

**EXAMINING THE ENVIRONMENTAL CONTEXT OF A HEALTH
PROMOTION INTERVENTION**

**THE SCHOOL NUTRITION ENVIRONMENT: EXAMINING THE CONTEXT
OF A HEALTH PROMOTION INTERVENTION**

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Abstract

Obesity is a major public health issue across all age groups. The obesity-related health outcomes of children and adolescents are unique and varied, and therefore need to be studied separately. In response, obesogenic environments have been the focus of attention in recent research. Important contributions have been made to focus on social (e.g., economic) and physical (e.g., geographical) environments based on their role in either hindering or facilitating opportunities for healthy eating. However, research on the policy environment is noticeably absent. Schools have been the setting for focused interventions, particularly in the area of obesity and nutrition. However, there is a paucity of research in this area in Ontario, and virtually no Canadian research has examined the secondary school setting. Therefore, this research focuses on local level factors shaping school nutrition policy implementation in Ontario, Canada.

The Analysis Grid for Environments Linked to Obesity (ANGELO) Framework was adopted to organize and conceptualize the local level policy environment. In the first phase of the study, a documentary analysis was undertaken to investigate the relationship between regional and upper level policies and technical reports. Results reveal distinct differences across federal, provincial and regional levels, including: 1) the availability of nutritious food in schools and having nutrition education as part of the curriculum were key components of the physical environment across federal and provincial levels; 2) federal and provincial priorities are guided by a health promotion framework, and a partnership approach to policy implementation; and, 3) gaps in regional level policy include incorporating nutrition education in the curriculum, and making the link between nutrition and obesity.

The second phase of study includes qualitative key informant interviews with community- and school-level school nutrition policy and program stakeholders (n=22) in nine schools three Ontario school boards, in order to understand local level factors shaping school nutrition policy implementation. The cost of healthy food for sale, revenue loss (economic), proximity of schools to off site food outlets (physical), the restrictive nature of policy, and the role of key stakeholders (political), the role of stigma and school culture (sociocultural), act as local level barriers to policy implementation. Findings suggest the need for consultation and communication between stakeholders, and strategies to reduce stigma and improve the school nutrition culture.

In the third and final phase of study three focus group interviews were conducted with secondary students (n=20) in two Ontario school boards in fall 2012. School boards were selected to represent both high- and low-income neighbourhoods. Results reveal high priced policy-compliant food for sale, lower revenue generation capacity, and more students purchasing food off-campus at nearby outlets. Limited designated eating spaces, and time constraints act as local level barriers to healthy eating. Student input on cafeteria menus and school community gardens, can facilitate healthy school nutrition environments. Community partnerships with key external stakeholders are needed to leverage financial and human resources to support school nutrition. Future policies need to consider the social context and conditions surrounding school nutrition. This research makes a number of theoretical, methodological and substantive contributions to the public health, adolescent health, and school health policy literature. Policy implications and future research directions are provided.

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Preface

For all the papers that are encompassed in this thesis, research design, data collection and analysis, in addition to manuscript preparation, was undertaken primarily by Michelle Vine. In Chapter 2, Michelle designed the data collection strategy, and coded and analyzed data. A research assistant helped to collect policies and technical reports, uploaded data into NVivo and coded policies and technical reports that had been pre-coded by Michelle. In Chapter 3, Michelle designed the data collection strategy, conducted key stakeholder interviews, and analyzed data, while a research assistant uploaded the interview transcripts into NVivo and applied codes to transcripts that had been pre-coded by Michelle. In both cases, Michelle supervised research assistants and developed the coding template. In Chapter 4, Michelle designed the data collection strategy, conducted student focus groups, and analyzed data. As thesis supervisor, Dr. Susan Elliott provided significant feedback and editorial expertise on all three manuscripts, in addition to Dr. Kim Raine on Chapter 4.

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Chapter One

1.1 Research Context

Obesity is a major public health issue, rising in both developed and developing countries, and particularly in urban settings (WHO, 2011). Rates of overweight and obesity have risen more than threefold since 1980 in some areas of the United Kingdom, North America, Eastern Europe, the Middle East, Australasia, China, and the Pacific Islands. By 2008, one billion adults worldwide were overweight, and over 500 million were obese; nearly 43 million children under the age of five were overweight in 2010 (WHO, 2011).

Overweight and obesity are defined as an abnormal imbalance between energy intake and energy expenditure, which represents a health risk (Luo et al., 2007). To date, body mass index (BMI) is the most commonly used measure of health risk associated with adiposity (weight (kg)/height (m)²) (Health Canada, 2012). A BMI of between 25.0 and 29.9 illustrates an increased health risk (overweight), while obesity (BMI \geq 30.0) represents a high health risk (Health Canada, 2012). Other useful measures adopted to calculate obesity-related health risk include waist circumference (Katzmarzyk, et al. 2006), and waist-to-hip ratio (Elsayed, et al. 2008). Obesity has become one of the most serious chronic diseases in the Canadian context.

In Canada, 60% of adults (aged 18 or older) are considered overweight (34%) or obese (26%) (Statistics Canada, 2012). These values are equivalent to 9 million overweight, and 7 million obese adults (Statistics Canada, 2012). These prevalence trends threaten the public health care system, and the health status of Canadians. Estimates of direct and indirect costs attributable to overweight and obesity in Canada were more than \$11 billion annually (Janssen, 2013; Anis, et al. 2010). These include:

physician care, medications, and costs associated with adiposity and other chronic diseases including, hypertension, type II diabetes, coronary heart disease and stroke, gallbladder disease, and cancers (Anis, et al., 2010). Indirect costs include the value of economic output lost due to illness, injury-related work disability, and premature death (Janssen, 2013). Research also suggests that a relationship exists between obesity in youth, and verbal and physical bullying behaviours (Wang, Iannotti & Luk, 2010; Puhl, 2009), being socially withdrawn and displaying less leadership and greater aggressive-disruptive behaviours in school (Zeller, Reiter-Purtill & Ramey, 2008).

Recent prevalence trends indicate that 20% of children and adolescents (aged 5-17) were overweight and 12% were obese between 2009 and 2011 in Canada (Statistics Canada, 2012). Across all age groups boys are more likely to be obese than girls (PHAC, 2011). Regional variation indicates that children in Atlantic Canada (Newfoundland, PEI, Nova Scotia) are more likely to be overweight than their counterparts in other regions (Pouliou & Elliott, 2009). First Nations populations living on reserve are also at an increased risk, where 36.2% of children and 14% of youth, are obese (PHAC, 2009).

Given that young people are vulnerable to overweight and obesity, and that the ensuing health implications are varied and unique, differing from those of adults, the obesity-related health outcomes of children and adolescents need to be studied separately. In addition, there is a strong propensity for overweight and obesity to persist into adulthood (Roberts, et al., 2012). Therefore, understanding the unique needs of young people is important, and: “The growing threat that overweight and obesity poses for children of the world has been identified as a major policy issue” (Raine, et al., 2008, p. xii).

Determinants of Obesity

Obesity is a complex health issue, resulting from interactions between biological, behavioural and environmental factors (PHAC, 2011). Obesity is the result of several interconnected determinants, including diet, physical activity, household socioeconomic status, sedentary behaviours and screen time, smoking, and community-level factors (e.g., availability of physical activity equipment, facilities or programs; urban/rural residence; access to food retail outlets and/or supermarkets) (PHAC, 2011). While we know that individual-level factors alone cannot fully explain the rise in obesity prevalence, it is imperative to understand the complex role of the environment, particularly as it relates to energy intake (food consumption) and energy expenditure (physical activity).

In the context of health-related behaviour modification, 'obesogenic' environments have been defined as the sum of influences (barriers) that the conditions, opportunities and surroundings of life have on promoting energy intake and limiting opportunities for energy expenditure at both the individual-and population-level (Townshend & Lake, 2009; Swinburn, Egger & Raza, 1999). Changing environments play a role in controlling or setting limits on the behaviour that occurs within it (Green, Poland & Rootman, 2000).

Important contributions have been made to focus on social and physical environments based on their role in either hindering or facilitating opportunities for healthy eating or physical activity (Oreskovic et al., 2009; Pearce et al., 2007; Cummins & Macintyre, 2006). Associations have been made between obesity and restricted opportunities for physical activity in the built environment. These include: living on or close to a highway, streets that lack sidewalks or have a sidewalk on one side only, poor access to recreational facilities and sidewalks, an individuals' perception of not being in

walking distance to shops (Giles-Corti, 2003), walkability (Pouliou & Elliott, 2010), land use, and urban sprawl (Booth et al., 2005). Neighbourhood disorder and proximity to high street facilities is also associated with obesity (Stafford, et al., 2007).

Conversely, high-walkability neighbourhoods are more likely to contain residents who report higher residential density, land use mix, aesthetics, street connectivity, and safety, and therefore, increased physical activity opportunities and lower obesity rates (Troped, et al., 2010; Saelens, et al., 2003). Active transportation (i.e., walking, biking) in neighbourhoods with higher perceived levels of traffic safety is strongly associated with active use of and proximity to recreation sites in youth (Grow, et al., 2008).

Geographical proximity and access to neighbourhood fast-food outlets are associated with increased neighbourhood deprivation, dietary intake, and the risk of obesity (Larson, Story & Nelson, 2009; Hemphill et al., 2008; Pearce, et al., 2007). On the other hand, increased access to supermarkets is associated with lower obesity rates, particularly in high-income neighbourhoods (Morland & Evanson, 2009; Spence, et al., 2009). In addition, additional food-related factors impacting obesity-related behaviour include, but are not limited to, food availability, consumption, portion size, high fat diets, pricing and marketing (Hoek & McLean, 2010; Hill & Peters, 1998).

Recent research has attempted to understand geographic (Harrington & Elliott, 2009; Lebel, et al., 2009; Ardern & Katzmarzyk, 2007) and socioeconomic variation (Ross et al., 2007; Janssen et al., 2004) in obesity trends. The findings of Ross and others (2007) illustrate the strong affect individual social position has on BMI in urban Canadians, particularly as it relates to women with low educational attainment. Other research reveals important geographical differences in Canada, with higher rates of

overweight and obesity found in the Atlantic Provinces (Pouliou & Elliott, 2009). While these findings provide evidence of geographical and socioeconomic variation in obesity trends in Canada, they also illustrate the extent to which environments matter.

To date, the role of social and physical environments have been well documented in the obesity literature; however, research on the policy environment is noticeably absent: "Support for individuals to counteract obesogenic environments will continue to be important, but the priority should be for policies to reverse the obesogenic nature of these environments" (Swinburn et al., 2011, p. 804). In this way, it is important to explore the school nutrition environment in an attempt to understand how policies and guidelines act as pathways through which the environment shapes opportunities for energy intake (food consumption) in youth.

Schools are an important element of the local environment for several reasons, including: 1) children and adolescents spend a large portion of their waking time at school, and are considered to be a "captive audience"; 2) school is an important social and physical environment for children and changes to these environments have been shown to impact health; 3) teachers can provide leadership, role modeling, support, reinforcement and feedback, and monitor progress; and 4) promoting the health of students is linked to greater academic achievement (Parcel et al., 2000). In this way, schools have been the setting for focused health promotion interventions in the area of obesity and nutrition.

School health promotion policies and interventions have been explored in the public health (McKenna, 2010; Story, et al., 2008; Sturm, 2008; Veugelers & Fitzgerald, 2005), epidemiological (Florence, Ashbridge & Veugelers, 2008; French et al., 2003),

and nutritional sciences (Downs et al., 2011; Taylor, McKenna & Butler, 2010; Lo et al., 2008) literature. Research in this area indicates that food policies can act as a barrier to healthy eating when students go off-campus to access fast food (Sturm, 2008; Neumark-Sztainer, et al., 2005). À la carte and vending machine access is inversely associated with fruit and vegetable intake (Kubik, et al., 2003). In a study of elementary, middle and high school students, Finkelstein and colleagues (2008) found that as children move into higher grades, school food environments become increasingly less healthy. Such findings illustrate the ways in which school food environments are both spatially and temporally shaped.

Other studies have assessed school nutrition policies via students' consumption patterns, and measured health outcomes (i.e., weight) (Jensen, et al., 2012; Whatley Blum, et al., 2011; Veugelers & Fitzgerald, 2005). For example, in a US study, Kubik, Lytle & Story (2005) found that food practices supporting frequent student snacking and the consumption of high-calorie, low-nutrient food and beverages, were negatively associated with students' body mass index.

In Canada, only a modest amount of research has been undertaken in the area of school nutrition policy and programming. Studies that do exist have explored the effects of school nutrition education initiatives (McKenna, 2010; Lo et al., 2008) and uptake of provincial guidelines (Downs et al., 2012; Taylor, et al., 2011). For example, in a study from Western Canada, the findings of Lo et al. (2008) illustrate the positive, yet brief and limited, implications of a nutrition education intervention, which aimed to improve high school students' beverage intake. These findings are consistent with those of McKenna

(2010), who found that when combined with food services, nutrition education has been shown to positively affect students' eating habits.

Recently, Downs and others (2012) in Alberta, Canada found inadequate support for guideline implementation, parental resistance, and a lack of human and financial resources as barriers to province-wide school nutrition policy implementation (Downs, et al., 2012). In Prince Edward Island, Taylor and colleagues (2011) found that loss of revenue generation, limited availability of policy-compliant foods, and the higher cost of healthy food, acted as barriers to provincial implementation. In British Columbia, the results of Rideout and colleagues (2007) indicate a wide availability of and exposure to junk foods in schools through snack machines, tuck shops and school fundraisers. Nutrition teams in schools are found to have a positive impact on school nutrition policy implementation (Rideout et al., 2007).

The literature provides only a partial explanation of school nutrition policy and programming. Most Canadian research has been undertaken in British Columbia, Alberta, and Prince Edward Island, but there is a paucity of research in this area in Ontario. While almost all research has been focused at the elementary school level, virtually no Canadian research has examined the secondary school setting where: there are fewer food-related rules (e.g., purchasing foods off-site), youth have more control over their nutritional decisions and intake, and they are more inclined to engage in risk-taking behaviours (e.g., smoking, alcohol, drug use, sexual, driving, violent behaviours). Studies that do exist have measured the health outcomes associated with nutrition interventions in the school (e.g., consumption patterns, weight status), the success of nutrition education interventions, and the availability of food in school-level food outlets. Little research has

examined specific local level contextual factors shaping school nutrition policy implementation.

1.3 Research Objectives

This thesis attempts to understand how policies and guidelines act as pathways, through which the environment shapes opportunities for energy intake in youth. Schools are an important element of the local environment, and changes to the social and physical environments have been shown to impact health. In this way, schools have been the setting for focused health promotion interventions in the area of obesity and nutrition. This thesis explores the school nutrition policy environment in Ontario, Canada in order to investigate local level factors shaping implementation. In doing so, the research will address three objectives:

- 1) To explore the consistency of policies across a range of spatial contexts (i.e., National, Provincial, regional),
- 2) To examine the perceptions of key stakeholders who are involved in policy implementation, and,
- 3) To investigate the perceptions of the user group.

1.4 Geographic Context

An overview of the evolution of the field of health geography and the geographies of obesity literature will put this research more directly into focus.

Disease causation was the focal point in medical geography in the 1970s and 1980s during the ‘Spatial Revolution’, when research focused predominantly on the geography of disease and the geography of health care. Medical geography was re-situated within social geography in the early 1990s, and a focus on place and space

helped to re-define the social nature of health and medicine. The concept and role of 'place' as more than just location drew much attention by prominent health geographers (Kearns & Moon, 2002; Kearns, 1993), and research on the relationship between the environment and human health emerged. In essence, where you live affects your health and wellbeing via access to treatment, health services and resources (Gatrell & Elliott, 2009).

A shift from medical geography to a new geography of health led geographers to focus on health as more than the absence of disease, and more closely on individuals' experiences of health. Social theory is useful for studying the incidence and prevalence of disease, spatial and temporal patterns of disease (e.g., positivist theories), subjective meanings and experiences of health and illness (symbolic interactionist approaches), the broad context of political, social and economic institutions and structures (structuralist approaches), and power relations and injustice associated with health and illness (conflict theory) (Gatrell & Elliott, 2009; Litva & Eyles, 1995).

In addition, the new health geography turned to both quantitative (e.g., surveys, GIS) and qualitative methods to better understand health and illness through individuals' lived experiences. In particular, qualitative research methods involve the use of in-depth, semi-structured interviews, focus groups and key informant interviews, among others (Babbie, 2007; Crabtree & Miller, 1999). Health geographers have made important methodological, theoretical and substantive contributions. Research in the area of obesity has emerged in the health geography literature.

Geographers focus on the role of place to understand human health, health risk and health inequalities. The environment is an important pathway to human health and

the relationship between the environment and human health has been studied in the health geography literature (Macintyre, McKay & Ellaway, 2006; Stafford & Marmot, 2003).

The geographies of obesity literature has explored spatial variation and deprivation through the physical and built environments (Harrington & Elliott, 2009; Pearce et al., 2009; Moon et al., 2007; Ross et al., 2007). Research also indicates that access to fast food outlets is an important pathway through which obesity develops (Crawford et al., 2008; Macintyre et al., 2005).

