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EVALUATION OF THE NUTRITION COMPONENT OF AN
INTEGRATED HEALTH CURRICULUM
FOR GRADE FOUR STUDENTS

by

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Thesis submitted to the
School of Graduate Studies and Research
in partial fulfilment of the requirements for the
degree of Master of Science in Nursing

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ABSTRACT

During the winter of 1994/95, a series of nutrition lessons were piloted in a grade four class in the Ottawa area. These lessons were the first component of an Integrated Health Curriculum. This curriculum was the result of the collaborative efforts of an elementary school of the Ottawa Roman Catholic Separate School Board, the University of Ottawa, School of Nursing, and the School-Age Health Division of the Ottawa Carleton Health Department.

The 'Healthy Eating' lessons ran over the course of two and a half months. The objective of the current research study was to measure the impact of the program and identify the processes involved in the curriculum implementation. The Comprehensive School Health model and the PRECEDE-PROCEED framework were used to direct the study, which involved both quantitative and qualitative methods.

The quantitative component of the study followed a quasi-experimental design. The health-related knowledge and attitudes of students who received the curriculum, were measured on three occasions: prior to curriculum implementation, immediately after, and two months post-instruction. The test scores were compared with the test scores from a cohort of students from a comparable classroom, which received no health instruction. A 2X2X3 mixed multivariate analysis of variance was performed on knowledge and attitude. The between variables were gender and intervention. The occasion of testing was a within subject factor. A preliminary MANCOVA was performed to consider age as a covariate, however age was not found to be a significant factor. No significant differences in knowledge or attitude scores could be identified between the two classes. No significant differences were identified on the basis of gender and there was no significant interaction between gender and intervention. The occasion of testing was the only factor to exert a significant effect ($p < .05$). These differences were attributed to the effects of maturation, and were of little clinical significance.

The qualitative component of the study incorporated classroom observation interviews with seven randomly selected students, a parent questionnaire and a teacher questionnaire. The qualitative data supported the potential of the Healthy Eating lessons.

It is expected that this study will assist in the refinement of the current curricular module, and help to guide the development of subsequent components of the Integrated Health Curriculum.

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List of Abbreviations

Children's Cardiovascular Health Promotion	
Attitude Scale	CVHPAS
Coronary Heart Disease	CHD
Comprehensive School Health	CSH
Cardiovascular Disease.	CVD
Integrated Health Curriculum	IHC
Ottawa Carleton Health Department.	OCHD
School Health Education Evaluation.	SHHE

CHAPTER 1

Introduction

The potential for interdisciplinary collaboration in school health is great, by virtue of the fact that so many players share the common goal of fostering the growth and well-being of children. The nursing profession has recognized that the determinants of health are complex, and that health promotion in the school environment is often best accomplished through the coordinated efforts of community members. Nurses at the advanced practice level can facilitate and support such efforts.

The recognition of both the need and potential for health promotion among school communities has also been recognized by the Royal Commission on Learning with the following statement: "We believe the model of a continuous, elementary-secondary emphasis on health promotion is a positive development in curriculum." (Vol. II, 1994, p.47)

In 1992, the School Age Health division of the Ottawa Carleton Health Department, and the University of Ottawa School of Nursing joined with a primary school of the Ottawa Roman Catholic Separate School Board in a three-way health partnership. This partnership was established to enhance and support healthy behaviours within the school community. By 1993, nurses at the advanced practice level were well-represented within the partnership, by a Clinical Nurse Specialist and a Public Health Nurse from the Health Department, and two faculty members and a graduate student from the University School of Nursing. Other partnership members included teachers, students, parent representatives, and the school principal.

One of the projects undertaken as a result of this partnership has been the development of a comprehensive, integrated health curriculum. The first unit of this curriculum, Healthy Eating, was implemented on a pilot basis from December, 1994 to February, 1995. The current research is an exploratory evaluation of the Healthy Eating curricular module. Background information on the planning and content of the lessons will be described in this chapter.

Problem

It is estimated that children between the ages of five and 18 spend approximately one-third of their lives in educational institutions (Green & Kreuter, 1991). The school environment is the 'worksite' of approximately one-fifth of the Canadian population. The report of the Ontario government's Royal Commission on Learning (1994) pointed out, however, that this 'worksite' is in actual fact, a 'part-time' workplace. "There are a thousand distractions, a thousand interests, anxieties, and needs, that compete insistently with schooling for the time and attention of young people" (Royal Commission on Learning, 1994, p.6).

While school is but one of many factors supporting and influencing the growth of children today, it is a very significant one. The school population consists of five million Canadian children and three hundred thousand staff and administrators (Minister of Supply and Services Canada, Canadian Association for School Health, 1993). It is logical to presume, therefore, that schools may be an effective venue for health promotion (Parcel, Simons-Morton & Kolbe, 1988; Green & Kreuter, 1991).

While the influences on health and health behaviours are varied and complex, one of the factors which appears to exert a significant impact is education (Green & Iverson, 1982; Allensworth & Kolbe, 1987; Green & Kreuter, 1991, Lavin, Shapiro & Weill, 1992). It would seem, however, that traditional approaches to health education have fallen short in their efforts to promote well-being of both adults and children. Cardiovascular disease, for example, remains the leading cause of death among Canadians despite being largely preventable and the focus of considerable public attention (Ontario Heart Health Survey, 1993). Educators, nurses and other health professionals have been prompted to search for creative strategies to promote well-being, and have increasingly found themselves to be allies in these effort.

The Report of the Royal Commission on Learning (1994), included the following statement forwarded by the Coalition of Ontario Agencies for

School Health Education:

The school systems are not responsible for meeting every need of their students. But where the need affects learning, the school must meet the challenge. So it is with health. Efforts to improve school performance that ignore health are ill-conceived, as are health improvements that ignore education. (Vol. II, 1994, p.47)

The Integrated Health Curriculum

The Integrated Health Curriculum project was initiated, in part, as a response to the Ontario Common Curriculum document (Ontario Ministry of Education and Training, 1993). The curriculum development was also driven by the shared commitment of partnership members, to the principles of Comprehensive School Health (Kolbe, 1986).

The Integrated Health Curriculum (IHC) was intended to serve as a comprehensive health education program for the junior grades, reflecting current health trends and information. This health program was expected to assist students in developing some of the skills and knowledge required to make healthy lifestyle choices. A focus on cardiovascular risk reduction was identified early in the planning phase of the project, on the assumption that many aspects of healthy living would be encompassed under the broad parameters of cardiovascular health.

Partnership members envisioned that the IHC would ultimately contain four units: Healthy Eating, Active Living, Substance Abuse and Self-Esteem. The expectation, as stated in the forward to the IHC, was that the lessons would promote:

- . Self-esteem and personal empowerment
- . A sense of enjoyment about learning
- . An appreciation of the spiritual dimension of health
- . An appreciation of the environmental influences on health.

The curriculum design reflected the principles of outcome-based learning. Outcome-based education, as described by Spady (1988), is

organized on the basis of desired outcomes, with an emphasis on mastery of skills and materials. An educationally integrated approach would ensure that all of the learning domains described in the Ontario Common Curriculum document were well represented within the activities (Ontario Ministry of Education and Training, 1993). The Common Curriculum outlines four learning domains: language arts, math, science and technology, self and society. The self and society domain incorporates social studies, business studies, family studies, guidance, and physical and health education (Ontario Ministry of Education and Training, 1993). Each of the curricular activities in the IHC was designed to meet one or more of the core learning objectives specified by the Common Curriculum document.

The 'Healthy Eating' lessons were piloted in a grade four class at the school involved in the health partnership. At the time of the current study, the other components of the curriculum (Active Living, Substance Abuse and Self-Esteem) were in the planning stages and were not ready for implementation.

The Healthy Eating lessons

The Healthy Eating lessons were developed by teachers, and a student teacher at the school. Curriculum consultants from the Ottawa Roman Catholic Separate School Board assisted in the development of the lesson plans. The teachers from the involved school, a dietician and nurses from the School Age Health division of the Ottawa Carleton Health Department, and a Masters nursing student from the university, worked collaboratively to establish the health content of the lessons.

The 'Healthy Eating' component of the curriculum consisted of eleven units or lessons for grade four students. Lessons were taught two or three times weekly, over a period of two and a half months. Most of the teaching units required two or three classroom sessions to complete. Classroom sessions were from 45 to 60 minutes in length. The lesson plans were intended to serve as a complete, comprehensive, and user-friendly

health education resource for teachers of the primary grades. Each lesson clearly identified which domain of the Ontario Common Curriculum (maths, science, language and/ or self and society) it addressed. Each lesson plan identified which specific learning outcomes, as described in the Common Curriculum, could be achieved through the learning activities. Lesson plans identified which learning strategies were employed (for example, individual work, group work, observing, analyzing, reporting, brainstorming, etc.). Required materials, assessment opportunities and follow-up activities were also described. It was expected that lessons would be integrated with other subjects, and require minimal resources and preparation time, thus enhancing cost effectiveness. A schedule of the lesson plans has been included in Appendix A. The content of the lessons will be further described in Chapter Three.

The lessons were designed to enhance the competencies of children to make healthy decisions, while also providing opportunities for students to enhance their math, language, scientific and art skills. This research study focussed on the health perspective and was not intended to reflect or evaluate the degree to which academic skills were met by students.

Objectives

The objective of this research study was to provide a process and summative evaluation of the first completed component of the new curriculum. The chapters to follow will describe the process and results of the evaluation study. Chapter Two will include a review of the literature and conceptual frameworks relevant to the Integrated Health Curriculum initiative and evaluation. The intervention, research questions, study design and research methods will be addressed in the third chapter. Findings will be presented in the Chapter Four. Conclusions, recommendations and implications for advanced nursing practice will be discussed in Chapter Five.

CHAPTER 2

A Review of the Literature and Theoretical Framework

This chapter is divided into two subsections. The first section will present previous research findings of relevance to the current study. The second part of the chapter will address the application of the Comprehensive School Health model (Kolbe, 1986) and the PRECEDE-PROCEED model (Green & Kreuter, 1991) to the current research.

Review of Previous Research

In order to establish a comprehensive appreciation of the issues involved in the Integrated Health Curriculum effort, the literature review will reflect the following elements:

- . The incidence of cardiovascular disease in Canada
- . The link between cardiovascular disease and childhood behaviours
- . Correlates and influences of child health behaviours and attitudes
- . The current attitudes and behaviours of Canadian children, with a specific focus on heart health and nutrition
- . Factors influencing school health promotion
- . Assessment in School Health Education.

In preparation for this research, computer searches were done using the following data bases: MEDLINE (1989-1994); CINAHL (1983-1995); Educational Resource and Information Centre (ERIC), (1982-6\1993) and the Psych.LIT DATABASE 1987-6\1993.

The Healthy Eating unit was originally intended to be the first component of a larger cardiovascular risk reduction program for the primary grades. Consequently, this literature review will briefly discuss cardiovascular disease and its implications for child health promotion. This will be followed by a discussion of those variables identified through previous research as influencing the health attitudes and behaviours of children. The current behaviours of Canadian children will

be reviewed, with particular emphasis on nutrition and heart health-related behaviours. The final element of the literature review will focus on school health promotion, and assessment.

Cardiovascular Disease in Canada

Cardiovascular disease (CVD) is defined as "a broad group of conditions, the major components of which are ischemic heart disease and stroke" (Heart and Stroke Foundation, 1993). CVD is the major cause of morbidity and mortality among Canadian adults, directly contributing to 39% of all deaths in Canada in 1990 (Heart and Stroke Foundation, 1993).

According to the Victoria Declaration on Heart Health:

Most cardiovascular disease is brought about by some combination of smoking, high blood pressure, elevated blood cholesterol, unhealthy dietary habits - including excessive alcohol consumption, a sedentary lifestyle and psychosocial stress. These risk factors are woven into the very fabric of life in many societies around the world. (Health and Welfare Canada, 1992, p.4)

It is estimated that two out of three Canadian adults demonstrate at least one of the major risk factors for CVD, as indicated in Table 1.

Table 1.

Percentage of Canadian Adults with CVD Risk Factors

	<u>Number of Risk Factors</u>			
	<u>zero</u>	<u>one</u>	<u>two</u>	<u>three</u>
<u>Percentage</u>				
% of males	34	44	20	3
% of females	37	43	18	1

(Canadian Heart Health Survey, 1992)

The incidence of major and associated CVD risk factors observed

among adults in Ontario parallels the national figures as indicated in Table 2.

Table 2

Percentage of Ontario Adults with CVD Risk Factors

Risk Factors	Percentage of Ontario adults demonstrating risk factors
High blood pressure	18%
Plasma cholesterol $\geq$ 5.2	42%
Smoke $\geq$ 1 cigarette daily	23%
Sedentary lifestyle	39%
Overweight	33%

(Ontario Heart Health Survey, 1993)

The prevalence and incidence of cardiovascular disease argue strongly for concentrated preventive efforts. Research findings which identify a link between adult heart disease and childhood precursors will be introduced in the next section of this chapter, to support the need for education and risk reduction efforts at an early age.

The Link between Adult Disease and Childhood Behaviours

There is evidence to suggest that a direct link exists between adult heart disease and childhood risk factors. Researchers involved in the PDAY study (Pathobiologic Determinants of Atherosclerosis in Youth) identified a direct association between clinical vascular disease and risk factor levels and indicators of obesity (PDAY, 1990). The authors also concluded that risk factors for CVD were established early in life.

Schrott, Clarke, Wiebe, Connor and Lauer (1979) found that risk factors for coronary heart disease in children in Muscatine, Iowa, were found to predict the risk factors of their parents, and vice-versa. Significantly higher cholesterol levels ($p < .01$) and significantly higher

reported coronary mortality rates ($p < .05$) were identified among adult relatives of children in the high risk group for CVD, as compared with relatives of those in the middle and low risk groups.

In Bogalusa, Louisiana, cardiovascular risk factors were tracked among 2336 children, ranging between two and 14 years in age, over a five year period. Children initially identified as falling in the extreme ranges for measurements of anthropometrics, systolic blood pressure, serum total cholesterol and *B*-lipoprotein cholesterol (greater than the 90th percentile) remained so in both second and third measurements ($p < .0001$). The researchers concluded that pathologic changes begin early in childhood (Weber, Cresenta, Voors & Berenson, 1983).

Longitudinal and cross-sectional studies have identified that many North American children already demonstrate risk factors for cardiovascular disease (Butcher, 1988; Frank, 1983; Kwiterovitch, 1986). Atherosclerotic changes related to cholesterol have been documented in North American children as young as three years of age (Kwiterovitch, 1986). Frank (1983) proposed that the low levels of physical activity and the consumption of high fat diets, commonly observed among North American children, were associated with a 38% higher risk of obesity.

McGill (1980) concurred that the antecedents of vascular pathology and atherosclerosis develop well before the third decade of life, and proposed that intervention prior to age twenty might prevent the development of heart disease in later years.

Labarthe (1992) argued:

The theoretical basis for understanding the development of atherosclerosis is a gradual process with onset well below the age of 20 is supported by the evidence concerning the early natural history of its main predictors ...Current knowledge also warrants dynamic research of efforts devoted to the prevention of the behaviours associated with CHD risk and the careful long-term monitors of its effects. (p.11)

In summary, there is considerable evidence indicating that risk factors for cardiovascular disease are established early in life. Consequently there is a growing recognition that cardiovascular disease prevention programs directed at children provide an opportunity to promote well-being and to decrease risk at an early age.

The next section of this chapter will review those variables which have been identified in the research as exerting an influence on the health attitudes, beliefs and behaviours of children.

Correlates and Influences of Child Health Attitudes and Behaviours

The literature suggests that patterns of health behaviours, even in young children, are remarkably complex and influenced by a number of factors. These variables, which will be discussed in detail below, include age, gender, self-esteem, ethnic background, socio-economic status, the influence of significant others, media influence, and education.

Age.

There is consistent agreement in the literature that age is a key factor influencing the health attitudes, beliefs, and behaviour of children. Early qualitative studies by Gochman (1971); Palmer and Lewis (1976), Natapoff (1978) and Eiser, Patterson and Eiser (1983) suggested that health attitudes and behaviours develop in a systematic and sequential pattern. While these studies were based on relatively small convenience samples, ($n = 108, 189, 264,$ and 80 respectively), their conclusions were supported by later research studies. Hester (1987) classified the responses of 225 children between the ages of six and 13, when they were asked to describe what a healthy child is like. From these responses, Hester distinguished twelve dimensions of health. These dimensions included activity-exercise, personal grooming, nutrition, physical health, behaviour, emotional health, sleep, dental health, friends, family, and substance use. The majority of responses were associated with the first four categories.

The contention that children view health from a multi-dimensional perspective has been supported by others (Dielman, Leech, Becker, Rosenstock & Havarth, 1992 ; Goldman, Whitney-Saltiel, Granger & Rodin, 1993). According to these authors, the most commonly identified aspects of health as recognised by younger children were physical fitness, exercise, and nutrition. As the cognitive abilities of children become more advanced, these health concepts were found to become more abstract and more likely to include mental health indicators.

Gender.

Gender appears to play a key role in the development of health attitudes, beliefs and behaviours. In 1984-85, the Health Promotion Directorate of Health and Welfare Canada supported the "Canada Health Attitudes and Behaviours survey: 9,12 and 15 year olds" (King, Robertson & Warren, 1985). This study, undertaken by the Queen's Social Program Evaluation Group, was intended to determine the health related patterns of Canadian children. This survey was administered to over 33,000 school students in grades four, seven, and ten; representing the nine, 12, and 15 year age groups, respectively. A two-stage cluster sampling design was used. Schools in each province were clustered based on characteristics such as language of instruction, school jurisdiction, type of community, location within the province, and school size. Schools were systematically selected from this list, and classes randomly selected, wherever possible from the chosen schools. Data were collected about nutrition, physical and leisure activities, substance abuse, safety, parent/child relationships, family roles, body image, and mental health. Among the findings of the Canada Health Attitudes and Behaviour study was the observation that female children perceived themselves as being less physically fit, more prone to physical ailments and less happy than their male counterparts (King et al., 1985). Furthermore, girls reported less positive family relationships as compared to boys (King et al., 1985).

The conclusion that gender exerts a role on health behaviours has

been supported by other studies which have found that female children in general, tend to pursue more positive health behaviours and take fewer health and safety risks than males (Ferguson, Yesalic, Pomhren & Kirkpatrick, 1989; Natapoff & Essoka, 1989; Stember, Stiles & Rogers, 1987). A notable exception to the conclusion that females generally pursue more positive health behaviours is the higher incidence of smoking and lower levels of physical activity among female children as compared to male counterparts reported in the Canada Health Attitudes and Behaviour study (King et. al, 1985).

Stember et al., (1987) conducted a multi-site study of 947 American children in grades one, four, and six. Gender was found to be a significant determinant of both perceptions of severity of health problems ($p < .05$), and vulnerability to health problems ($p < .001$). Female children were found to perceive a greater severity and vulnerability than their male counterparts.

Self esteem.

Self esteem has been recognized as a major factor in the development of health beliefs and behaviours (Ferguson et al., 1989; Gochman, 1971; Godin & Shephard, 1984; Lamarine, 1987; Lau & Klepper, 1988; Parcel, Simons-Morton, O'Hara, Baranowski & Wilson, 1989). Gochman (1971) suggested that a positive relationship exists between internal locus of control and potential positive health behaviours ($p < .05$). Ferguson et al. (1989) identified a positive correlation between self-esteem and intent and current exercise behaviour among middle school children ($p < .001$). Lamarine (1987) proposed that gender-related variations in self-esteem and internal locus of control may contribute to gender associated variations observed in health attitudes and behaviours.

Ethnic background.

Much of the research to date has involved convenience samples, drawing participants from predominantly white, mid-socioeconomic backgrounds. Consequently, generalizability has been severely restricted.

Nader (1989) recognized ethnic background as a significant variable in the impact of health education. Children and families involved in the study were randomly assigned to either a treatment or control group. The treatment group was exposed to a cardiovascular risk reduction program over the course of nine months. Anglo-Americans and Mexican-Americans in the treatment group were both found to have higher scores regarding knowledge and physical activity than their counterparts in the control group. However, the self-reported salt and fat intake among the Anglo-Americans in the intervention group was significantly lower than their Mexican-American counterparts in the intervention group. Nader (1989) concluded that there appeared a greater program impact with Anglo-American children as compared with Mexican-Americans, noting however, that tools with greater cultural sensitivity were warranted.

Lamarine (1987), measured the relationship among self-esteem, health locus of control, and health attitudes among Native Americans in New Mexico. A positive correlation was identified between health attitude inventories and self-esteem for males, and females, although this relationship decreased with age. A correlation of .26 between health attitude inventory and self-esteem scores was observed among males ($p=.001$), while the correlation for females was .36 ($p=.001$). The correlation between the health attitude inventory and self-esteem was .37 ($p=.001$) for fourth grade students, .26 for fifth grade students ($p=.003$), and .17 for sixth grade students ($p=.087$). Lamarine theorized that younger students may be more amenable to interventions aimed at enhancing health attitude through increasing self-esteem. Self-esteem was a moderate predictor of health attitudes among Pueblo and Navaho children, but not for Apache children. Lamarine proposed that this variance may have been related to cultural related variations in childrearing practices, self-esteem, and social organization within the tribes.

Socio-economic status.

The relationship between economic disparity and ill-health has been

well-established, and major studies in the United States and Canada have concluded that the health and well-being of children is compromised by economic circumstances (Canadian Institute of Child Health, 1994; Johnston, 1991; Wessel, 1989). Little data exists, however on the impact of economic status on the health attitudes of children. Researchers who have considered this variable have failed to find it a significant predictor of health attitudes and behaviours, in and of itself (Goldman et al., 1991; Natapoff, 1978). These authors theorized that socio-economic factors may exert an effect through their influence on other variables such as self-esteem and access to health care and health education.

Influence of significant others.

Not surprisingly, parental and peer influence have been found to play a significant role in the determination of health attitudes and behaviours of children. Palmer and Lewis (1976) concluded that by the age of eight, children possessed the reasoning skills and abilities to make health decisions. They proposed that the rules of seeking care and making health decisions were passed on to children by family members, teachers, and significant others. The Canada Health Attitude and Behaviour survey found that healthy family relationships were associated with higher self-esteem and more prudent safety attitudes (King et al., 1985).

Godin and Shephard (1984) examined exercise expectations of parents, peers and teachers as perceived by school children. A multivariate analysis was performed to evaluate normative beliefs and motivation to comply among 698 Toronto schoolchildren in grades seven to nine using current exercise behaviour, sex, and grade as independent variables. A significant difference ($p < 0.05$) was observed between the normative beliefs of parents and friends as perceived by active and sedentary children. Active children were more likely to perceive a positive expectation that they should exercise. The perceived beliefs of friends also varied between the groups and males were more likely to perceive a parental expectation for exercise. Age was also a significant factor in

determining the perception of normative beliefs of parents and friends ($p < 0.05$). The mean score for parental expectation among grade seven students was 1.31 (on a scale from -2 to 2), as compared to 0.95 among grade nine students. Similar age related variations were found for the expectation of friends (0.70 versus 0.44). Regardless of age, students rated the expectations of parents more strongly than friends. The motivation to comply, however, with the expectations of referent groups (parents, teachers, friends) was significantly lower among grade nine students as compared to the grade seven cohort. Grade seven students rated their motivation to comply with parents at 0.81 and friends 0.63. By grade nine, this trend was reversed and motivation to comply with parents was 0.02 as compared with friends 0.23 ($p < .001$). Older children were significantly less likely to comply with the expectations of any of the referent groups, than younger children. No significant correlation was identified between current physical activity habits and motivation to comply with the expectations of any of parents, teachers, or friends. Godin and Shephard (1988) concluded that students perceived a sense of personal control over their behaviour, and believed themselves "free of external pressures, including parents, teachers and even their close friends" (p.444).

The media.

