rise in childhood obesity has generated concern across a range of sectors. Stakeholders and experts in the area of children's health met at a Think Tank in Toronto organized by the Canadian Council for Food and Nutrition and the Program in Food Safety, Nutrition, and Regulatory Affairs at the University of Toronto to discuss the current evidence in place to inform the development of school policies to reduce childhood obesity. Although there is some evidence to suggest that school interventions may reduce obesity in children, there are other examples of programs that have had very little impact. The role of parents in the development of healthy eating and physical activity patterns is critical from the earliest stages of life and warrants further attention. Delegates agreed that we need ongoing input of experts and leaders from all sectors and fields to help us to effectively promote healthy lifestyles at schools and within the home, while respecting each child's need for safety, security, and respect.

Key words: childhood obesity, feeding practices, physical activity, screen time, school policy.

Résumé : L'augmentation des cas d'obésité infantile préoccupe un grand nombre d'intervenants. Sous l'égide du Conseil Canadien des aliments et de la nutrition et du « Program in Food Safety, Nutrition and Regulatory Affairs » de l'Université de Toronto, un groupe de réflexion composé des parties prenantes et des experts en santé infantile a vu le jour afin de discuter des politiques à mettre en place à l'école pour diminuer le nombre de cas d'obésité infantile. Même si des études rapportent que des interventions en milieu scolaire peuvent réduire le taux d'obésité chez les enfants, d'autres études révèlent que ces programmes ont très peu d'effet. Le rôle primordial des parents dans le développement des saines habitudes de vie sur le plan de l'alimentation et de l'activité physique dès le plus jeune âge mérite qu'on s'y arrête. Les participants au groupe de réflexion se sont entendus sur la nécessité de recevoir l'avis des experts et des dirigeants de tous les secteurs de la société pour faire la promotion des saines habitudes de vie à l'école et à domicile tout en assurant à l'enfant son droit au respect et à la sécurité.

Mots-clés : obésité infantile, pratiques alimentaires, activité physique, temps devant l'écran, politique scolaire.

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In June 2006, the Canadian Council of Food and Nutrition (CCFN), in partnership with the University of Toronto Program in Food Safety, Nutrition, and Regulatory Affairs (PFSNRA), arranged a "Think Tank on School Nutrition and Activity". The one-day event was created as a forum to evaluate research related to children's eating and physical activity behaviours and to make recommendations for the development of sound health policies aimed at preventing obesity in school-aged children in Canada.

The objectives for the program were provided in advance as follows:

(1) To develop an evidence-based policy approach for promoting healthy nutrition and active lifestyle environments in schools;

(2) To identify the partnerships required to implement effective school nutrition and activity policies;

(3) To serve as a catalyst for an increased focus on improving the nutrition and activity behaviour of school-aged children.

The morning included background presentations by researchers and practitioners, followed by participant breakout groups of 8 to 10 assigned the task of providing recommendations to guide future activities on school nutrition and activity policies. More than 100 participants included representatives from Health Canada, the Heart and Stroke Foundation, and various public health units, as well as the food industry, and experts in education, nutrition, physical activity, and pediatrics. The program was sponsored with funds that were donated by the National Institute of Nutrition, which recently joined forces with the Canadian Food Information Council to create the CCFN.

Childhood obesity in Canada

When compared with 1978 data, the data from the 2004 Canadian Community Health Survey indicate that rates of

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overweight and obesity for Canadian children have increased from 12% to 18% and from 3% to 8%, respectively, for an increase in the combination of 15%–26% (Shields 2005). Simultaneously, our general frame of reference for visually assessing children has changed, as substantiated by data on the gap between perception and prevalence of overweight and obesity in Canadian children. When asked about their own children, only 9% of Canadian parents indicated that their children were overweight and none indicated that theirs were obese (Ipsos-Reid 2006). Nonetheless, concerns about increasing rates of obesity have made child health a growing priority for many stakeholders, including government and non-government organizations, educators, health professionals, researchers, and the food industry. While most agree that parents have primary responsibility for their young children's health behaviours, the obesity crisis has given rise to organized efforts, across sectors, to diminish the rising prevalence. Because children spend a large part of their lives in school, and because parents have frequent contact with schools, the school environment has been targeted by stakeholders as an ideal setting in which to address the obesity crisis through changes in children's eating and activity behaviours. A recent survey of parents undertaken on behalf of the Canadian Medical Association indicated that parents support mandatory physical activity (90%), mandatory curriculum on the benefits of physical activity and a healthy diet (87%), and removing food that is high in fat, sugar, and salt from vending machines in schools (81%). Parents also indicated support for upstream approaches to the problem such as nutrition labels on fast foods (84%) and warning labels on foods that are high in fat, sugar, and salt (72%). Although they were supportive of tax breaks on healthy foods (63%) and the cost of programs to support physical activity (80%), they were less supportive of taxes on foods that are high in fat, sugar, and salt (43%) (Ipsos-Reid 2006).