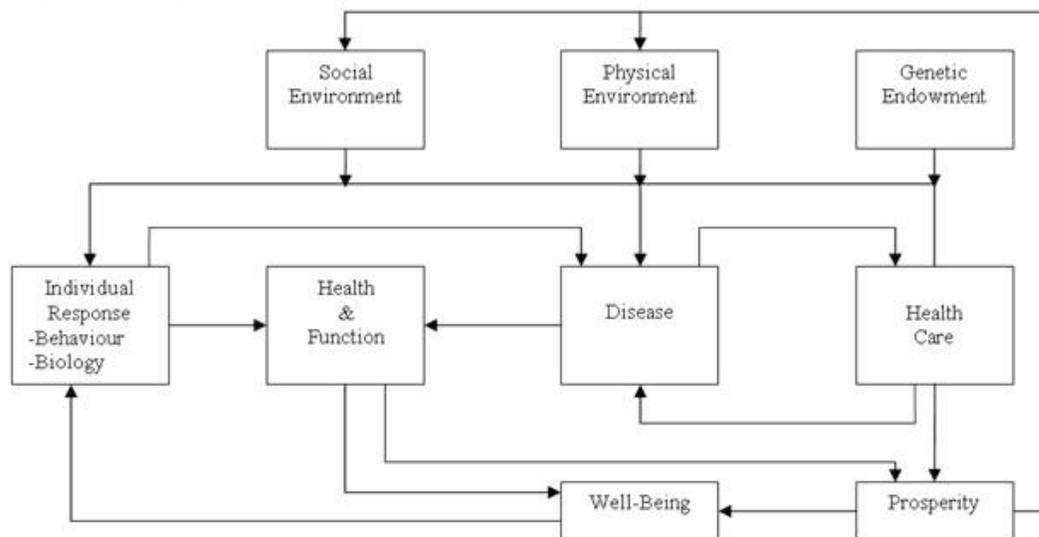
The role of policy in the geography of obesity literature is lacking, particularly as it relates to food and nutrition. In fact, only recently have there been any substantial contributions in this area (Lake, Townshend & Alvanides, 2010; Walton & Signal, 2010). Given that the: “Environment largely controls or sets limits on the behavior that occurs in it...[and]...changing environmental variables results in the modification of behavior” (Green, Poland, & Rootman, 2000, p.17), an exploration of environmental components (e.g., social, economic, political and physical) shaping school nutrition policy will help develop an understanding for the role of the school environment in either promoting or inhibiting opportunities for healthful eating.

1.5 Analytical and Theoretical Frameworks

A population health framework acknowledges both individual (biological and behavioural) and environmental determinants of health (Evans & Stoddart, 1994) (See Figure 1). Health outcomes are shaped by the interactions and patterns between multiple determinants of health, including: aspects of the social environment (e.g., income, education, social support, culture); aspects of the physical environment (e.g., urban design, water); individual behaviour; and genetics (Kindig & Stoddart, 2003). Health

researchers are encouraged to consider dimensions of the social determinants of health outside the health care sphere, including such areas as education, social support, and employment (Frank, 1995). Specifically, the current thesis adopts a population health approach to consider the complexity of interactions between environmental factors that shape school nutrition policy implementation in Ontario Canada. The Analysis Grid for Environments Linked to Obesity (ANGELO) framework helps to facilitate and extend this examination.

Figure 1: Population Health Framework, Evans and Stoddart, 1994



The ANGELO framework is a conceptual model developed (Swinburn, Egger & Raza, 1999) to identify specific factors contributing to an obesogenic environment. An ecological approach defines “obesity as a normal response to an abnormal environment, rather than vice versa” (Egger & Swinburn, 1997, p.477). In this way, the ANGELO framework facilitates an increased focus on the environment as an *important pathway to human health*. The ANGELO framework is a two-by-four grid that divides environments into level (micro or macro-level) and type (economic, sociocultural, physical and political) (Table 1). Microenvironments are settings in which individuals engage and

interact on the basis of close geographical proximity and common objectives (e.g. schools, workplaces, homes). Macroenvironments operate at a higher level, influencing the microenvironment (e.g., education and health systems). As a key determinant of health and obesity, food intake and physical activity are influenced by the environments within which they take place, and are listed as such in the grid (see Table 1).

Table 1: The Analysis Grid for Environments Linked to Obesity

SCALE TYPE	Micro-environment (settings)		Macro-environment (sectors)	
	<i>Diet</i>	<i>Physical Activity</i>	<i>Diet</i>	<i>Physical Activity</i>
Physical		What is available?		
Economic		What are the financial factors?		
Political		What are the rules?		
Socio-cultural		What are the attitudes, beliefs, perceptions and values?		

Adapted from Swinburn, Egger & Raza, 1999

1.6 Chapter Outline

This thesis is organized into five chapters, including this Introduction. Each of chapters two, three, and four contain a manuscript that has been submitted for publication; each manuscript seeks to fulfill one of three research objectives. A systematic analysis of local level factors affecting the implementation of school nutrition policies will help illuminate facilitators and barriers to successful implementation. An exploration of the consistency of policies across a range of spatial contexts is presented in Chapter two.

Chapter three corresponds to objective two, specifically, to examine the perceptions of key stakeholders involved in school nutrition policy implementation. Key

informant interview data from school personnel, including volunteers, from a range of research sites representing both high- and low-socioeconomic neighbourhoods, will illustrate how local level factors help to shape - by either hindering or supporting access to healthy foods - school nutrition policy implementation. This paper is an important example of how schools in low-socioeconomic neighbourhoods are confronted with unique challenges related to health programs and interventions targeting the school nutrition environment.

The purpose of Chapter four, which corresponds to objective three, is to investigate the perceptions of the user (students aged 15-20) group with respect to a school nutrition policy and programs. Students' perceptions of facilitators and barriers associated with these factors were gathered through focus group interviews. The findings of this paper will provide a useful example of how secondary students' perceive a school nutrition policy and program operating in their school.

Finally, Chapter five provides a summary of major research findings from chapters two through four, conclusions and next steps. Theoretical, methodological and substantive contributions of the research will be highlighted, in addition to future research directions.

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Chapter Two

Exploring the school nutrition policy environment in Canada using the ANGELO framework

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Exploring the school nutrition policy environment in Canada using the ANGELO framework**Abstract**

Excess body weight has become a major public health issue. Given the link between poor nutrition, obesity and chronic disease in youth, increasing attention is being paid to the school as an ideal setting for promoting nutritious eating practices. Informed by the ANGELO framework, we employ a documentary analysis to investigate the context of school nutrition in Canada, particularly the relationship between regional and upper level policies. In doing so, we examine policy documents and technical reports across three levels. We used mixed methods to analyze relevant English language policy documents and technical reports across Canada (n=58), published between 1989 and 2011. Results reveal distinct differences across federal, provincial and regional levels. The availability of nutritious food in schools and having nutrition education as part of the curriculum were key components of the physical environment across federal and provincial levels. Federal and provincial priorities are guided by a health promotion framework, and adopting a partnership approach to policy implementation. Gaps in regional level policy include incorporating nutrition education in the curriculum, and making the link between nutrition and obesity. Policy implications are provided, in addition to future research opportunities to explore the connections between these environments at the local level.

Introduction

The rising prevalence of obesity is a major public health issue. According to the World Health Organization, worldwide rates have increased substantially since 1980; an estimated 170 million children are overweight or obese (WHO, 2012a). Childhood obesity trends vary by country. According to the International Obesity Task Force, over 35% of US school-aged children were considered overweight or obese in 2004 (Lobstein & Jackson-Leach, 2007). Lower rates are observed in the UK (25%) (Rennie & Jebb, 2005), and Australia (27%) (Olds, et al., 2010). In Canada, 31% of the youth (aged 2-17) population is considered overweight or obese (Statistics Canada, 2012a).

Obesity is among the five leading global health risks for mortality (WHO, 2009). In particular, overweight and obese youth are at greater risk for several chronic diseases and co-morbidities, including: type II diabetes, impaired glucose tolerance, cardiovascular disease, and the metabolic syndrome (Lobstein & Jackson-Leach, 2006). In addition, overweight and obesity can also have psychosocial implications (e.g., prejudice, stigma, discrimination) (Bean, Stewart & Olbrisch, 2008).

Literature Review

Disparities in food accessibility means that some youth are more vulnerable than others. Research suggests that higher rates of overweight and obesity are associated with income inequality in developed countries (Pickett, et al. 2005). Poor dietary patterns, overweight and obesity have been linked to neighbourhood disparities (e.g., low income, rural neighbourhoods) (Larson, Story, Nelson, 2009). Access to grocery stores and supermarkets is constrained for individuals living in low-income or minority neighbourhoods; the high cost of healthy eating acts as a disincentive, resulting in high

rates of overweight and obesity and poor diet (Cummins & Macintyre, 2006). Canadian findings reveal higher levels of low-income, Aboriginals, lone parents, and renters in neighbourhoods with greater geographical proximity to fast-food restaurants (Hemphill, et al., 2008; Smoyer-Tomic, et al., 2008). Geographers have identified 'food deserts' in inner city, low socioeconomic neighbourhoods where access to healthy, affordable food is limited (Larsen & Gilliland, 2008).

While interventions to improve the nutritional status of youth are being developed across a range of settings, increasing attention is being paid to the school as an ideal setting for promoting nutritious eating practices given children spend a majority of their waking time there (McKenna, 2010). An unhealthy school nutrition environment includes access to unhealthy food (e.g., high fat, sugar content) for sale in vending machines, cafeterias, tuck shops and during school fundraisers (Rideout et al., 2007), large portion sizes (Colapinto et al., 2007), and high priced school lunch (healthy and unhealthy) (French, 2003).

In 1995, the World Health Organization (WHO) developed the Global School Health Initiative, upon which several recent reports have been based, including the International Union for Health Promotion and Education's (IUHPE) guidelines to promote health in schools (WHO, 2012b; IUHPE, 2010). In Canada, a Comprehensive School Health (CSH)¹ model was designed to support improvements in educational outcomes, with a focus on: social and physical environments, teaching and learning, healthy school policy, and partnerships in the school environment (PHAC, 2008). CSH recognizes: the direct link between health and improved learning in young people, and

¹ In other countries, CSH is referred to as "health promoting schools" or "coordinated school health" (PHAC, 2008).

that schools are an important agent influencing and promoting students' health and behaviour through positive lifestyle choices (PHAC, 2008). At the provincial level, the Alberta Project Promoting active Living & healthy Eating (APPLE Schools) supports healthy school communities through sustainable changes at school, home and in larger community environments (University of Alberta, 2012). The objective of APPLE Schools is: 1) to improve healthy living habits of students; 2) to increase knowledge of healthy living for students, teachers and the broader school community; 3) to implement and sustain CHS; and, 4) to build capacity for healthy schools (University of Alberta, 2012).

In Canada, primary and secondary education operates within provincial and territorial jurisdiction, granting these institutions the financial and administrative responsibility of the provinces and territories. While provincial-level school nutrition policies currently exist in British Columbia, Ontario, New Brunswick, Nova Scotia, and Newfoundland, other provinces are operating without one, including: Alberta, Saskatchewan, Manitoba, Quebec and Prince Edward Island. While variation exists in policy development across provinces, so do funding strategies. While this paper explores federal-and provincial-level policies and technical reports related to school nutrition in Canada, it also includes a case study of regional-level school nutrition policy in Ontario. In Ontario, there was and is no funding strategy tied to either the 2004 (PPM 135), or the new 2010 School Food and Beverage policy. Local-level student nutrition programs are, however, eligible to apply for partial program funding through government ministries and/or non-profit agencies (e.g., breakfast, snack, lunch programs). Schools also engage in fundraising efforts to support their school nutrition policy and related-programs.

Despite the efforts of Canadian provinces to improve the school nutrition environment, there appears to be only modest change in how youth are accessing healthy foods at school (McKenna, 2010). Therefore, the purpose of this paper is to investigate the context of school nutrition policy in Canada, particularly the relationship between regional and upper level policies. In doing so, we examine policy documents and technical reports across three levels – national, provincial and regional.

This paper is organized around the following sections, beginning with an overview of research methods. Findings from a qualitative analysis (Phase I) precede findings from a quantitative analysis (Phase II). A discussion is provided of how physical and sociocultural factors shape the school nutrition environment. Implications for future research and policy are addressed.

Case study: research methods

The Analysis Grid for Environments Linked to Obesity (ANGELO) framework informs this work, suggesting that environments contributing to the development of obesity be classified by size (micro or macro) and type (physical, economic, political and sociocultural) (Swinburn, Egger & Raza, 1999). The physical environment refers to "what is available", including both visible and less tangible factors such as nutrition education and training opportunities. The sociocultural environment refers to the attitudes and values associated with a community or society. The economic environment includes the cost of food, and interventions that may affect food intake (e.g., taxes, subsidies). Laws, regulation, policies and institutional rules affect the food-related behaviour of individuals (political environment) (Swinburn, Egger & Raza, 1999). The decision to focus on two types of environmental components was twofold: 1) there is a lack of research on the role of sociocultural factors as they relate to obesogenic

environments (Asanin Dean & Elliott, 2012); and, 2) the CSH model draws attention to social and physical environments in schools (PHAC, 2008).

Given that school nutrition policies have been developed in only five of ten Canadian provinces, relevant English language policy documents and technical reports across Canada were selected from the national (N=8) and provincial level (n=24) if they were published between 1989 and 2009. Regional (n=26) policies from Ontario were included if they were published between 1989 and 2011. Nutrition policies and interventions have been developed in response to rising rates of childhood overweight and obesity in Canada since the late 1970s. The decision to focus on two different publication time periods for national and provincial (1989-2009), and regional (1989-2011) documents reflects the fact that 81% of regional level policies emerged between 2007 and 2011, subsequent to the implementation of several key national and provincial technical reports and policies related to the vital role of nutrition in the school setting (between 2004 and 2006) in Canada. New Brunswick was the first province to implement a formal school nutrition policy in 1991, and is the only province to have undergone a revision (in 2008) since its implementation within the 20-year period between 1989 and 2009. Given that seventeen years lapsed between the emergence of New Brunswick's first policy and its revision, we opted to include both versions in the analyses.

We considered two categories of documents: i) policies, including nutritional standards/criteria related to food for sale at school; and, ii) technical reports devoted to healthy eating research and guidelines in schools, published by governmental (e.g., Ministry of Education) and non-governmental (e.g., Alberta Coalition for Healthy School

Communities, Canadian Institute for Health Information) agencies. Documents were excluded if they were not school-based, or if they focused exclusively on physical activity in schools.

Given that nearly 40% of the Canadian population resides in Ontario (Statistics Canada, 2011), and that it is the focus of later stages of this project, significant attempts were made (via email and telephone) to retrieve regional-level school nutrition policies from all English-language, public Ontario school boards (N=72). Twenty-nine school boards indicated that they were currently operating *without* a nutrition policy; we did not include policies from the twelve French language boards. Despite several attempts, we were unable to retrieve policies from an additional five boards.

Federal and provincial level documents selected for analysis addressed at least two of the following: a) population focus (children and youth aged 2-17); b) school based setting (primary- and secondary-schools); c) school nutrition environment (guidelines for nutrition standards and criteria, food for sale in school cafeterias, tuck shops, etc.); d) students' health status (overweight and obesity, healthy living); and e) population health (nutrition programs, interventions). Documents were publically available, and located through a web-based search of federal health agencies, provincial health ministries, non-governmental school nutrition organizations, and by scanning reference lists of documents selected for inclusion. Using the inclusion criteria identified above, the lead author finalized the sample of documents, which were compiled with the support of a research assistant.

Data analysis

Both qualitative (phase I) and quantitative (phase II) approaches were used in the analysis. Qualitative thematic analysis was adopted to explore high-level themes (i.e., principles and objectives, system themes, and key stakeholders) operating at the federal and provincial levels. A coding template was developed based on analyses of a sub-sample (n=5) of documents (randomly selected). The lead author coded all data by hand, whereby passages of text were selected to correspond to individual codes listed in the coding template. Data were then entered in NVivo software (8.0) for subsequent thematic analysis. During this process, key themes were generated deductively from the research objectives, and inductively as they emerged from the documents. The ANGELO framework was applied in order to extract themes related to the physical and sociocultural environments.

In phase II, regional level policies (n=26) were compared and contrasted in order to assess their consistency with the new provincial school nutrition guidelines for Ontario (Government of Ontario, 2010). In doing so, we aimed to understand if such federal and provincial level themes translated to regional level policy in phase II.

More documents were published in Ontario than in any other province (Table 1). Most documents (n=24) related to school nutrition were published in Canada during a 5-year period (2004- 2009). Consistent with publication trends at the provincial and federal levels, 92% of regional policies were published between 2004 and 2011.

Insert Table 1 here

Phase I: Qualitative analysis

Qualitative results are organized around the physical and sociocultural environments.

Within each of these a number of key themes emerged (Table 2).

Physical environment

Findings indicate consistency between the federal and provincial level with respect to the availability of nutritious food and marketing to children. Accessing nutritious food was a key federal priority, while student food choice and nutrition education were key provincial priorities.

Availability of nutritious food The availability of nutritious food in community-based settings was the highest provincial-level priority, and third highest federal priority. At the federal level, food availability was seen as a natural determinant of food choice in grocery stores, workplaces, and schools (see Table 2). "The physical environment within which children live includes the air they breathe, the water they drink, the food they eat, the products they use and the settings in which they live, learn and play" (Health Canada, 2004, p.23).

While results reveal a federal focus on broad settings, provincial documents lend themselves more specifically to the school setting, including food availability in, for example, cafeterias, canteens, classrooms, at sporting events, and on class trips.

Nutrition education Analyses suggest that nutrition education (curriculum) was high federal and provincial priorities, particularly as it relates to curricular improvements. Policy-makers recognize that education and knowledge are prerequisites for decision-making about food. In 2006, Nova Scotia made a commitment to ensure the continued development of evidence-based health education curriculum, including food and nutrition outcomes. In Ontario (2004) guidelines support, "At least 50 hours of nutrition education at the elementary level. Advocate for the need for nutrition education, particularly at the secondary school level" (Ontario Society of Nutrition Professionals in Public Health, 2004, p.24). In Saskatchewan (2004), nutrition education was outcome-based to,

"Provide adequate time for nutrition education so that students can learn general health skills (e.g., how to assess health habits, set goals for improvement) and specific nutrition-related skills (e.g., plan a healthy meal, read and compare food labels)" (Berenbaum, 2004, p.iii).

Accessibility of nutritious food Ensuring that nutritious food was accessible at the school level was the second highest federal priority, particularly related to, "Inequitable access to affordable, nutritious, safe, and culturally appropriate food through socially acceptable channels could contribute to higher obesity rates...access to food is a fundamental human right" (CIHI, 2003, p.12). The availability of nutritious food does not imply that students have access to or are even aware that it is available. Analyses illustrate that school personnel have a vital role in ensuring that students have a high-level of awareness about *where* they can access these foods, *when*, and *how*.