In 1991, Canadian researchers examined the dietary adequacy of food as represented by 'Prime Time' advertising over a five day period, on five Canadian television stations broadcasting in the London, Ontario region (Ostbye, Pomerleau, White, Coolish & McWhinney, 1993). The type, number and nutritional content of foods advertised between the hours of 7:00 to 11:00 pm on weekdays and between 7:00 to 11:00 am. on Saturdays, were analyzed. Advertisements for food products were found to account for 24 to 35% of all commercials featured during the time frame, representing the largest advertising output for any group of products. The large proportion of commercials advertised predominantly sugared cereals, fast foods and

low nutrient beverages, prompting the researchers to conclude:

The 'diet' advertised during 'prime time' does not appear to promote the kind of healthier food choices which many professionals would like to see and which have been recommended nationally. Rather, it appears, at best, to reflect current dietary patterns, which have been implicated in the etiology of obesity, ischemic heart disease and certain cancers. (Ostbye et al., 1993, p.373)

A similar American study found that food advertisements represented 56.5% of all advertisements. Of those food advertisements, 43.6% promoted foods which were classified as high in fats, oils or sugars (Koltz & Story, 1994). These authors concluded that "the diet depicted in Saturday morning television is the antithesis of what is recommended for healthful eating for children" (p.1298).

These studies confirmed the dietary inadequacy portrayed in food commercials directed at children. These findings are worrisome when considered in light of other studies which have found a direct correlation between the amount of time spent viewing television and the request purchase and consumption of foods advertised on television (Gorn & Goldberg, 1982; Nader & Nelson, 1989; Taras, Sallis, Patterson).

Education/ Intervention programs.

There is substantial evidence to suggest that health education may exert an influence on the health attitudes, knowledge and behaviours of children. Table 3 will introduce a number of school health studies which identified an impact on the behaviours or attitudes of children of similar age groups to the current study.

School Health Initiatives (cont.)

Devine, Olson Frongillo (1992)	7,8	Nutrition	Significantly higher test scores for attitudes were & were found at the $p=.05$ level in classes where 'Nutrition for Life' was taught, as compared to classes where no instruction had taken place. No significant differences identified where 'some' nutrition was taught, as compared to classes where Nutrition for Life was taught. Researchers attributed modest results to relatively limited hours of program exposure (median classroom time =3 hours).
Contento, Kell, Keiley & Corcoran (1992)	1-6	Nutrition	Treatment group, post-test only evaluation of knowledge and attitudes. Teacher evaluation component indicated 45% of lower elementary and 80% of upper elementary teachers felt that insufficient time was allotted for some sessions. All of the 16 teachers agreed or strongly agreed that students had enjoyed the program and that the lessons exerted a positive impact on the students' understanding of nutrition nutrition, and had improved the students' abilities to identify healthy foods.
Girgis, Sanson- Fisher, Tripodi & Golding (1993)	5,6	Solar protection	Students exposed to intensive instruction had significantly higher levels of sunscreen (1993) protection by 4 weeks and 8 month post-tests as compared to both control and standard intervention group. Students were more than twice as likely to apply sunscreen than children in control and standard groups in the first test and three times as likely in the long term. No differences were found between the control and standard intervention groups at either post-test, suggesting that minimal intervention was ineffective. Researchers concluded that success was due to the quality and type of intervention rather than health education itself.

Table 3.

School Health Initiatives

Study	Grades	Target Area	Major Findings
Coates, Jeffrey & Slinkard (1981)	4, 5	Nutrition Fitness	Significant increases in average number of heart-healthy foods in lunches ($p < .01$); decrease in amount of heart-healthy foods trashed ($p < .05$). No significant changes in exercise activity. Positive changes in nutrition knowledge, exercise and heart health knowledge, reported food and activity preferences at $p < .01$. Post-test improvements not maintained over time. Reported healthy food preferences decreased over time.
Perry, Mullis & Maile (1985)	3, 4	Nutrition	Changes in knowledge, preference and behaviour. ($p < .001$) 24-hour recall significant changes in five of 12 targeted food items; less sugared cereal ($p < .05$); more dark vegetables (≈ 5.35 , $p < .05$); less fried foods ($p < .005$) and less added salt (≈ 3.2 , $p < .05$).
Parcel, Simons-Morton, O'Hara, Baranowski & Wilson (1989)	3, 4	Nutrition Fitness	Decline in reported salt use from baseline to post-test, within treatment school ($p < .001$) Increase in exercise behavioral capability, self-efficacy and self-reported aerobic activities ($p < .01$).
Bush, Zuckerman, Theiss, Taggart, Horowitz, Sheridan Walter (1989)	4-6	Nutrition Fitness Tobacco	Positive impact on some physiological measures including systolic and diastolic blood pressure, serum HDL cholesterol. Positive impact on attitude towards & smoking. Mean difference in cigarette attitude between groups = 3.68 ± 1.23 ($p = .012$) and health knowledge with an observed difference in test scores between in test scores between the control and intervention school of 34 to 37.5% ($p = .01$) in first year, and from 31.7 to 35.2% in the second year of the program ($p < .05$).

(table continues)

The School Health Education Evaluation (SHEE), reviewed four major health education programs which had involved over 30,000 students in grades four through seven in 20 American states (Connell et al., 1985). Students exposed to comprehensive school health education demonstrated significant positive changes in their health-related knowledge and attitudes, compared with their counterparts who received no specialized education. Across the entire sample, effect sizes converted to proportions of the standard deviation of the measures employed were:

Program-specific knowledge	.65
Overall knowledge	.43
Attitude	.12
Reported practices	.27

(Connell et al., 1985, p.316)

The authors found that "school health program effectiveness was strongly related to the level of implementation" (p.316). According to the School Health Education Evaluation Report:

.'Large' effects (greater than .8 standard deviation) are achievable for general health knowledge gain, but only after more than 50 classroom hours. Conversely 'large' gains in specific subsets of health knowledge are achievable in far fewer hours.

. 'Medium' effects are achievable for general health practices when more than 30 hours of classroom instruction is provided.

.'Small' effects are achievable for general health attitudes, but these emerge only after 40 hours of classroom instruction are provided. (Connell et al., 1985, p.321)

The authors concluded a minimum of 40 to 50 classroom hours was required to achieve stable effects in knowledge, practices, and attitudes, and recommended that health education begin upon school entry and continue until graduation (Connell et al., 1985).

The next component of the literature review will focus on the health attitudes and practices of Canadian children, with a particular emphasis

on cardiovascular related behaviours and dietary habits.

The Current Health Attitudes and Behaviours of Canadian Children

The data collected in the Canada Health Attitudes and Behaviours Survey of 1984-85, (King et al., 1985) illuminated some disturbing trends and confirmed a worrisome parallel to risk factors commonly observed among adult populations.

- . Nearly one-half of the children surveyed did not eat a balanced diet
- . A full third failed to meet the requirements of the Canada Food Guide in one food group. An additional 12 to 14% lacked two food groups
- . Only one-sixth of nine and 12 year olds and one-third of 15 year olds reported taking daily scheduled physical activity in school
- . Over 25% of grade four students reported that they often could not sleep 'worrying about things'
- . Only 49% of all grade four students said that 'most of the time' they felt good about the way they looked.

(King et al., 1985)

The 'Canada Health Attitudes and Behaviours' Survey has yet to be repeated in this country. The findings of the nutrition component of the study have, however been corroborated over the years by smaller studies evaluating the dietary adequacy of children in various regions of Canada.

Three recent studies (Bidgood & Cameron, 1988; McIntyre, 1993; and Wolfe & Campbell, 1993), two of which were Canadian, investigated the dietary adequacy of primary school children. In each of these studies, schools were selected using stratified random sampling, based on the estimated socio-economic status of the school population. These studies identified a relatively low incidence of breakfast skipping with varying degrees of dietary inadequacy (Bidgood & Cameron, 1988, McIntyre, 1993, Wolfe & Campbell, 1993) as outlined in Table 4:

Table 4

Studies Examining Dietary Adequacy of Primary School Students.

Study	n	Grades	Major Findings
Bidgood & Cameron (Waterloo, Ont.) (1988)	639	4,6	Incidence of breakfast skipping = 8.6%. 90% of breakfasts contained two or more food groups.
McIntyre (Nova Scotia) (1993)	2500	1-3	Incidence of breakfast skipping = 4.5%. 86% of breakfasts contained two or more food groups.
Wolfe & Campbell (New York State) (1993)	1797	2,5	13% of children reported one or more food groups missing from diet, or two or more groups eaten only once daily.

The findings were consistent with the earlier Canada Health Attitude and Behaviour study (1985) which found that in general, 10.6% of students had diets which were inadequate in three or more food groups.

Bidgood and Cameron (1988) reported that although 8.6% of the students surveyed reported missing breakfast in the 24-hour period prior to the survey, 19.5% reported missing breakfast one or more times in a one week period. While 30.4% of the students met the recommendations for intake in all four major food groups, 30.6% of the population were inadequate on two or more of the four food indexes and 10.6% were inadequate on three or four of the four food groups. Of the children surveyed, 61% reported consuming four or more servings of 'junk food' during the 24-hour recall period. The researchers observed that most of the observed dietary inadequacy was not explained by missed meals/snacks, but by the content of the meals/snacks eaten (Bidgood & Cameron, 1988).

Bidgood and Cameron also concluded that patterns of meals and snacks missing and dietary inadequacy were not substantially different between high and low socio-economic groups (1988). Relationships were identified

between economic restraints and inadequate intake of specific food groups. Living below the poverty line, for example, was associated with higher levels of dairy product inadequacy. However "these relationships were not particularly strong" (Bidgood & Cameron, 1988, p. 68). Ethnic background and family income accounted for only 4% of the observed variance in meal/snack missing ($p = .0001$). The researchers concluded that lifestyle factors accounted for most of the observed inadequacies. These factors, as described by study participants, included 'no time', 'habit', 'don't like', beliefs, etc'. Bidgood and Cameron (1988) wrote:

While the constraints... ('lack of resources, lack of understanding, inadequate parental supervision, media/psychological problems')... are associated with higher levels of meals/snacks missing and dietary inadequacy, and are undoubtedly important obstacles for a number of these children, most of the meal/snack missing and dietary inadequacies in our sample seem to be explained by the life style factors. (p.74)

McIntyre (1993) supported the conclusions of the former study by reporting no significant differences in the incidence of breakfast-skipping and inadequate breakfast-eating for variables such as income, community size, day of the week, or time of the month (McIntyre, 1993, p.413); although age and gender were found to be significant. Of the grade one students surveyed, 6.1% reported missing breakfast, as compared to 3.2% in grade three ($p < .05$). Boys were also significantly more likely to skip breakfast than girls (5.4% compared to 3.9%, $p < .05$). One third of the children surveyed reported that they prepared their own breakfast. Children who prepared their own breakfast ate significantly more cereal, chips, pop and coffee than children for whom someone else prepared food ($p = .0001$).

In summary, socio-economic level was not found to be a prime determinant of dietary inadequacy, in and of itself. There is room for guarded optimism that influencing the food choices and preferences of

children may be within the realm of intervention. The next sections of the literature review will focus on factors considered relevant to the successful implementation and evaluation of school health education.

Factors influencing School Health Promotion

Well developed school health programs have demonstrated a positive impact on the health knowledge and attitudes of children (Connell et al., 1985). There is a general acknowledgement in the literature that prompting a behaviour change is more problematic than affecting changes in intent, attitude and knowledge.

Fors and Doster (1985), commenting on the School Health Education Evaluation findings, concluded that the success or failure of a health promotion program was to a large degree contingent on the level of administrative support. The authors argued that such support may help to assure that teachers are adequately prepared to teach and equipped with appropriate resources, thus increasing the likelihood of teacher fidelity to a planned program. They identified teacher fidelity to a planned curriculum as a major factor in promoting attitudinal and behaviour changes among students. Parcel et al., (1989) concurred with the observation that the levels of interest, commitment and motivation held by teachers were critical to the success of curriculum implementation.

Other factors identified as being instrumental to successful school health education were: prolonged reinforcement, cooperative active learning, family involvement, incentives, a coordinated approach and appropriate teaching training and support (Dartmouth Health Promotion Study, 1992; Girgis et al., 1993; Parcel et al., 1989; Terhune, 1984; Weiss & Kien, 1987; Williams & Plotnikoff, 1995). Stone, Perry and Luepker (1989) advised that curricula be theoretically grounded and primarily focussed on the development of health skills rather than knowledge.

Harlan (1989) agreed that the acceptance and institutionalization of school programs requires attention to cost and teacher acceptance.

Administrative support was also recognized as important by Smith, McCormic, Steckler and McLery (1993), who identified a positive correlation between perceived administrative support and teachers' implementation of school health curricula ($p < .05$), concluded that "a teachers' behaviour directly dictates the quality and quantity of health instruction in each classroom" (p.349).

Williams and Plotnikoff (1995) concurred, based on their process evaluation of a major primary school health and physical fitness initiative in Australia. The authors underscored the importance of administrative support and described school principals as 'gatekeepers' to health promotion curricula. Parental involvement, and adequate teacher preparation were also identified as critical factors in the successful implementation of their program.

Green and Kreuter (1991) wrote:

Failure to acknowledge and address the perceptions and feelings held by administrators, teachers and parents about their schools, however difficult those sentiments may be to quantify, can stop the best-designed well-intended program dead in its tracks. (p.365)

A 1990 survey of 15 elementary teachers, 15 secondary teachers, five program consultants, three program coordinators, and 30 school trustees representing ten different school boards across Ontario, identified a reluctance among teachers to assume roles as health educators in the absence of appropriate and available resources (Kent, 1990). This same study indicated that the legitimacy of health education is less entrenched than are traditional core subjects, citing a widespread concern shared by teachers that classroom time devoted to health detracts from the time available for other conventional subjects.

Assessment in School Health Education

The evaluation of school health promotion interventions presents a

challenge to health professionals and educators. Traditionally, school health education has emphasized the development of skills and knowledge. Curriculum evaluation has generally been performed on the basis of program specific questionnaires which often lack psychometric integrity (Green & Kreuter, 1991). A number of authors have identified that there is a scarcity of appropriate instruments to measure the health knowledge, attitudes and behaviours of children (Arvidson, 1990; Connell et al., 1985; Hester, 1985; Lamarine, 1987). McKinlay, Stone and Zucker (1989) stated "a distinguishing feature of school-based studies is the lack of control over the experimental context - the various elements in the school and/or the classroom" (p.311).

Green (1981) and Stone (1986) recommended the use of both quantitative and qualitative data for school health program evaluation. Christenson (1985) concurred, based on an evaluation study of a tobacco risk reduction program for grade six students. The qualitative data substantiated the quantitative findings and highlighted details which, according to the author, might otherwise have been missed. This information was instrumental in the program revision.

Mittelmark, Hunt, Heath, and Schmid (1993); Pirie, Stone, Assaf, Flora, and Maschewsky-Schneider (1994); and Winkleby (1994) argued for a broadening of evaluation concepts in relation to CVD prevention program evaluation, recommending the use of both qualitative and quantitative measures at the individual, organizational and environmental level. Davis, Gonser, Kirkpatrick, Wolfe, Lavery and Owen (1985) recommended that school health evaluations should frequently examine the perspectives of:

- . Pupils: their reactions and outcomes, with attention to student gains in knowledge, attitude and behavioral measures.
- . Teachers: the classroom process of implementing the curriculum and attainment of goals.
- . School district: its goals and educational mission.
- . Parents and community members: their perceptions of program value.

In conclusion, the incidence of risk factors for cardiovascular disease observed among the Canadian adult population, is disconcerting. Research findings identifying a link between childhood behaviours and adult heart disease support the need for intervention at an early age.

The frequent use of convenience samples, and a general lack of reported demographic data, has restricted the external validity of many health-related studies pertaining to children. Small sample sizes and a lack of statistical power may have contributed to the lack of effect identified in many of the intervention and evaluation studies. Despite their flaws and inconsistencies, however, both qualitative and quantitative studies have been congruent in their acknowledgement of the sophistication of children's health beliefs and behaviours.

Age, gender, self esteem, the media and family influence exert a role in predisposing, enabling or reinforcing health behaviours and attitudes. Well-mounted school health education efforts may exert a positive influence. There is considerable evidence to suggest that health education at an early age may be an effective mechanism for imparting knowledge, encouraging the adoption of healthy lifestyles and reducing the risk of adult disease.

The next section of this chapter will introduce the constructs of the two theoretical models which were used to guide the current research study.

Conceptual Framework

The current study was guided by the Comprehensive School Health framework (Kolbe, 1986) and the PRECEDE-PROCEED model (Green & Kreuter, 1991). The balance of this chapter will examine the application of these frameworks to the Integrated Health Curriculum evaluation.

Comprehensive School Health

Elements of the Comprehensive School Health framework (Kolbe, 1986)

supported the philosophy of the Health Partnership and the Integrated Health Curriculum. Comprehensive school health education was defined by the National Professional School Health Education Organization (1984) as:

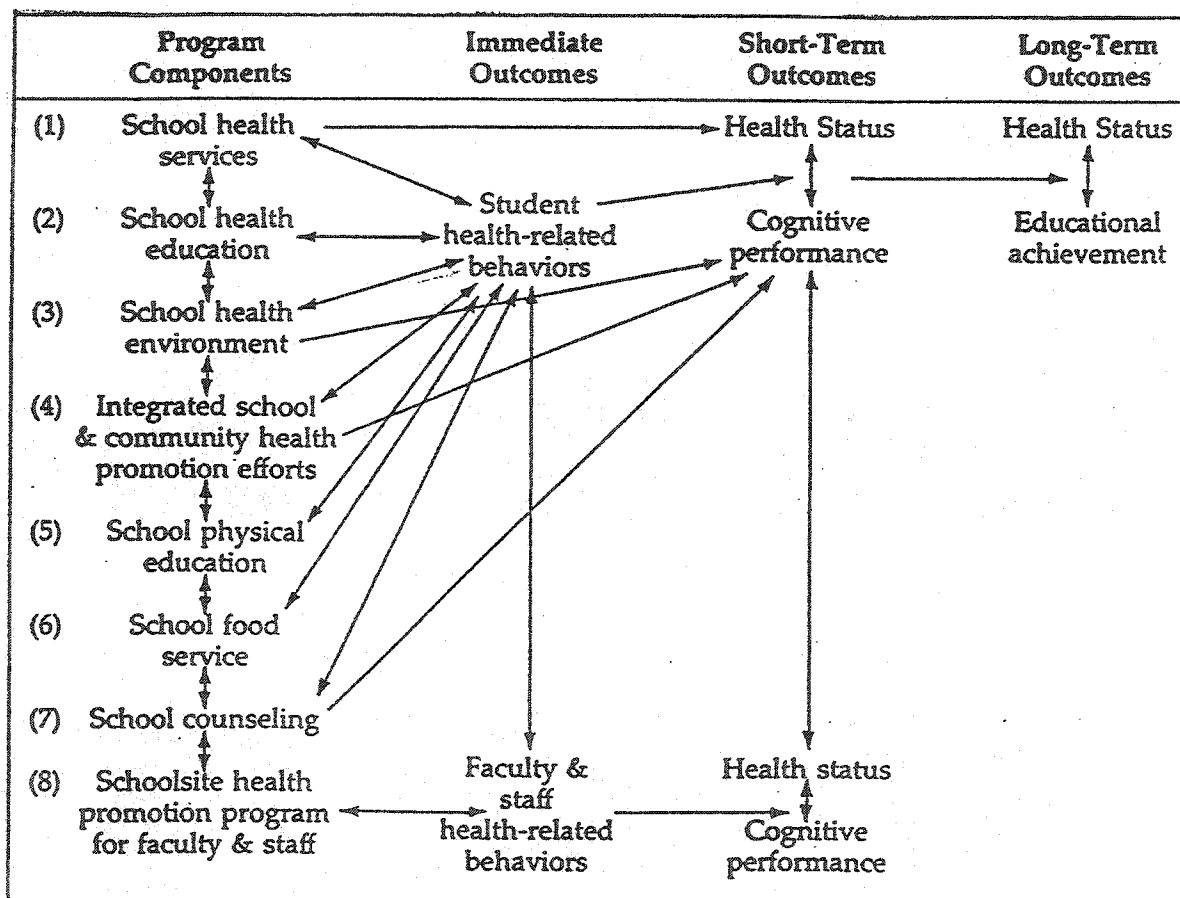
Health education in a school setting that is planned and carried out with the purpose of maintaining, reinforcing or enhancing the health, health related skill, health attitudes and practices of children and youth that are conducive to their good health. (p.312)

The Comprehensive School Health framework (Figure 1), developed out of the growing acknowledgement that a fundamental link exists between health and education (Allensworth, 1993; Allensworth & Kolbe, 1987; Kolbe, 1986). The Comprehensive School Health model identifies eight components integral to a comprehensive approach to school health. These components are thought to exert an influence on the health of the school population through predisposing, enabling and reinforcing health behaviours. According to Parcel, Simons-Morton and Kolbe (1988), each of the eight components of the school health program can "independently influence important health behaviours of large populations" (p. 436). However, "organizational changes in some of the components might substantially improve student health behaviours without educating students about the relationship between these behaviours and health, and without providing students with the motivation and skills they will need to continue these behaviours" (p.436). The application of the CSH framework incorporates "health education and related organizational changes to attain at least complementary if not synergistic effects" (Parcel et al., 1988, p.436)

Comprehensive School Health (CSH) includes a broad spectrum of programs, activities and services in schools and surrounding communities. Child/youth health status and educational achievement are conceptualized as being on a continuum. The concept of "comprehensiveness" implies that the multiple components of the school health program are meshed with the active involvement of the community, through the development of

connections, partnerships and the sharing of resources (Minister of Supply and Services Canada, Canadian Association of School Health, 1993). In the context of the current study, this 'sharing of resources' was evident in both the Health Partnership itself, and in the collaborative effort required to develop the Healthy Eating lessons.

Figure 1. The Comprehensive School Health Framework.



Note. From "Increasing the impact of school health promotion programs: Emerging research perspectives" by L. Kolbe, 1986, *Health Education* 17(5), p.50. Copyright Journal of Health Education. Reprinted by permission.

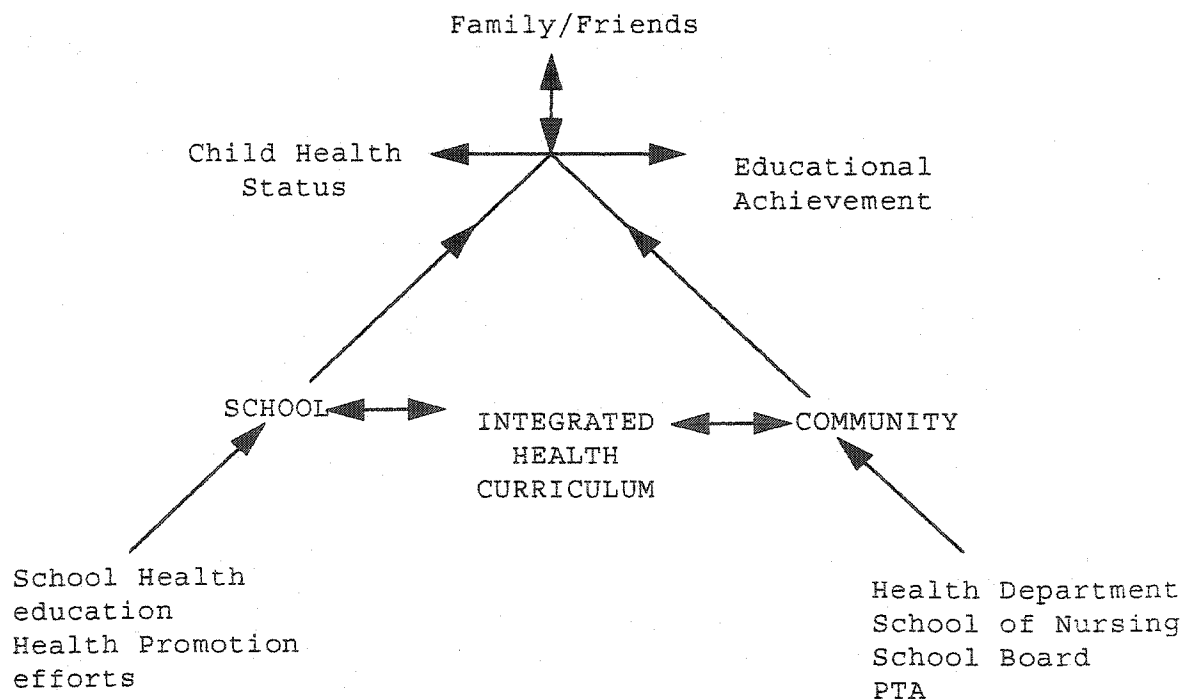
* In the context of this study, short-term health status refers to a heightened awareness of healthy living and healthy eating.

