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Mount Saint Vincent University  
Department of Applied Human Nutrition

**Food-related Beliefs, Attitudes, Knowledge, Eating Patterns and  
Intended Classroom Food Practices of BEd Students**

By  
Melissa MacEwen

A Thesis  
Submitted in partial fulfillment of the requirements for the degree of Master of Science in  
Applied Human Nutrition

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Mount Saint Vincent University  
Department of Applied Human Nutrition

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## **Abstract**

Children and youth are at an impressionable age, and their eating habits and nutritional health are influenced by a variety of people in their immediate environment. Children and youth learn by example and the eating habits they acquire early in life are often carried into adulthood. Teachers are key role models for children and youth, and through daily routines they are given the opportunity to model and communicate valuable nutrition information. It is important to focus on Education students as they will become role models for children and youth. It is crucial to raise awareness of how their own healthful habits can have long term benefits on the health of children and youth

This research project explores the association between the food related beliefs, attitudes, knowledge, eating patterns and intended classroom food practices of BEd students. Each of these factors can potentially affect the development of health behaviors of children and youth. Teachers have the ability to play an important role to better the students' day-to-day lifestyle at school. However, since health courses for education students are elective; many future teachers must rely on their previous knowledge and values for this important issue, whatever their perception may be.

One hundred and three students (79% response rate) enrolled in both the elementary and secondary BEd program at Mount Saint Vincent University completed a self-administered questionnaire adapted from the TEENS Teaching Staff Survey. Univariate statistics were used to describe the variables involved, while mixed model analysis of variance was used to examine the association between the variables.

Bandura's Social Cognitive Theory (SCT) and Bronfenbrenner's ecological model provided a theoretical framework for understanding the influence of social-environmental factors on the development of health behavior.

Study findings show that although 93% BEd students confirmed the importance of a healthy school food environment, two-thirds intended to use unhealthy classroom food practices (candy in particular), 65% reported high-fat or very high fat intakes and most (72%) respondents had mid-to-low nutrition knowledge levels. Respondents who demonstrated 'less support for a healthy school environment' were more likely to promote unhealthy classroom food practices. As well respondents who had high fat intakes and low perceived health were approximately 3 times as likely to use the cafeteria, canteen or vending machines than those with low fat intakes and high perceived health. Overall, results suggest that BEd students in this study recognize the importance of a healthy environment; however, they report knowledge, attitudes and behaviors which may act as barriers to their having a positive impact on student's eating habits in their future role as teachers.

It is important that school and health professionals continue to campaign for the development and implementation of policies and programs that support teachers in creating a healthy school environment. Research suggests that attention to the health related needs of teachers is required if significant and sustainable changes in the comprehensive school food environment are to be achieved. It is also important that teachers succeed as positive role models and contribute to normative practices that support the development of healthy eating behaviors. Study findings reinforce the need to have policies and programs that support teachers in establishing healthy classroom practices and compulsory nutrition education training for BEd students.

## **Acknowledgements**

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## **CHAPTER 1.0: INTRODUCTION**

### **1.1 Problem Statement**

Eating habits directly affect the health and development of young children in a variety of ways. Healthy eating patterns in childhood and youth support growth and intellectual development (1, 2). It also prevents early health problems like iron-deficiency anemia, obesity, eating disorders and dental issues (2, 3). Healthy eating patterns established early in life have the potential to prevent chronic diseases that occur later in life, such as heart disease, osteoporosis, and some types of cancer (1, 3).

With exception of the family, schools have more influence on the lives of youth than any other social institution (4). Children and youth spend a large part of their day in school and can consume as much as 40% of their total daily food intake within the school environment (5). Schools reach a large portion of children and youth from a variety of socioeconomic backgrounds. They provide a natural learning environment along with physical education classes, and many have food services (6, 7). Thus, schools are in a unique position to promote healthful food choices and help ensure appropriate nutrient intakes in both children and youth (8, 9).

School children and youth learn by example. Students observe the actions and behaviors of their teachers on a daily basis. Due to this repeated exposure, teachers are key role models for children and youth (10). As a result of the teacher's role and authority in the classroom, they have the ability to positively impact the eating behaviors of children and youth.

Education students can potentially have an important influence on the children and youth they encounter throughout their training. Also they are about to start a new career of educating and many of them are focused, thinking about their job as a teacher. It

is an ideal time to embed thoughts of healthy eating, and raise awareness of how their own healthful habits can have long term benefits on the health of children and youth.

## **1.2 Research Question**

This research will explore the following question: what is the association between the food related beliefs, knowledge, attitudes, and eating patterns and the intended classroom food practices of Bachelor of Education students? This research question was addressed by administering a questionnaire to students enrolled in the Bachelor of Education program (BEd) at Mount Saint Vincent University (MSVU). Based on BEd students' experience as student teachers and their interest in the education of children and youth, the focus of the questionnaire was on intended nutrition practices in the classroom and the school environment.

## **1.3 Research Objectives**

The objectives of this research are:

- 1) To describe the intended classroom practices of Bachelor of Education students in terms of food use and types;
- 2) To investigate what eating patterns and behaviors are role modeled at school by Bachelor of Education students;
- 3) To assess nutrition knowledge of Bachelor of Education students;
- 4) To explore the existence and nature of the associations between personal health and eating behaviors, attitudes and beliefs about the school food environment, nutrition knowledge, and demographic characteristics of Bachelor of Education students; their eating patterns at school and their intended classroom food practices.

## 1.4 Limitations

Findings from this study should be considered in view of their limitations. Participating students represent a convenience sample and may not be representative of the majority of BEd students. Views of participating students do not reflect teachers, and responses may not reflect future practices of these students as teachers.

## 1.5 Definition of Terms

*Classroom food practices to limit (CFPL)* – refers to using foods or beverages with low-nutritive value such as candy, doughnuts, cookies, or sweetened drinks as reward, incentive or special treat for students in the classroom. *CFPL* refers to practices that do not support healthy eating.

*BEd students' eating patterns at school* – refers to the BEd students eating the school lunch, purchasing food or beverage items from school vending machines, or purchasing food or beverage items from school cafeteria or canteen.

*School food environment index (SFEI)* – refers to the support of low-nutritive foods offered in vending machines, cafeterias, canteens and used in school fundraisers and the belief that the type or quality of these foods contributes to a healthy or unhealthy school food environment.

*Eating and children/teens index (EAT)* – developed to assess aspects of food intake and behavior which indicated a strong or weak belief in the notion that the foods children and teens eat affect their health and daily behavior.

*Personal health index (PHI)* – refers to a series of questions concerning eating habits, quality of foods consumed and amount of physical activity, used to determine present personal health.

*Fat screener (FAT)* – a 16-item food frequency screener used to estimate fat intake.

## **CHAPTER 2.0: LITERATURE REVIEW**

### **2.1 Introduction**

Research indicates that children's food preferences and food acceptance patterns are established in childhood and are greatly influenced by repeated exposure to food, and by the social context in which food is made available (11). Healthy eating habits are essential during childhood and adolescence to support growth and development and help decrease the prevalence of overweight and other chronic disease risk factors (2, 12, 13). The early years are ideal for providing nutrition information to children and youth as it can help to shape their food preferences and nutrient intake (12, 14).

The significance of the problem is highlighted by looking at the impact poor eating habits have on disease later in life. Although ongoing research offers contradictory reports on the health benefits of some dietary behaviors, numerous epidemiologic studies support an association between diets high in fat and low in fruit and vegetables and the occurrence of several prevalent chronic disease conditions, such as obesity, cardiovascular disease, diabetes and cancer (15-17). The number of overweight Canadians has more than doubled since 1985, and Atlantic Canadians have the highest rates of overweight and obesity in the country (18). In 1999, 38% of Nova Scotians had a body mass index (BMI) of more than 27, compared to 18% in 1985 (19-21). It has been estimated that the direct health care costs attributed to overweight and obesity for Nova Scotia easily exceeds \$90 million dollars annually (20).

Tremblay & Willms (22) present persuasive evidence of progressive increases in BMI for Canadian children from 1981 to 1996. The number of overweight boys and girls increased from 15% to 28.8% and 15% to 23.6% respectively from 1981 to 1996, suggesting that children aged 7-13 are becoming progressively more overweight (22).

Although the weight increases are substantial (22), children and youth have important nutrient requirements (2, 14). Thus, dietary energy must be adequate to ensure growth and spare protein from being used for energy, without being so excessive that obesity results (12).

Recent Canadian data suggest that from the period of 1994 to 1998, daily consumption of fruits and vegetables in young people has dropped (23), while results from another study show that over one-third of students surveyed ate candy and chocolate bars, snack foods, and soft drinks every day (24). Dietary changes observed in school aged children and youth are reflective of overall trends in the types of foods currently favored by North Americans. Both Canadian and US studies carried out since the early 1990's suggest a trend towards decreasing consumption of milk, vegetables, soups, whole grain breads, and eggs, while at the same time intake of fruit and fruit juices, carbonated beverages, poultry and cheese has increased (23, 25-27). In addition to this, a recent Nova Scotia study confirmed that physical activity decreases dramatically and progressively during adolescence, for both boys and girls (28). As well, fewer than 500 of the 15, 800 primary and secondary schools in Canada reach the recommended 30 minutes of activity each day put forth by Health Canada (29).

These trends in food intake and physical activity are particularly concerning because compared to thin children, overweight children have a greater risk of becoming overweight adults (18). Between 26% and 41% of obese pre-school children and 42% and 63% of obese children become obese adults (18, 30). The behaviors that increase the risk of cardiovascular disease and diabetes mellitus in adulthood actually begin early in life (22). Therefore an increased focus on the behaviors of children and youth can make a significant contribution toward preventing diabetes, heart disease and stroke in the adult



population (18, 31). One way to support this healthy behavior change, in particular improving eating habits, is to focus on the people who have repeated contact with children and youth on a consistent basis. Teachers have the opportunity to role model and help encourage healthy eating behaviors. They have a direct influence on students, with the potential to model and communicate valuable nutrition and health information.

According to Stone et al. (32) one of the most significant ways of improving nutritional health in children is through classroom based educational efforts that focus on personal and behavioral factors. Literature implies that eating behaviors in young people improve as a result of nutrition education (33, 34). However, research also suggests that knowledge alone will not necessarily result in healthy food choices or sustainable behavior change (35, 36). Some descriptive studies provide valuable information on the occurrence of factors, such as teachers' self-efficacy, nutrition education and availability of food choices in the school food environment that are likely to influence students' dietary behaviors (1, 7, 37-47). However, limited studies have looked at the classroom teacher, and there is a definite gap looking at the beliefs, habits and actions of BEd students, as a possible vehicle for conveying nutrition information to the students in the classroom (48).

## **2.2 Theoretical Background**

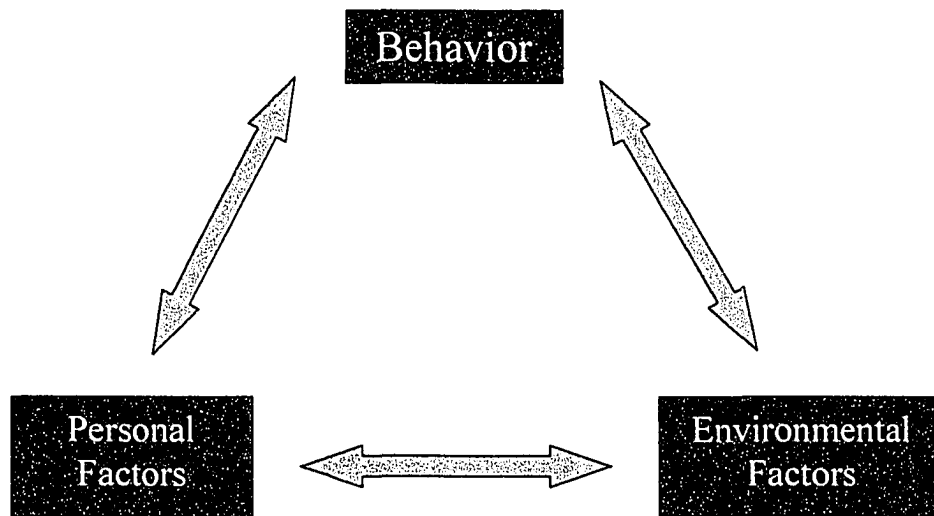
The influence of the social environment on childhood development is well recognized (49, 50). The study of the association between health behavior and social-environmental factors is receiving increased attention from researchers (49, 50). A social-environmental approach is distinguished by its focus on both the social and physical environment. Health behavior theories, such as Bandura's Social Cognitive Theory (SCT) and Bronfenbrenner's Ecological Model provide a theoretical framework for understanding the influence of social-environmental factors on the development of health behavior (51). Bandura's Social Cognitive Theory and Bronfenbrenner's Ecological Model have been previously used in describing and studying the determinants of attitudes and behaviors of school teachers, thus both are appropriate to draw on for this study (10, 48). In turn, this can help determine what school children and youth are learning, with regards to teachers modeling health behavior in school and incorporating nutrition into their classrooms.

## **2.3 The Social Cognitive Theory**

Bandura's SCT (Figure 1), one of the most significant and broadly applied theories in health behavior research (52), shares some similarities with ecological models such as Bronfenbrenner's. SCT is comprised of many constructs. In particular, reciprocal determinism, observational learning and behavioral capability provide theoretical guidance for this study. SCT hypothesizes that behavior is a result of cognitive, behavioral and environmental influences (10). Altogether, SCT is similar in many ways with ecological models of health behavior. However, Bandura's position that self-

efficacy is a requirement for behavioral change distinguishes SCT from ecological models, where the primary focus is the environment (10, 53).

**Figure 1. The Social Cognitive Theory Model (54)**



Personal factors such as cognitive, affective and biological events in a teacher's life can impact on his or her behavior. For example health and importance of nutrition can vary greatly from teacher to teacher based on individual thought process and personal beliefs. Environmental and personal factors work together to determine the behavior of the person, as each is dependent of the other (55).

The three main factors within the SCT model, environmental, personal and behavioral, are constantly influencing each other (55). Behavior is not only the result of the environment and the person, just as the environment is not only the result of the

person and behavior (55). They work in connection with each other as the environment provides models for behavior.

The conceptual model is applied to future teachers in this research. Environmental factors within the applied model can be divided into social environment and physical environment. The social environment consists of the teachers' students or colleagues and physical environment can include factors such as availability of certain foods within the school, potentially affecting the choices students see their teachers making.

There are many influences on food intake in children including the family environment, school, societal trends, media, and peer pressure (10). Role models can have powerful effects on food selection, especially when the modeler is similar to the observer, (56) or is seen as particularly powerful (57, 58) as in the case of the classroom teacher. Children learn about what to eat and why to eat, receiving reinforcements and incentives for eating from their families and the larger environment (59). At home, parents and older siblings are significant models for young children as they learn and imitate the individuals in their immediate environment. Most of this learning occurs during children's routine mealtime experiences, in the absence of formal teaching (60). Peers play a crucial role in child development as well by shaping similar beliefs, trying new foods and understanding of information regarding risk activities (61, 62). Peer influence can increase with age, and adolescents are particularly vulnerable because they share a stressful biological experience over a relatively short period of time (62).

Reciprocal determinism, a primary construct of SCT, as well as a basic principle of ecological models of behavior, suggests that behavior is influenced by both the person and the environment (52). Thus the behavior of school children and youth is determined by the interaction between the school environment and the individual. If children and

youth continue to eat unhealthy foods, and are being influenced by unhealthy behaviors demonstrated by teachers, poor health habits can track into adulthood (30, 63, 64).

Observational learning takes place when a person watches the actions of another person and the reinforcements he or she receives (52). Observational learning represents the ability to learn from the actions and reinforcements given by others and recognizes the environment as an important foundation of role models (52). Initially, children and youth observe the actions and behaviors of their parents at home often emulating similar behaviors (11, 57). Teachers are also key role models (48, 65) and children and youth observe their actions and behaviors, taking away messages from their observations. Teachers also have sufficient opportunity to influence children's eating habits, given their close proximity and repeated contact with students throughout the school day (48). In addition, teachers are responsible for teaching health curriculum outcomes related to nutrition at their grade-level (66). Because they are thought to be a primary means of conveying health information to students, teachers play a significant role in assisting children to learn how to lead healthy and successful lives (38, 39).

Teachers are viewed as authority figures, and some may continuously engage in negative health practices, for example poor eating habits, in the presence of their students. This may create the impression that it is encouraged to participate in this behavior. Health messages, such as healthy eating practices or positive attitudes about a healthy school food environment, are not always communicated through their actions in the classroom. Therefore whether or not nutrition education is being taught in school, messages are subsequently being delivered to students. These messages are sent to students through the teacher's personal values and habits which are translated through modeling.

Being a role model has been identified as the most powerful teaching strategy available (65). Role modeling is one of the most dominant means of transmitting values, attitudes, and patterns of thoughts and behavior to students (52). Reviewing the roles of teachers, Squires (39) noted that “it is important to identify modeling as a distinct function and heading in order to draw attention to what is a pervasive but sometimes unconscious, and even denied process in education. Teachers may not see themselves as models, and may even regret the very idea as pretentious and paternalistic, but it is difficult for learners not to be influenced by the living example set before them.”