Student food choice Student food choice was the third highest provincial priority. Schools play an important role in cultivating and promoting healthy eating behaviours given that: "Knowledge of healthy eating does not necessarily translate to better food choices unless the environment supports it too. The nutrition education students receive in the classroom may not match the messages conveyed in other school settings" (Government of Alberta, 2008, p.53). As a result, schools tend to adopt the message: make the healthy choice the easy choice.

Insert Table 2 here

Sociocultural environment

Results indicate that a high proportion of federal and provincial level policies and reports operate under a health promotion framework, and advocate for improved marketing to

children. A multi-sectoral approach to policy implementation was a strong federal level priority, while a partnership approach was a key provincial priority (Table 2).

Health promotion framework Health promotion initiatives are adopted as a way of influencing the culture of the school food environment at both federal and provincial levels. Federal-level priorities include initiatives (macro-level) aimed at reducing population-level rates of overweight and obesity, and related risk factors. Federal and provincial priorities call for an examination of local-level factors influencing the conditions within which the health of individuals is shaped.

The problem of obesity is complex. Ecological approaches to the promotion of healthy weights acknowledge this complexity and recommend action on many levels. Most strategies for promoting changes in dietary and physical-activity behaviour to date have focused on individuals and groups. The review of determinants of obesity, however, suggests a broader change in social environments (Raine, 2004, p.vi)

Provincial level priorities include nutrition interventions and frameworks (CSH, programs, services; food standards) for targeting the school and community setting.

Multi-sectoral approach Adopting a multi-sectoral approach was a key federal level priority (mentioned in all federal documents). Relevant key stakeholders included: parents and families, students, federal and provincial and municipal governments, non-profit organizations, and private sectors. Federal level policies indicate great value in multi-sectoral collaborations across government agencies, and with private sector (industry) and non-governmental organizations. In Prince Edward Island, this approach is guided by a formal partnership agreement.

Partnerships At the provincial level, a partnership approach is a key component of a healthy school nutrition environment. Such an approach includes, "Partnerships with key stakeholders, including students, teachers, parents, public health professionals,

caterers, and vendors to determine the best ways to promote healthier choices in the school environment" (Government of British Columbia, 2010, p.5). These partnerships can leverage much-needed (non-governmental) resources to support school nutrition initiatives and policy guidelines.

Increased access to community/public health nutritionists is one strategy being implemented in other jurisdictions. Businesses and non-governmental organizations can play an instrumental role through such activities as providing healthy breakfast and lunches, and supporting healthy vending machine options (Alberta Coalition for Healthy School Communities, 2006, p.22)

Marketing Improving marketing to children was supported at both the federal and provincial levels. At the provincial level, results suggest that lessons learned from anti-smoking campaigns be adopted in order to develop marketing campaigns for healthy eating in schools. For example, the availability of a variety of healthy food options, making food options more visible to students (e.g., counter-top refrigerators, placing fruits and vegetables at eye level), and reducing the cost of healthier foods are key marketing strategies. In addition, there is provincial level support for policy banning television food advertising to children under the age of 13 (in place in the province of Quebec, since 1978).

Phase II: Quantitative analysis

A total of twenty-six English-speaking school nutrition policies were included in the regional-level sample (Table 3). This represented a 43% retrieval rate from all English-speaking board policies. The Ontario School Food and Beverage Policy was used as a reference point for analysis (Government of Ontario, 2010).

Insert Table 3 here

Over 92% of policies were guided by a rationale linking nutrition and student learning (Table 4). Sixty-five percent of nutrition policies included information about which food

products to sell most (80%) of the time, to sell less (20%), and which products are not permitted for sale at school. 65% of policies contained information related to an anaphylaxis policy to reduce the risk of exposure to causative agents. However, very few school board policies made specific mention of Sabrina's Law² (2005). Sixty-two percent of policies made reference to implementation and monitoring of school nutrition policy. Fifty-four percent of policies contained nutrition criteria information (including fat, sodium content). Fifty percent of policies mentioned diversity of the school population in the context of accommodating religious and/or cultural food-related needs. A smaller proportion of policies included a message about reading food labels (39%), while a smaller 31% contained information related to food preparation (e.g., food safety, handling, storage).

Insert Table 4 here

Discussion

Given the rising rates of youth overweight and obesity and the importance of the school setting for children and youth, the aim of the study was to investigate the context of school nutrition policy in Canada, particularly the relationship between regional and upper level policies. In doing so, we examined policy documents and technical reports across three levels – national, provincial and regional. Qualitative thematic analysis was used to explore high-level themes operating at the federal and provincial levels, to understand if such themes translated to regional level policy. The results lead to a series of implications for policy.

² Sabrina's Law is a provincial-level law named after Sabrina Shannon, who lost her life from complications arising from an anaphylactic reaction while at school (Ontario, 2005).

First, making nutritious food available to youth was a key priority at all levels. Broader community settings were the focus at the federal level, while the school setting was the primary focus at the provincial level. These broader federal and provincial level themes related to the provision of nutritious food in school translated directly to the regional level vis-à-vis nutrition standards (i.e., sell most, sell less, not permitted for sale) and nutrition criteria (i.e., fat and sodium content) where food is offered for sale in cafeterias, tuck shops, vending machine, and during school fundraisers. Upper level policies inform regional policies in this area. Consistent with previous findings (Story, Neumark-Sztainer & French, 2002), further exploration is warranted given that the availability of nutritious food does not necessarily imply that students are eating it, and local-and individual-level (e.g., attitudes, food preferences) factors may act as barriers to nutritious eating.

Second, although the accessibility of nutritious food in schools was a key federal level priority, it was less so at the provincial level, and virtually absent from regional level policy. Food access in schools, particularly access to low-cost, nutritious food items is to a large extent shaped by socio-economic status (individual and neighbourhood) and nutrition knowledge and education. As the findings of Lytle (2009) suggest, access to healthy food options may be severely limited in places facing extreme poverty, or in rural regions. These findings reveal that economic factors (e.g., cost) are inherently connected to aspects of the physical environment (e.g., accessibility of nutritious food, geographical proximity to grocery stores and supermarkets) (Asanin Dean and Elliott, 2012). Access to food for vulnerable populations requires more attention at the local level, particularly in low-income neighbourhoods (Shearer et al, 2012). The school is a vital setting for

nutrition interventions, including offering subsidized breakfast and lunch programs (McKenna, 2010).

Third, nutrition education was a priority at both the federal and provincial levels. The provision of nutrition education in the school vis-à-vis curricular changes, nutrition initiatives and services related to healthy eating was perceived as vital at these upper levels. Although a large proportion (92%) of regional-level policies included a statement about the link between nutrition and improved learning outcomes, there was a lack of information about strategies to improve the quality and amount of nutrition education provided at the school level. These findings support key policy implications, including the development of unique curricular- and non-curricular school nutrition initiatives such as school gardens (Ransley, et al., 2010; Parmer and colleagues, 2009), and nutrition education programs designed to enhance the ability of students and their parents to identify more nutritious foods (Katz et al., 2011).

Finally, the Ontario School Food and Beverage Policy (2010), does not include Sabrina's Law (2005) in its statement regarding anaphylaxis management. While 65% of regional-level policies include a statement regarding anaphylaxis management, very few actually mention Sabrina's Law. These results reveal important policy implications, including potential inconsistencies in the inclusion of anaphylaxis management strategies (e.g., communication plan, regular staff training, individual management plans, medical files, emergency procedures, storage for epinephrine auto-injectors, etc.) across school board policies (Cicutto, et al., 2011).

Conclusions

The need for school-based nutrition policy and programming in Canada is evident based on rising rates of obesity and its links to chronic disease, issues of nutritional vulnerability, and the fact that children and youth spend much of their waking time in the school setting. Our findings suggest that the physical and sociocultural environments are key priorities at federal and provincial levels in school nutrition in Canada. Future research to explore the connections between all four types of environments (physical, economic, political, sociocultural) will help us better understand how the school nutrition policy environment is shaped by local level factors. In Ontario, Canada, an examination of the new Ontario School Food and Beverage policy (PPM 150) (Government of Ontario, 2010) is needed to understand facilitators and barriers related to policy implementation. For example, what types of local level factors shape the implementation of a provincial level policy across a province that includes 72 different school boards? What are some of the issues at the secondary school level, where students have access to off campus food venues? Is a "one size fits all" policy realistic? These and other related questions will be explored in later stages of this research.

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Table 1. Spatial and temporal distribution of school nutrition policies and technical reports in Canada

Temporal Spatial	1989- 1991	1992- 1994	1995- 1997	1998- 2001	2001- 2003	2004- 2006	2007- 2009	2010- 2011	TOTAL
Ontario- regional ³						***	***** *****	***** *****	26
British Columbia							† *		2
Alberta						†	†		2
Saskatchewan						††	† †		4
Manitoba						†	†		2
Ontario						† * † †	†		5
Quebec						†	†		2
New Brunswick	*			†			*		3
Prince Edward Island					†				1
Nova Scotia						*			1
Newfoundland					†	*			2
Canada	†		††		†	†††	†		8
Total	2	0	2	1	3	18	20	10	58

* signifies a policy document; † signifies a technical report

Table 2. Physical and sociocultural components of the school nutrition environment

Microenvironment	3 Key Themes	% of sources (# sources)
Physical	Federal	
	Availability of nutritious food	75 (6)
	Nutrition Education	75 (6)
	Accessibility of nutritious food	75 (6)
	Provincial	
	Availability of nutritious food	66.6 (16)
Nutrition education	66.6 (16)	
Student food choice	50 (12)	
Sociocultural	Federal	
	Health promotion framework	100 (8)
	Multi-sectoral approach to policy implementation	100 (8)
	Marketing to children	100 (8)
	Provincial	
	Health promotion framework	79.1 (19)
Partnership approach to policy implementation	58.3 (14)	
Marketing to children	45.8 (11)	

³ Implementation data were unavailable for two regional level school nutrition policies.

Table 3. School board nutrition policies in Ontario, Canada (1989-2011)

Access to policies	Public school board	Catholic school board	Total
Nutrition policy retrieved	13	13	26
No nutrition policy	18	11	29
Other reason	0	5	5
French-speaking school board	4	8	12
Total # of school boards	35	37	72

Table 4. Consistency of school board policies with provincial policy (1989-2011)

Policy document theme	% of policies containing theme (n=26)
Rationale linking nutrition and learning	92%
School nutrition standards	65%
Anaphylaxis policy to reduce the risk of exposure to causative agents	65%
Implementation and monitoring	62%
School nutrition criteria	54%
Diversity of students and staff must be taken into consideration in order to accommodate religious and/or cultural needs	50%
Reading food labels	39%
Food preparation	31%

Chapter Three

Examining local level factors shaping school nutrition policy implementation in Ontario, Canada

Status: Public Health Nutrition (*In press*).

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Examining local level factors shaping school nutrition policy implementation in Ontario, Canada

Abstract

Objective: Increasing numbers of overweight and obese youth draw attention to the school as an important setting for targeted nutrition interventions, given that it is where they spend a majority of their waking time. The objective of this study is to explore local level factors shaping the implementation of a school nutrition policy.

Design: In-depth, semi-structured interviews were conducted in person or via the telephone (a maximum of 60 minutes). An interview guide was informed by the Analysis Grid for Environments Linked to Obesity (ANGELO) framework, research objectives, and literature. Key themes centered on policy implementation, including facilitators and barriers (i.e., resources, capacity), user satisfaction (i.e., students), and communication strategies.

Setting: Secondary schools in Ontario, Canada

Subjects: 22 participants from local agencies supporting school nutrition programming (n=8) and secondary school principals, vice principals, and teachers (n=14) from nine schools across three Ontario school boards.

Results: Results are organized according to environments outlined in the ANGELO framework. The cost of healthy food for sale, revenue loss (economic), proximity of schools to off site food outlets (physical), the restrictive nature of policy, and the role of key stakeholders (political), the role of stigma and school culture (sociocultural), act as local level barriers to policy implementation.

Conclusions: Gaps in policy implementation include the high cost of food for sale, and subsequent revenue generation, the close proximity of internal and external food environments, the need for consultation and communication between stakeholders, and strategies to reduce stigma and improve the school nutrition culture.

Overweight and obesity are leading public health challenges, particularly among youth, given that an estimated 170 million children (<18 years) worldwide are overweight or obese, including 31% of Canadian youth (aged 2-17)⁽¹⁾. Overweight and obese youth are at an increased risk for various chronic diseases, and are at greater risk of becoming overweight adults⁽²⁾. Adiposity has also been linked to bullying behaviours, where overweight and obese youth are more likely than normal weight youth to be the victims of physical, verbal and relational abuse⁽³⁻⁴⁾.

Eating patterns in childhood and adolescence are important determinants of eating behaviour in adulthood⁽⁵⁾. Given that it is where youth spend a large proportion of their waking time, the school is an important setting in which to focus nutrition policies and interventions, particularly at the secondary-level where school food environments are less healthier than at the elementary level⁽⁶⁻⁷⁾. While some progress has been made in improving the school nutrition environment vis-à-vis the development of limiting access to low-nutrient, energy-dense food and beverages,⁽⁸⁻¹⁰⁾ findings are inconsistent⁽¹¹⁻¹²⁾. Other studies have explored the perceptions and experiences of key school-level stakeholders in the development and implementation of school nutrition policy⁽¹³⁻¹⁷⁾. These areas are both elaborated on below.

A review of the literature indicates inconsistencies in the health-related outcomes of school nutrition policies. For example, findings of a statewide school nutrition policy in the US indicate improvements in the healthfulness of foods consumed by public school students at lunch⁽⁸⁾. A four-state study examining the effectiveness of a multidisciplinary school-based intervention found positive changes in BMI through the consumption of fruits and vegetables, and engagement in physical activity⁽⁹⁾. In Prince Edward Island,

Canada, the findings of Mullally and colleagues⁽¹⁰⁾ indicate positive changes in student food consumption in accordance with the introduction of a provincial school nutrition policy. However, recent findings from Jensen and colleagues⁽¹¹⁾ in the US suggest that no changes in either sweetened beverage consumption or weight status were observed one year after the implementation of a healthy beverage policy. Such findings are consistent with those of Whatley Blum and et al.⁽¹²⁾ which reveal several barriers to a statewide nutrition policy, including the availability of other sugar-sweetened beverages, junk food, and soda advertisements.

With respect to factors shaping local level policy implementation, in the US, findings of a study related to the perceptions of foodservice directors (FSD) and principals of high school food service policies suggest the need for stronger communication strategies between school personnel and FSDs⁽¹⁶⁾. In a large state-wide survey related to school wellness policy implementation in the context of access to healthy food and healthy eating habits, Agron and colleagues⁽¹⁴⁾ cite a lack of adequate funding, competing priorities/lack of time, a need to garner the support of non-staff stakeholders (e.g., parents, students, community), and inadequate tools and training to support policy development and implementation in schools.

In Canada, the results of Taylor et al.⁽¹⁸⁾ highlight principals' perceptions of key barriers to school nutrition policy implementation in Prince Edward Island, including: lost revenue, the higher cost of healthy foods, and limited availability of policy compliant foods. In Alberta, evidence suggests that having both a school champion and financial support are integral to the successful adoption of provincial school nutrition guidelines⁽¹³⁾. In British Columbia, the results of Rideout and others⁽¹⁹⁾ indicate that any

positive effects of removing snack machines from schools are cancelled by the wide availability of junk food in tuck shops and during school fundraisers.

Inconsistent evidence exists about the success of nutrition policies in improving health outcomes. In Canada, findings indicate that the increased cost of healthy eating combined with the availability of unhealthy food for sale in schools, act as barriers to school nutrition policy implementation^(13,18-20). The varied landscape of school nutrition policy between provinces, combined with a lack of evidence related to policy components and implementation in Canada, and in secondary schools as opposed to elementary, provides an opportunity to assess local level factors shaping implementation⁽²⁰⁾. Given the changing nature of the school nutrition environment in the province of Ontario, Canada, the current research adopts qualitative research methods (i.e., in-depth interviews with key stakeholders) in order to understand how local level factors shape the implementation of a new provincial-level policy in secondary schools (grade 9-12) in Ontario.

In September 2011 the Ontario Ministry of Education implemented a new School Food and Beverage Policy (PPM 150)⁽²¹⁾, across all 72 school boards in the province. In conjunction with the Ontario Government's commitment to make schools healthier, PPM 150 strives to contribute to improved educational, attitudinal (e.g., food preferences and eating behaviours) and health-related outcomes, including reducing the risk of students' developing chronic diseases, including type 2 diabetes, cancer, and heart disease vis-à-vis nutritional standards (i.e., sell most, sell less, not permitted for sale). PPM 150 allows for ten special-event days where food and beverages sold in schools are exempt from the nutrition standards. Additional requirements include that schools: comply with the Trans

Fat Standards set out in Ontario Regulation 200/08 and Regulation 562 related to preparing, serving and storing food and beverages; develop strategies to reduce the risk of exposure to anaphylactic causative agents; ensure student access to drinking water during the school day; and, consider the diversity of students and staff through the accommodation of religious and/or cultural needs⁽²¹⁾. PPM 150 also recommends that boards, if available and possible, sell Ontario produced food and beverages, and avoid offering food and beverages as an incentive to students.

Based on: 1) earlier findings⁽²²⁾, which acknowledge a gap in the relationship between regional-and provincial-level school nutrition policy in the area of food accessibility, nutrition education, and vulnerable populations; and, 2) inconsistent evidence related to how youth are accessing healthy foods at school in Canadian provinces⁽²⁰⁾, the objective of the current study is to explore how local-level factors shape policy implementation in Ontario, Canada. In doing so, we examine key stakeholder perceptions of how local level factors shape the implementation of PPM 150.

This paper is organized according to the following sections, beginning with an overview of qualitative methods. Results of the research inform a discussion of how local level factors shape policy implementation, which includes policy implications and directions for future research.