** In the context of the current study, long-term health status refers to a reduced risk for Cardiovascular disease.

The Royal Commission on Learning (1994) voiced a commitment to the principles of Comprehensive School Health, with the following statement: "We believe that a comprehensive school health model, as recommended by the Canadian Association for School Health...is a healthy direction for Ontario schools... and encourage and support a healthy school emphasis within the core curriculum, that is strongly community-based and that incorporates mechanisms to facilitate collaborative planning and funding between the school system and public or private agencies concerned with physical and mental health" (Vol. II, 1994, p. 47).

The Integrated Health Curriculum incorporated the first four components of the framework: school health services, school health education, school health environment and integrated school and community health promotion efforts, as illustrated in Figure 2.

Figure 2. Current application of the Comprehensive School Health Model to the Integrated Health Curriculum initiative.



It was anticipated that the development of additional units of the curriculum would require the contributions of other players identified

within the framework. For example, the Active Living lessons might be incorporated into physical education classes. Similarly, school counselling services might become involved in the planning of the Self-esteem and Substance Abuse units.

One of the assumptions of Comprehensive School Health is that the influences on children's health are broad (Allensworth, 1993). By necessity therefore, plans for both the curriculum and its evaluation were broad in scope. Comprehensive School Health was a useful foundation for this evaluation. As the model suggests, the process required input from key players. The school principal, involved teachers, and representatives of the parent-teacher association had been consulted during the planning phase of the evaluation, and had reviewed the consent forms, letters and questionnaires prior to distribution to children and parents.

While the Comprehensive School Health framework provided a general direction for the evaluation process, a second model, PRECEDE-PROCEED, was applied to sharpen the focus of evaluation plans. PRECEDE-PROCEED is described as an organizing framework for health promotion (Green & Kreuter, 1991). Although not incorporated directly into the development plans, it provided a framework for clarifying the context and processes involved in the IHC development. It was also useful for isolating some of the variables which impacted on the health of children and for identifying some of the factors which might influence the reception by children, family and staff, of this new curriculum. The main players, influences, and relationships identified by the Comprehensive School Health framework could be placed in a more meaningful context through the application of PRECEDE-PROCEED. PRECEDE-PROCEED broadened the scope of the evaluation by illuminating what information should be sought, and from what sources.

PRECEDE-PROCEED

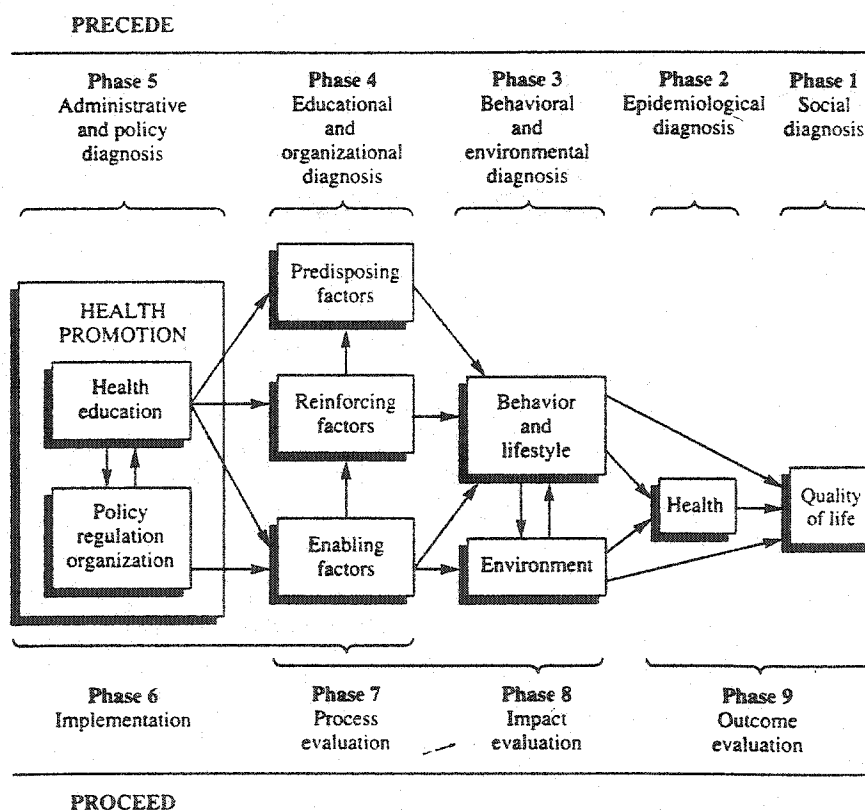
There is a distinct compatibility between Comprehensive School Health and PRECEDE-PROCEED. According to its founders, "the analytic

strength of the PRECEDE process is maximized when applied within the expanded concept of school health promotion" (Green & Kreuter, 1991, p.382). The variables identified within the comprehensive school health framework as influencing the lifestyle and health behaviours of children, may be further isolated and classified as predisposing, enabling and reinforcing factors in the PRECEDE-PROCEED framework.

PRECEDE-PROCEED, illustrated in Figure 3, is described as having two facets which "work in tandem, providing a continuous series of steps or phases in the planning, implementation, and evaluation process" (Green & Kreuter, 1991, p.22).

Figure 3.

PRECEDE-PROCEED.



Note. From Health Promotion Planning. An Educational and Environmental Approach (p. 354) by L. Green and M. Kreuter, 1991, Mountain View, CA, Mayfield Publishing Co. Copyright 1991 by Mayfield Publishing Company. Reprinted by permission.

The diagnostic phase of the model is called PRECEDE, an acronym for predisposing, reinforcing, and enabling constructs in educational /environmental diagnosis and evaluation. The developmental stage of health promotion planning, 'PROCEED', represents policy, regulatory, and organizational constructs in educational and environmental development (Green & Kreuter, 1991, p.1).

The variables of direct interest to the current evaluation study were for the most part, captured within the Precede 'educational and organizational' component of the framework. Three categories of factors are described within this component, as influencing individual or collective behaviours. These factors were identified as 'predisposing', 'enabling' or 'reinforcing factors'.

The model presupposes that "any given behaviour is a function of the collective influence of these three types of factors" (Green & Kreuter, 1991, p.151) and that the motivation towards any particular behaviour is influenced by a combination of the predisposing, enabling, and reinforcing factors. According to the authors, "the three conditions - predisposing, enabling and reinforcing - must be aligned for the behaviour to occur and persist. Any plan to influence behaviour must consider all three sets of causal factors" (Green & Kreuter, 1991, p.152.) The three categories of factors are :

Predisposing factors are those antecedents to behaviour that provide the rationale or motivation for the behaviour.

Enabling factors are the antecedents to behaviour that facilitate a motivation to be realized.

Reinforcing factors are the factors subsequent to a behaviour that provide the continuing reward or incentive for the behaviour and contribute to its persistence or repetition.

(Green & Kreuter, 1991, p.151)

Predisposing factors include the "cognitive and affective dimensions of knowing, feeling, believing, valuing and having self-confidence or a sense of self efficacy" (Green & Kreuter, 1991, p.154). "These factors can serve to facilitate or hinder motivation for change" (p.29). In the

context of the current study, predisposing factors included the previous knowledge of children about the concepts of healthy eating, and the beliefs and attitudes held regarding dietary intake. The perceived degree of control over personal health and more specifically over food choices were expected to predispose children to make certain decisions regarding their food intake. Prior skills in healthy food selection and preparation would be expected to influence current food choices. The attitudes and behaviours of the parents in regard to food preparation and intake are also important factors in determining the eating behaviours of children.

As described in the literature review, many other factors, exert an influence on the knowledge, attitudes and beliefs of children. Variables including developmental level, gender, self-esteem, ethnic background and the influence of others may predispose children to specific behaviours. Some of these factors, including age, gender, socio-economic level, and to some degree parental and media influence are, to a large degree beyond the realistic scope of school health promotion programs.

Enabling Factors include those "skills, resources, or barriers that can help or hinder the desired changes as well as environmental changes" (Green & Kreuter, p.29). It was expected that the availability, quality, and completeness of the Healthy Eating lessons enable children to learn about healthy living, provide some of the skills to help them make healthy food and lifestyle choices, and promote a positive attitude towards health.

Reinforcing Factors include the rewards received and the feedback the learner receives from others following the adoption of a behaviour (Green & Kreuter, 1991, p.29). It was expected that parents would encourage their child's efforts to pursue a healthy diet, thus reinforcing the health promotion message from school. Peer influence was also expected to be a reinforcing factor as many of the curricular activities involved group work. It was hoped that this would provide an opportunity for children to consider healthy eating as a behaviour, positively valued

by peers. Although not made explicit by the PRECEDE-PROCEED model, self-motivation was expected to be a significant reinforcing factor in the IHC. It was anticipated that students would be encouraged by their own successes and enjoyment of the learning activities, and would be motivated to assume greater control over their own health and nutritional intake.

Green and Kreuter (1991) described evaluation as being an "integral and continuous part of working with the model" and proposed that the criteria for evaluation are derived from the objectives defined in the PRECEDE phase (p.29). Consideration of some of the predisposing, enabling and reinforcing factors, provided the groundwork for the evaluation process. In the current study, some of these elements were measured through the application of pre- and post-tests. Classroom observation, parent and teacher questionnaires, and student interviews provided additional means of establishing what knowledge, attitudes and skills children possessed or acquired over the course of the instruction.

PRECEDE-PROCEED has been successfully applied to school-based studies of a similar nature to the current research, by Contento et al., (1992); Bush et al., (1989), Nader (1989), Parcel (1989); and Perry et al., (1985). The first two studies cited incorporated a modification of the model. This variation, proposed by Green and Kreuter (1991) for school health applications, introduced the concept of skills as an intervening variable between the educational constructs (predisposing, enabling and reinforcing factors) and the behavioral construct. Elements of PRECEDE applied to the Integrated Health Curriculum project are illustrated in Figure 4.

'Skills' in the Integrated Health Curriculum Evaluation.

'Skills' have not been added as an intervening construct, but have been considered as factors within the educational and organizational diagnosis. Inherent in the PRECEDE-PROCEED model is the assumption that each individual possesses a unique set of interpersonal and decision-making skills. Implicit in the model, is the underlying assumption that

Figure 4.

Elements of PRECEDE applied to the Integrated Health Curriculum Healthy Eating Lessons.

Administrative and Policy Diagnosis	Educational and Diagnosis	Behavioral and Diagnosis	Epidemiological Diagnosis	Social Diagnosis
	<u>Predisposing Factors</u>	<u>Health skills</u>		
Ont. Common Curriculum provides legislative supports	Age, gender, self-esteem, ethnic background Current knowledge of nutrition Current attitudes to health Current skills in choosing foods in accordance with recommendations of Canada Food guide Dietary habits of family and parents.	Heightened awareness of the dimensions of health Development of skills to healthy lifestyle choices.	Literature identifies poor dietary habits observed among Canadian school children. (Note, no specific information was gathered about the food habits of this particular cohort.	Reduction in CVD morbidity, mortality (Long-term)
Support of Three-way Health Partnership	Enabling Factors Availability, quality of the IHC Current decision-making skills Access to healthy food	Preventive Behaviour Children incorporate nutrition content of the IHC into their own diet	Childhood risk factors identified in literature as precursors to adult CVD.	Children will meet learning outcomes as identified in Common Curriculum Document (Short-term)
Administrative support from school board and principal			Risk of CVD include premature morbidity and mortality	
Funding, resources, provided by the school	<u>Reinforcing Factors</u> Perception of positive reward, personal satisfaction for making healthy food choices			
Expertise for curricular content provided by Health Department, University and schoolboard.	Influence of parents, media, peers, teacher regarding food choices			

"relevant cognitive skills, resistance to peer pressure, and social competence skills, in some combination, facilitate change or resistance to change" (Green & Kreuter, 1991, p.370). 'Personal health' and 'previous decision-making skills' have been included as predisposing factors.

As described in Chapter One, the Integrated Health Curriculum was based on the principles of outcome based education. One of the assumptions of outcome based learning is that each child possesses a unique set of interpersonal and decision-making skills (Spady, 1988). These skills are themselves related to a number of other factors - genetic, environmental, or otherwise. The intent of outcome based learning is that children will demonstrate specific knowledge, competencies and qualities, which will assist them in meeting the challenges of the adult world (Spady, 1988). The Healthy Eating lessons were intended to integrate other subject material with the health instructions, so that children would acquire both academic and health skills. It was assumed that children would acquire skills relating to health choices in general, and more specifically, to nutrition. It was hoped that the lessons would stimulate a sense of personal empowerment regarding health decisions. It was anticipated that students would become more knowledgeable about the basic food groups, and apply this knowledge to their own diet, and be able to identify, if not actually implement, appropriate strategies to enhance their well-being. Consequently, the 'personal health' and 'health decision skills' which might be fostered by the Healthy Eating lessons, are classified with 'enabling factors' as described in PRECEDE-PROCEED (Green & Kreuter, 1991).

The PROCEED phase identifies ongoing assessment and evaluation as critical to the success of health programs. As Green and Kreuter commented, programs are not likely to be positively received (or funded) unless their existence can be fully justified. The PROCEED component of the model guides the evaluation phase by returning to the original premises and principles of the project. Green and Kreuter (1991) cautioned

that the evaluation must be appropriate for the aims of the program:

Those who plan and implement comprehensive school health education programs that do not focus on specific behaviours that are determined at the epidemiological analysis to be important, should not expect to have a major impact on these behaviours in the short run. These programs are more fairly evaluated on the basis of short-term measures of student interests, comprehension, skills and attitudes. (p.368)

Green & Kreuter observed "school health educators are faced with the problem of linking health education activities to future behaviours, a problem confounded by the potential multitude of variables over time" (p.369). For the most part, illness is an issue far removed from childhood. The link between behaviours and their long-term consequences is more readily recognized among adults than among youngsters. As the literature review pointed out, the influences on the health knowledge, attitudes and behaviours are myriad. School health education may assist in promoting a healthy lifestyle, with the cautionary note that expectations remain reasonable (Green, 1979; Kolbe, 1982). It would be unrealistic to expect that grade four students would significantly and permanently alter their eating habits on the basis of one curricular unit. It would not however, be unrealistic to expect that the Healthy Eating lessons might increase the competencies of children to make decisions about nutrition, and increase the skills and inclinations which would enable them to make healthy decisions in the years to come. This research study was intended to reflect, as accurately as possible, the degree to which this short-term goal was achieved.

Green and Kreuter, (1991) proposed that "the first purpose that evaluation should serve is to help improve and adapt the program to the circumstances at hand" (p.227). The current evaluation study was expected to assist in furthering the development of the Healthy Eating lessons and future modules of the Integrated Health Curriculum. The study involved

both quantitative and qualitative elements, and was guided by the PRECEDE-PROCEED framework, as illustrated in Figure 5. The research questions and the methods by which they were investigated will be described in detail in the next chapter.

Figure 5. Current Application of the Educational and Organizational Component of PRECEDE-PROCEED

<u>PRECEDE PHASE</u>	<u>PROCEED PHASE</u>
<u>Predisposing Factors</u>	<u>Method of Evaluation</u>
Pre-existing knowledge about basic food groups	Pre testing with Heart Smart (Berenson et al., 1987)
Pre-existing attitudes health	Pre- testing towards with Children's Cardiovascular Health Promotion Attitude Scale (Arvidson, 1990)
Beliefs regarding and skills selecting healthy food choices	Student interview Parent questionnaire
<u>Enabling Factors</u>	<u>Method of Evaluation</u>
Personal health and decision making skills	Classroom observation Student interview and parent questionnaire
	Post-testing with Heart Smart
	Post-testing with Children's Cardiovascular Health Promotion Attitude Scale
Availability, quality completeness of IHC	Classroom observation Teacher questionnaire
<u>Reinforcing Factors</u>	<u>Method of Evaluation</u>
Influence of: teacher	Teacher questionnaire
peers	Student interview Parent questionnaire
parents	
Perception of positive reward, personal	Student interview Classroom observation

CHAPTER 3

Methods

It is the simplest thing in the world to test what a student is able to remember today from yesterday's lesson, but it's also of strictly limited value. The quality of learning is not easily or effectively tested with simple quantitative measures.

(Royal Commission on Learning, 1994)

This chapter will introduce the hypotheses and research questions under investigation in the current study. The setting, sampling procedures, ethical considerations, study design and methods will be described. The content of the Healthy Eating lessons will also be summarized. The evaluation of the Healthy Eating lessons incorporated both quantitative and qualitative elements in order to develop a comprehensive appreciation of the implementation process, the quality of student learning, and the acceptability of the pilot offering of the integrated health curriculum. The quantitative and qualitative elements will be considered separately, in view of their conceptually distinct approaches to research and "complementary strengths and limitations" (Polit & Hungler, 1991, p.26).

Overview of Study Design

One Grade Four class (the intervention group) received the Healthy Eating lessons over the course of two and a half months, from mid-December to late February. A comparable class (the comparison group) at another school received no health instruction during the same period. The quantitative component of the study was quasi-experimental and will be discussed in detail in the quantitative design section. The qualitative component will be described in the qualitative study design section.

Setting

The two schools involved in the current study were both small Roman Catholic elementary schools within five kilometres of each other, in Ottawa, Canada. Both institutions were located in upper socio-economic urban neighbourhoods. Of the 22 schools within the Ottawa Roman Catholic Separate School Board, the comparison school was considered by board officials, to be the most closely matched to the intervention school.

Sample

There was only one grade four class at the school where the Healthy Eating lessons were piloted. The intervention class was therefore, comprised entirely of grade four students. There was no single grade four class at the comparison school, although there was one grade three/four class. The comparison cohort included six grade three students. It had been originally anticipated that there would be equal numbers of students in both the intervention and comparison groups, based on the enrollment pattern of the previous year. There were in fact, 29 students in the intervention group (24 of whom participated in the study) and 18 students in the comparison group (all of whom participated).

Consent forms were sent to parents of students in the intervention and comparison groups outlining the purpose and protocol of the research study (Appendix D and E). All students whose parents granted permission for the data collection were considered eligible and included in this study. Twenty-five parents at the intervention school gave consent for participation immediately. One additional parent consented after viewing the questionnaire. One of 26 eligible students participated in the pre-testing, but was excluded from further testing, due to her limited ability to read or communicate in English. The pre-test results for this student were not entered into the data set. A second eligible child was absent for both the pre and post-test, and was consequently excluded from the quantitative component of the research.

The principal of the comparison school offered to write a letter outlining the purpose of the study which was sent with the research form to parents in the comparison group. All parents in the comparison group granted consent for the study although one parent asked to review the questionnaire prior to granting permission.

The parents of all children in the intervention group were asked to complete a questionnaire as part of the curriculum evaluation. A returned questionnaire was considered consent for participation in this phase of the research. Nineteen surveys were returned immediately, and one more was procured after a reminder letter was sent (Appendix F). The response rate was 71%. As the questionnaires were anonymous, it could not be determined if the three parents whose children did not participate in the evaluation did themselves participate in this phase of the evaluation. A consent form was also prepared for the teacher in the intervention school (Appendix G).

Ethical Considerations

The guidelines of the Faculty of Health Sciences Human Research Ethics Committee, the Roman Catholic Separate School Board Ethics Committee and the Ottawa Carleton Research Advisory Committee were observed. All consents and forms were submitted to these institutions for approval. The ethical approval for this study from the University of Health Sciences Human Research Ethics Committee is included in Appendix H.

The names of students appeared on the questionnaires for collection purposes within the classroom, but were coded for data entry. School personnel did not have access to the data and results did not appear in any school records. Data were reported as grouped data. Data sheets were stored in the private office of the investigator. All publications related to this study will protect the anonymity of those involved. This protocol was in accordance with the Freedom of Information and Protection Act, 1989 (Bill 49).

Confidentiality would have been broken, as per the ethics protocol,

had any concerns about child welfare been generated through this study. This situation did not arise. Information from a parent questionnaire was shared with the classroom teacher on one occasion, when it was believed that particular comments warranted the attention of the classroom teacher.

Research Questions and Hypotheses

The underlying assumption was that the program would have a positive effect on the knowledge and attitudes of children with respect to health. Stated in the null form, five hypotheses were under investigation:

- Hypothesis One:** *There will be no significant difference in test knowledge and attitude scores between children in a Grade Four class who received the Healthy Eating lessons and children in a Grade Four class who did not receive the lessons.*
- Hypothesis Two:** *There will be no significant differences in test knowledge and attitude scores between male and female students.*
- Hypothesis Three:** *There will be no significant interaction between gender and intervention on test knowledge and attitude scores.*
- Hypothesis Four:** *There will be no significant differences in test knowledge and attitude scores based on the time of testing.*
- Hypothesis Five:** *There will be no significant interaction between time of testing, intervention and gender on test knowledge and attitude scores.*

The issues of program implementation and acceptability, relied on the perceptions of 'key players' involved in the pilot curriculum project. These key players, as identified by the Comprehensive School Health framework (Kolbe, 1986), included the students, the classroom teacher, and the parents. The questions for consideration were:

- Students:** *What do students feel they have learned from these lessons? Have the lessons captured their interest and attention? Have the lessons motivated children to evaluate their own food choices?*
- Parents:** *Are the Healthy Eating lessons acceptable to parents? What are the perceptions of parents regarding the learning activities? Do parents identify an impact by the program on the nutritional habits of their children?*

Teacher: *What are the perceptions of the classroom teacher regarding the quality of student learning associated with this program? What is the experience of teaching this unit, for the classroom teacher? What recommendations for modifications can be formulated?*

The Intervention: Healthy Eating lessons

The curriculum development process exceeded the time frame for the current research. By December of 1994, only the first unit of the planned integrated health curriculum had been developed. Consequently, the curriculum to be evaluated was much smaller than originally anticipated.

The Healthy Eating lessons were taught over the course of two and a half months. Each of these lessons required two to three classroom sessions to complete. The lesson protocol is described in Appendix A.

The first lesson introduced students to the concepts of healthy living. Children brainstormed on the subject of healthy living, and were provided with a generic definition of healthy living. During the second lesson, students reviewed a list of healthy activities which had been generated during the previous brainstorming session, and identified which activities could be grouped together. Healthy eating, active living, substance abuse prevention and stress and coping were introduced as general concepts of healthy living.

In the third lesson, the concept of maintaining a food log was introduced. The next lesson focussed on establishing a parallel between man-made systems and their energy sources, and the human body and its energy source. In lesson five, children played a game involving the identification of food groups. Moderation and variety were emphasized. The Canada Food Guide (Health & Welfare Canada, 1993), was incorporated into this lesson.

In lesson six, children recorded, analyzed and graphed their own food intake. In the "I think I can - Goal Setting" lesson, students role-played about how they established goals. Children set specific nutrition goals for themselves, by comparing their food intake with the

recommendations of the Canada Food Guide (Health & Welfare Canada, 1993). Students discussed some of the problems they might encounter in trying to achieve their goal, and identified strategies to overcome these pitfalls.

During the lesson entitled "Fats, Salt and Sugar - The Hidden Facts", food stations were set up within the classroom. Children circulated throughout the room to examine foods which were classified as high in fat, salt and sugar. Students did individual research on fats and salt, and identified tips to promote healthy eating.

The last lessons focussed on the media influence on health. Part I of this unit, involved identifying advertising techniques. In Part II and III of this unit, children developed their own advertisements to promote healthy eating.