Children's eating patterns

The complexity of the development of children's eating behaviours was addressed by Dr. Leann Birch, Professor of Human Development and Nutritional Sciences at Pennsylvania State University. Her work suggests that school-based interventions may be too late for obesity prevention owing to the multitude of factors that influence childhood obesity and that have their effects from very early in life (Birch 2006). These include genetic predisposition, child feeding practices, and parents as role models. Although infants come equipped with innate preferences for sweet and salty tastes, feeding practices shape food preferences in children, including preferences for energy-dense foods over energy-dilute foods, preferences for restricted foods, and dislikes for foods they are pressured to eat (Birch et al. 2003). Food restrictions promote overeating as children tend to eat more "forbidden foods" when they are freely available (Birch et al. 2003). In obesigenic families (parents with high dietary intake and low activity levels) children are more likely to have low levels of physical activity and increased food intake, both of which promote obesity (Krahnstoeber Davison et al. 2005). A preference for healthy foods can be learned if the foods become familiar, are eaten by peer and adult models, and are paired with

positive social and physiological events. Universally, parenting practices constitute responses to environmental threats and include goals for a healthy and happy child and adequate growth. Throughout human history, food scarcity has been the major environmental threat; however, in today's environment, we are dealing with new threats of too much food coupled with excess inactivity. Experimental evidence indicates that responding with restrictive feeding practices tends to promote rather than limit food intake. School-based programs should thus be viewed in a broader context encompassing the total environment, of which school is one aspect. Based on Dr. Birch's research and the experience of others, a number of strategies were recommended as promising approaches to the early prevention of childhood obesity:

- (1) Provide early experience with flavours during pregnancy and breastfeeding to expose infants to a "flavour bridge" that will enable them to acquire broad food acceptance;
- (2) Prevent maternal obesity and excessive weight gain during pregnancy;
- (3) Promote exclusive breastfeeding until infants are introduced to solid foods in an appropriate and timely manner;
- (4) Parents need to be positive models of healthy eating, frequently providing new foods and promoting the development of fruits and vegetable preferences without coercion;
- (5) Parents need to promote physical activity, limit screen time, and ensure that children have sufficient sleep duration.

To follow through on these recommendations, parents need guidance on responsive parenting to recognize children's capacity to respond to hunger and fullness, to set appropriate limits, and to provide healthy foods in suitable portions. The roles and responsibilities for parents begin long before children attend school and have a lasting impact regardless of the school experience. It was acknowledged, however, that the effectiveness of each of the recommendations remains to be determined and requires prospective studies.

Food intake in Canadian school-aged children and adolescents was evaluated by Dr. Rhona Hanning, an Associate Professor of Health Studies at the University of Waterloo. Several recent (2000 onwards) Canadian studies have used various assessment tools, including 24 h diet recalls, food frequency questionnaires, and a behavioural risk factor surveillance system to ascertain children's dietary intakes (Boyce 2004; Gray-Donald et al. 2000; Hanning et al. (in press); Janssen et al. 2006; Phillips et al. 2004; Schenkel et al. (in press); Shields 2005; Starkey et al. 2001; Stockman et al. 2006; Veugelers et al. 2005). However, the quality of dietary intake data can be problematic, as there is a general tendency for under reporting, particularly with 24 h diet recalls in overweight and obese subjects. Nonetheless, available data indicate that school-aged children consume suboptimal intakes, notably from the vegetables and fruit and milk products groups (Hanning et al. (in press); Shields 2005; Starkey et al. 2001; Veugelers et al. 2005). Those who consumed fruits and vegetables less than 5 times per day were significantly more likely to be overweight or obese than those who ate fruit and vegetables more frequently ($p < 0.05$) (Shields 2005) and such an observation may generally reflect a less healthy diet. The low intakes of these

food groups are consistent with mean intakes below the estimated average requirement (EAR) for folate and vitamin A and the adequate intake (AI) for fibre and calcium (Schenkel et al. (in press)). Significant percentages of selected nutrients (approximately 30% for each of total energy, fat, and saturated fat and 50%–60% for added sugar) come from “other” food sources (Boyce 2004; Gray-Donald et al. 2000; Janssen et al. 2006; Phillips et al. 2004; Schenkel et al. (in press); Shields 2005; Starkey et al. 2001; Stockman et al. 2006; Veugelers et al. 2005). Based on her research using a web-based survey in over 5000 children, Hanning identified several key behaviours of children and adolescents that could be related to suboptimal food and nutrient intakes and overweight and obesity. These include dieting, breakfast skipping, snacking, and food consumed outside the home, such as at fast food restaurants and from vending machines.