Qualitative methods

In order to explore the perceptions of key school nutrition stakeholders, this study adopted a qualitative research design. Overall, key informant interviews (n=22) were undertaken with community-level (from a local public health unit, and community agencies with mandates supporting school nutrition) (n=8), and school-level participants

(i.e., secondary school principals, vice principals, teachers, and administrators from the school board) (n=14) from across three boards in Ontario, Canada between December 2011 and March 2012 (See Table 1).

Given the link between neighbourhood characteristics and issues related to food access and dietary patterns⁽²³⁾, school boards were selected from both low- and high-income census tracts (see Table 1). The principal and vice-principal of each school received an information letter via email. In participating schools, principals or vice-principals either agreed to participate, and/or passed the researcher's contact information onto a family studies/nutrition teacher for follow-up. Interviews were conducted in person (in a meeting space chosen by the participant), or via telephone by the doctoral student researcher.

An interview guide was informed by previous research findings, the current research objectives, and relevant literature (See Table 2). Key topics were related to: school nutrition in the region; perceptions of the school nutrition policy and/or program in operation in the school, or that which is the focus of organizational activities in community agencies, including facilitators and barriers to implementation; user satisfaction; and, strategies for improvement. Interviews were tape-recorded (with written permission) and transcribed verbatim for subsequent thematic analysis. Interviews lasted a maximum of 60 minutes. The study received clearance from the McMaster University Research Ethics Board, and the ethics committees of all three participating school boards.

Data analysis

The analytic process began during data collection. Data were analyzed as they were gathered, helping to shape ongoing data collection (i.e., question refinement, pursuing other avenues of inquiry in depth)⁽²⁴⁾. The Analysis Grid for Environments Linked to Obesity (ANGELO) Framework guided the development of a coding template⁽²⁵⁾.

The ANGELO Framework is a conceptual model designed to divide the food environment by size (macro and micro) and by type (economic, physical, political, sociocultural). Macro-level sectors (industries or services) influence food intake, and micro-level settings (where groups of individuals gather for a specific purpose, usually involving food) are influenced by those sectors. The economic environment refers to the cost of food, while the physical environment is concerned with food availability and accessibility. The political environment helps to determine the rules and guidelines surrounding food. The sociocultural environment is associated with the attitudes and beliefs of individuals as it relates to food. In this context, the ANGELO Framework was utilized to help determine: how local level factors shape policy implementation in a school setting; to what extent these factors are considered "obesogenic"; and, how they can be supported and prioritized in future policy interventions⁽²⁵⁾.

Analyses of a sub-sample (n=5) of interview transcripts (randomly selected) contributed to the development of the coding template. Four environmental components outlined within the ANGELO framework were mapped onto the data, and sub-themes emerged⁽²⁵⁾. The physical environment includes the following sub-themes: education, geography, provision of food to students in school venues, nutrition knowledge, school-level capacity and space to store food. Sub-themes within the economic environment included: lack of revenue generation from school cafeteria sales, lack of fundraising

capacity, high cost of nutritious food for sale, private sector competition, lack of student nutrition program funding, and contracts with food providers. The political environment included the following sub-themes: stakeholders, policy guideline compliance, nutrition standards, communication strategies, evaluation, and the role of government. The sociocultural environment included sub-themes related to role modeling, school champions, diversity, community partnerships, competing priorities of school, user satisfaction/dissatisfaction, and school culture.

Two researchers undertook an inter-rater reliability exercise, with each independently coding a subset of interviews (n=3). After reaching 64% agreement (a sufficient score), this process led to further discussion about meaning and interpretation of codes⁽²⁶⁾. Data were entered into a qualitative analysis software package (NVivo 8.0) for subsequent thematic analysis, whereby passages of text were selected to support individual codes listed in the coding template. Key themes were generated using a constant comparative method, deductively from the research objectives, and inductively as they gradually emerged from the transcripts.

Results

Given that it is mandatory for Ontario schools to adopt PPM 150 by September 2011, all three school boards were in compliance. However, while board two was operating in full compliance under the direction of their board representatives, boards one and three were operating in compliance, but with more local level reluctance. This reluctance may at least be partially linked to local level barriers, as described in the remainder of the paper.

All schools in the study were operating with a full cafeteria, with some also operating separate tuck shops. In seven of nine schools, an outside food service provider

manages cafeteria operations, whereby schools receive a portion of revenue from cafeteria sales. In two schools, instead of having a cafeteria provider, family studies students are responsible to prepare food and operate cafeterias under the supervision of their course instructor. Every school had at least one PPM 150-compliant vending machine, in which they were under contract and for which they receive a portion of revenue of sales. In addition to a cafeteria, one school operates (vis-à-vis students in family studies courses) a restaurant on a for-profit basis, which is accessible to staff and outside customers. All schools were running student nutrition programs (SNP), offering breakfast, snacks and/or lunch on a regular basis (e.g., daily, 2 times per week). SNPs are operated by school staff, students and volunteers, and are subsidized by funding from the province, external grants, and/or school fundraising initiatives. In some schools, students are asked to pay a small token to access SNPs, but payment is not mandatory. Seven of nine schools were within walking distance to off-campus fast-food outlets.

Qualitative results are organized according to the economic, physical, political, and sociocultural environments. Within each of these a number of key themes emerged:

- a) Economic environment - cost of healthy food for sale, loss of revenue generation;
- b) Physical environment - proximity of schools to off-site food outlets, link between healthy eating and student learning;
- c) Political environment - restrictive nature of policy, role of key stakeholders; and,
- d) Sociocultural environment - role of stigma, school culture.

Economic environment

Cost of healthy food for sale

Results reveal a link between the new provincial food and beverage policy, the cost of healthy food for sale, and a loss of revenue generation. Given the higher cost of policy-

compliant (nutritious) food for sale in the cafeteria, respondents recognize that policy guidelines act as a barrier, particularly for vulnerable students, for whom opportunities to access food (healthy or otherwise) may already be constrained at home. For example,

The consumer is telling us they want certain types of food, and consumers want things that are faster, and salad bars are expensive - the simple fact is that you can't eat well at the same price point as you can eat poorly (Principal).

While cost of healthy food for sale was a concern across all schools in the study, it was more pronounced in schools where a larger percent of the school population was considered low-income (i.e., as evidenced by % of low income households in board 1 (See Table 1), in addition to participants' perceptions of the school populations' demographics). Results indicate that stringent nutrition policy guidelines lead some students off campus to fast-food outlets, and/or grocery stores, where food is less costly.

Revenue

The focus of policy - selling nutritious foods at school more than 80% of the time - raises the cost of food for sale, and subsequently, reduces the number of student food purchases at school. As a result, given that schools receive a portion of funding from cafeteria and related food sales (e.g., tuck shops, vending machines), reduced food sales result in lower revenue. Thus, schools are required to engage in more fundraising activities.

Opportunities for food-related school fundraising within PPM 150 are limited as bake sales are restricted to ten days per school year.

Given that cafeteria providers appear unable to provide nutritious food within the nutritional confines of the policy at an appropriate cost, schools risk losing revenue, and ultimately, risk losing their cafeteria. A revenue loss means that cafeteria staff risk losing their jobs, which means students face the double burden of: 1) being unable to afford the healthy food being offered for sale in the cafeteria (despite the option to bring food from

home); and, 2) playing a larger role in food production in the cafeteria, as part of their family studies/foods courses.

We are losing money because of it, which is a huge annoyance because we pay staff here through the cafeteria ... So I have to cut my staff, which means more work for the kids, and more work for me as a teacher to produce the food in the cafeteria (Teacher).

Respondents revealed the tension between, on one hand, providing nutritious foods to students, and on the other, the revenues that schools gain as a result of selling unhealthy foods. For example,

The school gets money for having those vending machines in there [to sell diet pop and vitamin water]. I understand there have been cuts; the school is floundering around looking for ways to make money. I understand that, but I also think let's get a little more creative with it, and stop poisoning those kids' bodies to make money to educate them. It just seems counterproductive to me (Teacher).

Physical environment

Proximity of schools to off-site food outlets

Respondents' revealed that the close geographical proximity of schools to fast-food outlets acted as an obvious barrier to policy implementation. Students attending schools located near a downtown core were more likely to be in walking distance to inexpensive, unhealthy foods, thereby were more likely to purchase these types of foods. As one respondent revealed,

It [school food and beverage policy] just changes their habits. It doesn't change their habits in what they are eating. It changes their habits in terms of where they are getting the food (Principal).

Loss of cafeteria revenue is at least partially related to unrestricted access to off-campus food outlets, resulting in what school-based respondents perceived as competition between internal (i.e., school cafeterias, vending machines, tuck shops) and external community-based food service providers. For example,

I do know that our cafeteria profits have significantly decreased, and the kids in the older grades who have access to cars are driving to places in the community, and kids that don't are walking around the street because there is a pizza joint, a sub joint, and a variety store across the road (Vice-principal).

Link between healthy eating and student learning

While some respondents highlighted the link between healthy eating and improved student learning, they also acknowledged the role of hunger as an acute barrier to student learning. The school food and beverage policy was designed to provide nutrition standards and criteria in schools. Although nutritional health was a key priority of many school-level respondents, issues of poverty and hunger also existed. For example,

The bottom line is that no child should ever be hungry, If they are hungry, they can't learn, you can't teach them. Their priorities are so different (Teacher).

According to one vice principal, ensuring that students are being fed healthy foods vis-à-vis school meal (e.g., subsidized food available to students who qualify) programs was deliberately connected to student learning:

To make sure they were having a healthy lunch, we actually moved from giving them a lunchtime [cafeteria] voucher where they were very often getting fries and pop, to giving them an actual lunch whereby the right food groups are represented, in terms of nutrition, fats and fiber. Kids need to be fed if they are going to be awake in class and ready to learn, and we all know there is a huge link between nutrition and student learning (Vice-principal).

These, and other, types of strategies to promote healthy eating were common in many schools. Such strategies were consistent with PPM 150 in the context of nutritional standards, and changing student eating behaviours and food preferences.

Political environment

Nature of policy guidelines

Some respondents revealed that the school food and beverage policy (i.e., nutrition standards, nutrition criteria) is restrictive in nature. In this way, a family studies teacher reported some of the barriers related to accessing policy-compliant food, consistent with

nutrition standards and criteria, available to sell in cafeterias. While many schools have a food service provider in the cafeteria, in others, students in family studies/foods courses are responsible for cafeteria food production.

Our suppliers also said there are constraints related to quality control in terms of food choices. Because it is fairly new in Ontario, they don't have suppliers that are providing some of the things they want, or some of the things that they may have may not be as tasty as they could be (Teacher).

In addition to issues related to food service provision, some respondents indicated that the policy guidelines were too restrictive in nature, and that secondary students should be given the option to make food-related choices on their own, and in moderation. For example,

My Family Studies teachers and I really support the spirit of the population, and we always have. We want to teach kids to eat healthy foods to help prepare them. But we also live in the real world, and if we don't teach moderation they are never going to learn it (Teacher).

Role of key stakeholders

There are a number of key stakeholders who are integral to the success of the school food and beverage policy, including: teachers, vice principals, principals, school healthy action teams, government representatives (both policy-makers and funders), parents, students, cafeteria service providers, and members of the school council. In response to the question: 'whose responsibility is school nutrition in the community?' one key community stakeholder involved in the facilitation of a SNP across board one, replied:

Everyone's. I think there is a role for government, for school boards, and for independent committees. There is a role for parents and students to be helping out with the program, and then for other community members or non-profit groups. I think it is something that benefits everyone when students are learning well in school, and there needs to be more people involved in helping support that program (Community).

While some respondents felt strongly that responsibility for school nutrition was at the school-level, others felt that regardless of what schools are doing to promote healthy eating in schools, primary responsibility needed to lie with parents. For example,

As a result of this change in policy, the schools have a role to play so they must model healthier choices. I made a report to our Board of Trustees with respect to things that were happening with the ministry change, and first and foremost we communicated clearly to the board chair that we can do everything that we want to, but in the end, the responsibility lies with the parents (School board).

A public health representative revealed the role of the health unit in promoting healthy eating in schools,

The public health units are mandated to work with schools to help promote healthy eating. So public health staff, including public health dietitians, nurses, public health inspectors, activity specialists, we all work very closely with the schools (Community).

The extent of the role of public health in school nutrition policy implementation deserves further examination.

Sociocultural environment

Stigma

SNPs – partially funded through a provincial government ministry – provide breakfast, lunch and snack programs on a regular basis (daily, or 2-3 times per week, depending on the schools' funding model) to students at no cost. Given that SNPs do not provide food for sale, they are not guided by the new school food and beverage policy, but are instead guided by 2008 Nutrition Guidelines⁽²⁷⁾. Both community- and school-level respondents observed the stigma that students experience as a result of not having enough food, and/or not having money to purchase food at school. As one respondent illustrated,

One of the major barriers is finances. I think there is still some reluctance on the part of some students to come in, they are afraid that people will see that it somehow connects to their home life. It is the stigma – that is what they are afraid of (Teacher).

Some schools provide students with cafeteria lunch coupons as a way of reducing stigma. Other strategies include inviting teachers and principals to join students for breakfast at the SNP in order to ensure students that they are universal in nature. As one respondent illustrates,

If there is stigma around the program, the easiest way to overcome that is to have a teacher say, "The program is for everyone, I went there for breakfast this morning". But when teachers have never attended the program, then when a child says "Isn't that just for poor kids?" Teachers don't have easy responses to that question (Community).

SNPs are mandated to be policy-compliant (*vis-à-vis* the 2008 Nutrition Guidelines), but given the high cost of nutritious food and a limited operating budget (SNPs receive partial ministry funding, donations, and funds incurred by school fundraising) student nutrition programs are at-risk of being shut down.

School culture

The culture of the school nutrition environment appears to be largely dependent on the buy-in of key school-level personnel. A community-level stakeholder working in the area of school nutrition revealed the need for administrative buy-in and school champions to lead nutrition initiatives,

It seems to be a tiny bit hit or miss. School nutrition seems to be two real kinds of important things in my perspective. You need the buy-in from the principal because nothing goes on in a school without the buy-in from the principal. The second big key to success is having a strong person who kind of leads it and organizes it (Community).

Teacher support for SNPs is a vital component of their promotion and successful implementation at the school-level. Role modeling behaviours help to create a culture in schools where nutrition programs are seen as universal and acceptable.

Discussion

Given the rising rates of overweight and obesity in youth, and the fact that youth spend a large proportion of their waking time at school, it is important to examine this setting in the context of nutrition policies and interventions, particularly at the secondary school level where food environments become less healthy⁽⁶⁻⁷⁾. While some progress has been made in improving the school nutrition environment, stronger policies supporting healthier meals in schools, and limiting access to low-nutrient, energy-dense food, is needed^(20, 28). In-depth, semi-structured interviews were conducted with community- and school-level stakeholders in order to explore local level factors shaping school nutrition policy implementation. The results lead to a series of implications for policy.

First, given the varied landscape of school nutrition policy in Canada, and that a national school meal program has yet to be developed, all cafeterias are revenue driven. Ontario currently lacks a provincial funding strategy tied to the school food and beverage policy, and the high cost of policy-compliant foods for sale acts as a key barrier at the school level⁽¹⁸⁾. The implications of the high cost of nutritious foods are twofold: 1) students choose to go off-campus to purchase food elsewhere; and, 2) schools subsequently generate less revenue from food sales. Consistent with the results of Asanin-Dean and Elliott⁽²⁹⁾, and Story and others⁽³⁰⁾ physical environmental influences interact with individual factors (i.e., socioeconomic status) to impact eating behaviours. As such, some populations are more vulnerable than others, particularly in low-income neighbourhoods. The school is a vital setting for nutrition interventions, including offering subsidized breakfast, snack and lunch programs via SNPs. These findings support the need for a stronger financial commitment from both national and provincial

governments to provide subsidized policy-compliant foods in schools through PPM 150 and local-level SNPs.

Second, findings related to the proximity of schools to off-site fast food outlets reveal important policy-related implications. Given that secondary school students have access to the external food environment, a perception exists that schools are in competition with fast food and other off-site food outlets. This finding is consistent with that of Canadian research by Winson⁽³¹⁾, which found that the external food environment acted as a structural barrier to the internal school food environment. This is particularly true of Canadian schools where a nationally- or provincially-supported school meal program does not exist. Previous research⁽³²⁻³³⁾ highlights a positive association between neighbourhood deprivation and access to fast-food outlets. Our findings indicate that students attending schools located in low-income neighbourhoods may be even more likely to purchase foods from the external food environment, and therefore, may be at an increased risk of obesity and other nutrition-related chronic diseases^(2,34). Analyses of the external neighbourhood food environment surrounding schools are warranted in Ontario, Canada, particularly in light of the implementation of PPM 150.

Third, respondents consistently indicated that a range of key stakeholders could play a larger role in school nutrition policy implementation. The literature consistently indicates the need for enhanced communication strategies between policy-makers and those who are responsible for policy implementation^(16,35). Our findings reveal that consistent communications (e.g., newsletters, public meetings, student assemblies) between all stakeholders (e.g., government, school-level personnel, students, parents, community groups, public health) throughout policy implementation would enhance the

process. Consistent with the findings of MacLellan and others⁽³⁶⁾, early consultation with key stakeholders in policy development, is needed, and is an important predictor of the long-term success of such initiatives. In addition, public health dietitians have an important role in policy development and implementation vis-à-vis communication, engagement and education strategies for stakeholders⁽¹⁵⁾. Results of this research also point to a need for a process to create more alignment and consistency between PPM 150 and SNPs, which could be supported by public health dietitians given their expertise and knowledge about nutrition standards and criteria.