The Quantitative Element

Quantitative Study design

The quantitative component of the research followed a quasi-experimental, non-equivalent control group design, as illustrated in Figure 6. The quantitative measure of program impact was achieved by tracking mean test scores of knowledge and attitude, as measured by questionnaires completed by students on three occasions.

Figure 6

Quantitative Study Design

Intervention	O	X	O	O
	-	-	-	-
Comparison	O		O	O

where 'O' represents 'testing' at baseline, upon completion, and two months after intervention.

'X' represents treatment (exposure to the Healthy Eating component of the Integrated Health Curriculum).

Quantitative Data Collection

Knowledge and attitude questionnaires (Appendix I and J) were completed by students on three occasions. Approximately thirty minutes of

class time were required each time the two tests were administered. The initial testing was completed at both schools in early December, 1994, one week before the program implementation at the intervention school. This testing was repeated in both schools in late February, 1995, one week following program completion, and again two months later. Questions were read aloud by the investigator and students were asked to answer all questions by circling one response. It was emphasized on all occasions that students would not be graded on their answers.

Quantitative Measurement

As stated in the first chapter, the Integrated Health curriculum was originally intended to incorporate four health units (Healthy Eating, Active Living, Substance Abuse, and Self-esteem). Measurement tools were sought which would measure the knowledge and attitudes of children in this age group, about these health themes. A dearth of appropriate instruments was identified. Two questionnaires, which will be described shortly, were considered suitable. The instruments were not pre-tested due to time constraints but were reviewed by the curriculum development committee. Each of the tests measured cardiovascular elements, including nutrition.

Components of the 'Heart Smart' test for Grade Four students, (Berenson, Thompson, Nicklas, Harsha, Johnson & Webber, 1987), were selected to measure program effect on knowledge (Appendix I). The Grade Four test was reproduced with the permission of the Tulane Centre for Cardiovascular Health, New Orleans (Appendix K). The 'Children's Cardiovascular Health Promotion Attitude Scale' (Arvidson, 1990) was used in its entirety to measure general attitudes towards health (Appendix L).

The Heart Smart test.

The 'Heart Smart' test was developed as a means of measuring changes in student knowledge introduced by 'Heart Smart', a cardiovascular risk reduction program for elementary students. These multiple choice cognitive tests were intended to measure the health-related knowledge of physiology,

nutrition, exercise and behaviour of elementary schoolchildren.

The 52 item Heart Smart test for Grade Four students reported an internal reliability coefficient (KR-20) of 0.82 (Berenson et al., 1987). There appeared to be a compatibility between the planned core content of the Healthy Eating module as originally outlined by the Curriculum Development Committee, and the Heart Smart tests, however, once the curriculum was completed in late December, it became clear that some of the tests questions would not be appropriate. Eighteen questions were omitted completely as they did not match curricular content. Fifteen nutrition-related questions matched the proposed content of the Healthy Eating lessons. An additional 16 questions related to physical fitness or physiology were included as part of the Healthy Eating evaluation despite the fact that these subject areas had not been included as part of the IHC Healthy Eating module. These questions were included as a means of determining whether changes in test scores were non-discriminatory or whether variation occurred only for those questions relating to material which had been specifically taught in class. Five questions, relating to physiology, were of marginal relevance to the classroom material and were included as a means of establishing whether children had been prompted to make associations between the material they had learned and other health issues. An example of such questions was:

Which are the most important in the prevention of Heart disease?

- a) exercise and diet
- b) vitamins and minerals
- c) rest and relaxation
- d) medication and surgery

For scoring purposes, one point was granted for each correct answer. Missing data on the knowledge scale were scored as a zero on the assumption that failure to respond to any given question was related to a lack of knowledge about that subject. In the event that more than one response was selected, the response was assigned a score of zero.

Children's Cardiovascular Health Promotion Attitude Scale.

The Children's Cardiovascular Health Promotion Attitude Scale

(CVHPAS) is a 16 item four-point forced choice Likert scale designed to measure school-age children's attitudes toward cardiovascular health promotion. The instrument was originally piloted with 224 children between the ages of eight and thirteen, with a mean age of 10.61 years. According to the author, content validity for the scale had been established through a review of the current literature, and the advice of expert advisors in the field of pediatric cardiovascular health promotion (Arvidson, 1990). Construct validity was estimated by principal factor analysis. Four factors, physical activity, nutrition, smoking and stress control, remained in the final factor analysis of the scale. Internal consistency reliability alpha coefficients for the subscales were reported as 0.76 for Physical Activity, 0.70 for Nutrition, 0.74 for Smoking, and 0.63 for Stress Control (Arvidson, 1990). The alpha correlation coefficient for the entire scale was 0.80. Nunally (1978) recommended that the correlation coefficient for a scale fall between 0.80 and 0.90.

The CVHPAS was considered by the Curriculum Development Committee to be an appropriate measure of attitudinal change in this research study. Although nutrition was the primary focus of the Healthy Eating lessons, the themes subsumed within the CVHPAS had been identified in the first lesson, as general elements of healthy living.

Children were asked to select a response of 'Strongly Agree', 'Agree', 'Disagree' or 'Strongly Disagree' to each of 16 statements. In the current research, the wording of choices was changed to 'Agree a lot', 'Agree a little', 'Disagree', 'Disagree a lot'. This decision was based on the investigator's previous experience involving children of this age group and similar Likert responses. For scoring purposes, responses were indicated on a four point scale. Four points were granted for that response which was most consistent with a health promotion perspective, and one point was granted for the least desirable choice. In the event of a non-answer on the Attitude Scale, the mean score for that particular question, given by students of that school, gender and testing occasion,

was substituted. This was based on the assumption that attitudes would be fairly consistent among children of the same gender within the same classroom.

Quantitative Data Analysis

A 2x2x3 mixed multivariate analysis of variance was performed on knowledge and attitude. The between variables were gender (male, female) and school (treatment, no treatment) and occasion of testing (pre, first post, second post) were the within subject factor. Age was considered as a covariate in a preliminary analysis using a MANCOVA. SPSS (Statistical Program for Social Sciences, 1990) was used for the analysis. The comparisons of primary interest are illustrated in Figure 7.

Figure 7. Comparisons of primary interest in the Healthy Eating evaluation.

Group		Pre-test	Post-test(1)	Post-test(2)
Intervention	(male) (female)	knowledge	knowledge	knowledge
Comparison	(male) (female)	knowledge	knowledge	knowledge
Intervention	(male) (female)	attitude	attitude	attitude
Comparison	(male) (female)	attitude	attitude	attitude

Power Analysis and Sample Size Requirements

The following conventional standards for significance and effect sizes, as proposed by Cohen (1977), were adopted:

Alpha (α) = .05

Beta (β) = .20

Power ($1-\beta$) = .80

'Small' effect size for F tests = .10

'Medium' effect size for F tests = .25

'Large' effect size for F tests = .40

It seemed reasonable to search for a moderate effect size of .25. This was supported by data from the SHEE study (Connell et al. 1985) which identified an average effect size for program specific knowledge of .25, across four major elementary school health education initiatives (using individual children rather than the classroom as the unit of measurement) The SHEE study identified a lower average effect size for attitude of .08.

Sample size tables, (Cohen, 1992), were used to calculate the number of students required in order to achieve a power of .80, and to detect a medium effect size (.25) for a .05 level of significance. In order to detect a medium effect size, in a 2X2X3 factorial design, with three variables for consideration, (gender, school, occasion of testing), 76 students per group would have been required. This number exceeded the numbers of children available in this study.

Power tables (Cohen, 1977) were used to determine the power of the F test in the 2X2X3 design, at $\alpha = .05$, with N=24, (the number of students in the intervention class). The most liberal estimate of power, (using the sample of children in the larger class) was found to be .30. Even with this liberal estimate, power was well-short of the conventional power standard of .80. (Cohen, 1977). It was unlikely, therefore that the hypotheses under investigation would be rejected, unless treatment effects were very large. The small numbers and the low power were limitations to the current exploratory study. However, it was anticipated that the quantitative data would illuminate trends which would assist in assessing the potential of the curriculum.

Qualitative Element

A qualitative approach, aimed at gathering descriptive data, was used to help describe the processes involved in the curriculum

implementation and to identify and describe how children had reacted to the lessons. The procedures for data collection and data reduction, as described by Miles and Huberman (1984), will be discussed below. Potential biases and the various strategies for safeguarding against those biases will be described.

Qualitative Data Collection

Data collection activities included classroom observation during the implementation of the curriculum, semi-structured interviews with randomly selected students and with the classroom teacher, the review of selected health journals and the circulation of a post-curriculum questionnaire for parents of the intervention class. Neither video-taping nor tape-recording was done. While these methods would have ensured a more detailed and accurate record of classroom activities and improved accuracy in the transcription process, they might influenced classroom dynamics. The intent of the qualitative component of this study was to describe the curriculum as it unfolded in a natural classroom environment. The presence of the researcher, in and of itself, constituted an interference in that natural setting. Video-taping and tape recording might have altered the classroom atmosphere, and influenced the responses and reactions of both the teacher and the students.

Classroom observation.

All but two of the nutrition lessons were observed by the researcher. The classroom observation was intended to establish an appreciation of how the students in the grade four class responded to the lessons. For the most part, observation was non-participatory, although participatory observation was possible on several occasions, when children were involved with group work. For example, when the students were preparing their health advertisements, the researcher was able to circulate throughout the class and ask children about their projects.

Student interview.

Within a week of program completion, seven students were interviewed to discuss the learning activities and to establish the student's perceptions of the curriculum. These students had been selected randomly by lot. Those children whose parents had not granted consent for the study were excluded, as was a student with limited abilities in spoken English. It was believed that seven students, accounting for almost one quarter of the class, would provide a sufficiently representative sample. The statements of these students supported many of the conclusions drawn from the classroom observations.

Four female students were interviewed together and three male students were interviewed together. It had been originally planned that the researcher would meet individually with selected students, in order to reduce the possible effect of peer influence on their stated perceptions. However, meeting with the students individually was not feasible as there were a number of unrelated, but competing, activities occurring at the school, within the same time frame. A two week winter break made postponing interviews to a more convenient time impossible.

The interviews were held in the school library, and each lasted approximately 45 minutes. These semi-structured interviews were guided by an evaluator designed, open-ended questionnaire (Appendix M), which had been reviewed by the Curriculum Development Committee. Students were asked to discuss which health activities they had enjoyed and why, and what (if anything) they felt they had learned from the health lessons. These interviews provided some new information, and provided an opportunity to confirm or elaborate on themes or issues arising from the classroom observation data. During the interviews, children referred to their health journals to facilitate their recall of curricular activities. The journals of these seven children were later reviewed to support information obtained from the interview and observation data.

In the opinion of the researcher, a satisfactory degree of data

saturation was achieved through the interviews with the original seven students. Data saturation was described by Glaser (1978), as being that point at which new data do not add to the meaning of the general category. The students interviewed voiced similar opinions on their perceptions of the curriculum. It was difficult to determine whether responses were influenced by the fact that these discussions were held in a group.

Teacher questionnaire.

Upon completion of the nutrition unit, an interview was arranged with the classroom teacher to elicit her opinions on content, delivery and classroom acceptance of the curriculum. It was anticipated that the teacher would provide contextual information of potential relevance. This interview was constructed around a 24 question teacher's questionnaire (Appendix N), which had been adapted from the 'Classroom Teacher Health Curriculum Survey' Dartmouth Health Promotion (Dartmouth Health Promotion Study, 1992) and from the 'Evaluating the Opportunities for Oral Language' questionnaire from the Basic English Handbook Ontario Instrument Pool (Ontario Ministry of Education (1990)). The questionnaire was further revised after consultation with the Curriculum Development Committee.

Parent questionnaire.

A questionnaire for parents was distributed to children by the investigator upon completion of the Healthy Eating curriculum. Parents were requested to return the completed form to the school within three days, where they were collected by the researcher. The 15-item questionnaire (Appendix P) was adapted from the parent telephone survey of the Dartmouth Health Promotion Study (Dartmouth Health Promotion Study, 1992). In the present study, the questionnaire was written rather than verbal and the format of many of the questions was modified. Several questions specific to the curriculum were added. Parents were asked to consider a list of questions and circle one response from a series of choices. Five questions sought a 'YES', 'NO' or 'DON'T KNOW' response. For the other questions, response selections were based on a six-choice

modified Likert scale with response options ranging from 'NEVER' to 'ALWAYS'. 'DON'T KNOW' was included as a seventh option for most questions. Comments and elaborations were requested after many of the questions. Parents were asked to list their negative or positive comments about the health lessons, as well as their ideas for future health lessons. Parents who did not return the questionnaires within the first week received a reminder letter (Appendix Q). The responses are included with Appendix P.

Data Reduction and Data Analysis

Field notes were taken during the observation and interview sessions. Hand-written field notes were transcribed into 'write-ups' (Miles & Huberman, 1984) and entered into the computer immediately following the interaction. The 'write-ups' contained more content than the raw field notes, as the transcription process often facilitated the recall of details which had not been included in the raw field notes (Miles & Huberman, 1984, p.59).

Each of the write-ups were reviewed for content immediately after they had been entered onto the computer. The text was then analyzed in order to interpret and identify the meaning of the interactions. Codes were assigned to segments of the text, based on these interpretations. All of the material was reviewed a third time for coherence, once the data collection had been completed.

The 'coding system' was created to describe themes emerging from the observational and interview data as well as from the parent questionnaire. Miles and Huberman (1984) described 'codes' as 'categories' which "derive from research questions, hypotheses, key concepts, or important themes" (p.56). These codes serve as "retrieval and organizing devices that allow the analyst to spot quickly, pull out, then cluster all the segments relating to the particular question, hypotheses, concept or theme" (p.56).

Four codes (family involvement, interest, enjoyment and knowledge)

were pre-defined, on the basis of the frameworks and the literature review. As previously stated, the Comprehensive School Health framework (Kolbe, 1986) and the PRECEDE-PROCEED framework (Green & Kreuter, 1993) had been used to guide the direction of study. Both of these frameworks suggested that family involvement would be an important factor in predisposing, enabling and reinforcing the health-related behaviours of the children. Consequently, as the data were collected, attention was directed towards establishing evidence of family involvement. The 'family involvement' classification was later broadened to include both 'family attention' and 'family involvement'. Effort was also directed towards establishing evidence of student interest, enjoyment and knowledge.

With the exception of the four factors described above, other codes were developed and defined during the data analysis, using a 'grounded' approach, as described by Glaser and Strauss (1967). Codes were defined as they emerged from the data, and were continually revised as new information, relationships or common sequences emerged. The fact that frameworks had been used to guide the research, precluded the possibility of using a true 'grounded theory' approach (Miles & Huberman, 1984).

Many of the categories shared common features with other identified themes, and therefore much of the data could be clustered together. Miles and Huberman described 'clustering' as "the process of moving to higher levels or abstraction" and "subsuming particulars into the general" (1984, p.219). The clustering of similar themes facilitated the recognition of the conceptual coherence of the data. Themes which were not subsumed within larger classifications (for example, contextual interference) were classified as separate classifications. The data will be further described in Chapters Four and Five.

Potential Biases and Verification Procedures

The analysis of the qualitative data relied to a large degree on the subjective interpretations of the researcher. A number of potential

biases which should be acknowledged initially are summarized below.

Personal involvement.

From the onset, the development of an integrated health curriculum was considered, by the researcher, to be a worthy undertaking. Furthermore, there was an awareness that teachers at the intervention school had devoted a substantial amount of time and effort to the writing process. The personal involvement of the investigator, in both the Health Partnership and in the planning phase of the curriculum development, may have influenced the data interpretation, in favour of the lessons.

Researcher effect on the site.

The presence of the researcher in the classroom may have influenced the research findings. The teacher and students might have behaved differently, had the investigator not been actively observing the lessons. For example, the teacher may have been more thorough in her teaching plan or the students may have been more enthusiastic than usual, as a result of their awareness that they were being observed.

Site effect on the researcher.

Conversely, the researcher may have been influenced by the classroom experience. During the two and a half months in which the curriculum was taught, the researcher developed considerable respect for the expertise of the classroom teacher, and appreciated and enjoyed the unique personalities of children in the class. This personal association may have affected objectivity, making critical review more challenging.

Elite bias.

Elite bias was described by Miles and Huberman, as "overweighing data from articulate, well-informed, usually high-status informants, and under-representing data from intractable, less articulate, lower status ones" (1984, p.230). In this study, some children in the classroom, as in any class, were more enthusiastic by nature than others. This introduced the risk that inferences would be made based on observations of those students who were more demonstrative or verbal, thus leading non-

representative sampling (Miles & Huberman, 1984, p.231).

Bias of participants in favour of the curriculum.

The classroom teacher was aware that the lesson plans had been written by other teachers at the school. This information had also been shared with children and parents. This awareness may have influenced a more positive response from these parties, about the Healthy Eating lessons. This factor was beyond the personal control of the researcher.

Safeguards for Ensuring Validity

A number of safeguards were in place to decrease the potential for biased data interpretation. These safeguards thus helped to establish validity of the research methods and findings (Miles & Huberman, 1984, p.230).

The researcher was present within the classroom on a consistent basis over the course of two and a half months. It is acknowledged that the presence of an observer within the classroom was somewhat obtrusive. However, students in the classroom appeared comfortable with the arrangement, after the first few lessons. According to the classroom teacher, classroom dynamics were comparable, whether the observer was present or not, and whether health or some other subject was being taught.

Efforts were made to look for contrasts and comparisons within the classroom. For example, when classroom activities permitted interaction with the students, attention was specifically directed to speaking with children who were less active classroom participants, as well as with active participants. During the data analysis, attention was directed towards identifying both positive and negative evidence, and confirming or contesting interpretations associated with specific events.

The triangulation of multiple sources of data assisted in enhancing the validity of the study. Triangulation is described as "the act of bringing more than one source of data to bear on a single point" (Marshall & Rossman, 1990, p.146). In this study, data sources included direct

observation by the researcher, interviews with students and discussions with the classroom teacher, the review of selected student health logs and the written comments of the parents. These 'external' data sources usually confirmed the interpretations of the investigator, although this was not always the case. The use of multiple data sources often offered different perspectives, which might not otherwise have been considered.

The thesis advisor for this study reviewed both coded and uncoded excerpts of the transcribed notes and concurred that the information had been appropriately coded and classified. This provided a measure of inter-rater reliability and helped to establish that data had been interpreted accurately and objectively.

Findings and conclusions derived from the quantitative and qualitative data analysis will be presented in Chapter Four.

CHAPTER 4

Results

The study results will be discussed in this chapter. Basic demographic data will be provided, describing the sample by age and gender. The quantitative and qualitative elements will be considered separately in view of the different approaches to evaluation represented by these two methods. The quantitative results from the knowledge and attitude testing, will be presented initially, followed by a discussion of the qualitative data. The research findings will be summarized in the concluding section of this chapter.

Demographic Data

The total number of students in the study was 42. As previously stated, three parents in the intervention group had not granted permission for their children to participate in the data collection. Two of these children were male, and one was female. Age and gender descriptions of study participants are presented in Table 5

Table 5

Study Participants by Age, Gender

	<u>Intervention</u> <u>Grade Four class</u>	<u>Comparison</u> <u>Grade Four class</u>
	n = 24	n = 18
Age range (yrs)	8 - 10	8 - 10
Mean age	9	9
Females	12 (50%)	5 (28%)
Males	12 (50%)	13 (72%)

Three children in both of the groups had completed post-tests but had been absent during the pre-testing. In order to include these

students in the study, the mean pre-test scores for the appropriate gender and school were substituted for the missing data.

Quantitative Findings

A 2X2X3 mixed multivariate analysis of variance was performed on knowledge and attitude. The independent variables were intervention, gender and time of testing. The between variables were intervention (treatment, no treatment) and gender (male, female). The time of testing (pre, first post, second post) were within-subject variables.

The initial multivariate analysis of variance, examining attitude and knowledge revealed that the two variables were independent of each other. A correlation of .05 was identified between knowledge and attitude. Homogeneity of variance tests were performed. A Bartlett-Box test confirmed that these variables were not related (knowledge, $P=.48$, attitude, $P=.47$).

The data were reviewed for outliers, and no univariate or multivariate outliers were found at $\alpha = .001$. A MANCOVA was performed to consider age as a covariate. With the use of Wilks criterion, no significant relationship was identified between the covariate of age and the combined dependent variables. Therefore, adjustment for age was not required, and no further consideration was given to age in the analysis.

The raw test scores for knowledge are presented below in Table 6.

Table 6

Knowledge Scores of Students

Group		Pre-test	First Post-test	Second Post-test
Intervention	Male	18.14	21.64	23.5
	Female	18.91	21.64	23.82
Comparison	Male	16.42	21.17	20.75
	Female	18.0	20.4	21.6
Total		17.83	21.36	22.57

Note. Maximum score = 36. A high score represents a high level of knowledge

Mean test scores for knowledge, analysed by school and gender, are presented in Table 7.

Table 7

MANOVA Knowledge Between-Subjects Effect

Source of Variation	SS	DF	MS	F	Sig of F Tests
Within cells	1335.36	38	35.14		
School	64.91	1	64.91	1.85	.18
Gender	5.63	1	5.63	.16	.69
School by Gender	.26	1	.26	.01	.93

In the between-subjects design, the combined effects of intervention and gender were found to make no statistically significant contribution to knowledge scores [$F(1,38) = .93$]

Mean test scores for knowledge, observed over the total sample, are represented in Table 8.

Table 8

Mean Scores for Knowledge in Both Classrooms

	mean	std. Dev.	Minimum	Maximum	N
pre-test	17.83	3.31	10	27	42
first post-test	21.36	3.89	14	31	42
last post-test	22.57	5.12	7	31	42

The MANOVA within subjects results, as shown in Table 9, indicate that the occasion of testing exerted a statistically significant effect on knowledge scores ($p < .001$). Neither intervention nor gender were found to be significant factors at the .05 level of significance.

Table 9

MANOVA Knowledge Within Subjects Effect

Source of Variation	SS	DF	MS	F	Sig of F
Within cells	689.40	76	9.07		
Knowledge	398.97	2	199.49	21.99	.000
School by Knowledge	12.63	2	6.32	.70	.50
Gender by Knowledge	11.16	2	5.58	.61	.54
School by gender by knowledge	3.17	2	1.59	.17	.84

The raw test scores for attitude are presented below in Table 10.

Table 10

Attitude Scores of Students

		Pre-test	First Post-test	Second Post-test
<u>Group</u>				
Intervention	Male	60.36	57.93	56.14
	Female	60.18	60.09	56.36
Comparison	Male	58.42	58.83	57.0
	Female	59.2	59.2	56.4
Total		59.62	58.9	56.48

Note. Maximum score = 64. A high score represents a more positive health promoting attitude.

Mean test scores for attitude, analysed by gender and school, are presented in Table 11.

Table 11

Manova Attitude Between-Subjects Effect

Source of Variation	SS	DF	MS	F	Sig of F Tests
Within cells	1643.01	38	43.24		
School	3.04	1	3.04	.07	.79
Gender	5.69	1	5.69	.13	.72
School by Gender	2.06	1	2.06	.05	.83

In the between-subjects design, the combined effects of intervention and gender were found to make no statistically significant contribution to attitude scores [$F(1,39) = .83$].

The mean test scores for attitude across both groups, are presented in Table 12.

Table 12

Mean Scores for Attitude in Both Classrooms

	mean	std. Dev.	Minimum	Maximum	N
pre-test	59.62	3.58	50	64	42
first post-test	58.90	4.39	42	64	42
last post-test	56.48	4.44	43	64	42

The within subjects results for attitude scores are shown in Table 13.