Children’s activity and inactivity patterns

Our modern environment has reduced children’s physical activity (both organized and spontaneous) and increased their time spent in front of the “screen”; these are major factors contributing to declining energy expenditure and the rise in overweight and obesity rates among Canadian children according to Dr. Mark Tremblay, a Professor of Kinesiology at the University of Saskatchewan and currently at Statistics Canada (Tremblay et al. 2002; Tremblay and Willms 2000). In an international comparison of children’s activity patterns, the time devoted to physical education in Canadian schools was the lowest of all countries surveyed; less than half of Canadian youth report that they achieve the recommended (minimal) level of 60 min of physical activity 5d/week (Boyce 2004; Currie 2004). In addition, Canadian youth undertake long periods of inactivity; half of them reported watching more than 4 h of television/d and 30% reported that they spend more than 3 h/d on the computer (Boyce 2004; Currie 2004). Increased screen time (e.g., television, computers, movies, electronic games) is related to an increased likelihood for children becoming overweight and obese (Shields 2005; Tremblay and Willms 2003). The irony is that physical education has become marginalized in the modern school environment just when we need to address the problem of childhood obesity. By contrast, Old Order Mennonite children with a lifestyle reminiscent of the early 1900s are more active and more fit than modern-day Canadian children, despite having no physical education or institutionalized sport (Tremblay et al. 2005). The 2006 report card from Active Healthy Kids Canada corroborates these findings and allocates mediocre to failing grades for all of the measured parameters, including activity levels and family, community, school, and policy aspects (Active Healthy Kids Canada 2006). This report suggests that there is a critical responsibility for all sectors to address children’s need for physical activity, as well as a need to manage inactivity through reduced screen time.

School interventions

The evidence for school-based programs to significantly reduce obesity in children is inconsistent. Although some have proven successful, others have had limited impact. The authors of the Cochran Library review of interventions for

preventing obesity in children set out to determine the effectiveness of interventions and to identify the characteristics of both positive and negative programs (Summerbell et al. 2005). They concluded that most interventions did not result in significant improvements to children’s weight status, but that nearly all of them resulted in some improvement in diet or physical activity. Furthermore, they noted significant variation in study design and target populations that preclude clear recommendations for reliable sustainable interventions. Instead, they recommend that outcomes may only be possible when a multifactorial theoretical approach underlies the study design and generates changes to both the systemic and individual behaviours with all of the stakeholders engaged in the implementation of change (Summerbell et al. 2005). The most recent review of interventions aimed at reducing childhood obesity reported that 17 of 25 school-based programs were effective at reducing body mass index (BMI) or skinfolds (Doak et al. 2006). Whether or not the outcome was effective depended on numerous factors such as intervention (education, activity, dietary, reduction in screen time), target group (with variations in outcomes according to age, gender, and ethnicity), and outcomes measured (BMI, skinfold measures, distribution of obesity within the target group). Four programs were effective at reducing both BMI and skinfolds; two by directly increasing physical activity along with nutrition education and two by reducing television viewing. However, the review identified two potential problems that resulted from specific interventions; the first was an increased number of children who became underweight; the second was the stigmatization of overweight or obese children and adult role models (teachers, parents, community leaders) (Doak et al. 2006). The authors noted a need for future interventions to investigate the potential for parent–school partnerships to influence the home environment where lifestyle patterns are established (Doak et al. 2006).

Paul Veugelers, Associate Professor of Epidemiology at the University of Alberta, described the Children’s Life-style and School Performance Study (CLASS) conducted with 5200 grade 5 students and 282 school principals in Nova Scotia. The researchers collected data from children on dietary intake (using the Harvard Food Frequency Questionnaire), daily activities, and heights and weights. From the parents, they collected data on socioeconomic background; a survey on school programs and practices was conducted among the principals. The initial results demonstrated that food served at school and physical education levels both play a role in the development of childhood obesity. When all other factors were controlled for by the statistical model, overweight and obesity were each 39% more prevalent in the 20% of children who purchased lunch at school and overweight and obesity were less prevalent (39% and 46%, respectively) when physical education occurred twice or more each week (Veugelers and Fitzgerald 2005b). In a subsequent analysis of the same data, the schools were allocated to 1 of 3 categories; the first had no nutrition program, the second had a program that offered healthy menu alternatives, and the third had a comprehensive program. The 7 schools in the third category fell within the Annapolis Valley Regional School Board where a Health Promoting Schools Project was introduced in 1997. This project