According to SCT, behavioral capability highlights that if a person is to perform a particular behavior, he or she must know what the behavior is, and how to perform it. Thus, BEd students need to know the type of nutrition or health behavior they are encouraged to engage in, and have a basic understanding of a healthy lifestyle, in order to model healthy eating practices for their students. The concept of behavior capability distinguishes between learning and performance, because a task can be learned and not performed (52). Although they are important role models, many teachers are not adequately trained to teach nutrition (1, 38, 40-47). Studies show that teachers with nutrition training have more confidence and are more likely to teach nutrition in their classrooms (1, 38, 40-47). The presence of high quality teacher education and training is thought to be important in re-enforcing the behavior of children to become long term health learners (47). Bachelor of Education students at Mount Saint Vincent University are not required to complete courses in health or nutrition, yet the Nova Scotia Department of Education has “Elementary Health Curriculum” for grades P-6, “Personal Development and Relations Curriculum” for grades 7, 8 and 9, and then “Physically Active Living and Career and Life Management Curriculum” for grades 10, 11 and 12

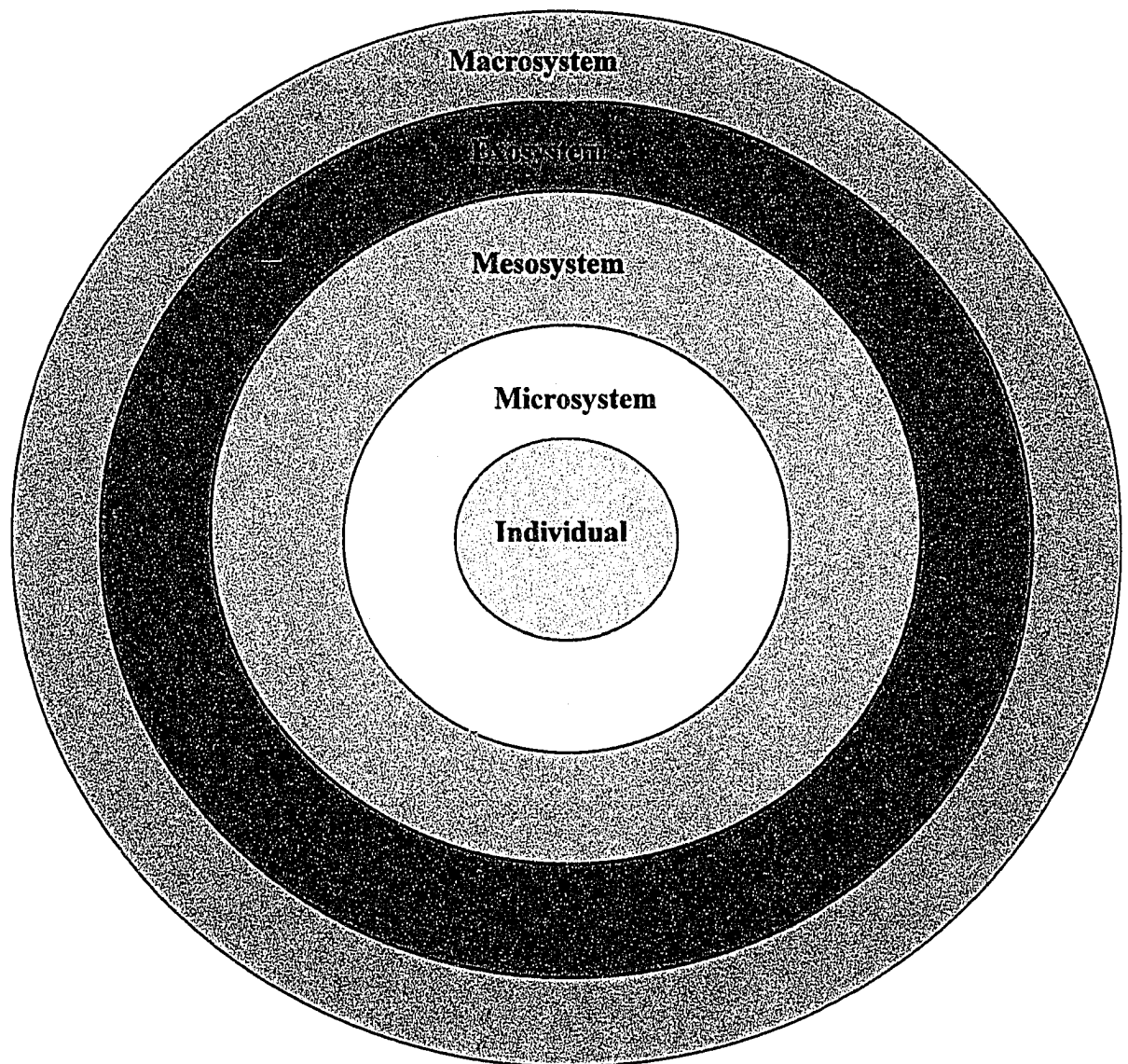
(66). Thus it is likely BEd students teaching in Nova Scotia will be responsible for teaching health related topics despite the lack of training.

Given the limited research conducted on teachers and nutrition in the classroom, it is important to investigate BEd student's nutrition knowledge, dietary behavior and the value they place on classroom food practices is emphasized. Examining teachers in training will help to explore the current level of exposure, as opposed to seasoned teachers. These answers will provide a glimpse into the beliefs, attitudes and practices of future teachers as role models in the classroom. As well, this research will determine the nutrition knowledge of new teachers embarking on a new career.

## **2.4 The Ecological Model**

The process whereby environmental factors influence behavior can be explained through the ecological model (Figure 2) shaped by Urie Bronfenbrenner (67, 68). Bronfenbrenner (1979, 1986) conceptualized the environment as consisting of four levels or systems (the microsystem, the mesosystem, the exosystem and the macrosystem).

**Figure 2. The Ecological Model**



The microsystem consists of interpersonal exchanges in specific settings, like family settings, schools or peer group gatherings. Exchanges between teachers and students or between student peers and the effects of role modeling and influence are apparent at this level. The mesosystem represents the interactions between settings, such as family and school or family and peer group. The strength and quality of these



associations or mesosystems exercise influence over the sustainability of health related behaviors (69). It has been well documented that health-related behavior change is often more sustainable when influences are coming from two prominent environments, such as school and home (9). The exosystem consists of settings where direct individual participation is limited or absent. Laws and policies are influenced by mass media, supervisory boards and community influence, determining issues like the availability of school-based vending machines or enforcement of nutrition policies (53). The macrosystem represents the encompassing social system, within which the other systems exist. This system influences both individuals and settings via economic factors, such as pricing and supplies, demand principles, political systems, and cultural beliefs and values (53).

Within these systems, individual and environmental factors interact in a reciprocal fashion and these interactions occur both within and between systems. An important concept of this model that may get overlooked is the dynamic nature of the connection within each system, and the subsequent dynamic nature of the systems themselves (68). For example, Bandura's concept of observational learning takes place within the microsystem of Bronfenbrenner model. Students are observing the actions of their school teachers on a daily basis, and exchanges or interactions between the two are important.

The education that each teacher receives can contribute to their future classroom environment and their teaching methods. When conveying nutritional messages or practices in the classroom, the decision often depends on personal values, or the teacher's societal norm. The teacher's internal judgment guides the overall evaluation throughout Bronfenbrenner's ecological systems. As a result of these substantial factors, the nutritional health of classroom students may be compromised.

The purpose of this research is to examine BEd students' food-related practices, eating patterns, nutrition knowledge, personal beliefs and attitudes towards diet and health. Each of these factors can potentially affect the development of health behaviors in the children and youth they will interact with. Education students are an effective population to target as they are becoming role models for children and youth. Thus it is crucial that these future teachers are aware of the significant impact they can have on children's eating habits. Second year BEd students were selected because they have experience with student-teacher relations in the classroom through practice teaching, and they have a consistent level of experience with teaching children. Also, with the high demands on teachers' time, it is becoming very difficult to access them as research subjects through school boards. In addition, no research has been conducted looking at the association between the eating patterns, practices, knowledge and attitudes of BEd students. These are important issues because of the impact future teachers can have on their students eating behaviors and nutritional health.

## **CHAPTER 3.0: METHODOLOGY**

### **3.1 Subject Selection**

The subjects for this study were selected by convenience sampling and were comprised of students enrolled in both the elementary and secondary BEd program at MSVU. All of the approximately 130 students in the second semester of their final year, who had completed their practice teaching component, were invited to participate.

### **3.2 Instrument**

The TEENS Teaching Staff Survey, developed by M.Y. Kubik and colleagues (51), was adapted with permission of the author and used in this study. The TEENS Teaching Staff Survey was designed to assess the classroom food practices and eating behaviors of middle school teachers, as well as nutrition knowledge and teachers' attitudes and beliefs about the school food environment. The survey was developed by the TEENS research staff using primarily original questions, and face validity was assessed by additional researchers. Pilot testing of the TEENS Teaching Staff Survey occurred within two different schools.

For purposes of this study, questions from the TEENS Teaching Staff Survey were tailored to include statements about teaching both children and youth. Questions were framed for BEd students rather than teachers, and certain items from the questionnaire were changed to reflect Canadian content. A section designed to assess nutrition knowledge was added. The adapted questionnaire comprised seven sections and collected information regarding personal health, personal eating habits, eating patterns when at school, classroom food practices, school food practices, nutrition knowledge and demographics (Appendix A). Face validity of the modified questionnaire was established

through two external reviewers: the Chair of the Department of Applied Human Nutrition at MSVU, who has experience with questionnaire development and child and youth nutrition, and a public health nutritionist who works within the public school system. In response to the external reviews changes were made to improve the appearance and readability of the questionnaire. As well, questions were altered to reflect Nova Scotia context. For example, items such as “sports drinks are available in school vending machines” thus were included.

To assess the usefulness of the modified questionnaire, on March 3<sup>rd</sup> and March 8<sup>th</sup>, 2004 (upon approval from the Ethics Review Board at MSVU) it was pilot tested on approximately 25 students in their final year of the Child and Youth Study Program at MSVU. These students were asked to take part in the pilot study because of the similarity in school work terms, experience, and knowledge with children and youth. Professors for the course were asked for permission to administer the tool during class time, and students were informed that participation was voluntary. Students were asked to assess the questionnaire for clarity and ease of completion. Through the pilot studies, it was established that the questionnaire would take approximately 20 minutes to complete. The wording of some questions was altered to further improve readability and comprehension.

### **3.3 Design & Procedures**

In collaboration with the Department of Education at MSVU, senior students in their final semester of either the elementary or secondary educations programs were invited to participate. At this stage of their educational program, all students had completed a minimum of 22 weeks of practice teaching under the observation of two different classroom teachers. To ensure optimum participation, the questionnaire was

distributed to students during a senior seminar. The professor responsible for the seminar class was asked to determine the best time and location to administer the questionnaire.

Confirmation and follow-up arrangements were made via telephone. On March 29<sup>th</sup>, 2004 the researcher visited the pre-arranged seminar during the final 30 minutes of the class. Following the distribution of the questionnaires, the researcher read instructions and informed students that their participation in the survey indicated informed consent (See Appendix B). BEd students were instructed to wait for further directions before starting to complete the questionnaire. The researcher collected the completed questionnaires as the students finished. Any students needing extra time, or wanting to fill it out at a later date were encouraged to return the questionnaires to a secure box in the Curriculum Development Resource Room, a location frequently used by education students. After all the questionnaires from the seminar class were collected, three free movie gift certificates were drawn for in appreciation for the students' time and participation. Only students who completed the questionnaire during class time were eligible for the draw.

### **3.4 Ethics**

Ethical approval was granted from the University Ethics Review Board at MSVU (Appendix C). Students were informed that participation in this study was voluntary. Responses remained confidential and questionnaires were stored in a locked cabinet and will be destroyed five years after the study is complete.

### 3.5 Data Analysis

#### 3.5.1 Dependent Variables

Two dependent variables were constructed analogous to the ones used by the TEENS study (51), as part of data analysis. The first variable “*classroom food practices-to-limit*” (CFPL) was a continuous variable representing classroom food practices that do not support healthy eating patterns among students (51). Five questions listed in Table 1 made up the *classroom food practices-to-limit* variable.

**Table 1 – Items included in the ‘Classroom Food Practices-to-Limit’ Variable**

<b>If you were the classroom teacher, would you:</b>
1. Use candy as reward, incentive, or as a special treat?
2. Use doughnuts or cookies as reward, incentive, or as a special treat?
3. Use sweetened drinks, like soft drinks or fruit drinks, as reward, incentive, or as a special treat for students?
4. Allow students to drink soft drinks in the classroom?
5. Allow students to eat food items, including candy, in the classroom?

Response categories to each of the questions in Table 1 were scored as 3 = “likely,” 2 = “somewhat likely,” 1 = “not likely,” or 1.5 = “uncertain.” Coded responses to the questions were summed and reduced by 5 units to produce the CFPL score on a scale ranging from 0 to 10. A score of zero would correspond to a respondent who said they were not likely to use any of the five strategies while a CFPL score of ten would correspond to a subject who indicated they were likely to use all of them. Higher scores indicate more frequent use of these unhealthy food practices.

The second dependent variable “*BEd students’ eating patterns at school*” encompassed four dichotomous questions that represented BEd students’ eating patterns at school during their practice teaching time (Table 2).

**Table 2 - Items included in the ‘BEd Students’ Eating Patterns at School’ Variable**

<b>How often did you:</b>
1. Eat the school lunch?
2. Purchase food items from vending machines at your school?
3. Purchase beverage items from vending machines at your school?
4. Purchase food or beverage items from the canteen or cafeteria at school?

Response categories for the questions were “4 or more times per week,” “1-3 times per week,” “2-3 times per month,” “1 time per month or less,” and “never.”

Responses for each item were then dichotomized to zero for ‘never use’ or one, for ‘any use’. Additional survey questions assessed types of beverages and snacks purchased from vending machines and cafeteria or canteen, as well as the frequency of these purchases.

### **3.5.2 Independent Variables**

Four independent variables were created as indices by summing responses to multiple items. Indices and scoring procedures for this study were those developed by Kubik et al. (51). For each of these index variables, students who failed to respond to any item of the index were assigned missing values as their score and were excluded from all analyses involving the index.

The “*school food environment index*” (SFEI) (Table 3) included eight items scored on a five-point Likert-type scale, with responses ranging from 0 = strongly disagree to 4 = strongly agree. Coding for three oppositely worded items was reversed. Scoring of responses to items was summed to produce an SFEI Index value with a range from 0-32. In the SFEI Index, 0 indicated strong disagreement with every item promoting a negative food practice, while a score of 32 indicated strong agreement with every item. Lower SFEI Index scores indicate stronger support for a healthy school food

environment. Chronbach's alpha coefficient of reliability was used as a measure of internal consistency. If the alpha value is 0.7 or greater, results can be interpreted as having good internal consistency (70). Cronbach's alpha for this index was 0.72. The median value of the SFEI Index was 10. This value was used to create a dichotomous variable wherein subjects with SFEI Index scores of 10 or less were assigned the dichotomous SFEI value of 1. Those whose SFEI Index scores were more than 10 were assigned the dichotomous SFEI value of 0.

**Table 3 - Items in the School Food Environment Index**

<b>Questions included in the 'School Food Environment Index'</b>
1. Vending machines at school should offer only healthy food and beverage items.
2. Food items from "fast food chains," such as McDonald's, Taco Bell, and Pizza Hut should be offered as school lunch alternatives in schools.
3. Selling high fat, high sugar foods, such as candy and cookies, as part of school fund-raising is okay because it helps provide revenue for school programs and school activities.
4. Students' eating behaviors are influenced by social pressures.
5. It doesn't make sense to offer students only healthy foods in school when they can choose to eat whatever they want outside of school.
6. Students should be able to buy soft drinks and candy at school.
7. Schools should be commercial free areas where there is no advertising allowed.
8. It is okay for schools to expect students to sell candy for fundraising purposes.

A six-item "*eating and children/teens*" (EAT) index was created (Table 4). Items were scored and coded, as described for the SFEI, with a possible score range of 0 to 24. The median value of the index was used to create a dichotomous variable. A score of 20 and lower (assigned a dichotomized value of 1) indicated a weaker belief in the notion that the foods children and teens eat affect their health and daily behavior. A score greater than 20 (assigned a dichotomized value of 0) indicated a stronger belief in the relationship between food and health.



**Table 4 - Items in the Eating and Children/Teens Index**

<b>Questions included in the 'Eating and Children/Teens Index'</b>
1. The foods students eat during the school day affect their readiness to learn.
2. It is important to have a healthy school food environment so there is consistency with health messages taught in the classroom.
3. Attention to eating behaviors is a priority issue to address throughout childhood and adolescence.
4. A school breakfast program can help students be ready to learn.
5. A school breakfast program can help reduce tardiness and absenteeism.
6. The food habits of children and youth affect their health as adults.