Table 13

MANOVA Attitude Within Subjects Effect

Source of Variation	SS	DF	MS	F	Sig of F
Within cells	417.32	76	5.49		
Attitude	192.53	2	96.26	17.53	.000
School by attitude	17.92	2	8.96	1.63	.20
Gender by attitude	9.81	2	4.91	.89	.41
School by gender by attitude	8.75	2	4.38	.80	.45

As was the case with the knowledge scores, intervention and gender did not exert a statistically significant effect on attitude scores. The occasion of testing, as was the case with the knowledge scores, was the only factor to be statistically significant ($p < .001$). The repeated measures analysis revealed that the occasion of testing significantly influenced both knowledge and attitudes scores although intervention and gender did not.

Multiple comparisons were performed to determine which differences demonstrated between the scores on each testing occasion were significant. Using the Neuman-keuls method of multiple comparison, the studentized range between means was compared to a determined criterion value of Q , obtained from a Critical Values of the Studentized Range Statistic table (Howell, 1982). A confidence interval of 95% was assumed. Calculations are contained in Appendix R.

The observed range between the knowledge pre-test and the first post test exceeded the criterion value of Q and was considered to be significant ($p < .05$). The observed range between pre-test and second post-test exceeded the criterion value of Q , ($p < .01$). The difference between the two post-tests was not considered to be significant as the studentized range was less than the criterion Q value. Statistically significant

differences were identified between the knowledge scores as measured by the pre-test and both of the post-tests, although a significant difference was not achieved between the two post-tests.

The studentized Q value observed between the attitude pre-test and the first-post test was less than the criterion value of Q. Therefore, no statistically significant difference was identified between the pre-test and the first post-test attitude scores. However, the difference between the pre-test and the final post-test was statistically significant ($p < .05$) as was the difference between the two post-tests.

In summary, the multivariate analyses of variance did not provide evidence that four of the five original hypotheses should be rejected. The first hypothesis, that there would be no significant difference in knowledge and attitude change scores between a classroom which received the Healthy Eating lessons and a classroom which did not receive the lessons, was not rejected. The second hypothesis, that no significant differences would exist between male and female students, was not rejected. The third hypothesis, that there would be no significant interaction between gender and intervention on knowledge and attitude scores, was not rejected. The fourth hypothesis was rejected, as the only factor which demonstrated a statistically significant effect was the occasion of testing. The final hypothesis, that there would be no significant interaction between the time of testing, intervention and gender, was not rejected.

Qualitative Findings

The qualitative data collection incorporated classroom observation, participant observation, interviews with seven students selected from the class and the classroom teacher, the review of selected health journals kept by children and a parent questionnaire. Varied data sets provided opportunity to assess factors which would have been difficult to quantify. The utilization of multiple data sources was helpful in that information

obtained from one source might corroborate, substantiate or refute observations and conclusions gathered from other sources (Miles & Huberman, 1984). In many instances, conclusions from the classroom observations and interviews were confirmed or supported by responses on the parent questionnaire.

Thematic categories were created as a means of classifying the data as comprehensively as possible. Most of the information was captured by one of twelve thematic categories identified from the data. Some of these categories were self-evident early in the analysis process, while others were added or modified as the transcribed information was further examined. These themes do not represent the reactions of all students to all of the lessons, it is acknowledged that individual differences existed among children in the Grade Four class. Nevertheless, the selected themes characterized the response of many of the students to the lessons. Many of these themes were related to each other, and could be further categorized into five larger clusters, as indicated below.

Cognitive

- Knowledge
- Critical thinking

Affective (positive)

- Self-awareness
- Personal control
- Pro-Action
- Interest
- Enjoyment
- Pride

Affective (negative)

- Lack of interest/attention
- Lack of understanding

Family attention

- Family awareness

-Family involvement

Contextual interference

Cognitive Dimension

Knowledge and critical thinking were incorporated under the larger heading of cognitive response. These themes were closely related, although subtle differences could be identified between the two.

Knowledge.

Comments classified under this thematic category demonstrated that a child had incorporated particular elements of the curricular material and was able to verbalize this content. The following statements quoted from the classroom sessions are examples of information which were classified under the 'knowledge' category.

Today I learned what makes a complete breakfast. Now I will try to make a complete breakfast. (The student added that a complete breakfast contained all the food groups.)

I thought that if you didn't eat breakfast, it wasn't a big deal, but it is.

The amount of food you need depends on your sex...how big or small you are...how active you are.

These comments from the parent questionnaire indicate that some parents believed the Healthy Eating lessons had contributed to the knowledge base of their children.

My child learned about the importance of a balanced diet. He complains less now when asked to choose apples over chips.

Better knowledge of the basic food groups.

In our opinion, the Health Curriculum has had a positive influence on our children, it increases their awareness about a healthy style of life.

Critical thinking.

The descriptor 'critical thinking' was added to the thematic inventory, when it was recognized that the 'knowledge' category did not entirely describe the nature of student learning. Critical thinking was differentiated from 'knowledge' by the level of insight which students demonstrated in regards to certain information.

'Knowledge' would be appropriate when there was evidence that a child had understood the essential concepts of a lesson. 'Critical thinking' was appropriate when there was evidence that this student had understood the lessons and was able to apply them in a meaningful way to his/her own personal situation or a larger context. Insight constituted the essential difference between the two categories. An example of 'critical thinking' occurred during the lesson 'The Food Chain'. During this lesson, children had divided into groups and selected a food choice such as 'fish sticks' or 'chocolate chip cookies'. Children identified the energy steps (human energy, mechanical, solar, electrical, etc.) involved in the production, packaging and marketing of that particular food item. One child commented in reference to one of the food items:

We could make this at home. It would take more time, but use a lot less energy.

Initially, a category named 'environmental awareness' had been created. This category was collapsed however, due to the recognition that an appreciation of environmental influences and impact was a reflection of the broader category of 'critical thinking'.

Further evidence of critical thinking was demonstrated when students were asked to consider the relationship between the media and health. The class viewed a series of videotaped television commercials and were later asked to identify what they had learned as a result of this 'viewing' session, in their health journals. Two of the students had noted the following:

For the commercials, I learned that things are not what they seem on TV. I also learned that people who make commercials and advertisements have great psychology, and they try to catch you. They also advertise things and products that aren't always healthy for you, and we have minds that decide if we want to buy that product or not.

I learned a great deal about commercial techniques these last few days. I've learned a lot. I'm amazed how many techniques they use. If I ever get tempted, it will help me not to because now I know that what people say are (sic) not always true. It also helps me not to get sucked into the product.

Other student comments indicated that the desired level of critical thinking had not been entirely achieved. During the discussions following the 'commercial viewing' one of the students posed the question "What if my parents ask what do commercials have to do with health". This question was then directed to the class by the teacher. For the most part, students had difficulties identifying the connection between media influences and personal lifestyle choices. Most children said they had learned about various techniques used in commercials to sell products, for example, that music, action and humour might be used to sell chocolate bars. However, very few children could make the connection between commercials and the decision to buy those chocolate bars. Considerable class time was invested in this discussion before the students arrived at the consensus that there was a connection between media images and health choices. When this issue was reintroduced during the student interviews, two of the seven students readily identified the relationship between health related behaviours and external influences, but the other students either did not recognize the relationship, or could not verbalize it.

Affective Dimension (positive)

Themes which were subclassified under this heading reflected an element of positive emotional response to the curriculum. Without question, reactions to the lessons were not uniform. Personality factors, unique to each child, may have predisposed particular reactions. For example, children who were by nature more confident in their ability to effect change in their environment, may have been more apt to try to incorporate healthier foods into their diet. An outgoing child might be more likely to participate in class activities, and demonstrate more overt enthusiasm than a child who is withdrawn by nature.

Self-awareness.

The teaching plan provided numerous opportunities for children to evaluate their own behaviours or assess their own learning. At the end of

most lessons children were asked to use their health journals to summarize what they had learned. The theme 'self-awareness' was closely related to 'critical thinking', but was differentiated by the degree to which children critically applied their knowledge in reference to their own behaviours. Comments classified in this category included:

I don't try too many different kinds of foods.

I eat a lot of 'Other foods' but not enough fruits and vegetables.

I learned that I eat a lot, but I don't eat a lot of 'Other foods'.

I learned that not everything I eat is in the four food groups.

I can improve my eating habits by eating more healthy foods.

In school today, I thought my goal on food was so-so, and I still need to work on it, but I am doing very well.

One of the parents wrote on the parent questionnaire, that the lessons had contributed in establishing:

Improved awareness of their bodies and how they need healthy fuel to grow and get through the day's activities.

Personal control.

This descriptive classification was not created until several weeks after the lessons had commenced. This theme emerged as children became increasingly familiar with the Canada Food Guide and became more adept at evaluating their own intake with respect to the recommended guidelines. One of the lessons, entitled, 'I think I can - Goal Setting' encouraged children to review their own food intake and set goals which would enable them to eat a healthier diet. This lesson was associated with the demonstration of a recognition by children of personal control over food intake. Children were able to demonstrate a perception of personal control over food intake, an enhanced recognition of personal responsibility in health decisions and an ability to problem-solve in relation to food choices. Examples of such statements were:

I think doing a food graph is good because you can take control of your diet.

I could get up a bit earlier so that I could eat a better breakfast.

If you don't like the vegetables you have at home, you could go to the store with your parents and pick out some of the fruits or vegetables you might like to eat.

When you go to the store, instead of buying potato chips and pop, you could look for more juice, real juice. You could look for things with only a little chocolate.

Pro-Action.

This category, closely related to 'personal control', was established in response to the observation that some children recognized an element of personal control over their eating habits and were prompted to assume responsibility and alter their eating habits. Many children stated that they had asked their parents for different kinds of snacks. It was difficult to ascertain the degree to which self-reported actions occurred and the degree to which they were hypothetical. There were indications, however, which confirmed these self-reported actions. The parent questionnaires, for example suggested that many students had, in fact, endeavoured to incorporate the basic food groups into their diets and to eat fewer 'other foods'. Six out of the 20 parents surveyed, stated that their families had modified their eating habits over the past two months as a result of their child's comments. Further research would be required to determine whether there were any sustained effects.

Pride.

Pride was selected as a thematic category when verbal comments, non-verbal cues or written work of students communicated a sense of accomplishment related to the learning activities. The 'Food Guide', 'Food Graph' and 'Goal setting' lessons in particular were associated with pride in achievement. For example, students said:

My goal was to eat a complete breakfast and eat more vegetables and fruit. I met my goal.

I did great with my fruit and vegetables.

My goal was to have something from each food group. (This statement was accompanied by a broad smile.)

The following statement appeared in the Health Journal of one of those students interviewed:

I finely met my goal. It was not thaat hard. I am rely prod of my selfe.

Interest.

Interest was selected as an indicator when large numbers of children raised their hands to given questions in class, when students were found to look directly at the teacher for sustained periods of time, or when private conversations between students related to the nutrition material. This theme was frequently selected, indicating that for the most part, the 'Healthy Eating' lessons held the interest of most students within the classroom. This view was reinforced by the teacher, and the students interviewed. One child stated:

I think almost everybody was interested, except maybe one or two kids. One of the boys just wasn't interested in health at all, right from the very beginning. He just didn't like anything to do with health.

Enjoyment.

This theme was selected when children appeared enthusiastic or excited about the lessons or curricular content. The categories 'interest' and 'enjoyment' were closely related, but were differentiated on the basis of the intensity of the affective response to the lessons. 'Enjoyment' was considered appropriate, for example, when children were observed laughing, smiling or participating enthusiastically during the classroom activities. The most obvious illustration of 'enjoyment' occurred during the previously described 'commercial viewing' lesson. At one point during this viewing, the students spontaneously began singing some of the commercial jingles. A high degree of enjoyment was also evident when children were planning their own health advertisement in the 'Health Ad' lesson.

During the student interviews, students were asked to name their three favourite lessons. The most frequent responses were the 'Food Graphs', the 'Food Log', and the 'Health Advertisements'. It is noteworthy, however, that the seven students interviewed collectively

named all of the lessons at least once, with the exception of the introductory lesson and the goal setting lesson, when asked to name their favourite lessons. The fact that most of the lessons were well represented on the list of "favourites", suggests that the teacher was able to provide for a variety of student learning styles and individual preferences in the classroom. The students interviewed agreed unanimously that most of their fellow students had enjoyed the lessons. One boy commented:

Really, I liked them all. Usually, most kids said 'Oh good' when we knew we were going to have the health lessons.

This latter comment bore a marked similarity to a notation in the classroom observation records that most children had smiled and said, "Oh Good", when the class began to review the personal food graphs.

Affective Dimension (negative)

Themes classified under this heading reflected an element of negative emotional response to the curriculum. Negative reactions were primarily related to either lack of interest or lack of understanding.

Lack of interest.

This category was selected when children were observed to devote their attention to activities other than the lesson at hand, or when they were heard discussing unrelated topics amongst themselves. This category was selected infrequently, although one student portrayed a general lack of interest during many of the lessons. The 'lack of interest' code was associated most frequently with the 'Goal Setting' lesson. Children were unusually distracted from the lessons on the day that 'Goal Setting' was discussed and they seemed to have difficulty focussing their thoughts. The field notes for that day included a notation that children had been more active than usual prior to the start of the lesson, after returning from recess. It was also noted that the weather had been unusually warm that day.

Lack of understanding.

Comments were classified in this category if they conveyed a lack of clarity about the curricular content. The greatest number of misunderstandings were associated with the lessons involving the individual Food Log and the recommendations of the Canada Food Guide (Health and Welfare Canada, 1993). A number of students were confused by the concept of 'minimum' recommended dietary servings. The children generally recognized when they did not meet the minimum requirements recommended in the Food Guide, as evidenced by comments such as:

I'm not getting enough fruit and vegetables.

I need to have more milk and milk products.

However, a number of children believed that they had consumed too much of a particular food group once they had surpassed the recommended daily minimum. Examples of comments which were categorized under the 'lack of understanding' theme were:

I am getting too many grain products.

I need to eat more grain and more meat. I ate too many vegetables.

The concept of serving size also represented a problematic area for some children. One child commented that she had consumed "twelve servings of cheese" in a day, when in fact, she had eaten twelve pieces of cheese, as opposed to twelve servings. The frequent misinterpretation of both recommended servings and serving size was confirmed by the following comment on one of the parent questionnaires:

Children need to be instructed how to measure 'one vegetable' allotment etc. My daughter thought two small celery sticks were equal to "two vegetables". As a result her total vegetable intake was so high she developed the goal 'To eat less fruits and vegetables'. This was not appropriate as she barely gets by as it is with vegetables.

The 'Hidden Fats / Sugars / Salt' lesson' was poorly understood by many of the children in the grade four class. During the data analysis, 'lack of understanding' was selected, as a descriptive category to describe many of the reactions and comments of children. This observation

was supported by comments from one of the parent questionnaires. One parent stated this particular lesson had resulted in "confusion". This parent noted that the risks of labelling food as high in salt/sugar/fat, without further discussion "may result in children thinking all foods are No-No's".

It was difficult to ascertain whether the misunderstandings relating to this particular lesson stemmed from contextual circumstances, a shortcoming in the teaching plan, or a combination of the two factors. During the interviews, several of the children stated that they had enjoyed the lesson or components of it but commented that it had been "too rushed". A memo in the classroom participation notes from that day confirmed that the lesson had started late and the class had been unusually subdued after another teacher had entered the classroom to discuss an unrelated incident involving the class.

During the 'Hidden Salt/ Fats and Sugar' lesson, fewer children volunteered answers as compared to other lessons, and there was a higher level of unrelated table talk than normally observed. Initially, 'lack of enjoyment' and 'lack of interest' were considered as codes to describe the response of children to this lesson. However, the behaviours of children during that lesson suggested that they were enjoying the activities. For example, they hurried from one 'station' to the next, to examine the foods identified as high in salt, fat or sugar. The children interviewed stated that they had enjoyed this lesson and several of them identified it as one of their favourite lessons.

When asked to describe what they had learned from that lesson, students offered vague answers, such as:

We learned that foods with lots of fat are greasy.

We learned that sodium chloride is another word for salt.

We learned that lots of food have hidden fats, salt and sugar.

None of the children interviewed identified the importance of variety or balance in diet, suggesting that they had not fully understood

the purpose of the lesson. Clearly, 'lack of enjoyment' and 'lack of interest' would not have been accurate interpretations for the general response to this lesson. The lesser degree of class participation, and the higher incidence of table talk, appeared to be associated with a lack of understanding, although a relationship between lack of understanding, lack of interest, and lack of enjoyment appeared to exist.

'Lack of understanding' was also used to describe teacher difficulties with the content. This occurred when the teaching plan failed to provide sufficient information for the teacher to respond to questions about meat substitutes.

Family attention

Family attention was interwoven through other dimensions (cognitive and affective). This theme emerged when there was evidence that the children had discussed the nutrition lessons with their parents or other family members. Two subcategories, family awareness and family involvement, were subsumed within the category of family attention. A distinction was made between these themes based on whether the attention of family members was passive or active.

Family awareness.

This category was used when children indicated that they had discussed some of the lessons or learning plans with their parents. Family awareness implied that parents were aware of the learning activities, but did not necessarily become directly involved in them.

During the student interviews most children volunteered that they 'sometimes' spoke to one or both of their parents about the health lessons. There was however, variation in the degree to which they shared information at home. One of the girls commented:

Sometimes, but not very often. I don't usually tell my parents what I'm doing at school. Only on the first day of school, when they ask.

The overwhelming majority of students raised hands when the teacher

asked if parents had noticed changes in their nutritional intake. Statements suggesting a degree of family attention were:

My Mum thinks it's good because I don't eat so much chocolate.

Comments from parents indicated that there had been some appreciation by parents of the learning activities. For example:

She has been very interested in the lessons, and is very enthusiastic when speaking of them. They have provided her with valuable information however change can be slow. Let's hope she will retain the information and continue to try and lead a healthier life.

Family involvement.

Family involvement implied that parents and children had discussed some of the lessons, and that parents had participated with their children in some aspect of the learning. This involvement may have occurred when parents enabled their children to make particular food choices, as exemplified by the following statements:

When my Mum went shopping, I went with her to pick out more fruit and vegetables.

I asked my Dad if he could go get some more fruit and vegetables and not so much junk.

On occasion, parents assumed a problem-solving role, in helping to clarify misconceptions or misunderstandings generated by particular aspects of the lesson plans. For example, the parent who commented that "confusion" had resulted when his or her child thought that "two celery sticks were equal to two servings of vegetables". This comment suggested that active intervention on the part of the parent had been necessary to clarify the issues.

Contextual Interference

This category was created to describe instances where curricular delivery or classroom dynamics were interrupted. For example, the nutrition lessons were interrupted for a two week period at Christmas, shortly after lessons had begun. Less obvious examples of contextual interferences included interruptions for announcements or assemblies.

The twelve themes described encompassed most of the data. A cautionary note must be added however that this list may not be entirely exhaustive, given the inductive nature of the research. The conceptual relationships between the themes and the implications will be considered in the next chapter. Although the quantitative element of the study failed to provide empirical evidence supporting the curriculum, the qualitative elements supported the potential of the new nutrition unit.

The conclusions and implications of the quantitative and qualitative data will be discussed in the next chapter. Study limitations, implications for future research and recommendations for curricular development will also be addressed in Chapter Five.

CHAPTER 5

Discussion

The quantitative and qualitative findings of the current research study will be considered in the first two sections of this chapter. This will be followed by a discussion of the study limitations. Recommendations for future study will be made, followed by a series of recommendations to assist in further curricular development. Implications for clinical practice will be addressed. The research findings will be briefly summarized in the concluding statements.

Discussion of Quantitative Findings

No statistically significant differences in health knowledge or attitudes, were identified between a class where the Healthy Eating lessons had been taught, and a class where no health lessons had been taught. Consequently the hypotheses regarding both knowledge and attitude, gender and their interactions could not be rejected. These findings should be considered in light of a number of limitations which will be discussed in detail in the section 'Study Limitations'.

The occasion of testing represented the only significant variable for both knowledge and attitude, among both groups of children. Maturation may have accounted for the observed differences over time. Maturation, as described by Polit and Hungler (1991) refers to "processes occurring within the subjects during the course of the study as a result of time rather than as a result of the treatment or independent variable. Examples of such processes include physical growth, emotional maturity, fatigue, and the like" (p.237).

The fact that the same tests were administered on three occasions may have resulted in testing effects among both cohorts of children. Testing effects are described by Polit and Hungler (1991) as "the effects of taking a pretest on the scores of a post-test". According to these

authors, "the first administration of the questionnaire might sensitize students to issues that they had not contemplated before. The sensitization may in fact, result in attitude changes whether or not instruction follows" (p.238).

The increase in knowledge scores in both groups may be related to the fact that students had read the questionnaire on three occasions. Students might have become familiar with the content after considering the questions three times. Students may also have been prompted to seek the correct answers from other sources, although there was no evidence to suggest that this had been the case.

The finding that attitude scores decreased, while knowledge scores increased, posed some interesting questions. In an attempt to interpret this finding, students were asked during the interviews if they could explain why some children might have changed their answers and picked 'less healthy choices' on the last tests, as compared to the first tests. One of the students volunteered, "I was one of the people who did that. I started to think that it was important to eat different things, and that it was okay to have some variety every now and again".

It would appear that both maturation and testing effects may have accounted for the apparent decrease in attitude scores. No particular subset of items (exercise, nutrition, self-esteem, tobacco use) appeared to have accounted for the difference in scores. The falling trend in attitude scores might indicate that students in both schools were more knowledgeable about healthy lifestyle choices, (either because of their personal developmental growth, or their sensitization by the test material), and by the third time they had written the test, they could more accurately identify what healthy food was, for example. Consequently, the students might have recognized that healthy food was not always their first choice.

There may have been extraneous variables influencing the children at both schools. These extraneous variables could have included media

influence or adjunctive health education unrelated to the current initiative. Discussions with both classroom teachers failed to reveal what those factors might have been.

Discussion of Qualitative Findings

While no substantial changes were identified in the quantitative findings between the class where the curriculum had been implemented and the class where it had not, the qualitative findings provided encouraging indicators supporting the potential of the Healthy Eating lessons.

Certainly, variations in the responses of children existed from lesson to lesson and among individual children. Nevertheless, relationships and common patterns could be identified among these themes, as illustrated in the diagrams to follow. The first diagram, Figure 8 identifies the conceptual mapping of the general classroom response to the Healthy Eating unit. Figure 9 focusses specifically on the relationship between the lessons, pride, pro-action, personal control and family involvement. Figure 10, illustrates the relationship between family attention, family involvement, lack of interest, and lack of understanding.