Fourth, reducing the role of stigma related to students' accessing SNPs in schools was a key concern. Our findings suggest that student participation in SNPs is compromised because of the potential for it to identify them as low-income⁽³⁷⁾. Role modeling healthy eating behaviours can positively impact the extent to which students experience stigma. While school-based strategies to reduce this stigma (i.e., emphasizing universal nature of SNPs, inviting teachers to attend) have been met with varying degrees of success, it is nonetheless an important priority. School culture was also raised as an important opportunity to promote and support PPM 150. For example, school garden initiatives have been shown to promote healthy nutritional intake, academic engagement, and students' sense of connection with their school⁽³⁸⁾. In addition, given that overweight and obese youth are at an increased risk of being the victims of physical and verbal abuse⁽³⁻⁴⁾, there is an opportunity to explore the social environment and social networks in the context of food and issues of body image and disordered eating⁽³⁹⁻⁴⁰⁾.

Our findings highlight important local level factors that shape provincial level policy implementation across three Ontario school boards, including the high cost of food

for sale and its implications for revenue generation, the proximity of schools to external fast-food sites, the need for consultation and communication between key school nutrition policy and program stakeholders, strategies to reduce stigma as it relates to accessing SNPs, and the importance of the school culture in promoting and implementing successful school nutrition policies.

While the sample size (n=14 school level participants, across three school boards) was small, we cannot make generalizations about these findings to all school boards in Ontario (N=72); however, we can expect these findings to be transferable to other schools in Ontario.

Future research to explore the perceptions of local level factors shaping school nutrition policy implementation and sustainability from the perspective of secondary school students is needed. For example, how important is healthy eating to you? How do you decide what to eat when you are at school? What factors impact how you decide what to eat at school? These and other related questions will be explored in later stages of this research.

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Appendices

Table 1 Socio-demographic comparison of school census tracts (median, participating schools) and province

	Board 1	Board 2	Board 3	Ontario
Average dwelling value	\$204,002	\$316,943	\$190,430	\$297,479
Median household income	\$45,035	\$80,991	\$45,902	\$60,455
High school education	72.6%	84.3%	69.2%	77.8%
Immigrant status	31.7%	21.7%	31.4%	28.3%
Unemployment rate	9%	4.3%	6.2%	6.4%
Low income households	27%	6.3%	15.6%	14.7%

Adapted from Statistics Canada, 2006 Canadian Census

Table 2 Interview guide

Construct	Question
Context	<p>What is your current role?</p> <p>What brought you to this position?</p>
School nutrition in the region	<p>Tell me about the landscape of school nutrition in your region</p> <p>To what extent do you or your organization see nutrition, broadly, and school nutrition, specifically, as a poverty issue?</p>
School nutrition policy/programming	<p>Tell me about the nutrition policy/programs currently operating in your school</p> <p>What were/are your school board's expectations for this nutrition policy/program?</p> <p>Have these expectations changed since its inception?</p> <p>What type of communication strategy is in place between your school board and the policy-maker and/or program funder?</p>
Perceptions about the policy/program	<p>What is the perception, in your view, about the success of the nutrition policy/program at the school-level?</p> <p>What are some of the perceived facilitators and barriers to implementation?</p>

Do you think the policy and/or program has achieved its expected goals?

Have there been any targeted evaluation strategies?

How do you perceive user satisfaction?

Are there any changes that you think would improve the policy and/or program?

Discussion

Is there anything else you would like to add that we have not already discussed?

Is there anyone else you think we should talk to about school nutrition, and/or your school's nutrition policy and/or program?

Table 3 The Analysis Grid for Environments Linked to Obesity (ANGELO) Framework

SCALE \ TYPE	Micro-environment (settings)		Macro-environment (sectors)	
	<i>Diet</i>	<i>Physical Activity</i>	<i>Diet</i>	<i>Physical Activity</i>
Physical		What is available?		
Economic		What are the financial factors?		
Political		What are the rules?		
Socio-cultural		What are the attitudes, beliefs, perceptions and values?		

Adapted from Swinburn, Egger & Raza, 1999

Chapter Four

Exploring the role of the policy environment shaping secondary students' healthy eating choices: A qualitative study

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ABSTRACT

BACKGROUND: Adolescence represents a time when physical, social and developmental changes affect eating behaviors and nutritional intake. Given that this population spend a large proportion of their waking time in school, and school is where many nutrition interventions have been implemented, we explore perceptions of local level factors shaping secondary school students' healthy eating choices vis-à-vis the implementation of a provincial policy.

METHODS: Three focus group interviews were conducted with secondary students (n=20) across two school boards in Ontario in fall 2012. School boards were selected to represent both high-and low-income neighbourhoods. The ANGELO framework was adopted to guide data analysis.

RESULTS: Results reveal higher priced policy-compliant food for sale, lower revenue generation capacity, and more students purchasing food off-campus at nearby outlets. Limited designated eating spaces, and time constraints act as local level barriers to healthy eating. Student input on cafeteria menus and school community gardens, can facilitate healthy school nutrition environments.

CONCLUSIONS: Community partnerships with key external stakeholders are needed to leverage financial and human resources to support school nutrition. Pricing strategies and food subsidies are needed to ensure that all students have access to nutritious food, particularly vulnerable populations. Future policies need to consider the social context and conditions surrounding school nutrition.

BACKGROUND

Rising obesity rates are a major public health concern. Having doubled worldwide since 1980, trends illustrate that more than 500 million adults were obese in 2008.¹ Rates of obesity in childhood and adolescence are equally as serious. For example, 13.1% of children (aged 5-11) and 10.2% of adolescents (aged 12-17) were obese between 2009 and 2011 in Canada.²

Excess weight in children and adolescents is linked to high blood pressure, glucose intolerance, pre-diabetes, cancer, heart disease, stroke, and an increased chance of being an obese adult.^{3,4} In addition to serious short-and long-term physiological outcomes, there are also psychosocial implications related to obesity, particularly in childhood and adolescence. For example, in a US study of youth aged 8-16, obese youth were described as being withdrawn, displaying less leadership and more aggressive-disruptive behaviors in school.⁵ Research demonstrates a link between overweight and obesity, and both weight bias and body image disturbance in children.⁶ Overweight and obese school-aged youth are also more likely than their normal weight peers to be perpetrators and victims of bullying.⁷

Obesity develops as a result of a complex set of interrelated factors - biological, behavioral and environmental.⁸ The obesogenic environment is derived from all environmental influences that encourage excess weight in individuals and populations.⁹ Healthy eating is an important determinant of obesity, and adolescence represents a time when physical, social and developmental changes affect eating behaviors and nutritional intake.¹⁰ Healthy eating behaviors are shaped by potentially modifiable pathways, which are *both* individual and environmental in nature.¹⁰⁻¹¹

Research on the implications of school nutrition policy and programming has focused on: 1) changes in student food choices and/or health outcomes; and, 2) experiences of key stakeholders of school nutrition policy implementation. For the purposes of this research we focus exclusively on the latter.

In studies of school stakeholder perceptions of school nutrition policies in the US, recent findings illustrate that competing priorities limit time devoted to school nutrition issues, inadequate funding and tools to support policy development, are key barriers to policy implementation.^{12,13} A number of key school-level issues exist, including parents' lack of knowledge of health issues, lack of education and support from non-staff stakeholders, the need to include a range of key stakeholders in policy development, and the need for leadership in school nutrition.^{12,14}

In the Canadian context, recent findings indicate: that principals are key champions for change, the important role for nutrition working group members, the need for a consultative approach with stakeholders, the risk of eating higher amounts of unhealthy foods when eating "in-between places" (on the go), support for policy to restrict fast food access on campus, designating healthy eating as a high priority.¹⁵⁻¹⁷ Key barriers to policy implementation in Canada include: limited resources and volunteers, conflicting roles regarding responsibility for feeding children, inadequate communication with students and parents about policy and menu changes, and student food preferences.¹⁸

While there is some consistency in the results of studies related to school nutrition policy implementation (e.g., lack of resources, knowledge of parents and students, competing school-level priorities), less evidence exists about the actual experiences of students who are directly impacted by policy. Instead, most studies focus on the

perceptions of school administrators, teachers, board members, school food directors, school wellness advocates, and parents.^{12-15,17} Studies that do exist, explore students' experiences at the elementary-and middle-school level school nutrition environment.^{16,18} Virtually no studies have examined secondary school student perceptions of the school nutrition environment, particularly in Canada. This environment is unique and varied given that students are in walking distance to and have the option to purchase food both on-and off-site. Further, given that the province of Ontario made the choice to extend their new Policy/Program Memorandum No. 150 (PPM 150)¹⁹ to secondary schools, an exploration of this environment is warranted.

Given the changing context of the school nutrition environment in Ontario Canada, this research utilizes focus group interviews to explore the perceptions of secondary school students in order to understand how local level factors shape their healthy eating choices vis-à-vis PPM 150. Particular emphasis will be placed on economic, physical and social factors to better understand the pathways in which the school nutrition environment is shaped.

The provincial government in Ontario implemented PPM 150 in all 72 school boards (both public and Catholic) across the province in the fall of 2011. The provincial government, through the Ontario Student Nutrition Program initiative, provides a small percentage of funding to support school-based breakfast, snack and lunch programs. In Ontario secondary schools, there are school-based, and course-based nutrition programs (e.g., culinary arts programs), which are for-profit, or funded by local community agencies (e.g., Breakfast for Learning <http://www.breakfastforlearning.ca/en/about-us>).

Based on: 1) recent findings which highlight implications related to the high cost of policy-compliant nutritious food for sale in schools, student access to off-site fast food outlets, the need for a multi-stakeholder approach to policy implementation, and the role of stigma in accessing student nutrition programs;²⁰ and, 2) a call for further research to determine how policy components affect implementation and outcomes,²¹ the purpose of this research was to investigate how secondary school students make healthy eating decisions in the context of implementation of a new nutrition policy. This study is part of a larger research program, which includes a mixed-method documentary analysis of relevant policy documents and technical reports in Canada (1989-2009) related to school nutrition,²² and an analysis of key stakeholder interviews of local level factors shaping school nutrition policy implementation in Ontario, Canada.²⁰

METHODS

Design

A qualitative research design was adopted to explore the perceptions of secondary school students of local-level factors shaping how they make healthy eating decisions in the context of implementation of a new nutrition policy. Three focus group interviews were conducted with secondary students (n=20) aged 15-20 across two school boards in Ontario between October and November 2012. In an earlier phase of research,²⁰ school boards were selected to participate from both low-and high-income neighbourhoods using census tract data; we approached the same schools to participate in this phase.

Procedures

The principal of each school we approached was sent an information letter. In all three participating schools, the principal forwarded the letter to a teacher who was

centrally involved in nutrition courses and/or programming, for follow-up. Three teachers agreed both to having their schools participate, and to facilitate the coordination of the focus groups in conjunction with the researcher (e.g., student recruitment, distributing consent forms, scheduling focus groups, reserving meeting space). Written consent from a parent/guardian was required if students were below the age of 18.

Instruments

A focus group interview guide was informed by previous research findings,^{20,22} research objectives, and associated literature. Open-ended questions explored definitions of healthy eating, perceptions of the influence of types of foods on health, body weight and grades, student purchasing behaviors, and school nutrition policy and programming. Focus groups took place in person in private meeting rooms at each school, and were between 45 and 60 minutes in length. Interviews were digitally recorded (with permission), for subsequent verbatim transcription.

Data Analysis

Data analysis and interpretation occurred concurrently with data collection, where each focus group was the unit of analysis. Qualitative data analysis is an iterative process, where within-and across-group differences and similarities are observed.²³ A theme code template was developed based on the principles of the Analysis Grid for Environments Linked to Obesity (ANGELO) framework (see Table 1).²⁴

The ANGELO framework is a conceptual tool used to consider the extent to which environments are obesogenic in nature, in addition to an applied tool for the prioritization of environmental factors for intervention research (see Table 1).²⁴ Since they spend a large proportion of their waking time in school, and it is where nutrition-

and obesity-related interventions have been developed for adolescents,²⁵⁻²⁶ we adopted the ANGELO framework to understand how individuals interact with this environment. According to the ANGELO framework, environments are divided by size (micro and macro) and type (physical, economic, political, sociocultural). Microenvironments (i.e., local settings, including schools, workplaces) are where individuals gather for a particular purpose, and are influenced by broad macroenvironments (i.e., education, health systems, government).²⁴

In the context of the secondary school setting, the economic environment includes the cost of food for sale. The physical environment refers to the types of foods available and accessible in the cafeteria, tuck shop, and vending machines. The political environment includes guidelines or rules that shape opportunities for healthy eating. The sociocultural environment refers to the attitudes, beliefs and values about food and nutrition, which contributes to the school culture.^{24,27}

Focus group data were loaded into a qualitative analysis software package (NVivo) for thematic analysis. Through this process, sections of text were selected to correspond to and support individual codes within the theme code template. Key themes were generated deductively from the research objectives, and inductively as they emerged from transcripts.

RESULTS

Three focus groups were undertaken (one in each of three secondary schools), with a sample size of twenty student participants. Focus groups ranged in size from between 5 and 9 students in total. Participants were in grades nine through twelve, and between the ages of 15 and 20. The sample included four male and sixteen female

participants. Socio-demographic information for each school board is included (see Table 2).

Qualitative results have been organized according to key themes that emerged within the 1) economic; 2) physical; and, 3) sociocultural environment.

1) Economic environment

The high cost of food for sale school in cafeterias acts as a barrier to students' purchasing nutritious food. In conjunction with the implementation of PPM 150, some schools saw the introduction of a new school food service provider. This introduction was accompanied by the perception of a rise in food prices. In addition, food prices and food quality were not necessarily consistent. High priced food led some students to purchase food off-campus, at a lower price. As described by one student:

The quality of food is not equivalent to the cost. The cost is unnecessarily high for things that are not very healthy, and they're not very tasty. So we don't blame students for going to [grocery store] and buying onion rings and potato wedges for \$2.00. Here we're buying a hard sandwich for \$3.50, and it's an everyday thing ... even \$0.50 matters to us (FG 3).

The stuff in the caf [cafeteria] is normally a lot more expensive. If you run over to [a fast food restaurant], you get a pretty big slice of pizza for only \$2.00, so a lot of people will just grab a coke and go outside the door, and just go over there. They don't have the money to go to the caf (FG 1).

Students compared themselves to other students in the context of how often they could purchase food during school hours (whether on- or off-campus). There was a link between what students could afford to eat at school, and their sense of self-image via economic status in relation to their group of friends. One female participant expressed this, as follows,

P1: If a lot of my friends are eating [from a fast food restaurant], and I have got soup or a sandwich, now I look kind of stupid. Little girl who has got her sandwich cut in fours.

R: What makes you feel that way?

P1: Well most of the time I don't really have a job; I have a summer job, so half the time I am broke.

R: So it is a money thing?

P1: Kind of (FG 2).

Lowering food prices seemed like an obvious solution to improving the food environment in schools. However, students were acutely aware that cafeteria sales generate profit, of which some schools receive a portion. They were also aware that high prices were an important predictor of profit-generation:

R: Are there any changes that you think would improve the food at school?

P1: Make the prices go down, but then again, if the prices went down they wouldn't make much profit.

P2: They usually get money for the yearbook (FG2).

Other modes of profit-generation in schools, including student bake sale fundraisers, are limited to ten designated school days, as per PPM 150 guidelines.

2) Physical environment

Proximity to off-site fast food outlets was an important indicator of how easily they could be accessed by students during lunchtime hours, or on breaks. Given that the three participating schools were located in densely populated neighbourhoods, which were in close proximity to numerous fast-food outlets, many students chose to purchase food off-campus. In the context of the implementation of the PPM 150, one student acknowledged that, "*Because there was no other alternatives, it was just like, "Oh by the way, we're not giving you junk food but five minutes down the street you can go buy even more than we*

would give you" (FG 3). Access to non-policy compliant foods and beverages was also available through adjoining or affiliated buildings (e.g., vending machines in community recreation centres) that were not under the same jurisdictional guidelines.

With respect to the physical space in schools where students eat their lunch, results revealed that many students eat lunch in hallways, go across the street to sit in their cars, or eat sitting on the curb. Given that students all ate lunch at the same time, at one school there was not enough space in the cafeteria for students to eat together (school 1). At another school, in what was once considered a food friendly space, library renovations has meant that students are prohibited from eating there, "*After last year the people in the back kept on throwing their food around and wouldn't pick it up*" (FG 2). In school 3, students perceived the changing nature of physical space for food consumption to be a result of the PPM 150. For example,

R: How has your cafeteria changed since the new policy came into effect?

P2: They took out everything that was unhealthy.

P3: I wouldn't say it's way emptier. You do see people sitting in there...

P2: But not because they're eating from the serveries.

P3: It's just them eating packed lunches and needing a place to sit.

P4: Before there were line-ups all the way out the hallway doors, and people would actually sit down in the cafeteria and it would actually be used to eat the food that you bought from the serveries (FG 3).

3) Sociocultural environment

While participants' agreed that their knowledge and education about nutrition came mostly from their parents and the school via course curriculum, responses varied about the extent to which healthy eating was important to young people - ranging from "very important," to "not at all important." For example, one student describes why healthy eating may not be a priority,

P1: I think healthy eating should be important to teens, especially with the rates and statistics of childhood and youth obesity, but it is not a priority for most people because their lives are too busy.

R: Do you think it is just that they are busy?

P1: No, they are probably lazy and having healthy food involves work, you have to cut up the food...(FG 2).

Despite its perceived level of importance, students were still cognizant of the positive impact of healthy foods on their health and wellbeing. Body image, self-esteem and mental health were also linked to healthy eating. *"When we make healthy foods choices I think for teenagers to be really healthy they have to get rid of those insecurities, and kind of cater to their own needs because some people are naturally inclined to be overweight or skinny, and you can't change that"* (FG 3).

Results reveal that time constraints were one of the key factors shaping students' healthy eating behavior, particularly in the morning. When asked to describe how decisions about healthy eating are made, one respondent noted, *"For me, it is probably whatever I can get to because at lunch I don't have as much time to grab stuff like most people, so whatever I can get I just grab and go"* (FG 1). Though many participants acknowledged the lack of nutritional value of many convenience foods, others nonetheless remained aware of the benefits of eating breakfast (e.g., improved focus and mental health).