A six-item “*personal health index*” (PHI) was created (Table 5). Items were scored on a four-point Likert-type scale, with responses ranging from 1= strongly disagree to 4 = strongly agree. The index was calculated by summing responses to each item, with a possible range of 6 to 24. The median value of the index was used to create a dichotomous variable, with scores 16 and lower (assigned a dichotomized value of 1) representing lower present personal health. Scores greater than 16, (assigned a dichotomized value of 0) represented higher present personal health.

**Table 5 - Items in the Personal Health Index**

<b>Questions included in the 'Personal Health Index'</b>
1. I consider myself in good to excellent health.
2. I am satisfied with my own eating habits.
3. I usually limit the amount of high fat food items I eat.
4. I do not usually limit the amount of high sugar items I eat and drink, like candy and soft drinks.
5. Most days I eat five servings of fruit and vegetables.
6. I am not satisfied with the amount of physical activity I get.

A 16-item “*fat screener*” (FAT) (71) was used to estimate fat intake. Response categories for the screener were 0 = “never,” 0 = “1 time a month or less,” 1 = “2-3 times per month,” 2 = “1-2 times a week,” 3 = “3-4 times a week,” and 4 = “5+ times a week.” The “never” response was categorized with the “1 time a month or less” response to

parallel with the index scales used by Kubik and colleagues (51). A fat screener score was created by summing the values of responses to each item. The score had a possible range of 0 to 64, where 0 corresponds to subjects whose frequencies for all items was at most once a month. Meanwhile 64 would correspond to someone who reports eating each item 5 or more times per week. A dichotomized fat screener variable was created, using the fat screener median score of 18 or greater (assigned a dichotomized value of 1). A score of 18 or greater represented a higher fat intake on a weekly basis, and a score of lower than 18 (assigned a dichotomized value of 0) represented a lower fat intake on a weekly basis. The fat intake score is based on the selection of high fat foods restricted to the fat screener used in this study.

The 11 nutrition knowledge questions were categorized as either a right or wrong answer. A knowledge score was computed for each respondent by counting the number of correct responses. Knowledge scores ranged from a possible 0-11. Subjects were then categorized according to their knowledge score into three approximately equally-sized groups. Respondents whose knowledge scores were between 9 and 11 were categorized as 'High,' those with scores between 7 and 8 as 'Middle' and those with scores between 0 and 6 as 'Low' knowledge. Chronbach's alpha coefficient of reliability using the standardized recoded questions was 0.6, indicating moderately strong internal consistency. The fact that this value is lower than the previously mentioned 0.70 target may reflect the wide-ranging content of the nutrition-knowledge questions.

Demographic variables that were assessed include: gender, grades taught during practice teaching, attained degree, and elementary or secondary teaching category.

### 3.5.3 Statistical Analysis

Univariate statistics were used to describe future classroom food practices, personal health, eating patterns and beliefs, and attitudes about the school food environment. Mixed model analysis of variance was used to examine the association of the dependant variable '*Classroom food practices to limit (CFPL)*' with personal characteristics, beliefs of BEd students' and the independent variables, *School food environment index (SFEI)*, *Eating and children/teens index (EAT)*, *Personal health index (PHI)* and *Fat screener (FAT)* as developed by Kubik and colleagues (26). A backward selection method was used, starting with a full set of predictor variables. Non-significant predictor variables were removed one at a time until each predictor retained in the model had a significance level below 0.05. Logistic regression was used to examine the relationships between the binary response variables that describe the '*BEd Students' Eating Patterns at School*' with the explanatory variables mentioned above. The Chi-square test for independence was used to examine the association between fat intake (FAT) and the responses to the item in the PHI pertaining to fat intake. All statistical analyses were performed using SAS version 8e (72).

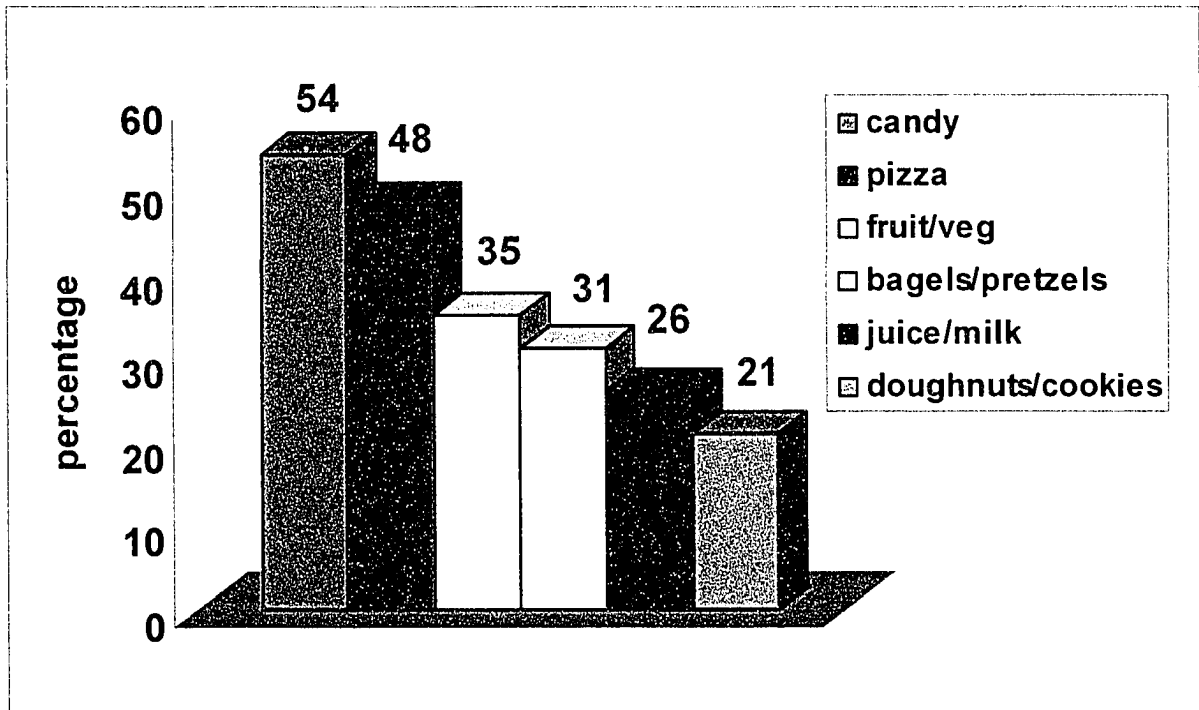
## **CHAPTER 4: RESULTS**

From the 130 questionnaires that were distributed in the seminar class, 103 were collected by the researcher, yielding a 79% response rate. No questionnaires were returned to the drop box in the Curriculum Development Resource Room. Of the questionnaires returned, 55% were from students in the elementary program and 45% were from students in the secondary program. Consistent with the gender distribution of the university, the majority (76%) of participants in this study were female.

### **4.1 Intended Classroom Food Practices**

Thirty-six percent of respondents reported that if they were the classroom teacher, they would be “likely” or “somewhat likely” to allow students to eat food items (including candy) during class time. Similarly, 33% of respondents would be “likely” or “somewhat likely” to allow soft drink consumption during class time. Candy and pizza were the food items most likely to be used as reward, incentive or as a special treat for students, while healthful food items would be used by approximately one-third of the respondents (Figure 3).

**Figure 3. Percentage of Students Likely or Somewhat Likely to Use Certain Items as Rewards or Incentives**



#### **4.2 BEd Student Eating Patterns at School**

Figure 4 shows that cafeteria or canteen use was the most prevalent eating pattern reported by respondents, with one in five (22%) reporting weekly purchases at the school. Cafeteria/canteen use was followed by beverage vending and snack vending, with the smallest number of participants purchasing lunch through the school lunch program. Although the majority (93%) of respondents did not purchase the school lunch, 42% of students participated in beverage vending and almost one quarter of respondents participated in snack vending.

**Figure 4. Percentage of BEd Students Who Use Food/Beverage Services at School**

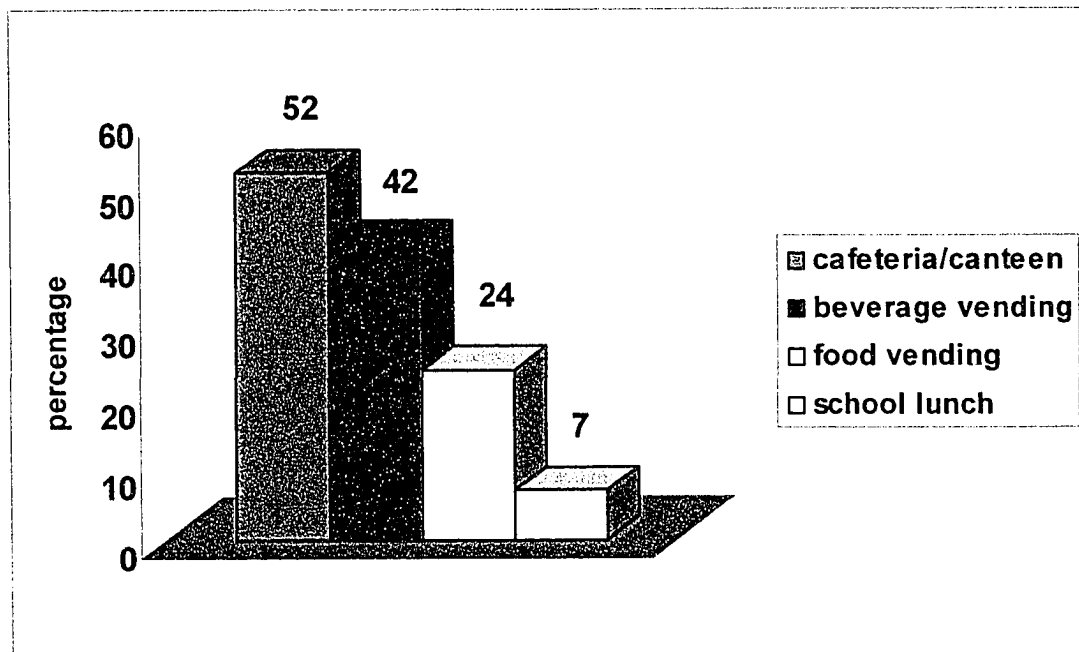
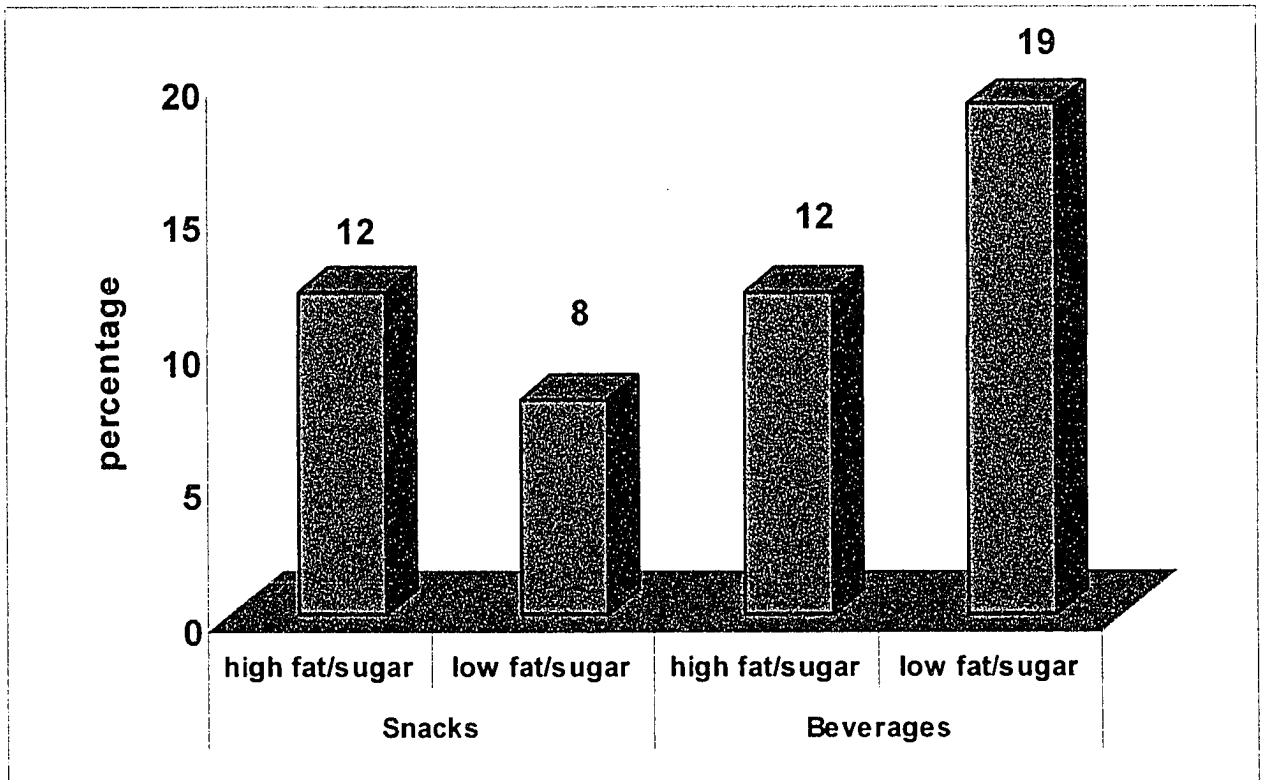


Figure 5 shows unhealthy snacks (candy, chips, and cookies) were purchased weekly by 12% of respondents who used the cafeteria/canteen. Lower fat snacks (popcorn, pretzels) were purchased weekly by 8% of respondents who used the cafeteria/canteen. Healthier beverages including bottled water, 100% fruit juice, and low fat milk were purchased more often from cafeteria/canteen on a weekly basis than were unhealthy beverages such as soft drinks, Fruitopia, Sunny Delight, and Gatorade.

Weekly purchases of high fat/sugar snacks and low fat/sugar snacks were bought in equal amounts from vending machines. In general vending purchases were low, however the majority (67%) of respondents who infrequently (2-3 times per month or 1 or less per month) bought snacks from vending machines, chose high fat items. Meanwhile, those respondents who infrequently bought beverages chose healthier items more often (56%).

**Figure 5. Percentage of BEd Students Who Purchased High/Low Fat or Sugar Snacks and Beverages from the Cafeteria or Canteen Weekly**



#### **4.3 School Food Environment Index (SFEI)**

Responses to items in the SFEI are highlighted in Table 6. The sample was divided on the issue of using low-nutritive foods for school fund raising purposes. More than one half of the sample was either uncertain or in favor of these ventures. BEd students in this study were also in agreement with regards to the appropriateness of schools using students to sell candy for fund raising events, with 43% uncertain and 33% supportive. While the majority agreed or strongly agreed that schools should be commercial-free areas, one quarter of the respondents were uncertain.

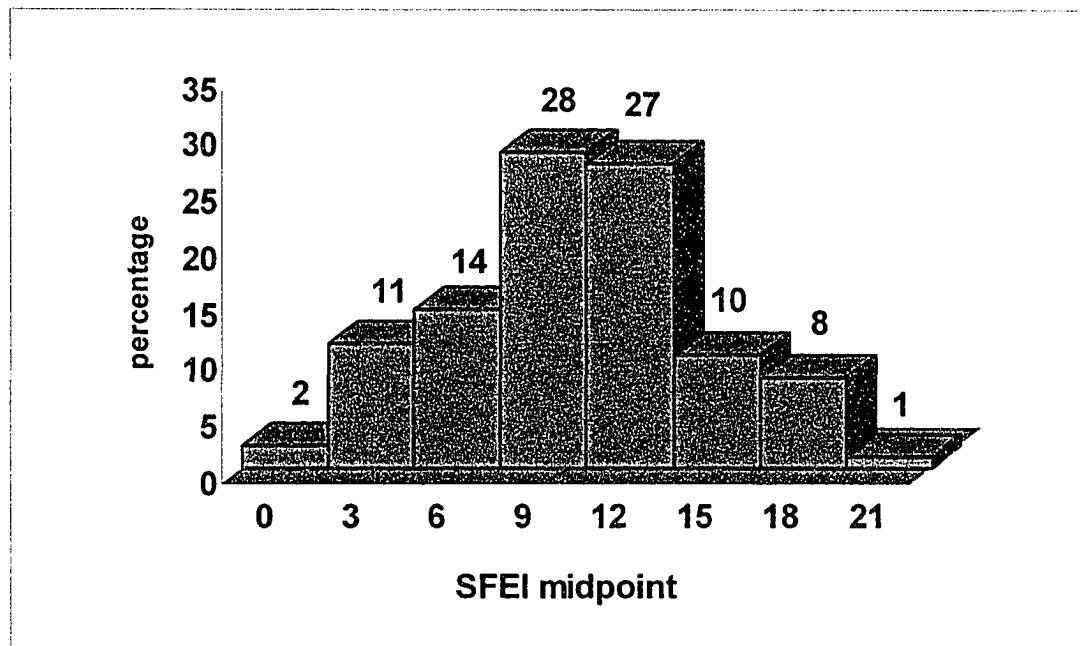
**Table 6 – Responses to Items in the SFEI**

	<b>Strongly Disagree/ Disagree n (%)</b>	<b>Uncertain n (%)</b>	<b>Strongly Agree/ Agree n (%)</b>
<b>Items in the School Food Environment Index</b>			
Vending machines at school should offer only healthy food and beverage items. (N=103)	12 (11.7%)	10 (9.7%)	79 (78.6%)
Food items from “fast food chains,” such as McDonald’s, Taco Bell, and Pizza Hut should be offered as school lunch alternatives in schools. (N=103)	84 (81.6%)	12 (11.7%)	7 (6.8%)
Selling high fat, high sugar foods, such as candy and cookies, as part of school fund-raising is okay because it helps provide revenue for school programs and school activities. (N=103)	31 (30.1%)	38 (36.9%)	34 (33.0%)
Students’ eating behaviors are influenced by social pressures. (N=103)	5 (4.9%)	7 (6.8%)	91 (88.4%)
It doesn’t make sense to offer students only healthy foods in school when they can choose to eat whatever they want outside of school. (N=102)	77 (75.5%)	16 (15.7%)	9 (8.8%)
Students should be able to buy soft drinks and candy at school. (N=102)	69 (67.7%)	16 (15.7%)	17 (16.7%)
Schools should be commercial free areas where there is no advertising allowed. (N=101)	7 (6.9%)	26 (25.7%)	68 (67.3%)
It is okay for schools to expect students to sell candy for fundraising purposes. (N=102)	24 (23.5%)	44 (43.1%)	34 (33.3%)

Distribution of participants SFEI scores are illustrated in Figure 6. The majority of respondents scored in the middle range with scores of 7.5-13.5 occurring most frequently.