Figure 8. Conceptual mapping of thematic patterns

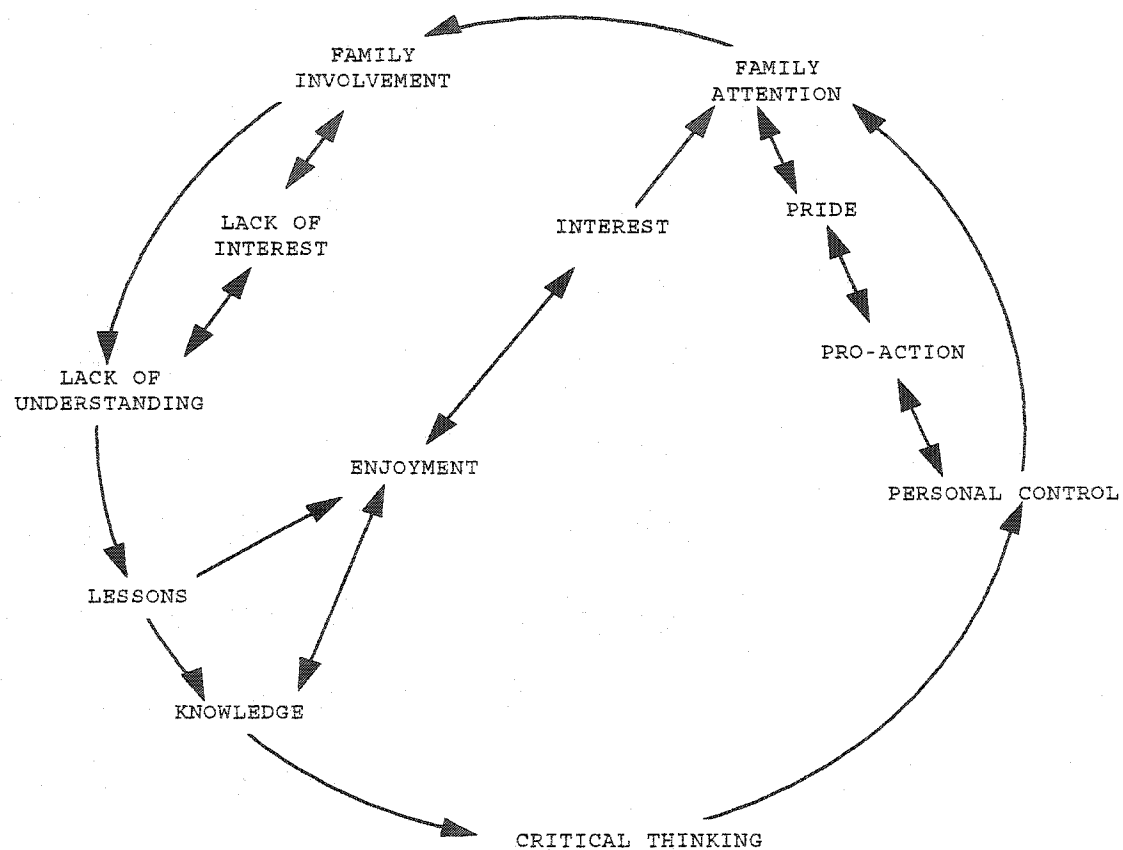


Figure 9. Cognitive-Affective (positive) Relationships

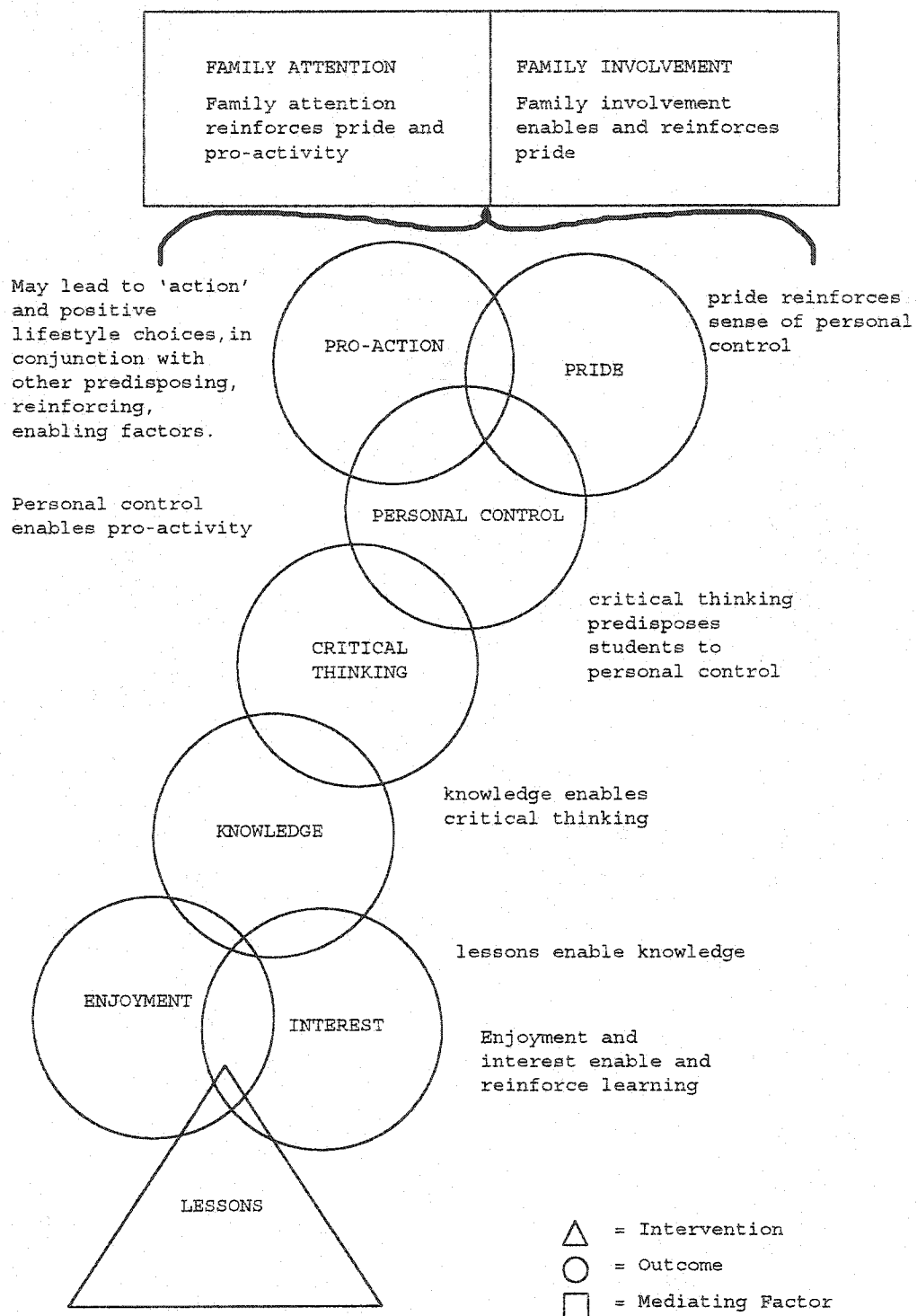
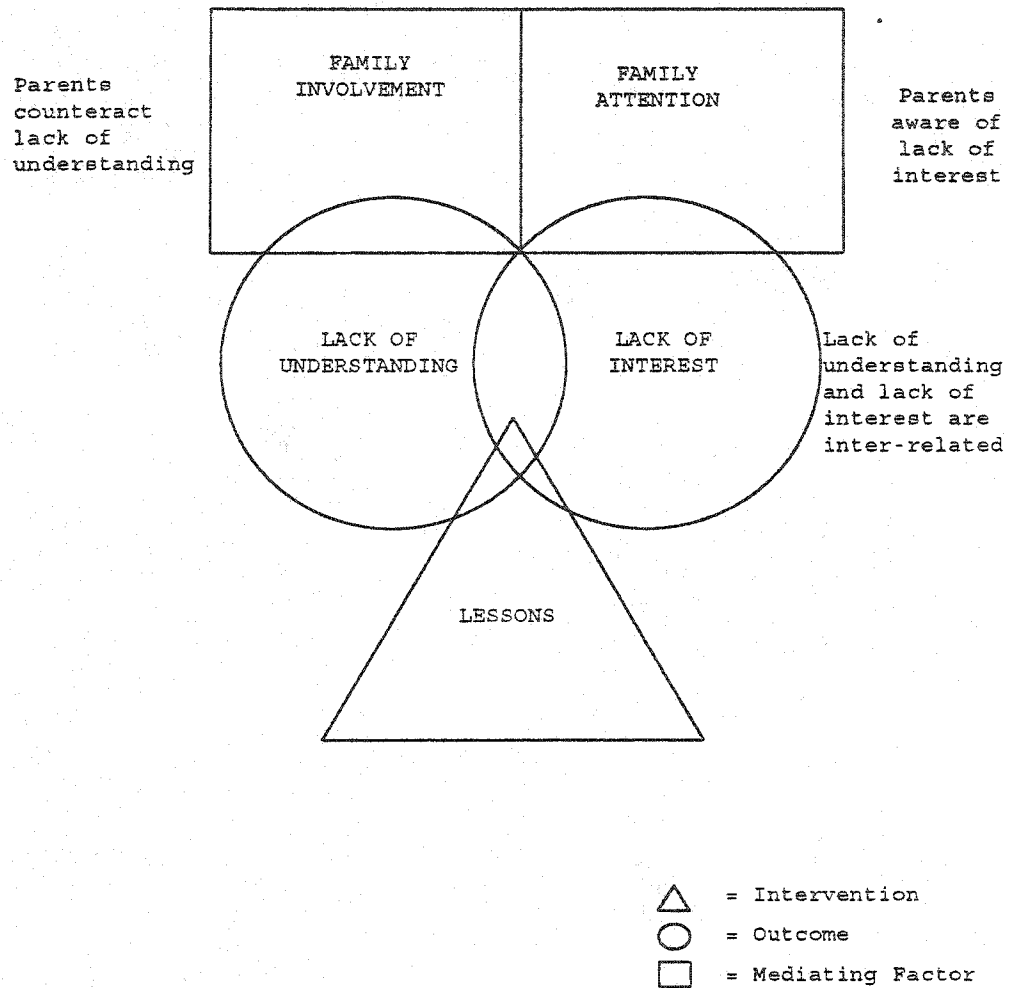


Figure 10. Affective (negative) Relationships



Lack of interest and lack of understanding were closely associated, although causal relationships were not identified based on the data gathered in this study.

Families were aware when their children were not interested or did not understand the lessons. Family involvement seemed to occur when there was a lack of understanding. In this case, parents appeared to have intervened to clarify misunderstandings generated from the class lessons.

The findings were consistent with the PRECEDE framework, and the themes identified through the qualitative data analysis were recognized as predisposing, enabling and/or reinforcing factors, as described in the Educational and Organizational component of the PRECEDE-PROCEED framework.

Predisposing Factors

Children in both classrooms had been familiar with the concepts of the Canada Food Guide before the start of this curriculum as a result of instruction in previous years. Many parents commented on the questionnaires that their families observed healthy dietary patterns. These parents expressed their contention that their children were predisposed towards healthy dietary practices.

One of the posits of the PRECEDE model is that certain predisposing factors may motivate individuals or groups to adopt particular behaviours. It was noted in the previous chapter that a lack of interest among many of the children had occurred during the 'I think I can - Goal setting' lesson, and that children appeared to have had a difficult time focussing their thoughts. It is possible that some of these difficulties may have been related to a lack of experience in setting specific goals in the past. It is also possible that previous positive experiences with goal setting may have predisposed other children to set achievable food goals for themselves, and recognize more fully the concepts of personal responsibility and personal accomplishments.

Enabling Factors

Children were given opportunities to document what they had learned in their health journals. The fact that they were able to do this, suggests that the lessons had supported the development of an enhanced appreciation of healthy eating and healthy living. Many of the students within the classroom claimed to have made a conscious effort to consume fewer 'other' foods, as classified by the Canada Food Guide, and eat more

from those recommended food groups in which they were lacking. This claim was supported by a number of parents. It would, however, be unlikely that these recent changes would persist unless other factors (such as parental encouragement) were in place to reinforce those new behaviours.

Comments from the parent questionnaire suggested that the Healthy Eating lessons had contributed to the knowledge base of their children. Green and Kreuter (1991) stated:

Health knowledge of some kind is probably necessary before a conscious personal health action can occur, but the desired health action will probably not occur unless a person receives a cue strong enough to trigger the motivation to act on that knowledge...Motivation must come from sources other than, or in addition to, factual knowledge...Knowledge is a necessary but usually not a sufficient factor in changing individual or collective behaviour. (p.157)

The identification of the critical thinking theme was encouraging. Children were prompted to adopt an advanced level of thinking and were able to apply the curricular content to themselves or to other situations. This supports the contention that the healthy eating lessons had enabled children to acquire some of the competencies and skills which might assist them in making more informed health choices.

It was interesting to note that the theme 'critical thinking' was noted relatively infrequently until approximately the seventh week of the curriculum. Knowledge preceded critical thinking. This may be interpreted as an indication that many weeks of instruction are required before children can begin to apply their new knowledge and problem-solve accordingly. This explanation would be consistent with the findings of the School Health Evaluation Study (Connell et al., 1985) which suggested that 40 to 50 hours of health instruction were required to establish changes in attitudes, knowledge and reported behaviour.

Knowledge and critical thinking were classified as cognitive factors, although they were closely linked with affective factors. 'Critical thinking' appeared to precede personal control, which itself preceded those behaviours classified as pro-active.

The relationship among learning, interest and enjoyment was perplexing. Children were observed to enjoy particular activities without demonstrating a resulting acquisition of factual knowledge or insight. For the most part, children seemed to have enjoyed the majority of the lessons, making it difficult to determine, based on the information collected, whether children learned from activities they had not enjoyed. Interest and enjoyment were positive emotional responses associated with the cognitive factors of knowledge and critical thinking.

By the same token, lack of interest/attention and lack of understanding were related to each other and were on occasion confused with one another, as described in the previous chapter. It was difficult to judge whether lack of understanding was a direct consequence of lack of interest, or whether the opposite was true.

Clearly, an association was found between interest, enjoyment and learning, although the precise nature of this relationship was undetermined. While interest and enjoyment did not directly 'cause' learning, they may have enabled children to learn more effectively. It is also logical to assume that interest and enjoyment reinforce the experience of learning.

The results of a 1993 study confirmed the relationship between interest, enjoyment and learning (Gilbert, Barr, Clark, Blue & Sunter, 1993). The study revealed that 18 to 21% of Canadian children do not complete highschool. "School-related factors were cited as the most important reason for quitting, by 40% of the males and 41% of the females who left school prior to highschool graduation" (Gilbert et al., 1993, p.27). Lack of enjoyment and lack of interest were identified as the primary school-related reasons for premature school departure. The

authors concluded:

There is an obvious relationship between grade averages and school experiences. Yet, even when these experiences were taken into account, graduates achieved higher grades than the leavers. It appears that graduates are able to achieve good grades whether or not they enjoy school, participate in class, or find classes interesting. On the other hand, these factors make a great deal of difference for the leavers. (p.38)

The classroom teacher commented that those children who were normally outspoken in class, tended to be outspoken during the Healthy Eating lessons, whereas children who were less verbal tended to remain so, although the teacher noted that some of these 'quiet' students may have participated more than usual during these lessons. These comments would support the premise that individuals are predisposed to behave in certain ways. The suggestion that children were motivated to adopt more active roles within the classroom was encouraging. It could be conjectured that the lessons and activities had facilitated this change and were therefore enabling factors in motivating some children to participate more fully in classroom activities. Whether this can be attributed to an enjoyment of the activities, an increased level of interest, or a positive classroom climate remains to be determined. It would be consistent with the premises of the model to suppose that some combination of the above factors contributed to the finding.

Clearly, a number of students had been confused about the concepts of serving sizes and recommended servings. Comments from the parent questionnaire suggested that some parents had intervened and tried to clarify these misunderstandings. In these instances, direct parental involvement was an enabling factor. Very few of the learning activities required direct parental input, which might explain why, in the context of this study, parental involvement was more often associated with trouble-

shooting or 're-building' learning, as opposed to collaborating and reinforcing learning. Parental attention appeared to be a reinforcing factor in motivating children to learn. Had a greater degree of active, parental involvement been incorporated into the curricular activities, parental involvement might have been more identifiable as a positive reinforcing factor.

Contextual interferences, such as the two-week interruption for Christmas holidays, may have acted as a barrier to learning. It appeared that children had more difficulty concentrating on the lessons on days when classes had been interrupted for announcements or assemblies. A definitive judgement on the precise effect of these contextual interferences can not be made, however, in view of the short time frame involved in the study.

Reinforcing Factors

According to the teacher, during the period of the health instruction, students had been heard, on occasion, to comment on the 'healthy' or 'unhealthy' lunches of other students within the classroom. This suggests that peer pressure was also a reinforcing factor.

In the final lesson of the Healthy Eating unit (Media Campaign, Part III), children divided into five small groups to develop advertisements promoting healthy food choices. These advertisements were to be presented to Grade Three students at a later date. Four of these groups recorded their 'advertisements' on video, while the remaining group presented a poster. A 'healthy eating - everybody's doing it' message pervaded each of the video efforts. Clearly, students recognized peer reinforcement as a means of encouraging other children to pursue healthy behaviours. It was also interesting to note that the poster incorporated a collage of magazine images of slender and obese individuals, and a series of healthy and non-healthy food choices. This conveyed, albeit in a simplistic fashion, that students identified physical 'beauty', as typically

portrayed by the media, as positively valued and associated with healthy food choices. While this view is not consistent with the curriculum's desired recognition of individual differences, it nonetheless indicated that children recognized stereotypes as reinforcing factors.

As previously stated, the children had a basic understanding of the concepts of healthy eating prior to the beginning of the new curriculum. It appears that these lessons both enabled the acquisition of new knowledge and reinforced previous material. The following comments of parents support this hypothesis:

(The curriculum) has reinforced in an enjoyable manner things that before were just plain old info stored in their heads.

Better knowledge of the different food groups.

Children seemed to be proud of their own growing ability to evaluate their dietary intake. They were also pleased with their parent's response to whatever dietary efforts they had made. Parental attention was frequently associated with demonstrations of a sense of personal control, pro-action or pride on the part of the grade four students. It is proposed that children were motivated by their own personal recognition and their parent's recognition. This supports the constructs of the model which presuppose that reinforcing factors play a role in motivating and perpetuating particular behaviours.

The Royal Commission on Learning (1994) described intrinsic motivation and external reward as the two types of motivators involved in learning. Intrinsic motivation was described as being "learning something because it is interesting and because the learner wants to know more or gain greater expertise" (Vol I, p.68). External reward was described as: "a happy-face sticker at the top of the paper, an A on the assignment, the offer of a job".

According to the Royal Commission on Learning:

While both types of motivation may lead to learning, what we call the "love of learning" comes from intrinsic motivations. Rewards

can help get students started at times, but research indicates that the reward should not become overly important to the learner: children who are motivated by concrete, short-term rewards (marks, etc) are less likely to continue learning once the reward has been received.

The Report of the Royal Commission of Learning suggests that some combination of interest, enjoyment, challenge and motivation sets the tone for, enables and supports the learning process. This view is consistent with the premises of the PRECEDE-PROCEED model which presupposes that any given behaviour is the function of the "collective influence" of predisposing, enabling and reinforcing factors.

The Royal Commission on Learning (1994) described motivation - learning as a circular process:

Motivated students learn more, but, in truth, more skilled and knowledgeable students are more motivated: students work hardest at their "best" subjects. Dull material indifferently taught is counterproductive to learning. However, the assumption that "fun" schooling will automatically increase learning is equally misguided. Students need to be motivated to accept challenges; they also need to be challenged to remain motivated. Nothing is more motivating than competence, and increasing competence is the essence of schooling. As students acquire competence, they perceive the power of knowledge, and are motivated to stretch themselves even more.

(Vol. I, p. 68)

Based on the current evaluation study, the strength of the Healthy Eating lessons lies in their potential to present new health information to students, in a challenging and enjoyable manner.

Summary of Findings

The Healthy Eating lessons represented the first component of an integrated health curriculum which may ultimately, as described in Chapter One, introduce three other subject areas: Active Living, Substance Abuse and Self Esteem. As stated in the first chapter, the mission statement of the IHC stated that the goal of the lessons was to promote:

- . Self-esteem and personal empowerment
- . A sense of enjoyment about learning
- . An appreciation of the spiritual dimension of health
- . An appreciation of the environmental influences of health

The evaluation of the first component of the curriculum suggests that the stated objectives were reflected by the Healthy Eating lessons. The observation that children took pride in their accomplishments and recognized an element of personal responsibility was an encouraging finding. Students seemed to have enjoyed the learning activities and developed a growing acknowledgement of the concept of the impact of environmental influences on health-related behaviours. An appreciation of any spiritual dimension (health, nutrition or otherwise) is difficult to measure. However, the introductory lesson presented the following relatively holistic definition of health which became a recognizable undercurrent throughout the lesson plans:

Healthy living is giving yourself the best chance to feel good, to be who you are, to enjoy the activities you like to do and to make decisions about the things you care about.

(Healthy Eating, Lesson I)

The lessons were designed to represent an educationally integrated approach that would ensure the learning domains outlined by the Ontario Ministry of Education Common Curriculum document (1994) were represented within the learning activities. Although this research study was not designed to evaluate the degree to which the new lessons met the

guidelines of the Common Curriculum, it appeared that each of the lessons had, in fact, incorporated one or more of the required domains (Mathematics, Self-in society, Science and technology, Language and Arts). As much of the classroom work was entered into a health journal, the classroom teacher was able to review, correct and comment on the quality of the student's work.

The qualitative findings were encouraging and supported the potential value of the pilot curriculum. It appeared that students were motivated to learn about health and nutrition throughout the period of instruction. For the most part, the interest and enthusiasm of Grade Four students was sustained throughout the unit. Accounts from the teacher, parents and from the children themselves, suggest that students were prompted to critically evaluate their own eating habits. The self-reports of children, and feedback from parents suggested that some children attempted to incorporate dietary changes. This suggests that the lessons were often successful in providing children with information and encouraged them to think critically about lifestyle choices. The assumption is that this type of education, in conjunction with other predisposing, enabling and reinforcing factors, will help to encourage children to make healthy food and lifestyle choices.

It was apparent that many parents had been aware, to varying degrees, of some of the curricular activities and for the most part, their feedback was positive. The response rate to the questionnaires was 71%. Of those parents, 85% said they had been aware of the Healthy Eating lessons had been taught. It could not be determined whether those parents who did not return the questionnaires had been aware of the classroom activities. The parent questionnaires helped to illuminate some misconceptions generated from the curricular content. These misconceptions were primarily related to the concept of minimum recommended servings as discussed in Chapter Four. In addition, parents were forthcoming with suggestions for enhancing the curriculum's potential. These suggestions

have been incorporated into the series of recommendations for further curricular development.

Study Limitations

Statistically significant results were not identified in this research study. A number of factors may have had a bearing on this outcome. These variables include measurement issues, sampling limitations and time constraints.

The random assignment of students to intervention and control groups was not feasible. This situation, although familiar to educational research, represented a threat to internal validity (McKinlay et al., 1989). The two schools were relatively well matched and were in close proximity to each other. However, the subtle differences which would be expected to exist in different classrooms and schools may have interfered with the integrity of the study. It was difficult to ascertain whether the post-test scores of the comparison class had been influenced by unknown and/or unanticipated extraneous variables such as other sources of health information.

The search for reliable and validated instruments presented a challenge. There was a scarcity of tools as identified in the literature for measuring health knowledge and attitudes of primary schoolchildren. This paucity of measurement tools constituted a limitation to the study, which was compounded by the fact that the development of the lessons was not completed until late November. This virtually coincided with the beginning of the research study. The CVHPAS and components of Heart Smart Tests seemed compatible with the Healthy Eating lessons although they were not specific to it. It is acknowledged however that the Healthy Eating unit was a relatively generic introduction to nutrition whereas the Heart Smart questions reflected a more scientific and physiological orientation. In hindsight, the degree to which the Heart Smart test matched the curricular content was less than desirable and using selected components of it may not have been suitable for the evaluation of this particular

curriculum.

According to the parents and the classroom teacher, the children were quite knowledgeable and aware of nutrition prior to the initiation of the curriculum. The quantitative statistics failed to confirm whether the curriculum had heightened this awareness, although the qualitative data suggested that it had. Previous positive and high level of knowledge about nutrition may have contributed to a ceiling for effects. It is noteworthy that the mean pretest attitude scores were also high. The overall mean score for males and females was 59.6 out of a possible 64. Attitude scores did decrease in both groups, although the clinical significance of this trend is doubtful. It is uncertain whether the same trend would have been observed, had a more diverse population of students been tested, or had there been more leeway for scores to change in both directions.

The curriculum was piloted with only one class in the school board. The number of students within the participating classroom was beyond the control of the researcher. Under the best of circumstances, the likelihood that statistically significant difference in knowledge and attitude scores would have been identified was remote, unless the magnitude of those differences were large. It is doubtful whether sample size was a significant limitation in this particular pilot study, given that the measures were imperfect for the situation. A repetition of the same testing with a larger sample size would be unlikely to highlight clinically significant differences. A larger sample size, would however, be recommended if more appropriate measurement tools could be identified.

The curriculum was initiated in mid-December and ended in late February. The lessons were suspended for a two week period at Christmas, while less notable interruptions to the continuity of the lessons included occasional fieldtrips and school assemblies. These delays may have had an impact on how the lessons were received and internalized by the students.