Garnering student input on the issue of nutrition was seen as an important opportunity to promote dialogue between students, teachers and administrators. As one participant expressed,

If we were somehow allowed to have input; if they had a survey, then we could just mark off what we would rather have to eat at the cafeteria, or bring down the prices. So if they had some sort of fundraiser that would be able to provide a

base price, the prices become cheaper, then more people would want to come back to the caf (FG 1).

Participants saw value in having their voices heard, and felt that this process could be facilitated quite easily. Participants identified a lack of a formal community strategy as it relates to PPM 150 implementation.

P2: All we knew was they are taking away food that we thought we should be allowed to have due to the fact that we can gather it from other sources. And so a lot of the students thought that was something bad, and 1) wanted answers that we weren't getting, and 2) had other ways of getting the food they wanted.

P1: I think the biggest flaw in that is that when you take something away you need a substitute for it, right? They didn't come up with any new products or new meal options, and just basically limited us to what we could be having as to some old, gross, cold sandwiches that we keep in the fridge that has some questionable tuna in it (FG 3).

Having a choice in the types of foods offered for sale in the school setting was one strategy for engaging students around this issue, in addition to providing a range of different types of nutritious options.

At one school, several respondents were members of a school-based advocacy team committed to developing an organic food garden to cook school meals, and supporting student education regarding the sustainability of crops and eating locally. Results reveal that the impetus for the organic garden was both social and economic in nature. Creating a culture of nutrition would both increase students' awareness of the importance of developing food gardens, and it would also be cost effective.

Students aren't always inclined to eat healthy foods but we want to work on marketing these foods so that it's more desirable to students and if it's offered at a lower cost then it's more likely students would want to stay at school and eat food here, as opposed to going out and spending their money elsewhere (FG 3).

One of the participating schools offered a culinary arts program where students were involved in preparing foods for the school-based breakfast program. This program

created a vital link between students and the nutrition environment, helping them to cultivate their culinary skills, and by preparing foods for other students in the school.

DISCUSSION

During adolescence, physical and social changes affect eating behaviors and nutritional intake.¹⁰⁻¹¹ It is imperative to examine the school environment where nutrition interventions are being developed and deployed, given that it is where adolescents spend a large proportion of their waking time. A paucity of research has examined the experiences of students who are impacted by policy. Instead, most studies focus on perceptions of school administrators, teachers, school food directors, school wellness advocates, and parents.^{12-15,17} Other studies explore students' experiences at the elementary-and middle-school level school nutrition environment.^{16,18} Virtually no studies have examined secondary school student perceptions of the school nutrition environment, particularly in Canada. This environment is unique given that students are in walking distance to purchase food both on-and off-site. Further, given that the province of Ontario made the choice to extend their new nutrition policy (PPM 150) to secondary schools, an exploration of this environment is warranted. In this way, we conducted focus groups to explore students' perceptions of how their healthy eating choices are shaped. Results lead to a series of implications for policy.

First, given that PPM 150 is not linked to a formal funding strategy, that Canada does not fund a national school meal program, and that cafeteria and other school food sales (e.g., vending machines, tuck shops) are revenue-driven, the price of policy-compliant food for sale acts a key local level barrier. The high cost of policy-compliant food significantly impedes students' access to affordable, healthful foods in school cafeterias, particularly in low income neighbourhoods.¹⁵ As a result, schools see fewer

students purchasing food in the cafeteria, and more students purchasing food off-campus at nearby restaurants or fast-food outlets, at lower cost. The implications of this change in purchasing behaviors may be twofold: 1) food purchased off-campus may be less nutritious than policy-compliant cafeteria food; and 2) schools experience a loss in cafeteria revenue. This study makes a contribution to the very limited Canadian literature on the financial impact of non-funded nutrition policies in schools.²⁰ An opportunity exists to explore the role of potential pricing strategies and food subsidies.²⁷

Second, results reveal that the implementation of a new school nutrition policy has seen fewer students both eating and buying (due to its high cost) their lunch in the cafeteria, in favor of school hallways, cars, or in fast-food outlets. In this way, opportunities for developing social connections based on the principles of healthy eating become limited. The literature supports population approaches that acknowledge the relationship between social context and conditions and population eating patterns.²⁷⁻²⁸ For example, the findings of Delormier, Frohlich and Potvin,²⁸ reveal the value in exploring how meanings and norms structure the conditions needed to support meaningful healthy food choices that are socially acceptable, and financially supported. Other findings indicate that social environmental factors may be more important for healthy eating than physical factors.²⁹ Findings of the current study have important policy implications, including that school administrators, planners, and policy makers need to ensure that new and existing schools design appropriate physical spaces where students can eat together.

Third, time constraints are an important factor shaping students' food-related decision-making.³⁰ Ensuring that school cafeterias, vending machines, and tuck shops

stock healthy policy-compliant convenience foods (e.g., fruit, fruit chews, granola bars, frozen fruit bars) would support and encourage students to make the healthy choice, despite their busy schedules.³¹ In addition, given that adolescents are largely autonomous in their food-related decision making, it is important that food marketing strategies targeting adolescents support nutritious food choices.^{27,32}

Limitations

While these results include several strengths, there are two primary limitations. First, the sample does not include low-income or rural school populations. We expect that findings from rural schools may be different based on limited access to off-site fast food outlets, which may actually support healthy eating in the school environment. Secondly, given the sample includes two of 72 school boards; we need to be cautious in making generalizations. However, we expect that there would be some level of consistency in other boards' experiences, particularly those operating in densely populated, urban neighbourhoods.

IMPLICATIONS FOR SCHOOL HEALTH

Our findings illustrate that several local level factors shape the healthy eating choices of secondary students in Ontario vis-à-vis PPM 150. Given that no nationally funded school meal program exists in Canada, the revenue-driven nature of school cafeterias, vending machines, and tuck shops, means that high prices act as barriers to student purchasing behaviors. Findings support the notion that the school environment includes the neighborhood, operating beyond the walls/grounds of the school. In this way, local level partnership development between schools and neighborhood grocery stores, food markets and food distributors, is needed in order to subsidize the cost of healthy foods for sale, and to leverage funds to support school nutrition. Recognition of the context

(demographic) in which school nutrition policies are being implemented is essential, particularly as it relates to vulnerable low-income populations.

Creating a culture of nutrition - including role modeling, student-led nutrition initiatives, and eliciting student input - is a vital component of a supportive nutrition environment. Further research to explore how best to measure sociocultural factors related to school nutrition on a larger scale is needed. For example, could public health units, in conjunction with school nutrition champions, facilitate the design and implementation of student-led nutrition programs?

Future research to focus on school nutrition policy and program implementation is warranted. A population health intervention approach would help to highlight the potential impact of these initiatives at the population level³³ Such findings would be useful to policy-makers, public health representatives and urban planners involved in healthy school design.

Human Subjects Approval Statement

The study received clearance from the XXX University Research Ethics Board, and the ethics committees of both participating school boards.

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APPENDICES

Table 1 The Analysis Grid for Environments Linked to Obesity (ANGELO) Framework

SCALE \ TYPE	Micro-environment (settings)		Macro-environment (sectors)	
	<i>Diet</i>	<i>Physical Activity</i>	<i>Diet</i>	<i>Physical Activity</i>
Physical		What is available?		
Economic		What are the financial factors?		
Political		What are the rules?		
Socio-cultural		What are the attitudes, beliefs, perceptions and values?		

Adapted from Swinburn, Egger & Raza, 1999

Table 2 Socio-demographic comparison of school board census tracts (median, participating schools) and province

	Board 1	Board 2	Ontario
Average dwelling value	\$204,002	\$316,943	\$297,479
Median household income	\$45,035	\$80,991	\$60,455
High school education	72.6%	84.3%	77.8%
Immigrant status	31.7%	21.7%	28.3%
Unemployment rate	9%	4.3%	6.4%
Low income households	27%	6.3%	14.7%

Adapted from Statistics Canada, 2006 Canadian Census

Chapter Five

Discussion and Conclusion

Introduction

Recent research on the determinants of obesity has focused largely on the role of individual-level variables (biology and behaviour). And yet the literature repeatedly indicates that environments and obesity are inextricably linked. Obesogenic environments promote unhealthy food intake and few opportunities for physical activity (Townshend & Lake, 2009). To date, important contributions have been made in the obesity literature to focus on the social and physical (Pouliou & Elliott, 2010; Harrington & Elliott, 2009; Oreskovic et al., 2009; Pearce et al., 2007; Ross et al., 2007) environments; however, research on the policy environment is noticeably absent.

Schools are important local level settings where focused nutrition interventions are being developed and implemented, and where youth spend a large proportion of their waking time. In Canada, only a modest amount of research has been undertaken in the area of school nutrition policy and programming. Studies that do exist provide only a partial explanation (e.g., consumption patterns, weight-related outcomes, nutrition education). Most research has been undertaken at the elementary and middle school level, but virtually no research has examined the broader policy landscape of secondary school nutrition policy implementation in Canada. Provincial-level school nutrition policies vary widely, and an opportunity exists to assess the policy context for nutrition promotion.

This research program adopted the ANGELO framework (Swinburn, Egger & Raza, 1999) to explore the school nutrition policy environment in Canada in order to

investigate local level factors shaping implementation. In doing so, the research addressed three objectives:

- 1) To explore the consistency of policies across a range of spatial contexts (i.e., National, Provincial, regional);
- 2) To examine the perceptions of key stakeholders who are involved in policy implementation in Ontario secondary schools; and,
- 3) To investigate the perceptions of the Ontario secondary school user group.

This chapter provides a summary of key research findings, followed by theoretical, methodological and substantive contributions. The chapter closes with policy implications and future research directions.

Summary of key findings

In chapter two, findings revealed distinct differences across federal, provincial and regional level policies. Integrating nutrition education into the curriculum, and the availability of nutritious foods in schools, were key components of the physical environment across federal and provincial levels. Although the accessibility of nutritious food in schools was a key federal level priority, it was less so at the provincial level, and virtually absent from regional level policy. Gaps in regional level policy include incorporating nutrition education in the curriculum, making the link between nutrition and obesity, and the omission of Sabrina's Law (anaphylaxis management strategy) in the Ontario School Food and Beverage Policy (PPM 150) (2010).

In chapter three, findings indicate that the high cost of policy-compliant food for sale, and loss of revenue from cafeteria sales (economic), proximity of schools to off-site fast food outlets (physical), the restrictive nature of policy, and need for a range of key

stakeholder involvement in policy development and implementation (political), and the role of stigma and school culture (sociocultural), act as key local level barriers to school nutrition policy implementation.

The findings of chapter four are threefold. First, given that PPM 150 is not linked to a formal funding strategy, that Canada does not fund a national school meal program, and that cafeteria and other school food sales (e.g., vending machines, tuck shops) are revenue-driven, the price of policy-compliant food for sale acts a key local level barrier. Second, the implementation of a new school nutrition policy has seen fewer students both eating and buying (due to its high cost) their lunch in the cafeteria, in favour of school hallways, cars, or fast-food outlets. Third, time constraints make it difficult for students to choose nutritious foods both within and outside of school.

Contributions

Theoretical Contributions

This study makes several theoretical and substantive contributions to the research literature on the geographies of health, school nutrition, and school health policy.

Theoretically this research utilized of the ANGELO framework (Swinburn, Egger & Raza, 1999) to organize and conceptualize the policy environment. With the exception of a recent study in the area of obesity-related policy and neighbourhood health (Asanin Dean & Elliott, 2012), most research in the area of nutrition and physical activity has adopted ANGELO for the purposes of undertaking systematic reviews (Lakerveld et al., 2012; Safron et al., 2011; Kirk, Penney & McHugh, 2009; Smith & Cummins, 2009; van der Horst et al., 2007). In this research, the ANGELO framework was particularly useful for conceptualizing and comparing the relationship between regional and upper level

policy priorities, by both scale & environmental type. For example, at the regional level, there is an absence of mention of the accessibility of nutritious food. Gaps identified in policy priorities (chapter 2) - nutrition education, and the link between nutrition and obesity - helped to frame research objectives and questions at the local level (chapters three and four). In this context, there is a need to further understand the policy development process. In doing so, partnering with key community-level school nutrition stakeholders and policy makers would provide an important opportunity to address the gaps between regional and upper level policies. A focus on food accessibility at the local level would help to address disparities in students' accessing healthy food. Such a focus would involve facilitating food subsidies, partnership development with local food retailers, and school garden initiatives. Further, there is a need to explore the policy context for school nutrition in vulnerable populations (north/south, rural/urban, ethnically diverse).

Substantive Contributions

This study makes several substantive contributions, all of which lead to implications for policy. First, findings help fill a gap in research related to the political environment surrounding obesity and, more specifically, healthy eating in schools (Raine et al., 2008). The adoption of the ANGELO framework helped to facilitate a systematic examination of school nutrition policy and technical reports operating across a range of levels (Swinburn, Egger & Raza). Findings illustrate gaps between Canadian federal and provincial, and regional level policy priorities in the area of healthy eating and school nutrition. The absence of the accessibility of nutritious foods from regional level policy is problematic, and has significant implications in school settings. Food access at school,

particularly access to low-cost, healthy food is shaped by socioeconomic status (individual and neighbourhood). Severely limited access to healthy foods may be prevalent in low-income neighbourhoods, and/or in rural regions (Lytle, 2009). These findings suggest that economic factors (e.g., cost) are intrinsically connected to aspects of the physical environment (e.g., accessibility of nutritious food, geographical proximity to fast-food outlets, grocery stores) (Asanin Dean & Elliott, 2012). Accessibility to nutritious food for vulnerable populations requires further attention at the local level, particularly in rural and low-income neighbourhoods (Shearer et al., 2012).

Second, findings support the notion that the school environment extends beyond the geographical and political boundaries of schools. While research on this environment has focused on food in schools, these findings also support a need to examine the external food environment, situated within the larger neighbourhood. These insights indicate how individuals relate to places, in addition to the position of places relative to each other (Cummins et al., 2007). By examining perceptions of key features of both the local area (i.e., school food outlets and student food behaviour), and structural relationships between the local area and the wider context within which it is located (i.e., competing retail outlets in the neighbourhood), a more comprehensive description of the school nutrition environment is provided (Cummins et al., 2007). These findings support the assertion that health interventions need to be examined within their social context (Chiu & West, 2007). For example, opportunities exist to develop community partnerships between secondary schools and local businesses. Such partnerships could help promote students' healthy eating through school subsidized menu options and coupons when

students eat away from school. Local level businesses and organizations have a role to play in health promotion efforts targeting secondary school students.

Third, findings illustrate the important role of the sociocultural environment. Population approaches that acknowledge the relationship between social context and conditions and population eating patterns are supported in the literature (Raine, 2005, Delormier, Frohlich & Potvin, 2009). Recently, results of Delormier, Frohlich and Potvin (2009) highlighted the value in exploring how meanings and norms structure the conditions needed to support meaningful healthy food choices that are socially acceptable, and financially supported. Findings of the current study have important health policy implications, including that school administrators, planners, and policy makers ensure that new school nutrition policies include a descriptive section on how to design appropriate physical spaces where students can eat together.

Future research directions

Three areas are identified for further research. First, the findings do not represent the experiences of rural and ethnically diverse populations. We do expect there would be differences in findings from rural and ethnically diverse schools based on their having more limited access to external food outlets, and having unique dietary needs. Given the noted barriers to food access in rural and remote regions, and that Canada is a nation of immigrants, there is a need for policies to promote inclusiveness of diversity and future research to explore the policy context for school nutrition in these areas.

Second, the data set includes the experiences of only one public health representative. Given their role in promoting health living, developing and implementing public policy, and advocating for conditions to improve the health of the population (City

of Toronto, 2013), they have a vital role to play in supporting the efforts associated with school nutrition. It is important to get a greater sense of perspective of informants in order to explore the experiences, perceptions and role or lack thereof of public health personnel in local school nutrition policy development and implementation.

Finally, given that the school is an important setting where nutrition interventions are being developed and deployed, it would be useful to examine this setting in the context of a population health intervention research model (Hawe & Potvin, 2009). Specifically, intervention research to examine nutrition programs aimed at improving nutritional intake of students in secondary schools across Ontario, including an assessment of how the policy environment influences program development and sustainability, is needed. For example, such an intervention would include mapping the environmental features of barriers and facilitators for healthy eating programs in schools vis-à-vis nutrition programs. In addition, go-along interviews and photo-voice methods would be a useful way to conceptualize the way in which individuals interact with their environments. An exploration of the broader environment, including key features of the local area (i.e., school food outlets) and structural relationships between the local area and the wider context within which it is situated (i.e., local food retailers), would provide a multi-level examination. Based on the findings of an exploration of the broader environment, the development of a nutrition intervention focused on making connections between the local area (schools) and the wider community context (local food retailers) would facilitate key community partnerships. In doing so, local supermarkets and fast-food retailers could partner with schools to provide subsidies on sales of healthy food options to students.

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Appendix A: Research Ethics Material

DATE

Letter of Information/Consent form: Phase 2 school-level stakeholder

The school environment: Understanding the context of a health promotion intervention

Investigators:

Student Investigator:

Michelle Vine
School of Geography and Earth Sciences
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Hamilton, Ontario, Canada
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Email: vinemm@mcmaster.ca

Faculty Supervisor:

Dr. Susan J. Elliott
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(905) 525-9140 ext. 23139
Email: elliotts@mcmaster.ca

Research Sponsor:

*Canadian Institutes of Health Research
Heart and Stroke Foundation of Canada*

Purpose of the Study

I am doing this research as part of my PhD dissertation. Specifically, my research seeks to examine a school-based nutrition program to understand the link between the school environment and health as it relates to a specific health promotion intervention. In doing so, my research will explore the perceptions of key informants of the factors influencing school nutrition policy.

You are invited to take part in this study on school nutrition in XXX, Ontario. I am hoping to learn about your experiences and/or perceptions of the XXX Policy and XXX Program.