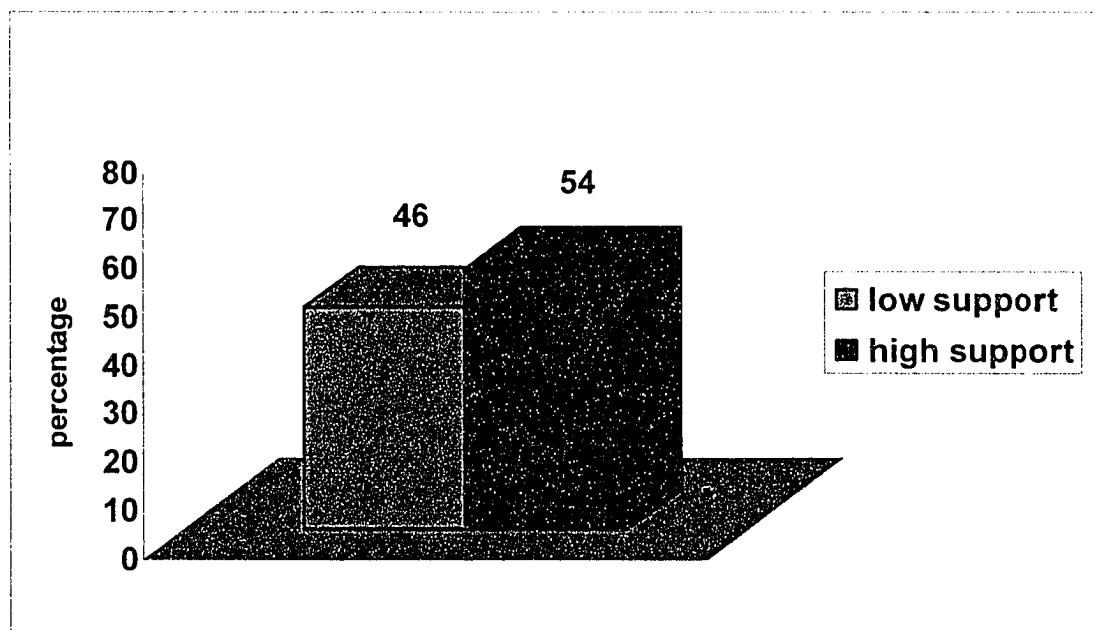


**Figure 6. Distribution of BEd Students School Food Environment Index Scores**



As indicated by the dichotomized SFEI variable, support for a healthy school food environment was not a priority for 46% of participants in this study (Figure 7).

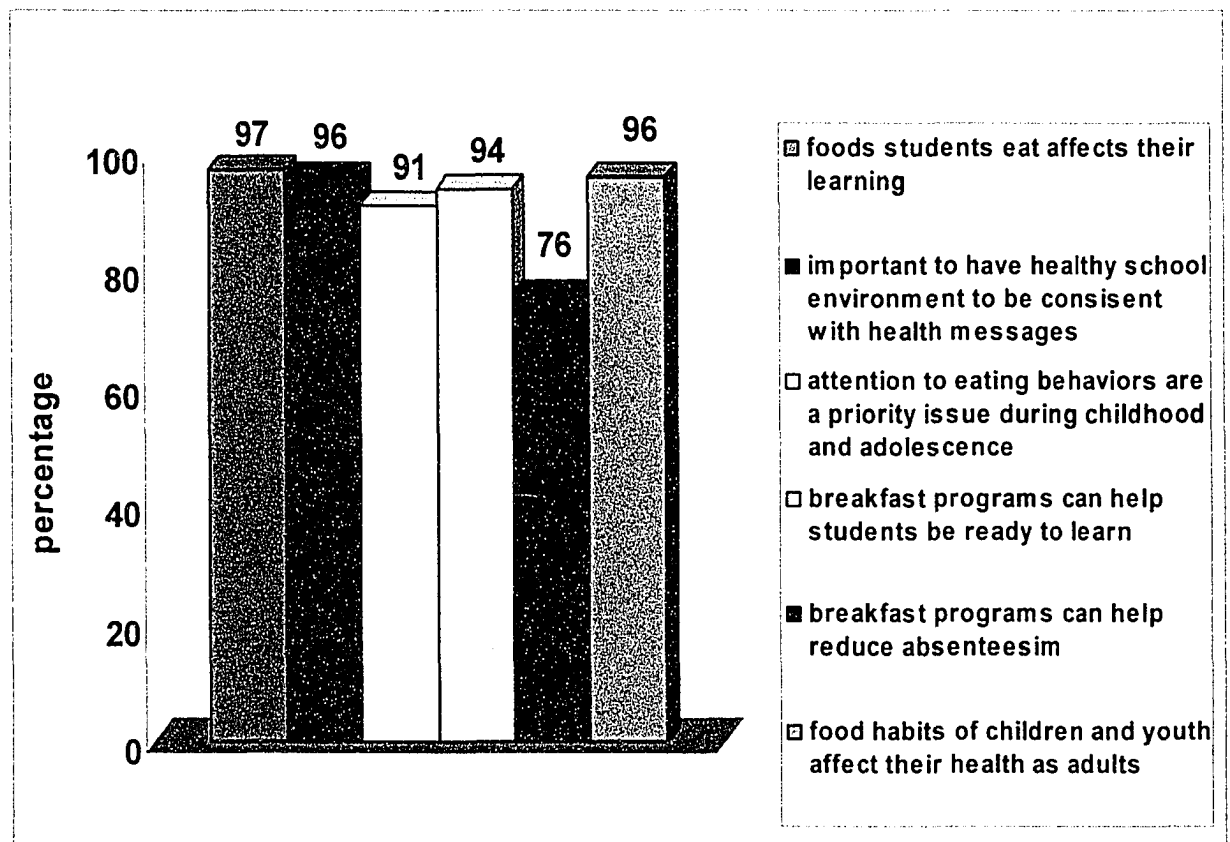
**Figure 7. Percentage of BEd Student Support for a Healthy School Food Environment**



#### 4.4 Eating and Children/Teens Index (EAT)

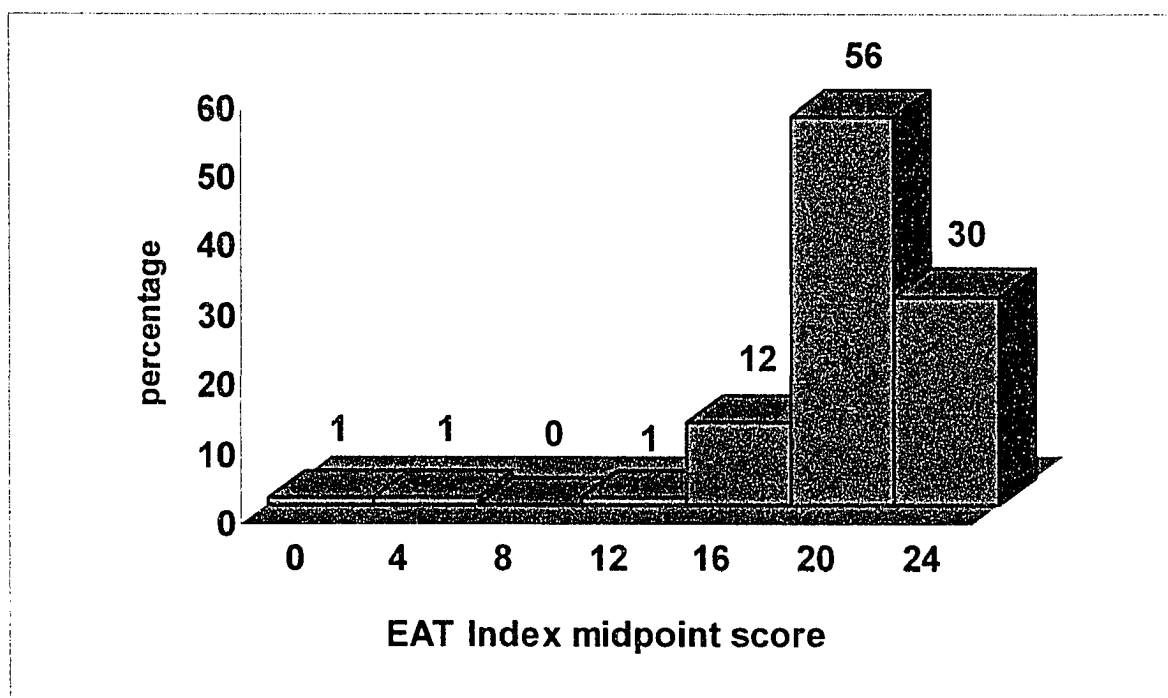
Participants in this study responded to items in the EAT index which indicated their belief that the food children and youth consume will affect their behavior (Figure 8 and Figure 10).

**Figure 8. Percentage of BEd Students That “Agree” or “Strongly Agree” with Items from the EAT Index**

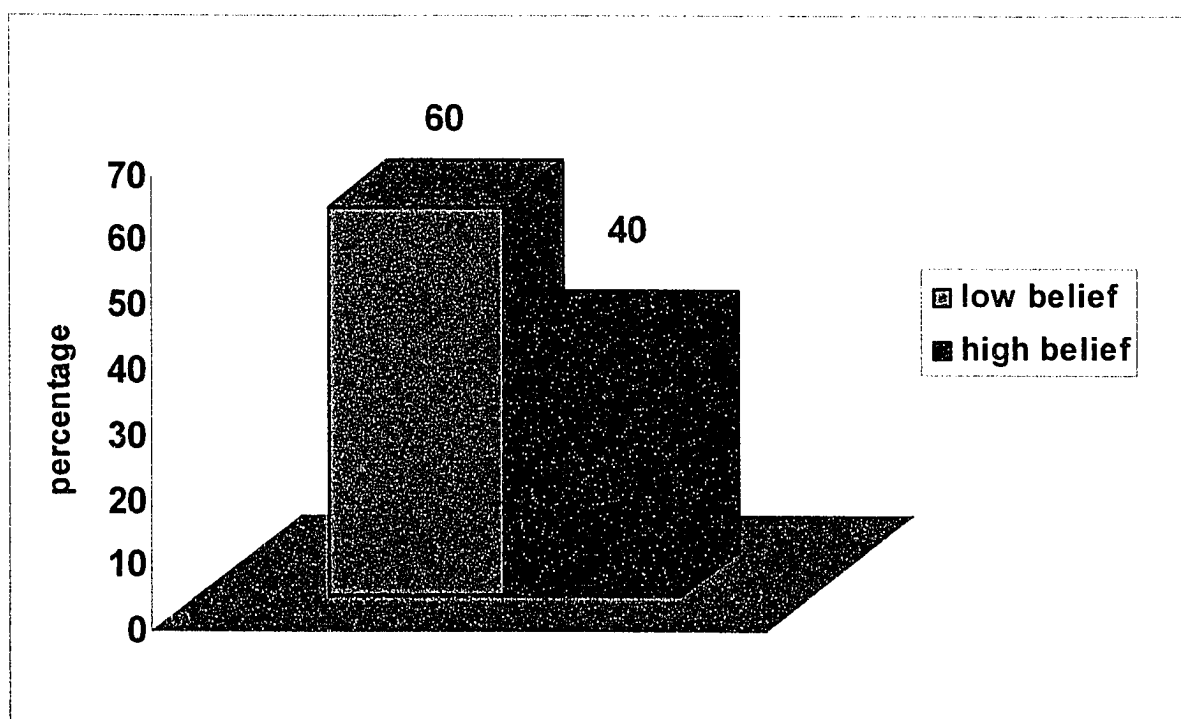


Distribution of participants EAT scores are illustrated in Figure 9. The majority of respondents had scores in the range of 18-22.

**Figure 9. Distribution of BEd Students Eating and Children/Teens Index Score**



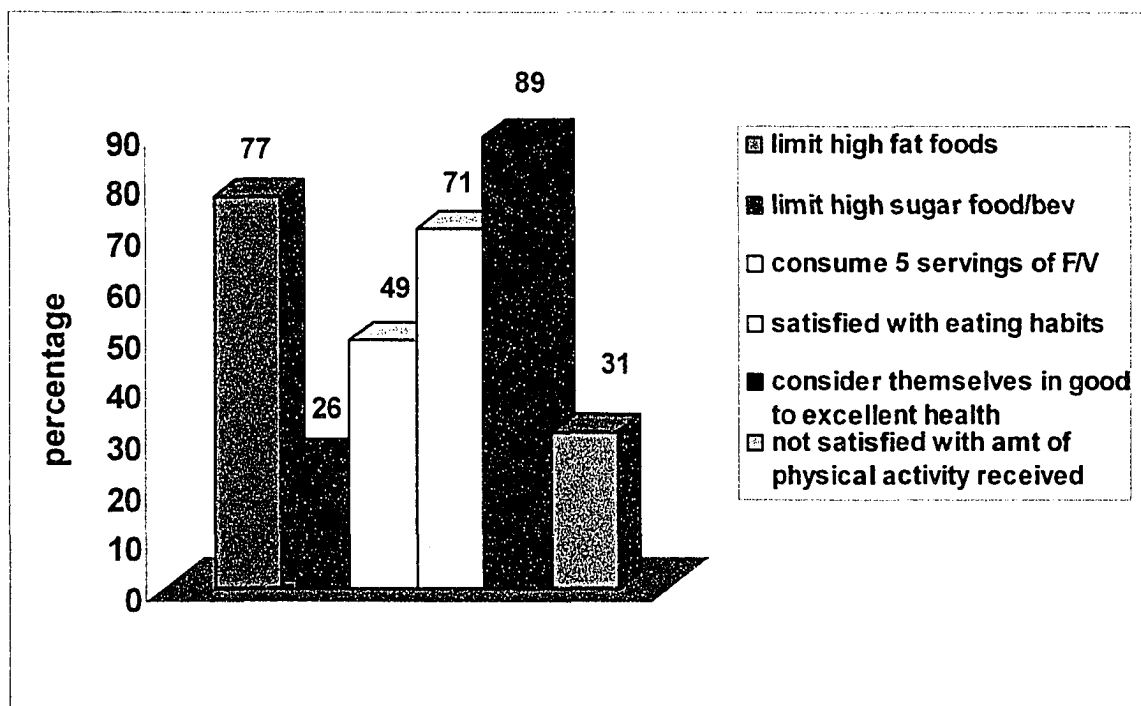
**Figure 10. Percentage of BEd Students That Believe the Foods Children and Youth Eat Will Affect their Behavior**



#### 4.5 Personal Health Index (PHI)

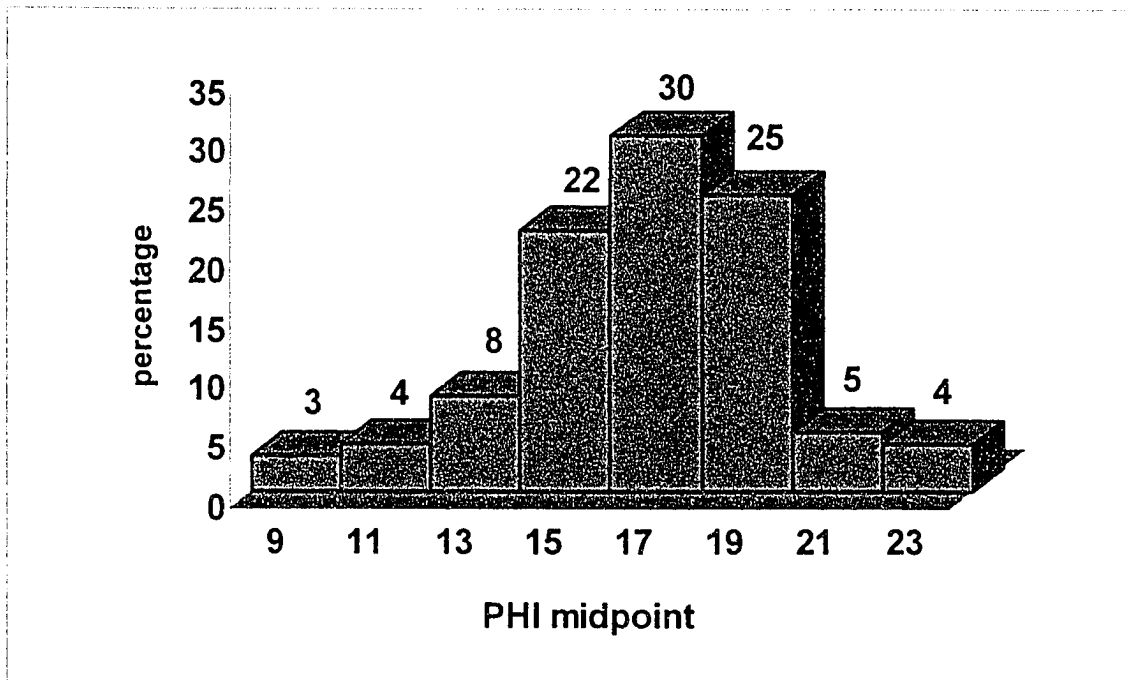
When asked if they usually limit the amount of high fat food items they eat, 77% of respondents “agreed” or “strongly agreed.” Participants who said they limit the amount of high fat food items they eat were more likely to have a low fat intake based on the FAT. Chi-square test for independence found a significant relationship (chi-square (3) = 11.3,  $p < 0.05$ ) between those who “strongly agreed” that they were limiting high fat foods (PHI - measured on a four point scale ranging from 6 to 24) and those who had low fat intakes (FAT - measured on a two point scale). In addition, fewer than half of the respondents reported consuming five servings of fruits and vegetables on most days. Only 26% of respondents reported that they usually limit the amount of high sugar items they eat and drink, like candy and soft drinks. Seventy-one percent of respondents were “satisfied with their eating habits,” and almost everyone considered themselves in “good to excellent health” (Figure 11).