While these interferences provided for less than ideal experimental conditions, they did reflect realistic constraints. Consequently, the timing of the curriculum may have served to both limit and enhance the study. The fact that the qualitative data supported the curriculum regardless of the delays was commendable.

The analysis of the qualitative data relied to a large degree on the subjective interpretations of the researcher. However, the threat of personal bias was offset by the fact that information was also sought from parents, students and from the classroom teacher. This triangulation helped to ensure that data were interpreted accurately and objectively (Miles & Huberman, 1984).

While the classroom teacher had not been involved in the curriculum development process, it is important to note that the lessons were piloted at the school where they had been developed. This was significant for two reasons. First, it may have augmented the enthusiasm with which the lessons were both implemented and received. A comparable degree of enthusiasm might not be observed in other schools. This situation may however, have helped to ensure that the activities and lesson plans were adhered to as originally planned, given that the classroom teacher was oriented to the unit by colleagues who had developed it. The SHEE study identified teacher fidelity to a planned curriculum as a key predictor of program success (Connell et al., 1985). Flay (1985) commented:

Both health-care researchers and program evaluators recognize that whether or not an efficacious treatment is actually delivered to the target audience ought to be assessed.... Collecting such data would make negative or marginal results more interpretable, in that it would be known whether or not a program had been made available to the appropriate target audience, under appropriate conditions, and whether or not they had accepted it. (p.465)

The fact the classroom teacher had followed the teaching plan with a high degree of fidelity helped to decrease the risk of Type III error in

evaluation. Green and Kreuter (1991) described Type III error as being "a conclusion that the program is ineffective when in fact the program was never really implemented as planned." (p.231)

The constraints and limitations of this study mirror some of issues identified as limitations in the ability to detect statistically significant treatment effects in larger community based outcome research. Luepker et al. (1994), in summarizing the findings of a long-term multifactor cardiovascular risk reduction program in Minnesota, identified problems including too few analysis units, sampling difficulties and strong secular trends among control groups. Mittlemark, Hunt, Heath and Schmid (1993) claimed that modest or negative results of current cardiovascular disease intervention studies may be related to unrealistic outcome objectives. The authors argued "the issue is not so much the ability of the intervention to affect behaviour but the ability to measure behaviour change" (p. 451). Certainly, each of these issues represented a concern in the current study.

Implications for future research

The findings and limitations of the current pilot study provided the groundwork for future research possibilities. However, a number of measurement issues require consideration prior to further investigation. Recommendations include:

1. The incorporation of a broader range of evaluative techniques into school health promotion studies.
2. The recruitment of a larger population sample.
3. Diversification of student population receiving the curriculum.
4. Shifting the timing of instruction within the school calendar to decrease contextual interferences.
5. Maintaining a mechanism for student, parent and teacher input.
6. Exploration of the most effective mechanism of enhancing family participation and family involvement, in health

activities at this school.

7. Exploration of how nurses might best facilitate future health promotion efforts at this school.

The incorporation of a broader range of evaluative techniques in school health promotion studies.

Both the quantitative and qualitative elements for evaluation could be enhanced. In terms of quantitative measurement, the development and validation of a program specific questionnaire would provide for a more precise evaluation of the program.

Other measures which might be incorporated into another evaluation of this curriculum include the observation of lunch food consumption over limited periods of time prior to, during and after the period of health instruction. Costs in terms of finance and manpower would be a consideration for this avenue of research. Children maintained food logs as part of the curriculum, however, more information could be gathered if a more systematic pattern of documenting self-recalled food intake were to be established. For example, children could analyze their own food intakes over two, three day period (weekdays, and weekends) at different points of the school year, rather than solely during the first weeks of the nutrition instruction. The incorporation of computerized dietary analysis programs for children would facilitate the analysis process. However, a cautionary note must be added; the observation of lunch changes is largely contingent on what types of foods parents are willing and able to provide for their children.

The qualitative elements of the evaluation could be strengthened by the adoption of portfolio assessment into the curriculum. Cleary (1993) described portfolios as a viable method of assessing student performance in health education. At present, students maintain a health journal in which they entered their food logs and much of the material they covered in class. This journal could be modified into a more organized health

portfolio, which could be used to document and track evolving concepts of health. Portfolio assessment could offer a rich resource for the identification of learning needs and learning achievements.

Recruitment of a larger population.

As discussed in the methodology section, a small number of children were available to participate in the current research study. A larger sample size would increase power, thus increasing the likelihood that measurement efforts would detect changes in knowledge and attitude. However, more appropriate measurement tools would be required.

Diversification of student population receiving the curriculum.

Subsequent phases of the evaluation should include the implementation of the program on a wider scale with children of varied backgrounds. Whether the curriculum would have been as positively received by a more diverse sample of children is a question for future consideration. In the Parent Questionnaire, many parents indicated that their children tended to eat healthy snacks prior to the commencement of the curriculum. The general level of awareness about healthy food choices, and the recommendations of the Canada Food Guide seemed to be quite high amongst parents and families at the Intervention School. Furthermore, the population of the Intervention and Comparison school were described by school board officials as being primarily from middle to upper socio-economic family backgrounds. It would be worthwhile to pilot this same curriculum at a school with a different socio-economic makeup. Similarly, whether the same lessons would have been taught with a comparable degree of finesse by other teachers remains to be seen. Without a doubt, the classroom teacher must be acknowledged as an important catalyst in the learning process. The implementation of the lessons in a broader range of classrooms would allow for an assessment of whether the lessons were sensitive to a broad range of cultures, and teaching and learning styles.

Shifting the timing of instruction within the school calendar.

Under other circumstances, the introduction of this unit would

probably have taken place during the Fall or Spring semester. This first option was not feasible, as the lesson plans had not been finalized until late November. The lessons started in early December in order to accommodate plans for two post-tests within the academic year. In this study, both the research plans and the health lessons were subject to the constraints of the school calendar. The interruption introduced by the Christmas holidays might be avoided in subsequent years if the lessons were implemented at a different time during the school session.

Maintaining a mechanism for student, parent and teacher input.

Green and Kreuter advised that "classroom health educators should try to make process evaluation, and selected levels of impact evaluation, an integral part of their instructional program" (Green & Kreuter, 1991, p.379). Substantial information for the current study was gathered through the student interviews, parent questionnaires and discussions with the classroom teacher. The incorporation of these approaches to similar evaluation projects would be recommended as an avenue for continuing quality assurance. Attention should be directed towards establishing the degree of information diffusion to family members. This might be accomplished through a parent questionnaire or interview.

Should the curriculum be implemented on a wider scale, different circumstances might allow for a more comprehensive evaluation of the pilot Healthy Eating program. Green and Kreuter (1991), commenting on school health education research wrote:

...the evidence is strengthening on the linkages between knowledge gain, positive attitudes, health and social competence skills, and those risk behaviours. Though the need for all levels of evaluation is pressing, the responsibility for outcome studies and most impact studies, with their demands for sophisticated designs and large sample size, must be borne by academic researchers with grant support. (p.379)

Exploration of the most effective mechanism of enhancing family participation and family involvement.

In order to enhance the potential of this and future units of the Integrated Health Curriculum, it would be worthwhile to determine the most effective methods of sharing health information with families at this particular school. The following questions might be considered:

- . Would parents read health information if it were to be included in school newsletters?
- . Would parents participate in health assignments and projects with their children? For example, would parents react positively to maintaining a family food log, which children could evaluate?
- . Would parents participate in health information seminars or in health activities which might be held at the school?

Exploration of how nurses might best facilitate future health promotion efforts at this school.

As described previously, the continued involvement of nurses in this, and other school health promotion endeavour, is recommended. Further discussions with staff, parents and students at this particular school might establish the direction of future collaborative efforts, including the design of further curriculum modules.

Recommendations for Curricular Development

The qualitative elements of the study confirmed that the curriculum was well received, and supported the potential of the lessons. Twelve recommendations for further curricular development were formulated as a result of the data analysis. Suggestions from students, parents and from the classroom teacher have been instrumental in the development of this list of recommendations. The recommendations include:

1. Elaboration of concepts of healthy living in the introductory lesson. The introductory lesson would include a more thorough discussion of the human body (at an age appropriate level) and the relationship between healthy lifestyle, health choices and nutrition in general. This may facilitate a fuller appreciation of the concept of personal choice and responsibility for health. The goal setting lesson might have more impact if students could readily identify the connection between what they do and how they feel.
2. Further class discussion devoted to the theme that the distinctive characteristics and differences which exist between individuals make them unique and special. Children were taught in class that food and energy requirements depended on factors such as weight, sex and age. However, the use of stereotypical body shapes in the collage 'advertisement' assembled by one of the groups of students suggested that more emphasis should be placed on 'feeling good' as a positive consequence of healthy behaviour rather than 'obesity', for example, as a negative consequence.
3. Clarification of the concept of recommended daily intake as per the Canada food guide. This would entail a discussion of the meaning of 'minimum' intake versus 'maximum' intake.
4. Clarification of the concept of 'serving size'. The use of food models to 'build' a healthy meal might be an appropriate method for clarifying the issue and giving children a 'hands on' opportunity to practice their skills at selecting appropriate quantities of recommended foods.
5. The adoption of a greater emphasis on variety, particularly non-meat sources. This might provide an opportunity to develop an

appreciation for different types of food, to prepare foods, or an opportunity to learn about foods of different cultures. The reinforcement provided by peers in a comfortable environment might counteract the reluctance identified by some children and their parents to try different foods.

6. An elaboration of the importance of variety and balance, particularly in reference to the lesson on fats, sugars and salt. The role and importance of fats, sugars and salts should be introduced at the beginning of the lesson. An emphasis on moderation rather than elimination should be maintained. The role of vitamins and minerals could be introduced at this time in order to make the material more informative and challenging.
7. The incorporation of computer technology into the curriculum to meet the wide range of student interests and learning styles. The Healthy Eating unit successfully incorporated a number of strategies, including individual work, group work, brainstorming, tactile work and class discussions. A technological component is currently being considered, whereby students could enter their food intake and receive a computerized printout of their nutrient intake. This would provide a challenging learning opportunity, consistent with an educationally integrated approach.
8. The devotion of more class time to the 'Goal Setting' lessons. Students had been asked in class to discuss goals they had attained in the past. They were also provided with an opportunity to role play. More discussion about health goals and problem solving around issues which might stand between children and the achievement of their personal goals would be warranted. Positive reinforcement in relation to these activities would be continued.

9. The enhancement of family involvement. This may be accomplished in a number of ways. For example, family involvement might be increased if children were asked to develop a collection of favourite healthy recipes from home. Children might be asked to bring a food label from home to discuss label-reading, which could be incorporated as part of the Hidden fats\salt\sugar lesson. The health department might facilitate the dissemination of information directly to parents via the school newsletter. This might include a brief article on Healthy Nutrition, or 'Heart Health' hints.
10. If feasible, opportunity could be provided for students to prepare a 'healthy meal' or a 'healthy recipe'. This activity had been described in the curricular plans as a 'follow-up' activity. Several students, and some parents had voiced an interest in such an activity. This might provide an excellent opportunity for students to try healthy food in a supportive peer atmosphere. Should such a lesson take place, it could serve as a venue to introduce cultural aspects of eating, or issues such as food hygiene.
11. The incorporation of student portfolios into the lesson plans. The utilization of portfolios as opposed to health journals would integrate the concept of self-evaluation and recognition for personal learning into the curriculum in a more meaningful fashion. The use of portfolios is compatible with the philosophy of outcome based learning as described by Spady (1991). Consequently, portfolios would be an appropriate mechanism for encouraging children to critically evaluate their own learning and take pride in their own accomplishments. The fact that pride was identified through the qualitative data analysis as closely associated with self-efficacy, pro-action and family involvement adds support to the

idea of personal health portfolios. Ideally, these portfolios would be kept from one year to the next, so that the learning activities of subsequent school years would build on previous learning. Jackson (1994) also advocated the use of health portfolios:

Comprehensive school health education programs need to differentiate between knowledge students must acquire and appropriate behaviours they should demonstrate. Thus, increased emphasis should focus on developing and implementing methods to monitor and evaluate the effectiveness of interventions. Diverse evaluation strategies such as portfolios, student-reported data, and case studies should be used. (p.179)

12. The fuller integration of theoretical models into the curriculum development process. The integration of a health planning model, such as PRECEDE-PROCEED, might facilitate a more robust intervention, by introducing predisposing, enabling and reinforcing factors into the planning phases of the curriculum. The fuller adoption of the Comprehensive School Health model might broaden the scope of intervention and promote Healthy Eating on a school-wide rather than grade specific level. The overt incorporation of these theoretical models may enhance the effectiveness and implementation of further health promotion efforts within the school community.

Implications for Clinical Practice

The research findings support the utilization of theoretical models in the planning and evaluation of school health promotion projects. Collaborative efforts in school health promotion, one of the basic tenets of the Comprehensive School Health framework (Kolbe, 1986), was evidenced in the planning, development and evaluation of the Healthy Eating unit.

The PRECEDE-PROCEED model (Green & Kreuter, 1991) had not been used explicitly in the development of the program, however, the qualitative findings supported the constructs of the model. As indicated in Figure 4 in Chapter Two, the design and support for the curriculum initiative were compatible with the organizing structure of the framework. The significance of administrative support in the planning and implementation of this project was discussed in Chapter Two. All parents in the comparison school granted permission for their children to complete the questionnaires, (although one parent asked to review the questionnaire prior to doing so), while three parents refused consent in the intervention school. As described in the third chapter, the principal of the comparison school had sent a letter of support while no such letter was sent at the intervention school. When considered in light of the PRECEDE model, this overt demonstration of administrative support in the comparison school might have been a predisposing factor in the decisions of parents to participate in the study, while parents in the intervention school may not have been aware of the administrative support behind the project. There was a high degree of support for this research demonstrated by the administration of the Ottawa Separate Roman Catholic School board. The Principal, classroom teacher and the members of the Curriculum Development committee participated in varying degrees to the design of the questionnaires. Previous research studies had been received enthusiastically at the school. Similarly, staff at the comparison school were also enthusiastic. The initial contact with that school had been facilitated by the Principal of the intervention school. Representatives from the School Board assisted in securing the commitment of that school in the role of the comparison group. Certainly, this situation demonstrates the complementarity between PRECEDE-PROCEED and the Comprehensive School Health model. The successful planning and organization of school health endeavour requires the inclusion of parents as partners, along with school and health representatives, and other

community members.

Specific attention to the issue of family involvement would be warranted in future school health promotion endeavour. Three out of 20 parents said that they had received no information from any source about the curricular activities. Furthermore, only 65% percent of those parents surveyed, said they had heard about the curriculum from their children. While it would have been unrealistic to expect that all children would share their classroom experiences in the same fashion at home, the degree of family awareness and family involvement was less than anticipated. The theoretical models and the school health education literature identify family involvement as an important factor in the successful implementation of comprehensive school health education. Consequently the further involvement of parents and families is included as one of the recommendations for curricular development.

The fact that knowledge scores increased for both groups was encouraging from a health promotion standpoint. For whatever reason, children in both schools had become more successful, over the course of four months, at answering specific health questions. This finding, did not however, provide quantifiable support for the Healthy Eating lessons. The observation that attitude scores dropped in both groups, over the course of four months, highlights the importance of concentrating school health promotion efforts on the shifting of attitudes at an early age, in conjunction with the sharing of knowledge.

The observation that children themselves reinforced particular behaviours by commenting on each other's lunches, and their selection of peer pressure as a technique for their own 'health advertisements', suggests that peer reinforcement may be an appropriate strategy for health promotion among children of this age group. The findings of the current study suggest that the further incorporation of increased family awareness and involvement in the curricular activities, might facilitate the promotion of positive attitudes among Grade Four students.

As previously stated, nurses were well-represented within the Health Partnership, and had contributed to the development of the first unit of the integrated health curriculum. The fact that the program had been successfully piloted and positively received, underscores the importance of collaborative practice in the school health arena and interdisciplinary collaboration. This pilot project illustrates that nurses can assist in bringing health to the agenda of educators, and facilitate health promotion efforts. The continued involvement of nurses in school health promotion efforts such as this, is recommended. The participation of nursing students in school environments, is also advised, so that future professionals can develop an expertise at working within the comprehensive school health framework.

Advanced practice nursing, clearly has a significant role to play in the school health arena. The expertise of Masters prepared nurses from both the University of Ottawa and the Ottawa Carleton Health Department, contributed to a large degree to the success of the three-way partnership. The ability to apply community development and health promotion theory and research-based findings into practice, was evident in both the partnership and the curriculum development process. The potential for the educational and collaborative aspects of the Advanced Nursing role were also supported in this project.

Conclusions

The benefits of comprehensive school health education are well supported by the literature. The current research study represented an evaluation of the first completed component of a planned integrated health curriculum for the primary grades. A distinct compatibility between the guidelines of the Ontario Ministry of Education Common Curriculum (1993) document was achieved in the Healthy Eating lessons. The quantitative element of the study failed to identify statistically significant difference in knowledge and attitude scores between children who had been

taught these lessons and children who had not. The qualitative data, however, indicated that the curriculum had been well-received, and suggested that it might be a cost effective and promising means of introducing children to healthy lifestyle choices. The refinement of the current nutrition unit, and the development of future units of the Integrated Health Curriculum is recommended. It is hoped that the completed educational program will help to instill a positive and proactive outlook on health among school children and enable them to develop some of the skills and knowledge they may require to reduce health risks in the years to come.

It would appear that the time is ripe for community members to work together to promote and support the well-being of the young generation. This conviction was echoed in the following statement from the Report of the Royal Commission of Learning (1994):

Obviously all social institutions need to work together, more frequently and more effectively than in the past, to provide the best conditions for the healthy development and growth of children. Families, business institutions, social and recreational agencies, religious institutions, community groups, including those representing the arts, schools - must all contribute to what is really a collective responsibility". (Vol. 1, p.57)

The challenge for the nursing profession, is to make a full contribution to this 'collective responsibility'. Nurses can help to shape the face of school health promotion by aligning themselves with educators and actively pursuing school health partnerships. Advanced Practice Nurses may well assume a lead in this process by creating opportunities to share research-based findings with others, by offering their knowledge and expertise to other community members, and by applying leadership skills in the coordination and facilitation of community efforts to support the well-being of children.

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Appendix A

The Healthy Eating Time Frame

<u>Date</u>	<u>Lesson</u>	<u>Lesson Title</u>
early December	Lesson One	Introduction to 'Health Quest Part I
mid December	Lesson Two	Introduction to Health Quest Part II
mid December	Lesson Three	The Food Log
late December	Lesson Four	Healthy Eating - Energy
early January	Lesson Five	Food Groups
early January	Lesson Six	Food Log -Analysis
mid January	Lesson Seven	"I think I can" - Goal Setting
late January	Lesson Eight	Fat, Salt and Sugar - The Hidden Facts
early January	Lesson Nine	Media Campaign - Part I
mid February	Lesson Ten	Media Campaign - Part II
late February	Lesson Eleven	Media Campaign - Part III



Mayfield Publishing Company

Appendix B

November 22, 1994

Dear Ms. Graham:

This is in reply to your request of November 3, 1994.

You may have Mayfield's permission to include the diagram on page 150 of the second edition of *Health Promotion Planning: An Educational and Environmental Approach* by Lawrence W. Green and Marshall W. Kreuter in your thesis.

We do ask that credit be given to the book, authors, and publisher, and reproduce the copyright line as it appears in the book.

Thank you for your interest in Mayfield.

Sincerely,

Pamela Trainer
Rights & Permissions Director



UNIVERSITÉ D'OTTAWA
UNIVERSITY OF OTTAWA

MAY 22 1995

FACULTÉ DES SCIENCES DE LA SANTÉ
FACULTY OF HEALTH SCIENCES

Sandra J. Graham
M.Sc.N. student

Association for the Advancement
of Health Education
1900 Association Drive.
Reston, Va.

Attention: Audrey

I am currently involved in the Evaluation of a Health Curriculum for Grade Four students, as a Master's Thesis for the University of Ottawa School of Nursing. I will be applying the Comprehensive School Health model in my research. I am seeking permission to reproduce a diagram from the journal:

Health Education

1986

17(5)

p.50

Figure: School Health Promotion Components
and Outcomes

With your permission I would like to acknowledge your journal and incorporate the figure as part of my Thesis.

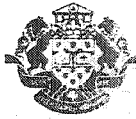
I hope to publish my research within the next two months so I look forward to hearing from you at my home address. Thank you for your attention to this matter.

Sincerely,

Sandra Graham
(M.Sc.N candidate)

Permission is granted to copy the above referenced material as a part of your thesis research requirements, but not for any commercial use.

*Editor
6/8/95*



Université d'Ottawa - University of Ottawa

Faculté des sciences de la santé
Ecole des sciences infirmières

Faculty of Health Sciences
School of Nursing

Appendix D

Consent-Parents (Intervention School)

Sandra J. Graham R.N.
M.Sc.N student
University of Ottawa,
School of Nursing

Dear Parents:

.....(Name)..... Elementary School has planned a new Health Curriculum for Grade Four and Five students. This program will run over the next few months. I will be conducting a research project to evaluate the effectiveness of curriculum and to see what children learn from the planned activities. Mr. ..(name)..., Principal of ... (name)... School has kindly allowed me to ask your assistance in the evaluation process as consent is needed for any data used for research purposes.

Students will be given a questionnaire on three occasions. The questions are about health attitudes and knowledge. The questions are not of a personal or offensive nature and will take approximately 30 minutes of class time to complete. Any students who do not fill out the questionnaire will be provided with other activities during the designated time period. I would also like to observe classroom Health activities and to review the children's 'Health Portfolios' to look for changes in their understanding about health. Some students will be selected and randomly to discuss the school health activities and the work they have done, during class hours. This will take approximately twenty minutes.

I will ask parents to complete a questionnaire at the end of the program. Comments from parents would be used anonymously to help evaluate the curriculum.

The information collected will be used for Research purposes and will remain anonymous. It will not appear in any school or medical records. This project has received approval from the Faculty of Health Sciences Human Research Ethics Committee. The Chair of this Committee is Dr. Frank Reardon (564-5920). If you have any questions, I may be reached at ... (phone number)... or you could contact my thesis advisor, Betty Cragg at 787-6606.

I would be grateful for your cooperation, but participation is voluntary. You may withdraw consent at any time. There will be no negative consequences to your child. This research will help ...name.... School to plan its' health education directions. The results of the study will be made available to parents upon completion of the Evaluation.

Whether or not you grant permission for your child to participate in the Curriculum Evaluation Research, please complete the attached form and return it to the school by Sept. 20, 1994. Thank-you.

Sandra Graham, R.N.

CONSENT FOR PARTICIPATION

I have read and understood the request for my son/daughter to participate in the Evaluation of the Integrated Health Curriculum.

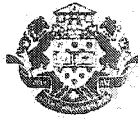
I understand I may withdraw my child from the study at any time without penalty. The information is confidential and is protected under the Freedom of Information and Privacy Act, 1989 (Bill 49).

-----I GIVE PERMISSION FOR MY SON/DAUGHTER TO
PARTICIPATE IN THIS CURRICULUM EVALUATION STUDY.

-----I DO NOT GIVE PERMISSION FOR MY SON/DAUGHTER TO
PARTICIPATE IN THIS CURRICULUM EVALUATION STUDY

Name of Student: _____ Date: _____

Signature of Parent or Guardian _____



Université d'Ottawa - University of Ottawa

Faculté des sciences de la santé
École des sciences infirmières

Faculty of Health Sciences
School of Nursing

Appendix E

Consent (Comparison School)

Sandra J. Graham R.N.
MSc.N. student
University of Ottawa,
School of Nursing

Dear Parents:

I am a Graduate Student at the University of Ottawa, School of Nursing. I am conducting a research project to evaluate a new Health Curriculum.

A new approach to Health Education is currently being planned at another school. This project will not be tested at your school at the present time; however your Principal has kindly granted permission to ask for your assistance.

I would like to compare the health attitudes and knowledge of Grade Four and Five students at this school with the health attitudes and knowledge of students at the other school. This will help to evaluate the effectiveness of their health curriculum, and help to determine whether it might be worthwhile to share it with other schools.