evolved from a grassroots effort and community mobilization. A major outcome was the development of the following policies. Students were offered healthy lunches only with a “no junk” policy; they had daily physical activities and after school access to the gym; they were provided with a health and nutrition curriculum with both parental and community involvement. Compared with the other school categories, the children in the Annapolis Health Promoting Schools Project had better diets, more physical activity, and less screen time resulting in a decreased risk of overweight (59%) and obesity (72%) (Veugelers and Fitzgerald 2005a). The children at schools with some type of nutrition program showed a 9% less likelihood of overweight and a 15% less likelihood of obesity. The government’s response to these research findings included increased hiring of full-time sport animators, healthy active living consultants, and public health nutritionists across the province, as well as continued funding and expansion of the Annapolis school project to all schools in the district. Although the question remains as to whether school-based interventions improve health outcomes 40–50 years later in life; in the absence of such a long term study, the bulk of the available evidence indicates that they have the potential to offset the current trends towards rising obesity.

Although they lack a research base, other numerous and distinct policies have been developed by school systems across Canada. Lucy Valleau, a Public Health Nutritionist, described one example of the policies developed by the Ontario Society of Nutrition Professionals. They recently created a School Nutrition Workgroup mandated to work with the school community to promote and support healthy eating. Their call to action included the following proposed elements of a healthy school nutrition environment: healthy, reasonably priced, culturally appropriate foods; positive role modeling; student breakfast and lunch programs; safe and pleasant eating areas; appropriate scheduling of nutrition breaks; parent and community involvement; nutrition education for students; nutrition education for staff; and a food and nutrition policy to help make healthy food choices the easier food choices. A “Nutrition Tools for Schools” toolkit has been developed to provide a step-by-step process to implement the healthier school nutrition environments described in the call to action. These have been piloted in 18 schools with a planned evaluation.

Break-out group discussions

Following the morning presentations, participants were divided into break out groups (of approximately 10) and were asked to respond to the following questions:

Question 1: sufficiency of the evidence base

- (a) Is there sufficient evidence for developing a policy to guide nutrition and active lifestyle environments in schools?
- (b) If evidence base is not sufficient, what are the gaps?

Question 2: forging partnerships

With a goal of developing a policy that would promote

nutrition and active lifestyle environments in schools, what partnerships are needed for the following:

- (a) Build the evidence base (if needed) to develop a sound policy;
- (b) Develop a policy;
- (c) Implement a policy;
- (d) Sustain a policy;

The groups provided recommendations to guide future developments on school nutrition and activity-related policies and gave strong support for the development of effective, consistent policies that will promote nutrition and physical activity for all Canadian children and their families. However, it was agreed that there remains a need for more evidence from Canadian longitudinal interventions and opportunities for collaborative multi-sectoral approaches, including input from the academic, health, and educational professionals, as well as from the private sector (food, sports, media) and civic leaders.

Summary

The recent rise in childhood obesity is a result of many complex and interconnected social and environmental changes that have recently evolved to promote over consumption and low levels of physical activity. There is a clear sense of urgency for leadership to promote healthy lifestyles for children and their families. However, no simple solutions are on the horizon. Feeding behavior begins with the family and may have origins in prenatal practices; both eating and physical activity patterns are related to elements of nature and nurture. Altering these behaviours requires significant knowledge and practice for those who seek to modify the inborn predisposition toward energy imbalances and efforts must involve early parental education and support. By the time children reach school age, their already established eating and activity practices may be difficult to reshape. Therefore, school-based programs may be most effective when they support and reinforce healthy practices at home. These efforts must ensure that overweight children are treated with care to avoid the negative outcomes associated with weight teasing and disordered eating (Haines et al. 2006). Efforts must likewise ensure that children who are lean do not lose weight.

At present there is a need for a repository of school-based interventions wherein program interventions and their results are shared. Canadian policy developers can then have access to a comprehensive database of school-based interventions to recommend best practices. (At a recent meeting organized by the Centre for Behavioural Research and Program Evaluation and the Population Health Research Group at the University of Waterloo, plans were developed to follow through on this initiative.) Authors of the most recent Cochrane review of childhood obesity prevention programs noted that the outcomes of very few long-term (i.e., 12 month long) programs have been published. Although they have the potential to make an impact, the “efficacy in terms of preventing obesity remains poorly understood” (Summerbell et al. 2005). Although action in the area of children’s health should proceed on the best available evidence rather than wait for better evidence, we need ongoing input of experts and leaders from all sectors and fields to help us effectively promote

healthy lifestyles, while respecting each child's need for safety, security, and respect. In addition to prospective longitudinal intervention research, we also require applied research, including behavioural and process (advocacy and implementation) evidence in real-life settings to determine the best practices, policies, and programs as a basis for broader implementation. Policies based on pressure to act rather than on sound knowledge and awareness of the complexity of the obesity problem are likely to lead to non-productive outcomes.

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