**Figure 11. Percentage of BEd students who “Agreed” or “Strongly Agreed” to Items in the Personal Health Index**



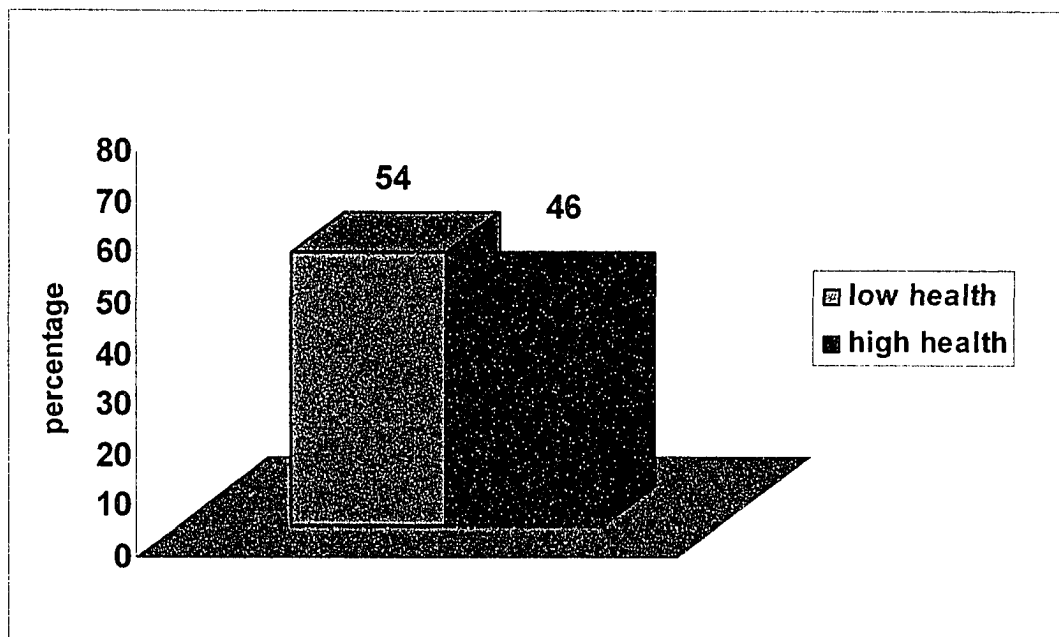
Distribution of participants PHI scores are illustrated in Figure 12. More than three-quarters of the PHI scores were most frequently among 14-20.

**Figure 12. Distribution of BEd Students Personal Health Index Score**



Based on the distribution for the PHI, 54% of respondents perceive themselves as having low health (Figure 13).

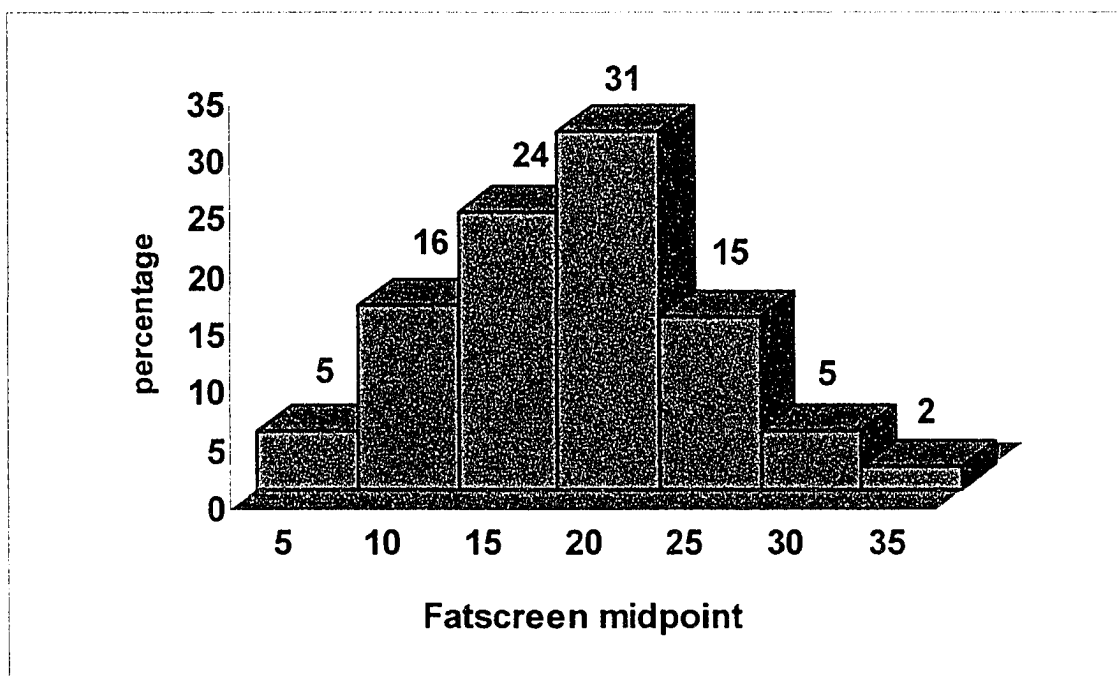
**Figure 13. Percentage of BEd Students Perceive Their Own Health as High or Low**



#### **4.6 Fat Screener (FAT)**

Based on reported intakes, FAT scores were computed and the distribution is illustrated in Figure 14. Based on the FAT score, respondents were categorized as very low fat, average fat, high fat and very high fat as shown in Table 7. Sixty-five percent of respondents reported intakes which were classified as high-fat or very high fat.

**Figure 14. Distribution of BEd Students FAT Screener Score**



**Table 7 – Fat Scores of BEd Students, by Category and by Gender**

<b>Distribution of Fat Scores, of BEd Students, by Category and by Gender</b>			
	<b>Total</b>	<b>Female</b>	<b>Male</b>
<b>Fat Score<sup>a</sup></b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>
0-7: Very low fat intake ( $< 25\%$ calories)	5 (5.1%)	5 (6.7%)	0
8-14: Average fat intake (30-35% calories)	29 (29.6%)	24 (32.0%)	5 (21.7%)
15-22: High fat intake ( $> 35\%$ calories)	42 (42.8%)	31 (41.3%)	11 (47.8%)
23+: Very high fat intakes (40-50% calories)	22 (22.5%)	15 (20.0%)	7 (30.4%)
<b>Total Sample<sup>b</sup></b>	<b>98 (100%)</b>	<b>75 (77%)</b>	<b>23 (23%)</b>

<sup>a</sup> The 17-item Block Fat Screener was used to determine scores and to specify categories

<sup>b</sup> Mean fat score = 17.8 (SD 6.9) Median fat score = 18 (range 3-36)

#### **4.7 Nutrition Knowledge Index**

When nutrition knowledge was assessed, many of the respondents did not know or were uncertain that sports drinks are not recommended for children and youth who are moderately active (Table 10). Almost everyone disagreed that it was “okay for children and youth to drink lots of soft drinks because they need lots of extra calories to grow,” but 62% of respondents did not know or were uncertain if soft drinks were low in fat. The majority of BEd students in this study knew that fruit drinks like “Fruitopia” or “Sunny Delight” do not count as a fruit serving. However, almost one quarter of respondents did not know or were uncertain whether the number of servings of fruits and vegetables is at least five servings per day. Consistent with the previous statement, the questions answered incorrectly most often involved the number of servings outlined in Canada’s Food Guide to Healthy Eating. Other questions which were often answered incorrectly dealt with use of vitamin and mineral supplements, sports drinks, eating disorders and obesity. Fifty-five percent of items in the nutrition knowledge index were answered correctly most often and they included: concerns around soft drinks, importance of milk products and quality of fruit servings (Table 8).



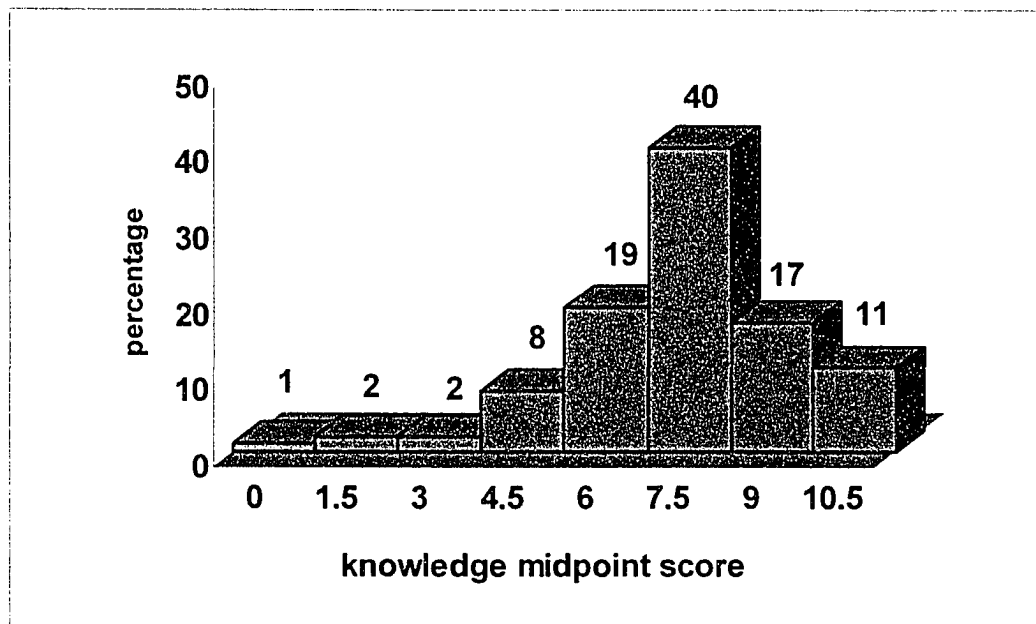
**Table 8 – Nutrition Knowledge Index Items**

Nutrition Knowledge Items	Percentage of BEd students answering True, False or Uncertain		
	True	False	Uncertain
Fruit drinks, like Fruitopia or Sunny Delight count as a fruit serving.	5%	<b>80%</b>	15%
It is okay for children and youth to drink lots of soft drinks because they need lots of extra calories to grow.	1%	<b>97%</b>	2%
Sport drinks are not recommended for children and youth who are moderately active.	<b>35%</b>	24%	41%
The recommended number of servings of fruits and vegetables for children and youth is at least 5 servings per day.	<b>77%</b>	7%	16%
It is okay for children and youth to eat without worrying about fat because they need lots of extra calories to grow.	3%	<b>88%</b>	9%
Soft drinks are low in fat.	<b>38%</b>	52%	10%
Only fresh fruit and vegetables count towards the recommended daily servings of fruit and vegetables.	10%	<b>80%</b>	10%
Milk products are an excellent source of calcium.	<b>97%</b>	4%	2%
Children and youth are at greater risk for developing eating disorders than they are for becoming obese.	25%	<b>41%</b>	34%
The number of servings outlined in Canada's Food Guide to Healthy Eating will not meet the needs for children and youth.	8%	<b>54%</b>	38%
Vitamin and mineral supplements should be taken in addition to a healthy diet.	30%	<b>41%</b>	29%

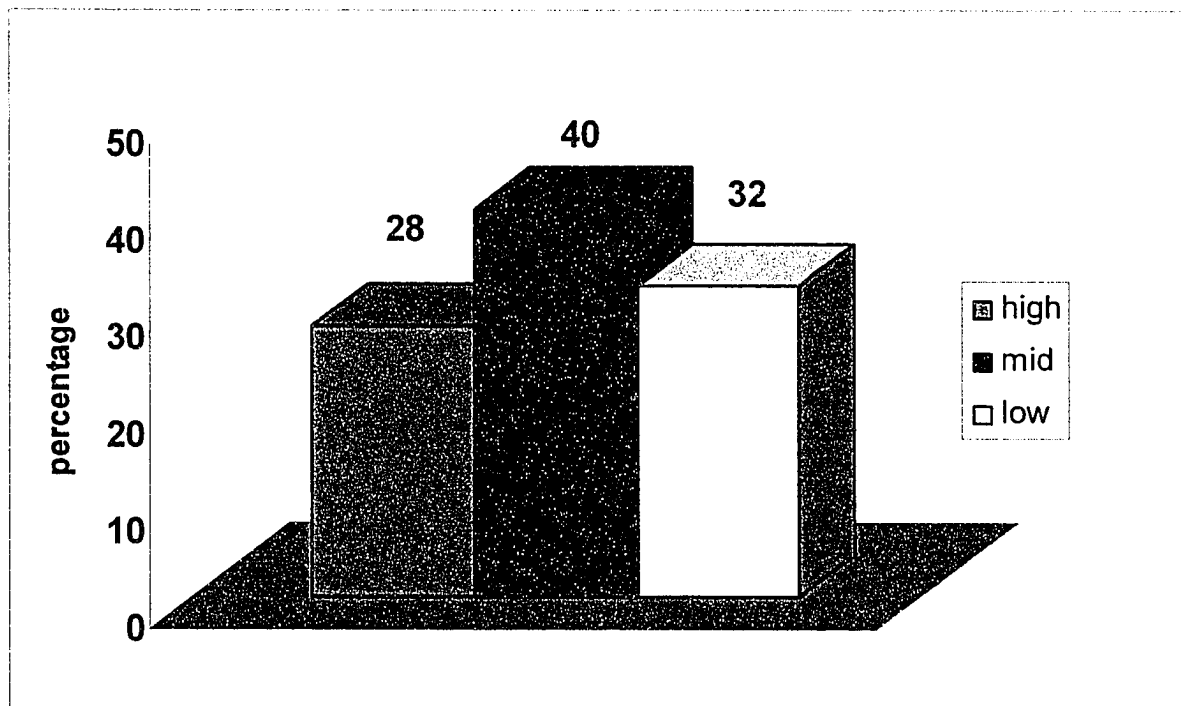
**Note:** Bolded responses are the correct answers.

Based on the questions used to create the nutrition knowledge index, (Table 7) the majority of BEd students in this study had a nutrition knowledge score in the mid range, reflecting scores of 7-8 (Figure 15). However, 70% of nutrition knowledge scores were in the mid or low range (Figure 16).

**Figure 15. Distribution of BEd Students Nutrition Knowledge Index Score**



**Figure 16. Percentage of BEd Students with Nutrition Knowledge in the High, Mid and Low Range**



#### 4.8 Predictors of Classroom Food Practices-to-Limit (CFPL)

Several factors were significant predictors in the multivariate analysis with CFPL as the dependent variable (Table 9). Higher CFPL scores were associated with less support for a healthy school environment, higher perceived health, teaching secondary level, and being male. Other factors included in the multivariate analysis which were not statistically significant were the nutrition knowledge score, high fat intake, and degree prior to BED.