Procedures involved in the Research

During the study, I will be conducting an interview with you, lasting a maximum of 45 minutes. I will ask you to suggest a time and location of convenience for the interview, or we can do a telephone interview. With your permission, the interview will be tape-recorded and transcribed for future analysis. I will also ask you for some demographic/background information, such as your age and education.

I will send you the interview guide ahead of time so you have a sense of what we will be discussing. I will be asking you questions about your perceptions of and role in the XXX policy and XXX program. Key questions include the following:

- Can you tell me about the XXXX program, operating in the XXX School Board?

- What is your role (if any) in the administration or operation of XXX?
- What are some of the perceived facilitators and barriers to program implementation?

Potential Harms, Risks or Discomforts:

It is not likely that there will be any harms or discomforts from/associated with participating in this research study. You do not need to answer questions that you do not want to answer or that make you feel uncomfortable, and you can withdraw (stop taking part) at any time. I describe below the steps I am taking to protect your privacy.

Potential Benefits

Findings from this study will help us to understand local-level factors that shape policy implementation, including key facilitators and barriers. As a result of this study, the local community, key stakeholders, and the scientific community will be able to learn about the process of implementing school-based nutrition programs. The findings will also be valuable to health policy-makers.

Payment or Reimbursement

There will be no payment for participation in this study.

Confidentiality

Information about the decisions of potential or actual respondents to participate will remain confidential; only the student researcher and the faculty supervisor, both at McMaster University, will have access to this information, as well as to all research data. All information collected will be kept confidential and analyses will not allow for identification of organization or individual. In doing so, no identifying information of participants or organizations will be used in order to protect the identity of research participants.

The interview will take place in a location that is private, and at a time that is most convenient for the participant. All respondents will be asked to provide written permission to have their interview audio-recorded (below), for subsequent transcription and analyses. If respondents decide they do not wish to have their interview audio-recorded, the student researcher will take written notes instead.

Research data will be accessible only by the Student Investigator and Faculty Supervisor. The interview transcripts will not contain participant names or contact information. Privacy will be respected.

The information/data you provide will be kept in a locked desk/cabinet where only we will have access to it. Information kept on a computer will be protected by a password. Once the study has been completed, the data will be destroyed after 7 years.

Participation and Withdrawal

Participation in this study is entirely voluntary, and there are no consequences to nonparticipation. If participants decide to participate, they may decide to stop at any

time, even after signing the consent form or partway through the study. If a participant decides to withdraw from the study, they can contact us to let us know and there will be no consequences.

Information about the Study Results

I expect to have this study completed by April 1, 2012. If you would like a brief summary of the results, please let me know how you would like it sent to you. Following project completion, a research summary will be sent to the XXXX District School Board, research ethics board.

Questions about the Study

If you have questions or need more information about the study itself, please contact me:

Michelle Vine
School of Geography and Earth Sciences
McMaster University
1280 Main Street West
Hamilton, Ontario, Canada L8S 4K1
Email: vinemm@mcmaster.ca
T: 905-525-9140 ext. 20438

This study has been reviewed by the McMaster University Research Ethics Board and received ethics clearance. If you have concerns or questions about your rights as a participant or about the way the study is conducted, please contact:

McMaster Research Ethics Secretariat
Telephone: (905) 525-9140 ext. 23142
c/o Research Office for Administrative Development and Support
E-mail: ethicsoffice@mcmaster.ca

CONSENT

I have read the information presented in the information letter about a study being conducted by Michelle Vine, of McMaster University.

I have had the opportunity to ask questions about my involvement in this study and to receive additional details I requested.

I understand that if I agree to participate in this study, I may withdraw from the study at any time. I have been given a copy of this form. I agree to participate in the study.

Signature: _____

Name of Participant (Printed) _____

1. I agree that the interview can be audio recorded.

... *Yes*

... *No*

2. ...*Yes, I would like to receive a summary of the study's results.*
Please send them to this email address

or to this mailing address:

Information Letter/Consent form: Phase 3 secondary school student

Understanding how local level factors shape students' healthy eating choices in a school nutrition program

Investigators:**Student Investigator:**

Michelle Vine
School of Geography and Earth Sciences
McMaster University
Hamilton, Ontario, Canada
(905) 525-9140 ext. 20438
E-mail: vinemm@mcmaster.ca

Faculty Supervisor:

Dr. Susan J. Elliott
Dean, Applied Health Sciences
University of Waterloo
Waterloo, Ontario, Canada
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Email: elliotts@uwaterloo.ca

Why are we doing this study?

In this study, we want to explore the local level factors that shape healthy eating choices in secondary schools in youth aged 14-19. We are interested in understanding what factors adolescents perceive to impact their food choices, including factors enabling or hindering healthy food choices, peer influence on food choice, and how role modeling impacts food choice. We are also hoping to understand what role the Ontario School Food and Beverage Policy (PPM 150) and the XXX Program plays in determining adolescent eating choices.

What will happen during the study?

You will be asked to take part in a focus group interview with between 4-6 other students from your school, which will be led by a student researcher from McMaster University. The focus group interview should last approximately 1 hour, and will take place in your school during your lunch hour, or after school. In the focus group we will talk about things like food choices at school, factors that influence your decisions about eating nutritious foods, and how others affect your food choices. For example, some of the questions you will be asked include:

Tell me how you decide what to eat when you are at school

Do you find that it is easy or difficult to make nutritious food choices at school?

How would you describe a nutritious lunch?

Do you think your friends impact your decisions about what you eat at school?

We will be tape recording the interview so that we can type it out and read it at a later date.

Will anything bad happen during the study?

It is not likely that anything bad will happen if you decide to participate in the study. If you do feel embarrassed or uncomfortable by any of the questions you are asked, you do not have to answer those questions. You can choose to withdraw (stop taking part) from the study at any time. Due to the focus group format, there may be some social (peer) pressure on students not to withdraw from the study in front of others (i.e., it would be too embarrassing).

The student researcher will also be available to you and your parent(s)/guardian to discuss any concerns you/they may have about the research before, during and after the focus group. A summary of responses will be provided back to you in a timely manner, so that you are able to see your responses in relation to others.

What good things could happen if I decide to participate?

We hope that the study will help us understand more about what secondary school participants think about nutritious eating at school, and what factors help to decide their food choices. The study findings could help your school board and public health personnel develop nutrition programs for secondary schools.

Will I be paid for participating in the study?

As a way of thanking you for participating in the study, we will give you a \$20 gift card. You will be given a choice between a gift card to a movie theatre, a gift card to a mall, and a gift card to a grocery store- all close to your neighbourhood.

Who will know what I said or did in the study?

Everyone's views are welcomed and important. The information, which we will collect today, will be attributable (*connected or associated*) to you as a group. Nothing you say in the study will be told to anyone else, including your teachers, other students and parent/guardian. We will not identify quotes or ideas of *any one person* of this group. Because of the nature of small communities or groups, it is possible that people could link participants in this room to quotes in the report. This is why we need to talk about confidentiality. We *are* assuming that when we learn about one another's views, they remain confidential. In a small community (group) like this, people are identifiable to some degree by their views and opinions. Having said this, and having made these requests, you know that we cannot guarantee that everyone in the room will honour the request. So we are asking you to make only those comments that you would be comfortable making in a public setting; and to hold back making comments that you would not say publicly.

Anything heard in the room should stay in the room. All voices are to be heard, so I will step in if too many people are speaking at once or to make sure that everyone has a chance to speak.

Only the student researcher and the faculty supervisor will be able to hear and read the things you have said in the focus group.

All information that is recorded and typed will be stored in locked cabinets, and only the student researcher and faculty supervisor will have access.

You and your parent/guardian will be asked to sign this consent form so that we have your written agreement to have the focus group interview tape recorded (below), for subsequent typing. The typed focus group interview will not include your name, contact information or the names and contact information of any other students participating in the focus group.

What if I decide to participate and then change my mind?

You are volunteering to participate in this study, and nothing bad will happen if you decide you do not want to participate, even after you sign the consent form or partway through the focus group interview. If you decide to withdraw from the study, you will still receive your token of appreciation. In cases where a participant decides to withdraw from the study, removal of data from the focus group transcript is not possible (i.e., if a participant withdraws then his/her data will be retained (i.e., not deleted).

If you decide to withdraw from the study, please contact Michelle Vine by email at vinemm@mcmaster.ca, or telephone at 905-525-9140, ext. 20438. You do not need to provide a reason for your decision, just simply state that you would like to withdraw from the study.

What if I want to know about the study results?

I expect to have this study completed by November 1, 2012. If you would like me to send you a brief summary, please let me know how I can send it to you.

Following project completion, a research summary will be sent to your school board.

Questions about the Study

If you have questions or if you want more information about the study, please email or call me at:

Michelle Vine
School of Geography and Earth Sciences
McMaster University
1280 Main Street West
Hamilton, Ontario, Canada L8S 4K1
Email: vinemm@mcmaster.ca
T: 905-525-9140 ext. 20438

This study has been reviewed by the McMaster University Research Ethics Board and received ethics clearance.

If you have concerns or questions about your rights as a participant or about the way the study is conducted, please contact:

McMaster Research Ethics Secretariat
Telephone: (905) 525-9140 ext. 23142
c/o Research Office for Administrative Development and Support
E-mail: ethicsoffice@mcmaster.ca

CONSENT

I have read the information presented in the information letter about a study being conducted by Michelle Vine, of McMaster University.

I have had the opportunity to ask questions about my involvement in this study and to receive additional details I requested.

I understand that if I agree to participate in this study, I may withdraw from the study at any time. I have been given a copy of this form. I agree to participate in the study.

Signature of Participant : _____

Name of Participant (Printed) _____

Signature of Parent/Guardian _____

1. *I agree that the interview can be audio recorded.*

... *Yes*

... *No*

2. *...Yes, I would like to receive a summary of the study's results.*

Please send them to this email address _____

or to this mailing address: _____

Appendix B: Data Collection Tools

Interview Guide: Phase 2 School-level stakeholder

(School-level Stakeholder from the
XXX School Board)

*The school environment: Understanding the context of a
health promotion intervention*

Interview Questions

The following questions seek to explore: the key informant's current role; the context of school nutrition in XXX (city); the perceived goals of the PPM 150 policy and XXX program; perceptions about the success of the XXX program, including facilitators and barriers to program implementation, and strengths and weaknesses; and the extent to which the XXX program has (or should) participated in an evaluation strategy.

Construct	Question	Probes
Context	<p>What is your current role at the XXX School Board?</p> <p>What brought you to this position?</p>	<ul style="list-style-type: none"> - length of time in current position? - has your role changed over time? - what training have you had for this job/position? - what types of things do you do in this role?
School nutrition in Hamilton	<p>Tell me about the landscape of school nutrition in XXX (city)</p> <p>To what extent do you or your organization see nutrition, broadly, and school nutrition, specifically, as a poverty</p>	<ul style="list-style-type: none"> - what's going on in school nutrition in Hamilton? - whose "responsibility" is school nutrition in this community (i.e., the community, the school, parents)?

	issue?	
XXX program	<p>Tell me about the PPM 150 policy?</p> <p>Tell me about the XXX program</p> <p>What were/are the XXX's (school board's) expectations for XXX?</p> <p>Have these expectations changed since its inception in 2000?</p> <p>What type of communication strategy is in place between the XXX (school board) and the XXX (funding ministry) with regards to the XXX program?</p>	<p>-objectives, goals, implementation issues</p> <p>- what are the goals/objectives of the XXX program?</p> <p>- who (stakeholders) participated in the design of this program?</p> <p>- who participates in the implementation of the XXX program?</p> <p>- if so, how come?</p> <p>- is there an annual program review?</p>
Perceptions about the XXX program	<p>What is the perception, in your view, about the success of the XXX program at the school-level?</p> <p>What are some of the perceived facilitators and barriers to program implementation?</p> <p>Do you think the XXX program has achieved its</p>	<p>Positive?</p> <p>Negative?</p> <p>Resources?</p> <p>Personnel?</p> <p>- strengths of program-weaknesses of program</p>

	<p>expected goals?</p> <p>Have there been any targeted evaluation strategies for XXX?</p> <p>How do you perceive user satisfaction with the XXX program?</p> <p>Are there any changes that you think would improve the XXX program?</p>	<p>If so, who have they been conducted by?</p> <p>If not, do you see a need for an evaluation strategy?</p> <p>- quality of programming</p> <p>- student/school experiences of XXX</p>
Discussion	<p>Is there anything else you would like to add that we haven't already talked about?</p> <p>Is there anyone else you think we should talk to about school nutrition, and/or the XXX program?</p>	
Demographic data		<p>Educational level</p> <p>Age</p>

Thank you very much for your input- it is much appreciated.

Interview Guide: Phase 2 community level stakeholder

(Representative from community agency)

*The school environment: Understanding the context of a health promotion intervention***Interview Questions**

The following questions seek to explore: the key informant's current role; the context of school nutrition in XXX; the perceived goals of the XXX program; perceptions about the success of the XXX program, including facilitators and barriers to program implementation, and strengths and weaknesses; and the extent to which the XXX program has (or should) participated in an evaluation strategy.

Construct	Question	Probes
Context	<p>What is your current role at the XXX (community agency)?</p> <p>What brought you to this position?</p>	<ul style="list-style-type: none"> - length of time in current position? - has your role changed over time? - what training have you had for this job/position? - what types of things do you do in this role?
School nutrition in Hamilton	<p>Tell me about the landscape of school nutrition in XXX</p> <p>To what extent do you or your organization see nutrition, broadly, and school nutrition, specifically, as a poverty issue?</p>	<ul style="list-style-type: none"> - what's going on in school nutrition in XXX? - whose "responsibility" is school nutrition in this community (i.e., the community, the school, parents)?

XXX program	<p>Tell me about the XXX program</p> <p>What is your (organizations) role with respect to the XXX program in XXX?</p> <p>In what way(s) does your organization support the XXX program?</p>	<ul style="list-style-type: none"> - what are the goals/objectives of the XXX program? - who (stakeholders) participated in the design of this program? - who participates in the implementation of the XXX program? - what policy guides school nutrition programming and the XXX program in this community? - what areas of school nutrition are most important to your organization? - have these changed over time? - what types of support does your organization provide to the XXX program? For example, in-kind or financial resources, expertise, etc.
Perceptions about the PIN program	<p>What is the perception, in your view, about the success of the XXX program in the community?</p> <p>What are some of the perceived facilitators and barriers to program implementation?</p> <p>Do you think the XXX program has achieved its expected goals?</p> <p>Have there been any targeted evaluation strategies for XXX?</p>	<p>Positive?</p> <p>Negative?</p> <p>Resources?</p> <p>Personnel?</p> <ul style="list-style-type: none"> - strengths of program - weaknesses of program <p>If so, who have they been conducted by?</p> <p>If not, do you see a need for an evaluation strategy?</p>

	<p>How do you perceive user satisfaction with the XXX program?</p> <p>Are there any changes that you think would improve the XXX program?</p>	<p>- quality of programming</p> <p>- student/school experiences</p>
Discussion	<p>Is there anything else you would like to add that we haven't already talked about?</p> <p>Is there anyone else you think we should talk to about school nutrition, and/or the XXX program?</p>	
Demographic data		<p>Educational level</p> <p>Age</p>

Thank you very much for your input- it is much appreciated.

Focus Group interview guide: Phase 3 secondary students

Understanding how local level factors shape students' healthy eating choices in a school nutrition program

Researcher(s): Michelle Vine

NOTE: TEXT WRITTEN IN ITALICIZED BOLD CAPITAL LETTERS CONSTITUTES ADDITIONAL REMINDERS MEANT TO GUIDE THE FOCUS GROUP FACILITATOR ONLY.

[THE COMPLETION OF THE INTRODUCTORY SECTION OF THE FOCUS GROUP SHOULD TAKE APPROXIMATELY 10-15 MINUTES]

I) INTRODUCTION AND INSTRUCTIONS:

Hello, my name is Michelle Vine. Thank you for agreeing to participate in this focus group meeting. Just to remind everyone, I'm looking for your opinions about how students' make healthy eating choices in high school.

[POINT OUT REFRESHMENTS if available, NAME TAGS if used – people should use their first name or pseudonym only].

In a minute, we will all introduce ourselves – first names only. But first, I would like to walk you through the consent form that is in front of you.

[FOR FACILITATOR: REVIEW INFORMED CONSENT FORM AND ANSWER ANY QUESTIONS ABOUT IT. COLLECT SIGNED CONSENT FORMS AND ENSURE THAT PARTICIPANTS HAVE A COPY OF THE LETTER OF INFORMATION TO TAKE WITH THEM (IF APPROPRIATE FOR THE TOPIC AND GROUP).

Confidentiality: ***[READ ALOUD]*** Before we begin our discussion about healthy eating at school, I want to spend a few moments **talking about confidentiality** and to go over some basic ground rules for our focus group discussion today:

- Everyone's views are welcomed and important.
- The information, which we will collect today, will be attributable (*connected or associated*) to you as a group.
- We will not identify quotes or ideas of *any one person* of this group. Because of the nature of small communities or groups, it is possible that people could link participants in this room to quotes in the report. This is why we need to talk about confidentiality.
- We *are* assuming that when we learn about one another's views, they remain confidential. In a small community (group) like this, people are identifiable to some degree by their views and opinions.
- Having said this, and having made these requests, you know that we cannot guarantee that the request will be honoured by everyone in the room.

- So we are asking you to make only those comments that you would be comfortable making in a public setting; and to hold back making comments that you would not say publicly.
- Anything heard in the room should stay in the room.
- All voices are to be heard, so I will step in if too many people are speaking at once or to make sure that everyone has a chance to speak.
- I may also step in if I feel the conversation is straying off topic.
- At the end of the focus group I will also ask you to answer a few questions about your gender and age (Focus Group Background Information Sheet).
- You can expect this discussion group to last about 1 hour.