**Table 9 - Multivariate Association with Classroom Food Practices-to-Limit as the Dependant Variable**

	LS-Mean	Difference	95% CI	p-value
<b>Sex</b>				
Male	3.07	0.89	-0.05, 1.83	.035
Female	2.18	-----		
<b>SFEI<sup>b</sup></b>				
Less support	3.48	2.00	1.06, 2.94	.0001
More support	1.48	-----		
<b>Personal Health Index<sup>c</sup></b>				
High Health	3.06	1.42	0.48, 2.36	.002
Low Health	1.64	-----		
<b>Teaching Category<sup>d</sup></b>				
Secondary	3.72	2.44	1.50, 3.38	.0001
Elementary	1.28	-----		

Note - LS Mean = Least Square Mean; CI = Confidence Interval

<sup>a</sup> Classroom Food Practices-to-Limit Scale, a continuous measure, using a four-item summary score, with a range of 0-10. Higher scores indicate greater use of unhealthy classroom food practices, alpha = 0.68

<sup>b</sup> SFEI = School Food Environment Index is an eight-item index, with a range of 0-32

<sup>c</sup> Personal Health Index = measures perceived health

<sup>d</sup> Teaching category = secondary level = grades 7-12; elementary level = grades P-6

#### **4.9 Predictors of BEd Students' Eating Patterns at School**

Outlined in Table 10 are results from the multivariate analysis, with *BEd student eating patterns* as the dependant variable. Findings are described based on holding the FAT screen levels constant. Compared to respondents with high fat intakes, those with low fat intakes have odds approximately 1/3 as large of not using the cafeteria or canteen. This suggests that respondents with high fat intakes are approximately 2.5 times as likely to purchase items from the cafeteria or canteen. Findings are described based on holding the Health index constant. Compared to respondents with high health, those with low health have odds approximately 1/3 as large of not using snack or beverage vending. Suggesting that respondents with low perceived health are approximately 3 times as likely to purchase items from either beverage or snack vending machines. Findings are described based on holding the EAT index levels equal. Compared to respondents with a low EAT index, those with a high EAT index have approximately 4 times higher odds of not using snack vending. Suggesting that respondents with low belief in the notion that the foods children and teens eat affects their health and daily behavior, are approximately 4 times as likely to purchase items from snack vending machines. Age, SFEI and nutrition knowledge were not significantly related to respondents eating patterns at school. As well, no variables significantly predicted school lunch purchases.

**Table 10 – Multivariate Association with BEd Students' Eating Patterns at School as the Dependant Variable**

	<b>Beverage Vending<sup>a</sup></b> (N=101) OR (95% CI) p-value	<b>Snack Vending<sup>a</sup></b> (N=99) OR (95% CI) p-value	<b>Cafeteria/Canteen<sup>a</sup></b> (N=97) OR (95% CI) p-value
<b>Fat Score<sup>b</sup></b> High fat Low fat	NS <sup>c</sup>	NS <sup>c</sup>	.351 (.137, .899) .03
<b>Health Index<sup>c</sup></b> Low health High health	.291 (.121, .701) .006	.313 (.111, .879) .03	NS <sup>c</sup>
<b>EAT Index<sup>d</sup></b> Low belief High belief	NS <sup>c</sup>	3.98 (1.29, 12.2) .006	NS <sup>c</sup>

Note – MSVU = Mount Saint Vincent University; OR = Odds Ratio;

CI = Confidence Interval; Knowledge = Nutrition knowledge score

<sup>a</sup> Adjusted for other significant predictors in the model

<sup>b</sup> Fat Score based on fat screener

<sup>c</sup> Health Index is a six-item measure, with a range of 6-24. Lower scores indicate low perceived personal health

<sup>d</sup> EAT Index is a six item measure, with a range of 0-24. Lower scores indicate low belief in the notion that the foods children and teens eat affect their health and daily behavior

<sup>e</sup> NS = Not significant at in multivariate model at  $p > .05$

## CHAPTER 5: DISCUSSION

While there has been great interest in the role of the school environment in promoting and supporting the development of healthy dietary behaviors (7, 9, 73, 74), only one study has previously investigated teacher modeling, as well as food practices, beliefs and behaviors of school teachers (47). This research study is the first in Canada to examine the food-related practices and eating patterns of BEd students, and determine what factors may be influencing these in today's school environment.

Classroom food practices, such as giving students incentives and rewards, are common in schools (51). When these incentives and rewards are unhealthy food items, it promotes negative eating behaviors within the classroom on a regular basis (75). Findings from this study suggest that the use of food as an incentive/reward would be a common classroom practice for over one third of BEd students when they are the classroom teacher. Predominately, candy would be the most frequently used food item. This finding is consistent with the research conducted by Kubik et al. with regards to the food-related practices of elementary teachers (51, 75).

Almost all respondents in this study did not purchase the school lunch and took a prepared lunch from home. Bringing lunch from home rather than purchasing lunch from school is a more positive habit only if the quality of foods brought is better than the options purchased in the cafeteria or school lunch program. Observational learning is very likely to take place if classroom students see their teacher bring their own lunch as opposed to buying something from the cafeteria each day. In Canada, there are no national food programs or policies in place; thus, students observing their teacher bringing lunch from home may provide a good example to school children and youth. However, student teachers usually are not as financially stable as full-time teachers and

the majority of the participants in this study may have not purchased the school lunch for economic reasons. Therefore this may not be a practice they will continue as teachers.

Although many students did not buy their lunch at the school, purchasing school snacks occurred more frequently. This may be explained by the fact that snacks are often cheaper than a lunch meal. Although foodservice was not measured in this study it is possible that some schools did not have a cafeteria or school lunch program available, but did have canteens where snacks could be purchased. Surveys conducted recently raise some concerns regarding the availability of foods in a number of Canadian schools (76-80). By purchasing these often less healthy snacks at school, BEd students may not always role model healthy eating patterns in schools. This is a concern since dietary quality in children and youth appears to be decreasing (23, 25-27) and their prevalence of snacking is increasing (81). Therefore teacher modeling of poor dietary habits may further exacerbate the problem.

Vending machines in the school environment have been subject to controversy in recent years. A survey of 58 PEI schools indicated that the majority of foods sold in vending machines were unhealthy (80). While vending machines are responsible for much needed revenue for schools, it is important to consider the potential health impact on individuals within the school setting. Vending use was not as much of a concern in this sample when compared to Kubik et al. (51) especially with regards to beverage vending. The small percentage of student teachers who purchased items from vending machines selected healthier beverages like 100% fruit juice and bottled water. This encouraging result may reflect the recent decision of the Canadian Beverage Association to remove soft drink vending services from Canadian elementary schools (82). Providing foods with low nutritional value at school in vending machines, cafeterias, canteens and

fundraising programs undermines support for a healthy school food environment (9).

Moreover, Bachelor of Education students in this study are providing a good example for their students by purchasing healthier drinks at the school.

Canada's Food Guide to Healthy Eating encourages Canadians to limit the amounts of high fat foods in their diet (83). The fact that most BEd students in this study had high fat intakes, yet reported limiting the amount of high fat items in their diet, could suggest some students may not realize which foods are high in fat. Although there is no recent data available on the eating behaviors of all Nova Scotians, in previous years diets in Nova Scotia have been typically high in fat (84). This may help explain the high fat intake of the majority of BEd students. As well, when investigating the food habits of Canadians, Starkey et al. found the most common foods consumed included fats and oils, carbonated beverages, fruit drinks, snack foods and desserts such as pastries, cakes and pies (85).

Consistent with the results from Kubik et al (51) and diets in Nova Scotia (86), less than half of students in this study reported eating five fruits or vegetables on most days. Yet the majority of students said they were satisfied with their eating habits, and almost everyone considered themselves to be in good to excellent health. This suggests that BEd students may have an exaggerated impression of their perceived health, or that their nutrition knowledge may be inadequate. Scores from the personal health index indicated that greater than half of BEd students in this study were in the 'low health' category; contradicting the statement that they considered themselves in good to excellent health. This low rate of perceived health may be a barrier for these future teachers to have a positive impact on their students, by setting a good example.



Given that a health curriculum is implemented from primary to senior high in Nova Scotia, new teachers may be responsible for teaching nutrition or health related topics at some point in their career. With the growing rates of overweight and obesity, (22) fundamental nutrition information should be a priority for teachers as it can be integrated into many class subjects at any level. Nutrition knowledge (based on a knowledge score for BEd students in this study) was almost evenly distributed between the low, mid and high range, with the highest percentage of students in the mid to low range. Considering that only basic nutrition knowledge questions were asked, a higher percentage in the mid to high range would have been expected, as many of the questions were centered on school children. However, this finding is not surprising considering the health education course offered to BEd students at MSVU is elective. An average of approximately 17% of students was enrolled in the course per year over the past five years, (87) indicating these students may not value health education or that it is not promoted within the program. The most alarming finding in this sample of students (who are prepared to become classroom teachers) was that only approximately half knew that the number of servings outlined in Canada's Food Guide will meet the needs for children and youth. This suggests that many students do not realize Canada's Food Guide to Healthy Eating is appropriate not only for adults, but children and youth as well.

Results of this research suggest that many factors can affect the intended classroom food practices of a student teacher. Based on assessment of *classroom food practices-to-limit* for BEd students, support of the school food environment was seen as one predictor of classroom food practices-to-limit. Student teachers, who were less supportive of the school food environment, were more likely to use low-nutritive foods as incentive and rewards in the classroom, indicating a general lack of support for practices

that encourage a healthy eating environment for their students. Schools play an important role in promoting healthy eating in children and youth; they should also be responsible for providing an environment that supports healthy eating (9, 76-80). Healthy food challenges, or providing more awareness around how much candy is used as treats, may help to prevent or reduce the use of low-nutritive foods at school. Although behavior change is not limited to modifications within the school, actions and awareness can help make positive changes in the food related practices of some teachers.

In the United States, as indicated from the School Health Policies and Programs Study (SHPPS) less than 25% of schools nationwide prohibit or discourage teachers from using “junk foods” as student incentives/rewards (88). In addition, worksite, teacher-oriented health promotion programs that focus on nutrition and dietary behavior are offered by only 14.4% of schools (89) and outside the federal meal program, less than 25% of schools had policies in place regarding the nutritional quality of foods (89). Similar information is not available for Canadian schools although it is likely that nutrition programming for teachers is minimal at best. Increased interest in school nutrition has helped to establish policies and programs throughout many Canadian provinces (9, 76-80). In Nova Scotia, schools in several regions have begun to take steps to improve nutrition and increase physical activity (90). To date nutrition policy is self-initiated by individual schools; however, there are three established school food projects and one food policy at the school board level (90, 91). While there seems to be some interest throughout the province in school health programs, initiatives to date are often random, limited and characterized by inadequate resources (90). Research indicates that comprehensive school health programs are effective in improving eating practices, increasing physical activity and possibly reducing obesity (92, 93). Thus there is urgency

for a province-wide, sustainable approach to addressing nutritional issues of children and youth throughout schools in Nova Scotia (90).

Classroom food practices differed depending on whether students intended to teach elementary or secondary school. BEd students, who completed their teacher training at the secondary level, anticipated using food incentives in the classroom more often than their elementary level counterparts. Kubik and colleagues (51) found that teachers who taught middle grades were more likely to use food incentives than those teaching older grades. Students who are in junior high and high schools frequently switch classroom teachers several times in one day. Thus if candy or other high fat/sugar items are being used as rewards, children and youth may be receiving these items multiple times each day. The BEd students at the secondary level in this sample may have needed to use incentives/rewards more often to motivate the older children. It is also possible that they were exposed to the classroom teacher using candy as incentive/reward more often during their practice teaching placements. Although promoting unhealthy foods (candy and pizza) in the classroom may be routine, it can be contributing to unexpected problems in the classroom and negative health practices in the future.

It is difficult to identify reasons for individual behaviors, especially with regards to BEd students eating patterns at school. BEd students' high fat intake emerged as a significant predictor of cafeteria or canteen use. This is not surprising given that items sold in school cafeterias and canteens are generally low nutritive, higher fat items (16). While concerns around poor food availability within schools are often targeted at children and youth, these negative choices also have an affect on adult health. Interestingly, BEd students who rated low on the health index were more likely to participate in beverage vending. Again the removal of soft drink vending machines from elementary schools may

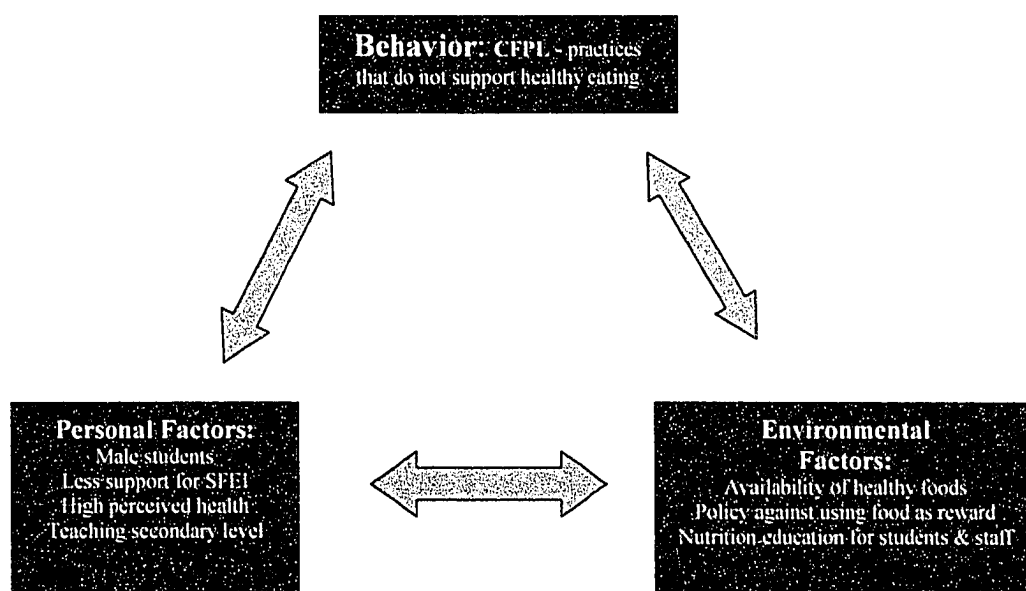
be a possible explanation for the high percentage of healthier beverages purchased by this sample.

Our findings are consistent with those of Kubik et al. in that gender, grade taught and low support for the school food environment were identified as significant predictors of *classroom food practices-to-limit* (51). Since we studied education students, subjects taught and years of teaching were not assessed in this study. Kubik and colleagues (51) found a greater number of factors to be predictive of their dependent variable *Teacher eating patterns at school* than were established with this study. Differences may be attributed to the larger sample size in the study by Kubik et al. (51). Canadian data will differ from the United States (US), as school food policies between the two are varied. The US has implemented the National School Lunch Program and the School Breakfast program as part of the School Meals Initiative for Healthy Children, thus giving their US teachers exposure to nutritious food choices by promoting a healthy environment throughout the school (88). Although provincial initiatives are increasing, Canada does not yet have such nation-wide policies in place to encourage positive choices regarding health and nutrition. In addition, the homogenous sample of Bachelor of Education students used in the study limits generalizability; however, it also improves control within the study.

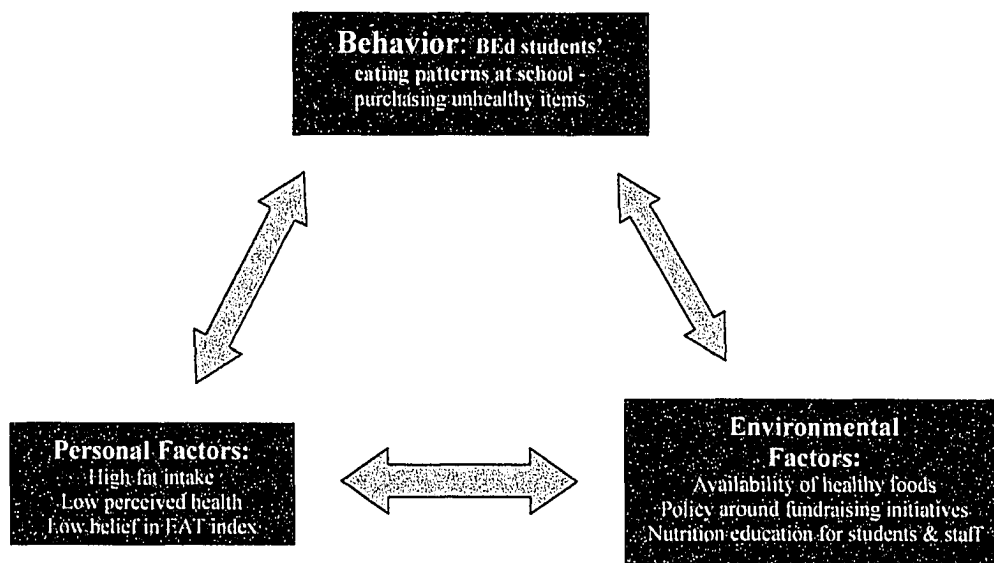
The ecological framework is evident in this study through the exosystem where the individual is influenced by laws or policies set out by a separate supervisory board. The exosystem encompasses factors that practice teachers traditionally would not have any control over, but regardless would still impact their experience. For example, the recent influence of the Canadian Beverage Association removing soft drinks from elementary schools (82), may impact BEd students and their teaching environment. An

ecological approach can be applied to the every day experiences for student teachers in a classroom; however the results from this study are described more clearly through the conceptual models derived SCT and the results of this study. The two dependent variables represent the behavior in these models (Figures 17 and 18).

**Figure 17. Conceptual Model for BEd Students' Classroom Food Practices-to-Limit**



**Figure 18. Conceptual Model for BEd Students' Eating Patterns at School**



As figures 10 and 11 show, the predictors of *classroom food practices-to-limit (CFPL)* and *BEd students eating patterns at school* represent the personal factors that impact health behavior. Environmental factors, and in particular physical factors, also help to shape behavior and support healthy eating (54). These can be nutrition policies and programs that are implemented throughout the school and in conjunction with the personal factors; they can have an affect on behavior (73). In-turn, many nutrition policies and programs can help change personal factors in an individual such as attitudes towards a healthy school environment (73). As well, increased nutrition education and awareness can help to shape positive attitudes and foster better food choices (34). The conceptual models aim to provide a better understanding of the predictors of health behavior. They underscore the importance and the necessity for implementation of school food policy around availability of healthy foods and fundraising campaigns that contribute to school vitality. As well they support the need for nutrition education and

programming for school children and staff, with the goal that positive nutrition behaviors will be role modeled in a healthy school environment.

Research indicates that if meaningful and sustainable changes in the larger school food environment are to be achieved, consideration to the health related educational and training needs of teachers is imperative (94). If teachers are to succeed as positive role models and contribute to normative practices that support the development of healthy eating behaviors by students, school and health professionals should continue to advocate for the development and effective implementation of policies and programs that support both students and teachers (51).

## **CHAPTER 6: RECOMMENDATIONS**

The knowledge gained from this research can help to advocate for mandatory nutrition education for BEd students. In addition to ongoing training and support for school teachers, educational efforts need to be more firmly directed toward BEd students within the university setting. Nutrition knowledge can be a powerful foundation to help make healthy choices in the school environment (36).

As well, this study provides a rationale for implementing school nutrition policy and programs to support teachers and students through a healthier school environment. Encouraging teacher's to participate in nutrition programs and implement policies can help to foster positive changes within the school environment. A teacher's direct involvement in nutrition programs beyond the school curriculum, sends a powerful message to students, parents and colleagues; reinforcing the value and importance placed on the learning environment of children and youth.

The increased attention regarding food availability within Canadian schools has prompted much discussion around the quality of food and beverage items offered to both students and teachers. Offering a variety of healthy foods and beverages strengthens positive messages that are taught during a lesson or modeled by a teacher. Consistent healthy eating messages at school are needed to help students eat well and maintain a healthy weight (9). Although the Nova Scotia government and school system have a growing interest in nutrition policy (90), it is recommended that schools take the lead and provide a supportive healthy eating environment by reducing the availability of low-nutritive foods (9).

Tracking behavior overtime would be a beneficial recommendation for future research in this area. Following these students over time would help determine if changes



occurred with BEd students' eating patterns, classroom food practices, and nutrition knowledge once they began teaching; helping to confirm in this sample how present behavior is a predictor of a classroom teacher's behavior.

## **CHAPTER 7: CONCLUSION**

This study was the first in Canada to examine future classroom food practices and eating patterns of Bachelor of Education students. BEd students can be a good example of the type of positive role model the school system needs for encouraging healthy eating in children. They have the potential to bring a renewed sense of responsibility and commitment to work toward a healthy school environment. This in-turn supports the development of healthy eating behaviors in children and youth both in the classroom, and through daily routine.

The objective of this study was to describe the food related knowledge, attitudes, beliefs, eating patterns and intended classroom food practices of Bachelor of Education (BEd) students about to enter the teaching profession and identify factors associated with classroom food practices and eating patterns.

Study findings show that although most BEd students confirmed the importance of a healthy school food environment, two-thirds intended to use unhealthy classroom food practices (candy in particular), many reported high-fat or very high fat intakes and most respondents had mid-to-low nutrition knowledge levels. Respondents who demonstrated 'less support for a healthy school environment' were more likely to promote unhealthy classroom food practices. As well, respondents who reported high fat intakes and low perceived health were approximately three times as likely to use the cafeteria, canteen or vending machines as those with low fat intakes and high perceived health. Overall, results suggest that BEd students in this study recognize the importance of a healthy environment; however, they report knowledge, attitudes and behaviors which may act as barriers to their having a positive impact on student's eating habits in their future role as teachers.

It is important that the nutrition community continue to advocate for the development and implementation of policies and programs that support both students and teachers within the school setting. More attention to these important issues is required at the university level, creating an increased awareness of the impact negative health practices have later in life. Collective efforts between the school's social and physical environments will support the trend towards a holistic approach of well-being for the entire school community. With the alarming rates of poor health among Nova Scotian's, there is a sense of urgency to advocate for awareness in BEd students. They have the ability to positively impact future school food environments and work toward a healthier, more productive atmosphere for children and youth to engage in.

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## Appendix A - BEd Student Survey

### SECTION A: PERSONAL HEALTH

Thinking about my own health...

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. I consider myself in good to excellent health.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
2. I am satisfied with my own eating habits.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
3. I usually limit the amount of high fat food items I eat.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
4. I do not usually limit the amount of high sugar items I eat and drink, like candy and soft drinks.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
5. Most days I eat five servings of fruits and vegetables.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
6. I am not satisfied with the amount of physical activity I get.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>



### SECTION B: PERSONAL EATING HABITS

How often do you EAT....

	Never	1/MONTH or less	2-3 times a MONTH	1-2 times a WEEK	3-4 times a WEEK	5+ times a WEEK
7. Hamburgers or ground beef	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
8. Beef or pork, such as steaks, roasts, ribs, or in sandwiches	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
9. Fried chicken	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
10. Hot dogs, or Polish or Italian sausage	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
11. Cold cuts, lunch meats, ham (not low-fat)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
12. Baked fish	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
13. Salad dressing (not low-fat)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
14. Butter or stick margarine	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
15. Soft tub margarine or oil	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
16. Eggs (not Egg Beaters or just egg whites)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>

	Never	1/MONTH or less	2-3 times a MONTH	1-2 times a WEEK	3-4 times a WEEK	5+ times a WEEK
17. Muffins or biscuits	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
18. Cheese, cheese spread (not low-fat)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
19. Whole milk	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
20. French fries, fried potatoes	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
21. Corn chips, potato chips, popcorn, crackers	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
22. Doughnuts, pastries, cake, cookies (not low fat)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
23. Ice cream (not sherbet or non-fat)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
24. Fruit juice, like orange, apple, grape - fresh, frozen, or canned (not sodas or other drinks)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
25. Any fruit, fresh or canned (not counting juice)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
26. Vegetable juice like tomato juice, V-8, carrot	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
27. Green salad	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
28. Potatoes, any kind including baked, mashed or	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
29. Vegetable soup, or stew with vegetables	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
30. Any other vegetables, including string beans, peas, corn, broccoli, or any other kind	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>

### SECTION C: EATING HABITS AT SCHOOL

31. Thinking back to your time spent practice teaching, on  
**most** days did you...

- 1 ☐ Purchase your lunch at the school
- 2 ☐ Bring your lunch from home
- 3 ☐ Did not eat lunch



Thinking back to your time spent practice teaching, how often did you...

32. Purchase food (not beverage) from vending machines at your school?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ There are no vending machines at my school

**\*If you checked boxes 1-4, complete question 32 a & b →**

**\*If you checked box 5, go to question 33**

**\*If you checked box 6, answer the following question: ↓**

32-1 If there was a food vending machine at your school, would you be likely to purchase something?

- 1 ☐ Yes
- 2 ☐ No
- 3 ☐ Not sure



32 a) Purchase high fat or high sugar food items, like candy chips, or cookies from school vending machines?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ These items are not available in the vending machines

32 b) Purchase low fat items, like popcorn or pretzels, from school vending machines?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ These items are not available in the vending machines

33. Purchase beverage (not food) items from vending machines at your school?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ There are no beverage vending machines at my school

**\*If you checked boxes 1-4, complete question 33 a & b →**

**\*If you checked box 5, go to question 34 on the next page**

**\*If you checked box 6, answer the following question: ↓**

33-1 If there was a beverage vending machine at your school, would you be likely to purchase something?

- 1 ☐ Yes
- 2 ☐ No
- 3 ☐ Not sure

33 a) Purchase sweetened soft drinks or fruit drinks, like Fruitopia, Sunny Delight or Gatorade, from school vending machines?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ These items are not available in the vending machines

33 b) Purchase 100% fruit juice, bottled water or skim or low fat milk drinks from school vending machines at my school?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ These items are not available in the vending machines

34. Purchase food or beverage items from the cafeteria or canteen at school?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ There is no canteen or cafeteria at my school

**\*If you checked boxes 1-4, complete question 34 a-d →**

**\*If you checked box 5, go to question 35 on the next page**

**\*If you checked box 6, answer the following question: ↓**

34-1 If there was a cafeteria or canteen at your school, would you be likely to purchase something?

- 1 ☐ Yes
- 2 ☐ No
- 3 ☐ Not sure

34 a) Purchase high fat or high sugar items, like candy, chips or cookies from the school cafeteria or canteen?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ These items are not available at my school

34 b) Purchase low fat items like pretzels or bagels from the school cafeteria or canteen?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ These items are not available at my school

34 c) Purchase soft drinks or fruit drinks, like Fruitopia, Sunny Delight or Gatorade from the school cafeteria or canteen?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ These items are not available at my school

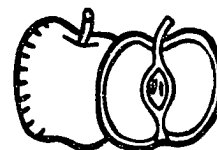
34 d) Purchase bottled water, 100% fruit juice or low fat milk drinks from the school cafeteria or canteen?

- 1 ☐ 4 or more times per week
- 2 ☐ 1-3 times per week
- 3 ☐ 2-3 times per month
- 4 ☐ 1 time per month or less
- 5 ☐ Never
- 6 ☐ These items are not available at my school

## SECTION D: CLASSROOM FOOD PRACTICES

If you were the classroom teacher, would you...

	Likely	Somewhat Likely	Not Likely	Uncertain
35. Use candy as reward, incentive or as a special treat for students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
36. Use pizza as reward, incentive or as a special treat for students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
37. Use doughnuts or cookies as reward, incentive or as a special treat for students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
38. Use low fat food items, like bagels or pretzels, as reward, incentive or as a special treat for students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
39. Use fruits or vegetables as reward, incentive or as a special treat for students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
40. Use sweetened drinks, like soft drinks or fruit drinks as reward, incentive or as a special treat for students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
41. Use bottled water, 100% fruit juice or low fat milk drinks as reward, incentive or as a special treat for students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
42. Give out food coupons, like Pizza Hut food coupons, as rewards or incentives to students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
43. Allow students to drink soft drinks during class time?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
44. Allow students to eat food items (including candy) during class time?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
45. Withhold a food or beverage item from a student as punishment?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
46. Praise students when you see them eating healthier foods, such as fruit juice or low fat snack items?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
47. Eat lunch or recess snacks with the students?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
48. Include information on nutrition and healthy eating as part of your lesson plans?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>





## SECTION E: SCHOOL-WIDE FOOD PRACTICES

In your opinion...

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
49. The foods students eat during the school day affect their readiness to learn.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
50. Vending machines at school should offer only healthy food and beverage items.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
51. School prepared lunches are healthy.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
52. School lunch should include more fruits and vegetables.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
53. Food items from "fast food chains," such as McDonald's, Taco Bell and Pizza Hut should be offered as school lunch alternatives in schools.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
54. Selling high fat, high sugar foods, such as candy and cookies, as part of school fund- raising is okay because it helps provide revenue for school programs and school activities.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
55. Students' eating behaviors are influenced by social pressures.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
56. It is important for schools to have a written school nutrition policy which addresses food related issues, such as food in the classroom or food selections in vending machines.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
57. High fat and high sugar foods are used as reward and incentive in the classroom because students prefer these kinds of foods.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
58. Students in my school seem to eat healthy diets.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
59. If more healthy food and beverage items were available in vending machines or at the canteen or cafeteria, students would purchase them.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
60. It is important to have a healthy school food environment so there is consistency with health messages taught in the classroom.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
61. More healthy food and beverage items should be offered in the vending machines and at the cafeteria and canteen.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

In your opinion...

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
62. Parents of students are concerned about the nutritional health of their children.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
63. The eating behaviors of teachers influence the eating behaviors of students.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
64. Food and beverage items available at school and school sponsored functions influence students' eating behavior.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
65. As a teacher, I can influence school food policy.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
66. The food and beverages offered in schools must comply with Provincial school food policies.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
67. Schools give adequate attention to student nutrition.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
68. Most teachers use food (including candy) as a reward or incentive for students.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
69. Food habits are determined before students reach middle school.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
70. The nutritional health of students should be a school priority.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
71. School decisions about selling food items from fast food chains, like McDonald's, Taco Bell and Pizza Hut, should be made at the School Board level.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
72. Students should be provided the foods they want at school.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
73. Attention to eating behaviors are a priority issue to address throughout childhood and adolescence.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
74. The school environment (i.e. vending machines, classroom food rules, foods students see school staff eat) affects students' food choices.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
75. School decisions about vending machines and the food and beverage selections offered should be made at the School Board level.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

In your opinion...

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
76. Nutrition education should give students the skills to make healthy food choices.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
77. It doesn't make sense to offer students only healthy foods in school when they can choose to eat whatever they want outside of school.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
78. Students should be able to buy soft drinks and candy at school	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
79. Fewer students eat the school prepared lunch as a result of vending machines, canteens, and cookies and candy sold during the school day for fundraising.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
80. A school breakfast program can help students be ready to learn.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
81. A school breakfast program can help reduce tardiness and absenteeism.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
82. The food habits of children and youth affect their health as adults.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
83. Schools should be commercial free areas where there is no advertising allowed.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
84. Product advertising on vending machines influences students to purchase the advertised item.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
85. It is okay for schools to expect students to sell candy for fundraising purposes.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
86. Parent input is considered when deciding food rules in the classroom.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
87. The foods and beverages offered in school are affordable.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
88. It is primarily the role of the parent to teach children about healthy eating and healthy choices.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
89. It is important for schools to teach students the basic skills of food preparation, so they can put nutrition knowledge into practice.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

## SECTION F: NUTRITION KNOWLEDGE

In your opinion ....

	TRUE	FALSE	Uncertain
90. Fruit drinks, like Fruitopia, Sunny Delight or count as a fruit serving.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
91. It is okay for children and youth to drink lots of soft drinks because they need lots of extra calories to grow.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
92. Sport drinks are not recommended for children and youth who are moderately active.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
93. The recommended number of servings of fruits and vegetables for children and youth is at least 5 servings per day.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
94. It is okay for children and youth to eat without worrying about fat because they need lots of extra calories to grow.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
95. Soft drinks are low in fat.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
96. Only fresh fruit and vegetables count towards the recommended daily servings of fruit and vegetables.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
97. Milk products are an excellent source of calcium.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
98. Children and youth are at greater risk for developing eating disorders than they are for becoming obese.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
99. The number of servings outlined in Canada's Food Guide to Healthy Eating will not meet the needs for children and youth.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
100. Vitamin and mineral supplements should be taken in addition to a healthy diet.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

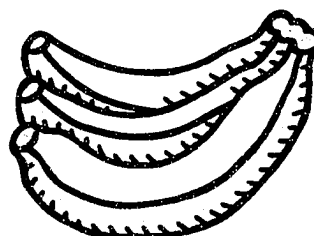
## SECTION G: DEMOGRAPHICS

101. What year were you born?  
19\_\_ \_\_

102. Are you a male or a female?

1 ☐ Male

2 ☐ Female

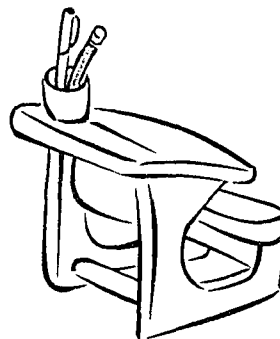


103. What grade(s) were you responsible for during your practice teaching? (check all that apply)

- 1 ☐ Primary
- |                                    |                                     |
|------------------------------------|-------------------------------------|
| 1 <input type="checkbox"/> grade 1 | 1 <input type="checkbox"/> grade 7  |
| 1 <input type="checkbox"/> grade 2 | 1 <input type="checkbox"/> grade 8  |
| 1 <input type="checkbox"/> grade 3 | 1 <input type="checkbox"/> grade 9  |
| 1 <input type="checkbox"/> grade 4 | 1 <input type="checkbox"/> grade 10 |
| 1 <input type="checkbox"/> grade 5 | 1 <input type="checkbox"/> grade 11 |
| 1 <input type="checkbox"/> grade 6 | 1 <input type="checkbox"/> grade 12 |

104. What was the approximate number of students in the school(s) where you completed your practice teaching?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



105. Did the school(s), where you spent most of your time, serve a rural or urban community?

- 1 ☐ Urban  
2 ☐ Rural

106. What subject(s) were you responsible for during your practice teaching? (check all that apply)

- |                                                        |                                               |
|--------------------------------------------------------|-----------------------------------------------|
| 1 <input type="checkbox"/> Language Arts               | 1 <input type="checkbox"/> Physical Education |
| 1 <input type="checkbox"/> Math                        | 1 <input type="checkbox"/> Art                |
| 1 <input type="checkbox"/> Social Studies              | 1 <input type="checkbox"/> Music              |
| 1 <input type="checkbox"/> Science                     | 1 <input type="checkbox"/> Computers          |
| 1 <input type="checkbox"/> Health                      | 1 <input type="checkbox"/> Family Studies     |
| 1 <input type="checkbox"/> Other, please specify _____ |                                               |

107. What is your background field(s) or undergraduate degree(s)? (please list all)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

108. Where did you complete your undergraduate degree? (location or university name)

\_\_\_\_\_

109. In the space below, please feel free to comment on healthy eating in schools, or any recommendations or observations you might have.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Appendix B – Introduction Letter and Informed Consent



Dear Participant,

Nutrition plays a major role in the health and well-being of school children and youth. Teachers have a unique opportunity to convey nutrition information to children and youth through a variety of avenues. Research is an essential tool in understanding the nutritional messages school children and youth are receiving from their teachers; only then can the appropriate information be translated into practical advice for change.