Use of Tape Recorder *[If applicable]*

- As you will recall, this focus/discussion group will be recorded to increase accuracy and to reduce the chance of misinterpreting what anyone says.
- All tapes and typed interviews will be kept in locked cabinets in the researcher's office.
- Names will be removed from typed interviews. Participants will have coded numbers attached to their name, which only I will know.
- Only my thesis supervisor and I will have access to typed interviews (with personal names removed) of this focus group.
- For typing purposes, I might remind you to say your first name for the first few times you speak so that when I'm transcribing the tape I can get used to recognizing your voice. That will ensure we assign the correct code to each person's answers. I will give you a gentle reminder.
- I'll also ask that when using short forms, you say the full name at least once to aid transcription.

[AT THIS POINT, GROUP MEMBERS CAN QUICKLY INTRODUCE THEMSELVES –remind them that it is 'first names only'.]

[HAND OUT ANY MATERIALS (IF APPLICABLE) THAT THE PARTICIPANTS WILL NEED DURING THE FOCUS GROUP INCLUDING PENS OR SCRAP PAPER. GIVE THEM A FEW MINUTES TO READ OVER ANY WRITTEN MATERIAL NOTING THAT THEY CAN MAKE NOTES IN THE MARGINS BEFORE THE DISCUSSION BEGINS.]

II. INTERVIEW

- Focus group discussion begins with the facilitator asking the first question.
- *Open up discussion for general responses of participants to each question.*
- **Interview questions:**

Construct	Question	Probes
1. Healthy eating	<p>What does being healthy mean to you?</p> <p>What does healthy eating mean to you?</p> <p>Where did you learn about how to eat healthy?</p> <p>How important is healthy eating to teenagers today?</p> <p>How important is healthy eating to you?</p> <p>How does the types of foods you eat influence:</p> <p>-your health?</p> <p>-how you feel?</p> <p>-your body weight?</p> <p>-how well you do in school?</p>	<p>-how would you describe a healthy breakfast, lunch or dinner, drink?</p> <p>-at school, from your parents, peers?</p>
2. Healthy eating at school	<p>How often do you buy something to eat or drink during the school day?</p> <p>Where do you buy food or drinks from during the school day?</p>	<p>-cafeteria</p> <p>-vending machines</p> <p>-tuck shop</p> <p>-store or restaurant nearby</p> <p>-breakfast, snack, lunch</p>

	Does your school have any nutrition programs available to students?	
3. Determinants of healthy eating	<p>Tell me how you decide what to eat when you are at school</p> <p>What factors impact how you decide what to eat at school?</p> <p>Are there any changes that you think would improve the food environment at school?</p>	<p>-cost</p> <p>-nutrition</p> <p>-what is available</p> <p>-what friends or teachers are eating</p>
4. Other comments/ questions	Is there anything we forgot or something important that we should know about?	

Wrap-up:

- Introduce the following anonymous “information sheet” now.
- Remind participants “what is said in the room should stay in the room”.
- Thank the participants.

FOCUS GROUP BACKGROUND INFORMATION SHEET

PLEASE DO NOT

Put your name

on this sheet

INSTRUCTIONS: Please fill in this that will provide us with some basic background information about you.

1. I'm a (Check one):
 Male

 Female

2. I'm (Check one):
 between the ages of 13-15

 between the ages of 16-18

 over the age of 19

 I prefer not to say

3. I'm in grade (Check one):
 9

 10

 11

 12

 Other _____

 I prefer not to say

Please turn over this brief information sheet and leave it on the table when you leave.
Thanks.

Appendix C: Recruitment Materials

Recruitment letter: Phase 2 School-level stakeholders

DATE

NAME OF CONTACT OF ORGANIZATION, TITLE, ADDRESS

Dear Mr/Ms:

The current research study, entitled “**The school environment: Understanding the context of a health promotion intervention,**” is part of my PhD dissertation being undertaken in the School of Geography and Earth Sciences at McMaster University. We would like to enlist your help in a study about school nutrition policy and programs operating in your school. We invite you to participate in an interview (lasting 45 minutes) that will assist us in documenting your perceptions about local-level factors shaping implementation of nutrition policy and programs in XXX schools. Representatives from the Ministry, the school board, public health and a selection of schools will be asked to take part in this phase of research to get a sense of these factors. Given your organizational involvement you were identified as being a key informant in XXX, Ontario.

This research has received approval from the Research Ethics Board at McMaster University. Research ethics board clearance has also been received from the XXX.

In the next week we will contact you to discuss your interest in participating in the interview, and to schedule an interview date that is convenient for you. In order to help prepare interview responses, an electronic copy of the interview checklist will be sent to you in advance.

We hope that you will be interested in participating and look forward to speaking with you directly in the next week. If you have any questions, please do not hesitate to contact Michelle Vine, PhD Candidate, by phone at **905-525-9140, ext. 20438, or by email at vinemm@mcmaster.ca**.

Sincerely,

Michelle Vine, MA
Student Investigator
School of Geography
and Earth Sciences
McMaster University
Hamilton, Ontario

Susan Elliott, PhD
Faculty Supervisor
School of Geography
and Earth Sciences
McMaster University
Hamilton, Ontario

Recruitment letter: Phase 2 Community-level stakeholders

DATE

NAME OF CONTACT OF ORGANIZATION, TITLE, ADDRESS

Dear Mr/Ms:

We would like to enlist your help in a study about the [local school nutrition] program. As part of “**The school environment: Understanding the context of a health promotion intervention,**” we invite you to participate in an interview (45-60 minutes) that will assist us in documenting your perceptions about factors influencing implementation of the XXX program in XXX schools. Representatives from the Ministry, the school board, public health and a selection of XXX schools will be asked to take part in this phase of research to get a sense of these factors. Results of key stakeholder interviews during phase one will be used for the purposes of informing focus groups with the user group (phase two). The findings of both phases of research will provide an evidence base to better understand the link between the school environment and health as it relates to a specific health promotion intervention. Given your organizational involvement you were identified as being a key stakeholder in the XXX program in XXX, Ontario.

Participation in this study is entirely voluntary, and there are no consequences to nonparticipation. In addition, information about the decisions of potential or actual respondents to participate will also remain confidential; only McMaster University researchers will have access to this information, as well as to all research data. All information collected will be kept confidential and analyses will not allow for identification of organization or individual. In doing so, no identifying information of participants or organizations will be used in order to protect the identity of research participants. This research has received approval from the Research Ethics Board at McMaster University.

In the next week we will contact you to discuss your interest in participating in the interview, and to schedule an interview date that is convenient for you. In order to help prepare interview responses, an electronic copy of the interview checklist will be sent to you in advance.

We hope that you will be interested in participating and look forward to speaking with you directly in the next week. If you have any questions, please do not hesitate to contact Michelle Vine, PhD Candidate, by phone at **905-525-9140, ext. 20438, or by email at vinemm@mcmaster.ca**.

Sincerely,

Michelle Vine, MA
Student Investigator
School of Geography

Susan Elliott, PhD
Faculty Supervisor
School of Geography

Ph.D. - M.M. Vine

McMaster University - Geography & Earth Sciences

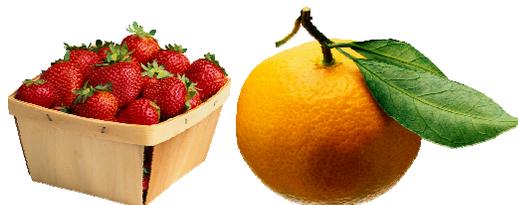
and Earth Sciences
McMaster University
Hamilton, Ontario

and Earth Sciences
McMaster University
Hamilton, Ontario

Recruitment Poster: Phase 3 secondary school students



Inspiring Innovation and Discovery



**PARTICIPANTS NEEDED FOR
RESEARCH IN HEALTHY EATING**

We are looking for volunteers to take part in a study about health eating at school.

DO YOU KNOW ABOUT:

- **the Ontario School Food and Beverage Policy (PPM 150) operating in your school; and/or**
- **the Hamilton Partners in Nutrition (HPIN) program (which provides breakfast and/or lunch to students in your school)?**

If so, we would like to invite YOU to participate in a one hour focus group interview!

In appreciation for your time, you will receive
a \$20.00 gift card

For more information about this study, or to volunteer for this study, please contact:

Michelle Vine
905-525-9140 Ext. 20438
Email: vinemm@mcmaster.ca

This study has been reviewed by, and received ethics clearance by the McMaster Research
Ethics Board

Technical Appendix: Research Methods

The purpose of this section is to provide additional details on the research methods adopted in this thesis. These include criteria for the selection of policies, technical reports, school board and school selection criteria, participant recruitment strategies, and data analysis procedures.

Phase 1: Document analysis

The purpose of this paper was to investigate the context of school nutrition policy in Canada, particularly the relationship between regional and upper level policies. In doing so, we examine policy documents and technical reports across three levels - national, provincial, and regional. Selection criteria focused on category of document, publication period, and inclusion/exclusion criteria. Two categories of documents were considered: i) policies, including nutritional standards/criteria related to food for sale at school; and, ii) technical reports devoted to healthy eating research and guidelines in schools, published by governmental (e.g., Ministry of Education) and non-governmental (e.g., Alberta Coalition for Healthy School Communities, Canadian Institute for Health Information) agencies. Documents were excluded if they were not school-based, or if they focused exclusively on physical activity in schools.

Given that nearly 40% of the Canadian population resides in Ontario (Statistics Canada, 2011), and that it is the focus of later stages of this project, significant attempts were made (via email and telephone) to retrieve regional-level school nutrition policies from all English-language, public Ontario school boards (N=72). Twenty-nine school boards indicated that they were currently operating *without* a nutrition policy; we did not include policies from the twelve French language boards because of budgetary restraints related to translation. Despite several attempts (a maximum of 3) via email and telephone, we were unable to retrieve policies from an additional five boards.

Federal and provincial level documents selected for analysis addressed at least two of the following: a) population focus (children and youth aged 2-17); b) school based setting (primary- and secondary-schools); c) school nutrition environment (guidelines for nutrition standards and criteria, food for sale in school cafeterias, tuck shops, etc.); d) students' health status (overweight and obesity, healthy living); and e) population health (nutrition programs, interventions). Documents were publically available, and located

through a web-based search of federal health agencies, provincial health ministries, non-governmental school nutrition organizations, and by scanning reference lists of documents selected for inclusion. Using the inclusion criteria identified above, the lead author finalized the sample of documents, which were compiled with the support of a research assistant.

Nutrition policies and interventions have been developed in response to rising rates of childhood overweight and obesity in Canada since the late 1970s. The decision to focus on two different publication time periods for national and provincial (1989-2009), and regional (1989-2011) documents reflects the fact that 81% of regional level policies emerged between 2007 and 2011, subsequent to the implementation of several key national and provincial technical reports and policies related to the vital role of nutrition in the school setting (between 2004 and 2006) in Canada. New Brunswick was the first province to implement a formal school nutrition policy in 1991, and is the only province to have undergone a revision (in 2008) since its implementation within the 20-year period between 1989 and 2009. Given that seventeen years lapsed between the emergence of New Brunswick's first policy and its revision, we opted to include both versions in the analyses. Relevant English language policy documents and technical reports across Canada were selected from the national (N=8) and provincial level (n=24) if they were published between 1989 and 2009. Regional (n=26) policies from Ontario were included if they were published between 1989 and 2011.

Qualitative thematic analysis was adopted to explore high-level themes (i.e., principles and objectives, system themes, and key stakeholders) operating within federal and provincial level policies and technical reports. A coding template was developed based on analyses of a sub-set (n=5) of randomly selected documents. All documents were coded using a line-by-line coding technique, whereby passages of text were selected to correspond to individual codes listed in the template (Miles & Huberman, 1994). Data were then uploaded to NVivo (8.0) where they underwent a second coding using the same coding template. During this process, key themes were generated deductively from the research objectives, and inductively as they emerged from the documents. The ANGELO framework was applied to the data in order to extract themes related to the physical and sociocultural environments.

Regional level policies (n=26) were compared and contrasted in order to assess their consistency with the new Ontario School Food and Beverage Policy (PPM 150,

Government of Ontario, 2011). In doing so, an SPSS (18) data file was developed based on key themes existing within PPM 150 (i.e., rationale linking nutrition and learning, school nutrition standards, anaphylaxis policy, implementation and monitoring, school nutrition criteria, diversity of students and staff, reading food labels, food preparation). Regional policies were coded according to whether or not they included each theme (yes/no). In doing so, we aimed to understand if federal and provincial level themes translated to regional level policy.

Phase 2: Key stakeholder interviews

In order to explore the perceptions of key school nutrition stakeholders, this study adopted a qualitative research design. Overall, key informant interviews (n=22) were undertaken with community-level (from a local public health unit, and community agencies with mandates supporting school nutrition) (n=8), and school-level participants (i.e., secondary school principals, vice principals, teachers, and administrators from the school board) (n=14) from across three boards in Ontario, Canada between December 2011 and March 2012 (See Table 1).

The original recruitment strategy involved the recruitment of secondary schools operating in one school board given its socioeconomic and ethno cultural diversity. However, gaining ethical clearance from the research ethics council of the school board was a lengthy process (nine months), and given the time constraints associated with doctoral research, the sample was expanded to include three school boards based on their representing a range of populations. Schools were recruited to represent the lowest SES census tracts (via median household income as an indicator in the 2006 Census) in all three boards. We approached the SES schools in each board to participate (~40% of schools in each board). Two schools participated in *board 1* (of a possible six who were approached; there were 18 secondary schools in total in the board). In *board 2*, four of nine schools were approached (of a possible 16 secondary schools in the board). In *board 3*, a total of three schools (all schools that were approached; of a possible seven secondary schools across the board) participated. Although we used the same recruitment strategy in all three school boards, board 2 did not contain a similar proportion of low-income neighbourhoods as did the other two boards. Therefore, our sampling strategy resulted in schools representing a range of both low- and high-income neighbourhoods.

The principal and vice-principal of each school received an information letter via email. In participating schools, principals or vice-principals either agreed to participate, and/or passed the researcher's contact information onto a family studies/nutrition teacher for follow-up. Interviews were conducted in person (in a meeting space chosen by the participant), or via telephone by the doctoral student researcher.

An interview guide was informed by previous research findings, the current research objectives, and relevant literature (See Table 2). Key topics were related to: school nutrition in the region; perceptions of the school nutrition policy and/or program in operation in the school, or that which is the focus of organizational activities in community agencies, including facilitators and barriers to implementation; user satisfaction; and, strategies for improvement. Interviews were tape-recorded (with written permission) and transcribed verbatim for subsequent thematic analysis. Interviews lasted a maximum of 60 minutes. The study received clearance from the McMaster University Research Ethics Board, and the ethics committees of all three participating school boards.

The analytic process began during data collection. Data were analyzed as they were gathered, helping to shape ongoing data collection (i.e., question refinement, pursuing other avenues of inquiry in depth) (Pope, Ziebland & Mays, 2000). Analyses of a sub-sample (n=5) of interview transcripts (randomly selected) contributed to the development of the coding template. Four environmental components outlined in the ANGELO framework (physical, economic, political, sociocultural) were mapped onto the data, and sub-themes emerged (Swinburn, Egger & Raza, 1999). All transcripts were coded by hand using a line-by-line coding technique; passages of text corresponding to template codes, were selected (Miles & Huberman, 1994). Data were uploaded to NVivo (8.0), where key themes were generated both deductively from the research objectives, and inductively from the transcripts.

Two researchers undertook an inter-rater reliability exercise, with each independently coding a subset of interviews (n=3). After reaching 64% agreement (a sufficient score), this process led to further discussion about meaning and interpretation (Barbour, 2001). Consistent with Miles and Huberman's (1994) coding dependability assessment procedure, agreements were represented when the same code was applied to a similar section of text (with a margin of error between five and ten lines). The inter-rater

reliability score was calculated as follows: the number of agreements divided by the sum of all agreements and disagreements.

Phase 3: Focus groups

A qualitative research design was adopted to explore the perception of secondary school students of how local level factors shape how they make healthy eating decisions. Three focus group interviews were undertaken (n=20 students) with secondary students aged 15-20 across three Ontario school boards. In phase 2, school boards were selected to participate from both low-and-high-income neighbourhoods vis-à-vis census tract data. We approached the same schools to participate in phase 3.

The principal of each school we approached was sent an information letter. In all three participating schools, the principal forwarded the letter to a teacher who was centrally involved in nutrition courses and/or programming, for follow-up. Three teachers agreed both to having their schools participate, and to facilitate the coordination of the focus groups in conjunction with the researcher (e.g., student recruitment, distributing consent forms, scheduling focus groups, reserving meeting space). Written consent from a parent/guardian was required if students were below the age of 18.

A focus group interview guide was informed by previous research findings, research objectives, and associated literature. Open-ended questions explored definitions of healthy eating, perceptions of the influence of types of foods on health, body weight and grades, student purchasing behaviours, and school nutrition policy and programming. Focus groups took place in person in private meeting rooms at each school, and were between 45 and 60 minutes in length. Interviews were digitally recorded (with permission), for subsequent verbatim transcription.

Data analysis and interpretation occurred concurrently with data collection. Qualitative data analysis is an iterative process, where within-and across-group differences and similarities are observed (Miles & Huberman, 1994). A theme code template was developed based on the principles of the ANGELO framework (Swinburn, Egger & Raza, 1999). Focus group data were loaded into a qualitative software analysis package (NVivo 8.0) for thematic analysis. Through this process, sections of text were selected to correspond to and support individual codes within the theme code template (Miles & Huberman, 1994). Key themes were deductively generated from the research objectives, and inductively as they emerged from the transcripts.

References

Barbour, R.S. (2001). Checklists for improving rigour in qualitative research: A case of the tail wagging the dog? *British Medical Journal*, 322(7294), 1115-1117.

Miles, M.B., and Huberman, A.M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook* (2nd Ed.). Thousand Oaks: Sage Publications.

Pope, C., Ziebland, S., and Mays, N. (2000). Qualitative research in health care: Analysing qualitative data. *British Medical Journal*, 320, 114-116.

Swinburn, B., Egger, G., and Raza, F. (1999). Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine*, 29, 563-570.