I am a graduate student in the Department of Applied Human Nutrition at Mount Saint Vincent University (MSVU). As part of my Master of Science Degree I am conducting a survey to provide information on BEd students' food-related practices, eating behaviors, nutrition knowledge, personal beliefs and attitudes towards diet and health. Your participation is important to this project, and information collected will only be used in writing my thesis and related scholarly publications or events.

Throughout the course of your Education Degree, you have completed many weeks of practice teaching. As you complete this questionnaire think about the time spent in the classroom during your teaching training. As well, reflect on your own lifestyle and beliefs and attitudes.

All students in their final year of the BEd (elementary and secondary) program at MSVU are asked to participate in this survey. The MSVU Human Ethics Review Committee has approved this questionnaire. It will take approximately 20 minutes to complete. Participation is voluntary and all responses will remain anonymous. Your decision to participate will not influence your seminar grade or reflect your teaching ability.

**If you are willing to participate**

- **Please complete the questionnaire and return it to the researcher visiting your seminar class, or complete the questionnaire at a later time and return it to the locked box in the Curriculum Development Resource Room by April 6<sup>th</sup>, 2004.**

**Note: By completing this questionnaire you are indicating your consent to participate. Please DO NOT put your name or any identifying information on your questionnaire. If you are not willing to participate please return the uncompleted questionnaire to the researcher.**

zn

Sincerely,  
Misty MacEwen, Graduate Student, MSVU

## Appendix C – MSVU Ethics Review Form

### MSVU ETHICS REVIEW APPLICATION FORM

**Directions:** Submit one copy of the entire application to the Research Office. Make sure that you attach all relevant supporting documentation (copies of surveys, interview questions, informed consent forms, etc.). All proposals submitted for review must have this cover sheet. Use as much space as you need to answer the individual sections (A-J).

**Note:** If you are not sure if your research project requires ethics review, please consult with the Chair of the UREB before undertaking a submission.

**Date:** March 1, 2004

**Name of Person(s) Submitting Application:** Melissa (Misty) MacEwen

*Food-related Beliefs, Knowledge, Attitudes, Behavior, Eating Patterns and Intended Classroom Food Practices of BEd Students*

**Department(s):** Applied Human Nutrition

;  
;  
;

);

**Category of Researcher:**  
Graduate Student (Master Sc Thesis)

**Category of Research**  
Minimal Risk Expedited Review

**This project is currently under review by:** NA

**This project has already been reviewed by:** NA

**This project has been awarded funding by:** NA

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**Signature of Researcher**  
Melissa MacEwen, BSc Foods & Nutrition  
Graduate Student in Applied Human Nutrition  
Mount Saint Vincent University

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**Signature of Supervisor**  
Theresa Glanville Ph.D  
Thesis Supervisor  
Department of Applied Human  
Nutrition  
Mount Saint Vincent University

## A. SUMMARY

A healthy lifestyle has been promoted through Canada's Food Guide to Healthy Eating. Despite this widely distributed information many people still do not adhere to diets high in fruits and vegetables and low in saturated fats. Eating habits directly affect the development of young children in a variety of ways. Healthy eating patterns in childhood support growth and intellectual development, and prevent early health problems like iron-deficiency anemia, overweight, eating disorders and dental issues (Stang, Story & Kalina, 1998). As well, healthy eating patterns established early in life can prevent chronic diseases that occur later in life, such as heart disease, osteoporosis, and some types of cancer (Stang, Story & Kalina, 1998). Therefore, it is important that these unhealthy practices that children acquire early in their lives change, or the consequences may be severe.

Recent Canadian data suggest that from the period of 1994 to 1998, daily consumption of fruits and vegetables in young people has dropped (Health Canada, 2000), while results from another study show that over one-third of students surveyed ate candy and chocolate bars, snack foods, and soft drinks every day (Evers, Taylor, Manske et al, 2001). The number of overweight boys and girls increased from 15% to 28.8% and 15% to 23.6% respectively from 1981 to 1996, suggesting that children aged 7-13 are becoming progressively overweight (Campagna, 2002).

Obesity is of great concern because compared to thin children; obese children have a greater risk of becoming overweight adults. Between 26% and 41% of obese pre-school children and 42% and 63% of obese children become obese adults (Heart & Stroke, 1999). The behaviors that increase the risk of cardiovascular disease and diabetes mellitus in adulthood actually begin early in life. Therefore, it is essential that prevention begin in early childhood (Tremblay & Willms, 2000).

One of the most significant ways of achieving nutritional health for children is through classroom based educational efforts that focus on personal and behavioral factors (Stone, Baranowski, Sallis & Cutler, 1995). Literature implies that eating behaviors in young people improve as a result of nutrition education (Lytle & Achterberg, 1995; Contento, Balch, Bronner et al, 1995). However, research also suggests that knowledge alone will not result in healthy food choices or sustainable behavior change (SNE, ADA, ASFSA, 1995). Limited studies have looked at the classroom teacher as a possibility for conveying nutrition information to the students through their actions. Some descriptive studies provide valuable information on the prevalence of certain factors in the school food environment likely to influence students' dietary behaviors (Story, Hayes & Kalina, 1996). However, less research has been conducted looking at the student-teacher interaction taking place with regards to nutrition in the classroom on a daily basis.

Teachers are viewed as authority figures. As a result of this potential influence, if they continuously engage in negative health practices in the presence of students, it creates the impression that it is okay to participate in this behavior. Because they are thought to be a main link for conveying health information, teachers play a significant role in assisting children to learn how to lead healthy and successful lives (Maney,



Monthley & Carner, 2000). However, these health messages are not always communicated properly through their actions in the classroom, or emerging value systems.

The outcome of encouraging children to become long term health learners will be re-enforced by assuring high quality elementary teacher education and training (Peterson, Cooper & Laird, 2001). A study conducted in Minnesota public schools showed that teachers with previous nutrition training were more likely to teach nutrition than those without training; regardless of what type of preparation they had received (Stang, Story & Kalina, 1998). A survey of Idaho elementary school teachers indicated that 71% had never taken a course in nutrition, and 87% had never attended a nutrition workshop (Thomas, Long & Zaske, 1994). Reviewing these limited studies on teachers and nutrition in the classroom, emphasizes the importance of investigating BEd student's nutrition knowledge, dietary behavior and the importance they place on nutrition and well-being.

Whether nutrition education is being taught in school or not, subsequently messages are being delivered to students continuously via the teacher's personal values and habits. Teachers as a model for attitudes, as well as a model for behavior, may be a role that students in BEd programs do not consider without the opportunity to develop that perspective. With attitude being an important determinant of behavior, positive attitudes must be nurtured and considered a goal in health education for both prospective teachers and their potential students (Hedrich, 1999).

There is increasing awareness that social-environmental factors are among the most powerful predictors of young people's behavior (Resnick, Bearman, Blum et al, 1997; Perry, 1999). As well, significant changes in the family unit, work patterns and the availability or promotion of low-nutritive foods and beverages have placed the spotlight on the vital role schools have in determining the eating behavior of children and adolescence (CDC, 1996). Finally, the availability of health behavior theories such as Bronfenbrenner's Ecological model (1979, 1986), and Bandura's Social Cognitive Theory (1986), to guide research and provide a theoretical framework is invaluable. These theories integrate the distinct influence of the social environment in the development of health behavior.

The purpose of this research is to provide information on BEd students' food-related practices, eating behaviors, nutrition knowledge, personal beliefs and attitudes towards diet and health. Each of these factors can potentially affect the development of health behaviors in children and youth. The research question for this study is: What is the association between eating habits, nutrition knowledge, attitudes, beliefs and future classroom food practices of BEd students?

The objectives of this research are:

- 1) To determine if the use of food as an incentive/reward by BEd students is going to be a common classroom practice;
- 2) To determine what types of foods will be used as incentives/rewards;
- 3) To investigate what eating behaviors BEd students' role model at school;
- 4) To assess BEd students' nutrition knowledge;
- 5) To explore if personal health and eating practices, attitudes and beliefs about the school food environment and demographic characteristics of BEd students, influence their eating behaviors at school and their future classroom food practices.

## **B. SPECIAL CONSIDERATIONS**

Not Applicable

## **C. RESEARCH APPROACH OR METHOD**

In collaboration with the MSVU Education Department, a list will be collected of senior students who are in their final semester. These students will be in either the elementary or secondary education programs and will have completed their practice teaching component thus far. A notice about the study will be sent out to all students using the Department list serve. To ensure optimum participation, the questionnaire will be distributed to students during an annual senior seminar.

An in-class survey design is appropriate for this study to yield a high response rate. Students, who voluntarily consent to participate, will complete the questionnaire during the first twenty minutes of their seminar. The researcher will collect the completed questionnaires. Any students needing extra time, or wanting to fill it out at a later date will be encouraged to return the questionnaires to a locked box in the Curriculum Development Resource Room, a location frequently used by education students. After the seminar, a group email will be sent to students via the list-serve thanking them for their participation and reminding students who still have questionnaires to return them, as questionnaires will be accepted for one week following the email prompt.

To show appreciation and value for their time, free movie passes will be randomly drawn for those students who complete the questionnaire during the seminar. When students hand in their completed questionnaire, they will be given a ticket with a duplicated number on it. The student will keep one half and the other will be placed in a box. The movie passes will be drawn from the box in front of the class before the researcher leaves. Only those students who complete the questionnaire during class time will be eligible for the draw for the movie passes.

The subjects for this study will be students enrolled in the BEd program at MSVU. Approximately 130 students in the second semester of their final year, who have completed their practice teaching component thus far, will be invited to participate. Second year BEd students were selected because they have experience with student-teacher relations in the classroom through practice teaching, and they have a consistent level of experience with teaching children.

## **D. THIRD PARTY PERMISSION**

None

## **E. RESEARCH SURVEYS, QUESTIONNAIRES, INSTRUMENTS, ETC.**

The TEENS Teaching Staff Survey will be adapted and used for this study (Appendix A). Participants will complete this self-administered, in-class survey that includes closed-ended questions. The previously validated TEENS Teaching Staff Survey was designed to assess the classroom food practices and eating behaviors of middle school teachers, as well as teachers' attitudes and beliefs about the school food environment. The survey was developed by the TEENS research staff using primarily original questions. Face validity was obtained by additional researchers, and pilot testing occurred within two different schools.

For purposes of this study, questions from the TEENS Teaching Staff Survey were tailored to include questions about teaching both children and youth. As well, questions were framed for BEd students rather than teachers. The TEENS study was an American project, so some of the beverage drinks and foodservice terms were changed to have a more Canadian context. The questionnaire is divided into seven sections and will collect information regarding personal health, personal eating habits, eating habits when at school, classroom food practices, school food practices, nutrition knowledge and demographics.

The Chair of Applied Human Nutrition at MSVU, who has experience with questionnaire development and child & youth nutrition, will examine the questionnaire using face validity. A public health nutritionist who works within schools will also help validate the survey. The questionnaire will be pilot tested to assess clarity and ease of completion on students in their final year of the Child & Youth Study program at MSVU. The questionnaire will take approximately 20 minutes to complete.

## **F. RISKS**

This research project is minimal risk to participants. A potential risk to participants is if the student thinks the outcome of this questionnaire will reflect on their final grade or their ability as a teacher. It will be made clear to the BEd students that participation in the survey is voluntary; results will remain anonymous and will not reflect on final semester grades. The researcher will address this issue verbally in front of the class, and as well it will be stated in the introduction letter of the questionnaire (Appendix B).

## **G. INFORMED CONSENT**

Each student will consent to participate by completing the questionnaire. The introduction letter will explain that participation is voluntary and that the decision to participate will not have an influence on the student's seminar grade or reflect the teaching ability of the student.

## **H. PRIVACY, CONFIDENTIALITY, ANONYMITY**

The introduction letter will ask students not to put their names or any identifying information on their questionnaire, thus keeping all information anonymous. Once the questionnaire is complete the student can drop it in a box near the front of the seminar room. Any students who choose to fill the questionnaire out at a later date will be encouraged to return the nameless survey to a locked box in the Curriculum Development Resource Room. These questionnaires will be picked up by the researcher one week following the email prompt.

All questionnaires will be stored in a locked filing cabinet, with access limited to the researcher and her thesis committee. When the project has been completed, data will be securely stored for 5 years in the event that an audit of the project is conducted, or that the information is required for further analyses. No identifying information will be presented while disseminating the results from this study. After the five year point the questionnaires will be destroyed by the researcher.

## **I. DEBRIEFING**

Not Applicable

## **J. DISSEMINATION OF RESULTS**

The researcher will publish the information gathered from this study in a peer review journal, newsletters and other related literature sources. The Education Department at MSVU and the participants will be provided with the executive summary of the results of the study and, access to the thesis when completed. The results of this research will also be presented to her thesis committee and members of her faculty as a required component of her Masters program. This study will also be presented at relevant conferences and seminars and to the Education Department at MSVU.

## Appendix D - Response Summary Questionnaire

<b>BEd Students Beliefs and Attitudes About the School Food Environment and Their Perceptions of Personal Health</b>			
	<b>Strongly Disagree/ Disagree n (%)</b>	<b>Uncertain n (%)</b>	<b>Strongly Agree/ Agree n (%)</b>
<b>School Food Environment Index</b>			
Vending machines at school should offer only healthy food and beverage items. (N=103)	12 (11.7%)	10 (9.7%)	79 (78.6%)
Food items from “fast food chains,” such as McDonald’s, Taco Bell, and Pizza Hut should be offered as school lunch alternatives in schools. (N=103)	84 (81.6%)	12 (11.7%)	7 (6.8%)
Selling high fat, high sugar foods, such as candy and cookies, as part of school fund-raising is okay because it helps provide revenue for school programs and school activities. (N=103)	31 (30.1%)	38 (36.9%)	34 (33.0%)
Students’ eating behaviors are influenced by social pressures. (N=103)	5 (4.9%)	7 (6.8%)	91 (88.4%)
It doesn’t make sense to offer students only healthy foods in school when they can choose to eat whatever they want outside of school. (N=102)	77 (75.5%)	16 (15.7%)	9 (8.8%)
Students should be able to buy soft drinks and candy at school. (N=102)	69 (67.7%)	16 (15.7%)	17 (16.7%)
Schools should be commercial free areas where there is no advertising allowed. (N=101)	7 (6.9%)	26 (25.7%)	68 (67.3%)
It is okay for schools to expect students to sell candy for fundraising purposes. (N=102)	24 (23.5%)	44 (43.1%)	34 (33.3%)
<b>Eating and Children/Teens Index</b>			
The foods students eat during the school day affect their readiness to learn. (N=103)	4 (3.9%)	2 (1.9%)	97 (94.2%)
It is important to have a healthy school food environment so there is consistency with health messages taught in the classroom. (N=103)	4 (3.9%)	3 (2.9%)	96 (93.2%)
Attention to eating behaviors are a priority issue to address throughout childhood and adolescence. (N=103)	5 (4.9%)	7 (6.8%)	91 (88.4%)
A school breakfast program can help students be ready to learn. (N=101)	4 (4.0%)	3 (3.0%)	94 (93.0%)
A school breakfast program can help reduce tardiness and absenteeism. (N=102)	6 (5.9%)	20 (19.6%)	76 (74.1%)
The food habits of children and youth affect their health as adults. (N=102)	3 (2.9%)	3 (2.9%)	96 (94.2%)
<b>Personal Health Index</b>			
I consider myself in good to excellent health. (N=103)	11 (10.7%)	-	92 (89.3%)
I am satisfied with my own eating habits. (N=103)	30 (29.1%)	-	73 (70.9%)
I usually limit the amount of high fat food items I eat. (N=102)	24 (23.5%)	-	78 (76.5%)

I do not usually limit the amount of high sugar items I eat and drink, like candy and soft drinks. (N=102)	27 (26.5%)	-	75 (73.5%)
Most days I eat five servings of fruit and vegetables. (N=103)	53 (51.5)	-	50 (48.6%)
I am not satisfied with the amount of physical activity I get. (N=103)	71 (68.9%)	-	32 (31.1%)

\* Responses were reverse coded for index