I will be asking that children in your child's class fill out three questionnaires over the course of the year. These questions about health knowledge and attitudes, will require approximately 30 minutes of class time. Students who do not fill out the questionnaire will be provided with other activities during this time period. In no way will questions be of a personal or offensive nature.

The information collected will be used for research purposes and will not appear in any school or medical record. All information will remain anonymous. Names and identification will not appear on the data sheet.

This project has received approval from the Faculty of Health Sciences Human Research Ethics Committee. The Chair of this committee is Dr. Frank Reardon (564-5920). If you have any questions, I may be contacted at ..(phone number)... or you could contact my thesis advisor, Dr. Elizabeth Cragg at 787-6606.

I would be grateful for your cooperation, but participation is voluntary. You may withdraw consent at any time, without negative consequences for your child. The data collected may help to guide health education directions within the Board.

Whether or not you grant permission for your child to complete the questionnaire, please complete this form and return it to the school with your child by Sept. 20, 1994.

Thank-you.

Sandra Graham, R.N.

CONSENT FOR PARTICIPATION

I have read and understood the request for my son/daughter to participate in the Evaluation of the Integrated Health Curriculum.

I understand I may withdraw my child from the study at any time without penalty. The information is confidential and is protected under the Freedom of Information and Privacy Act, 1989 (Bill 49).

-----I GIVE PERMISSION FOR MY SON/DAUGHTER TO
COMPLETE THE QUESTIONNAIRES.

-----I DO NOT GIVE PERMISSION FOR MY SON/DAUGHTER TO
COMPLETE THE QUESTIONNAIRES.

Name of Student: _____ Date: _____

Signature of Parent or Guardian _____



Université d'Ottawa - University of Ottawa

Faculté des sciences de la santé
École des sciences infirmières

Faculty of Health Sciences
School of Nursing

Appendix F

Reminder Letter-Parents (Intervention Group)

Sandra J. Graham R.N.
MSc.N. student
University of Ottawa,
School of Nursing

Dear Parents:

You may have recently received an information letter asking for consent for participation in a Research project, evaluating a new Health Curriculum for children. Your child's teacher kindly sent the original information letter home with your child on my behalf. If you have completed and returned the consent form, I would like to thank you for your time. If you have not yet had the opportunity to do so, I would be most grateful if you would take a few minutes to do so now. Please return the Consent form to the school within the next few days.

Please find enclosed another copy of the original information and consent form. Please feel free to contact me if you have any questions. I may be reached through ... (name) ...
School, at .. (phone number) ...

Thank-you,

Sandra Graham, R.N.



Université d'Ottawa - University of Ottawa

Faulté des sciences de la santé
École des sciences infirmières

Faculty of Health Sciences
School of Nursing

Appendix G

Consent (Teacher)

Sandra J. Graham R.N.
MSc.N.student
University of Ottawa,
School of Nursing

Dear Teacher:

I am a Graduate Student at the University of Ottawa, School of Nursing. I am currently conducting a research project with the University of Ottawa, and the Ottawa Roman Catholic Separate School Board.

In the Fall of 1994 an Integrated Health Curriculum will be piloted at ..(name)... School. It is my intention to evaluate this trial curriculum. This evaluation will include testing the health knowledge and attitudes of students at ...(name)... and comparing them with the results of students in a similar school situation. This testing will take place once before curriculum initiation and on two occasions thereafter. Seven randomly selected students will be asked to discuss their Health Portfolios with the Researcher as another component of the Evaluation. Parents will be asked to complete a questionnaire regarding their impressions of the program.

I am also asking for your assistance as the teacher responsible for teaching the planned curriculum. The comments that you make regarding which components of the program translate well into the classroom will be of primary importance to both the evaluation and the planning of future directions for this project.

The information collected will be used for research purposes and will not appear in any school or medical record. Names and identification will not appear on the data sheet. Names will not appear in any written or published reports about the Research.

This project has received approval from the Faculty of Health Sciences Human Research Ethics Committee. The Chair of this committee is Dr. Frank Reardon (564-5920). If you have any questions, I may be contacted at ...(phone number)... or you could contact my thesis advisor, Dr. Elizabeth Cragg at 787-6606.

Please review the Consent form on the following page and kindly return it to me as soon as possible. Thank you for your kind attention.

Sandra Graham, R.N.

CONSENT FOR PARTICIPATION

I am familiar with the Research Protocol involved in the Evaluation of the ...(name).. Integrated Health Curriculum. I am aware that the Teacher Evaluation of the learning activities will be a component of the Curriculum Evaluation. I am aware that my comments on these questionnaires may be forwarded to the ...(name)...Integrated Health Curriculum Development Committee for future modification of the teaching program.

I understand I may withdraw from the study at any time without penalty. The information is confidential and is protected under the Freedom of Information and Privacy Act, 1989 (Bill 49).

-----I AGREE TO PARTICIPATE IN THE CURRICULUM EVALUATION STUDY.

-----I DO NOT AGREE TO PARTICIPATE IN THE CURRICULUM EVALUATION STUDY.

Name _____ Date: _____



UNIVERSITÉ D'OTTAWA
UNIVERSITY OF OTTAWA

FACULTÉ DES SCIENCES DE LA SANTÉ
FACULTY OF HEALTH SCIENCES

November 9, 1994

Sandra Graham
student
School of Nursing
Roger Guindon Hall
451 Smyth Road
INTRA

SUBJECT: Your project entitled "Evaluation of an integrated health curriculum for grade four students"

Dear student,

It is my pleasure to inform you that the Faculty of Health Sciences, Human Research Ethics Committee, after study of the documentation provided, concluded that your project met the appropriate standards of ethical acceptability and falls within Category 1A.

I hereby attach a copy of the certificate of clearance granted by the University Human Research Ethics Committee.

This certificate is valid for a period of one year from the time of issuance. I would also like to remind you that, in accordance with the policies of the UHREC, it is your responsibility to notify the Committee of any major changes in this project.

On behalf of the Committee, I wish you success in your project.

Sincerely,

Francis D. Reardon, Ph.D.

Chair

Human Research Ethics Committee



UNIVERSITÉ D'OTTAWA
UNIVERSITY OF OTTAWA

FACULTÉ DES SCIENCES DE LA SANTÉ
FACULTY OF HEALTH SCIENCES

**CERTIFICATION OF INSTITUTIONAL HUMAN RESEARCH ETHICS
COMMITTEE
FACULTY OF HEALTH SCIENCES**

This is to certify that the Institutional Human Research Ethics Review Committee of the Faculty of Health Sciences has examined the research proposal by **Sandra Graham**, a student from the School of Nursing for the project entitled : "**Evaluation of an Integrated Health Curriculum for Grade Four Students**" and concludes that, in all respects, in the proposed research protocol meets the appropriate standards of ethical acceptability, at a Category 1A level.

MEMBERS OF THE COMMITTEE

<u>Name (Optional)</u>	<u>Position held</u>	<u>Department of discipline</u>
Victor Boucher	Professor	Programme of Audiologie/Speech Pathologie
Claire-Jehanne Dubouloz	Professor	Programme of Occupational Therapy
Fabienne Fortin	Professor	School of Nursing
Nadia Lebreux	Student	Human Kinetics
Roch Paquin	Member-at-Large	
Daniel Proulx	Professor	Faculty of Law
Francis Reardon	Chair	Human Research Ethics Committee School of Human Kinetics

SIGNATURE

94.10.09

Date

Committee Chairperson - Francis D. Reardon, Ph.D

CABINET DE LA DOYENNE/OFFICE OF THE DEAN



Université d'Ottawa - University of Ottawa

Faculté des sciences de la santé
École des sciences infirmières

Faculty of Health Sciences
School of Nursing

Appendix I Knowledge Questionnaire

This is not a test. We want to learn what you know about nutrition and healthy living.

INSTRUCTIONS: Read each question carefully and circle the letter of the best answer. Remember to circle only ONE answer. Answer EVERY question even if you must guess.

1. The heart is like a:
 - a) wheel
 - b) pump
 - c) filter
 - d) computer
 - e) none of the above.
2. The word pulse refers to:
 - a) your blood pressure
 - b) the amount of blood in your heart
 - c) how fast your heart beats
 - d) the amount of blood your heart can pump
3. The veins in your body:
 - a) carry blood to your arms and legs
 - b) return blood to the heart
 - c) bring blood to the skin
 - d) move blood to the brain
4. The heart is mostly made up of:
 - a) muscles
 - b) veins
 - c) arteries
 - d) capillaries
5. The heart moves fluid into tubes called:
 - a) lipids
 - b) arteries
 - c) cholesterol
 - d) intestines

6. Your blood brings:
- a) oxygen and carbon monoxide to the brain
 - b) nutrients and oxygen to the cells
 - c) water and bacteria to the heart
 - d) vitamins and carbon monoxide to the hands and feet
7. Which one of the following is true?
- a) fat is not used for energy
 - b) vitamins help the body use food to grow and heal
 - c) the major use for sodium is to provide energy
 - d) carbohydrates are also called proteins
8. Which exercise is best for your heart?
- a) bowling
 - b) swimming
 - c) lifting weights
 - d) football
9. Which one of the following sets of foods includes all healthy snacks?
- a) Koolaid, potato chips, apples
 - b) granola bars, cookies, carrot sticks
 - c) raisins, candy bars, fruit juice
 - d) grapes, yogurt, carrot sticks
10. The four food groups are:
- a) bread group, dessert group, vegetable group, milk group
 - b) milk group, bread group, fruits and vegetable group, meat group
 - c) fruit group, vegetable group, protein group, snacks group
 - d) milk and vegetables group, fruit group, breakfast group, vitamin group
11. Creamy and greasy foods contain a lot of:
- a) sugar
 - b) salt
 - c) fat
 - d) vitamins
 - e) water



12. Peanuts belong to the:
- a) nuts food group
 - b) bread food group
 - c) milk food group
 - d) meat food group
13. The major nutrients are:
- a) carbohydrates, meat, minerals, protein, and milk
 - b) eggs, fat, vitamins, water, carbohydrates, and nuts
 - c) cholesterol, calories, protein, water, fat and vitamins
 - d) carbohydrates, vitamins, proteins, water, fat and minerals
14. Bologna and french fries are high in:
- a) fat
 - b) sugar
 - c) vitamins
 - d) calcium
15. John was making a snack after school one day. He wanted a snack that would be Heart healthy. Which snack should he prepare?
- a) biscuit, butter, jelly, milk
 - b) whole wheat bread, turkey, skim milk
 - c) cheese sandwich and potato chips
 - d) bread, bologna, mayonnaise, whole milk
16. Foods high in sugar:
- a) can lower your blood pressure
 - b) are low in calories
 - c) help you think better in school
 - d) have few nutrients
17. A food in the milk group that is low in fat is:
- a) skim milk
 - b) butter
 - c) Canadian cheese
 - d) sour cream



18. Which of the following are all risk factors for heart disease?
- a) not getting exercise, eating fatty foods, low blood pressure
 - b) smoking cigarettes, eating low fat foods, high blood pressure
 - c) eating fatty foods, smoking cigarettes, high blood pressure
 - d) eating fatty foods, jogging, high blood pressure
19. Which of the following foods are all Heart healthy?
- a) hotdogs, juice, baked potatoes
 - b) pizza, cheese, whole milk
 - c) hamburger patty, canned peas, Koolaid
 - d) baked fish, fresh green beans, skim milk
20. Which of the following is not true:
- a) beans belong to the meat group
 - b) potatoes belong to the bread and cereal group
 - c) lettuce belongs to the fruit and vegetable group
 - d) yogurt belongs to the milk and milk products group
21. What is the recommended number of servings per day?
- a) 5 servings from the meat group
 - b) 2 servings from the fruit and vegetable group
 - c) 3 servings from the milk and milk products group
 - d) 1 serving from the bread and cereal group
22. Which of the following foods are heart healthy?
- a) salty foods
 - b) fresh foods
 - c) greasy foods
 - d) creamy foods



23. Which of the following foods is not a sugary food?
- a) vanilla ice cream
 - b) Coca-Cola
 - c) bran muffin
 - d) chocolate chip cookies
24. Which is the un-Heart healthy way to cook fish?
- a) fried
 - b) baked
 - c) broiled
 - d) poached
25. In a Heart-healthy diet, eggs should be eaten:
- a) no more than three times a week
 - b) everyday
 - c) to provide lipids
 - d) to prevent high cholesterol
26. What are the three stages of a heart healthy workout?
- a) aerobic exercise bout, rest period, stretching period
 - b) warm-up period, calisthenic period, rest period
 - c) warm-up period, aerobic exercise bout, cool-down period
 - d) calisthenic period, stretching period, cool-down period
27. What is a good heart rate to reach while doing heart healthy exercise?
- a) 60 beats per minute
 - b) 100 beats per minute
 - c) 150 beats per minute
 - d) 200 beats per minute

28. When you do stretching exercises, it is best to:
- a) stretch until it hurts and hold it for 5 minutes
 - b) slowly stretch until you feel it in your muscles and hold it for 10 seconds
 - c) stretch as far as you can and then quickly draw back
 - d) stretch only after you have reached a high heart rate
29. All of the following are benefits of exercise except:
- a) promotes growth and development
 - b) makes the heart stronger
 - c) increases body fat level
 - d) lowers blood pressure
30. Doing push-ups, pull-ups and sit-ups develops:
- a) cardiovascular endurance
 - b) muscular endurance
 - c) flexibility
 - d) imbalance
31. When jumping rope for fitness, it is important to:
- a) jump as high as you can
 - b) keep the arms straight
 - c) jump without lifting your feet very high
 - d) keep your legs straight
32. The most important part of physical fitness is:
- a) cardiovascular endurance
 - b) muscular endurance
 - c) flexibility
 - d) strength
33. Cool-down exercises are important because they help the heart to:
- a) pump faster
 - b) get stronger
 - c) recover gradually
 - d) grow larger



34. In an individual fitness program, you should:
- a) use activities based on your needs
 - b) only do exercises that feel "easy"
 - c) use the same activities whenever you exercise
 - d) choose anaerobic activities
35. Which are the most important in the prevention of cardiovascular disease?
- a) exercise and diet
 - b) vitamins and minerals
 - c) rest and relaxation
 - d) medication and surgery
36. Too much saturated fat in your diet may cause diseases of the:
- a) respiratory system
 - b) nervous system
 - c) circulatory system
 - d) skeletal system





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Appendix J

Children's Cardiovascular Health Promotion Attitude Scale

The purpose of these questions is to find out how you and other children feel about exercise, nutrition, smoking, and problem solving. Please answer the following questions as truthfully as you can. There are no right or wrong answers. THIS IS NOT A TEST!

1. How old are you? _____ 2. Grade: _____
3. Are you a Girl: _____ Boy: _____

Circle the answer which tells how you feel.

4. I like to exercise

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

5. When I grow up I am going to exercise.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

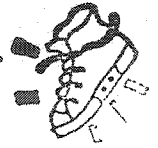
6. Exercising is fun.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

7. I exercise because it makes me healthy.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

8. I like to eat a good breakfast every morning.



- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

9. I like to eat vegetables.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

10. I like to eat healthy food every day.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

11. When I am hungry after school I like to eat fruit or something good for me.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

12. It bothers me if my parents or other adults around me smoke.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

13. Smoking can cause cancer.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

14. It bothers me if other people around me smoke.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

15. When I grow up I am going to smoke.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

16. I have a grown-up I can talk to about my problems (such as your parents, a teacher, or a neighbour).

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

17. My parents listen to me when I want to tell them something.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

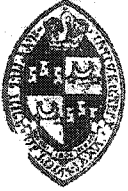
18. Most of the time I am happy.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot

19. I like being me.

- a. agree a lot
- b. agree a little
- c. disagree
- d. disagree a lot





Tulane University Medical Center

SCHOOL OF PUBLIC HEALTH & TROPICAL MEDICINE
Center for Cardiovascular Health SL29

Gerald S. Berenson, M.D.
Director

70112-2699



Ms. Sandy Graham

July 14, 1994

Dear Ms. Graham:

Enclosed please find the questionnaire that you need. I am sorry that it took so long to respond to your request but I had difficulty locating it. I hope that you find it helpful. We agree to let you use the forms but would appreciate the following credit line:

Printed with permission from the Tulane Center for Cardiovascular Health, New Orleans, LA, USA

If you have a problem with the wording please contact me at

Good luck with your project.

Sincerely yours,

A handwritten signature, likely of Barbara Katzman, consisting of a stylized 'B' and 'K'.

/Barbara Katzman
Program Coordinator
Tulane Center for
Cardiovascular Health

encl

Appendix L

August 16, 1994

Sandra Graham

Dear Ms Graham,

I received a copy of your abstract on your pending research to evaluate the health curriculum in the schools. I am happy to grant you permission to use the Children's Cardiovascular Health Promotion Attitude Scale in this process. Your research is exciting in the much needed area of health promotion in children.

I do expect appropriate credit in any written material. I also would appreciate receiving information on the results of your study.

Good luck with your research. If I can answer any questions or be of any further assistance please feel free to contact me.

Sincerely,

Cathy R. Arvidson, Ph.D., R.N.
Assistant Professor



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Appendix M

Student Interview Questions *

This form is to be followed for interview of selected children upon completion of the curriculum while reviewing the Health Journal.

I want to talk about some of the things you've been learning at school in the past while. Could we talk about what you've been doing in class?

1. In class you have been learning about healthy living and healthy eating. Some of the activities were:
2. What kinds of things did you learn about?
3. What were some of the things you did that you enjoyed when the class was learning about Nutrition?
4. Were there any things that you didn't like?
5. What did your class think about this activity?
6. You have been keeping a Health Journal. What kinds of things do you have in it? Why do you think you kept a journal like that?
7. At the beginning, your teacher asked you to think about what you could do to stay healthy. Can we look and think about this? Are there any difference? Why do you think that is?
9. Your made some goals for yourself in class, things that you wanted to do. What were they? What do you think about those goals? Were you happy with the goals you set for yourself? Did you do what you wanted when you set those goals?
10. What did your Mum and Dad think about some of the things you were doing in class?
11. One day in class someone asked why we were learning about commercials in a curriculum on health. What would you say to that? How would you answer that question if someone asked you?
12. What other types of things do you think should be included when you're learning about health.

* This form was used as a guideline, and was not used verbatim.



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Appendix N

Teacher's Questionnaire *

- 1a Did you complete the lesson plan?
- 1b. If you did not complete the lesson, Why not?
- 1c. If you modified the lesson, how did you modify it?
2. How much classroom teaching time did this unit require?
total hours =
- Did this unit provide students with abundant opportunities to:
3. respond to language, literature and the media
4. respond to the ideas of others?
5. think, feel, exercise their imaginations, and make personal judgements?
6. interact in pairs, small groups, and as a class?
7. talk with other people, both within and outside of the school?
8. speak with and listen to one another, and build self-confidence and self-esteem?
9. be active observers?
10. engage in both receptive language activities (such as listening, reading and viewing) and expressive language activities (speaking, writing)
11. brainstorm and discuss ideas?
12. Did the children in your class appear to enjoy this module?
For example:
Did they discuss it after class?
Did they answer questions enthusiastically?
Did children who do not normally participate, do so during this activity?
13. Did the activities/lessons hold the attention of most students?
14. For the children in your class, the concepts presented were:
too complex
appropriate
too basic

15. Student participation, (e.g. through discussion, questions, etc.) was:

poor
fair
adequate
more than usually observed

How would you increase student participation?

16. Please comment on whether the quality of the student's work assignments was:

greater than what was expected?
average quality?
less than what was expected?

17. Did most children appear to be satisfied with their own personal progress and achievements during this part of the curriculum?

18. Was there any evidence of family involvement in the lessons? What was it?

19. What materials other than those described in the lesson plan did you require for teaching this activity?

20. Did you enjoy teaching this activity?

21. Which aspects of this module succeeded?

22. What aspects of this module did not succeed?

23. What changes would you recommend?



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Appendix P

Results of the Parent Questionnaire

Unless otherwise stated, 20 parents responded to each question.

1. DID YOU RECEIVE ANY INFORMATION FROM ANY SOURCE ABOUT THE NEW HEALTH CURRICULUM?

- | | |
|--------|-------|
| I. YES | (85%) |
| II. NO | (15%) |

2. FROM WHICH SOURCES DID YOU HEAR ABOUT THE CURRICULUM?

- | | |
|--------------------------------|-------|
| I. YOUR CHILD | (65%) |
| II. OTHER PARENTS | (0%) |
| III. THE RESEARCH CONSENT FORM | (30%) |
| IV. THE TEACHER | (0%) |
| V. THE NEWSLETTER | (25%) |
| VI. OTHER: | (25%) |
| VII. NOT APPLICABLE | |

Commonly, more than one source was offered. For the most part, the child was listed as one of those sources. The principal was the most frequently identified 'Other' source of information.

3. SOME OF THE NUTRITION LESSONS INCLUDED KEEPING A FOOD LOG, SETTING NUTRITIONAL GOALS, KEEPING A HEALTH JOURNAL AND MAKING A HEALTH

ADVERTISEMENT. DID YOUR CHILD DISCUSS THESE ASSIGNMENTS OR
ACTIVITIES AT HOME?

- | | | |
|------|--------------|-------|
| I. | NEVER | (5%) |
| II. | RARELY | (15%) |
| III. | OCCASIONALLY | (35%) |
| IV. | OFTEN | (30%) |
| V. | USUALLY | (10%) |
| VI. | ALWAYS | (5%) |
| VII. | DON'T KNOW | |

4. OTHER THAN THOSE LISTED ABOVE PLEASE LIST ANY OTHER HEALTH LESSONS
YOUR CHILD HAS MENTIONED RECENTLY.

Three parents responded, with the following:

-commercial, healthy breakfast

-food graphs.

-the negative effects of smoking. (This in fact, had been covered
very briefly in the introductory lesson).

5. IF YOU AND YOUR CHILD DISCUSSED SOME OF THESE ACTIVITIES AND
LESSONS, DO YOU THINK YOUR CHILD FOUND THEM:
INFORMATIVE?

- | | | |
|------|--------------|-------|
| I. | NEVER | (0%) |
| II. | RARELY | (5%) |
| III. | OCCASIONALLY | (25%) |
| IV. | OFTEN | (25%) |
| V. | USUALLY | (20%) |
| VI. | ALWAYS | (20%) |
| VII. | DON'T KNOW | (5%)* |

INTERESTING?

I.	NEVER	(0%)
II.	RARELY	(5%)
III.	OCCASIONALLY	(30%)
IV.	OFTEN	(20%)
V.	USUALLY	(15%)
VI.	ALWAYS	(25%)
VII.	DON'T KNOW	(5%)*

ENJOYABLE?

I.	NEVER	(0%)
II.	RARELY	(15%)
III.	OCCASIONALLY	(20%)
IV.	OFTEN	(25%)
V.	USUALLY	(10%)
VI.	ALWAYS	(25%)
VII.	DON'T KNOW	(5%)*

* The parent who had answered 'Don't know' wrote that he had not discussed the work with his child.

6. IN YOUR OPINION, HAS YOUR CHILD SEEMED MORE ENTHUSIASTIC THAN USUAL ABOUT THE HEALTH LESSONS AND ASSIGNMENTS AS COMPARED TO OTHER SCHOOL SUBJECTS?

I.	MUCH LESS THAN USUAL	(0%)
II.	LESS THAN USUAL	(10%)
III.	NO MORE THAN USUAL	(35%)
IV.	A LITTLE MORE THAN USUAL	(10%)
V.	MORE THAN USUAL	(45%)

VI. MUCH MORE THAN USUAL (0%)

VII. DON'T KNOW (0%)

7. OVER THE PAST TWO MONTHS HAS YOUR CHILD BEEN ASKING FOR "HEALTHY FOODS" MORE OFTEN THAN USUAL? (FOR EXAMPLE, HAS HE OR SHE TALKED ABOUT PICKING AN APPLE INSTEAD OF EATING POTATO CHIPS?)*

I. NEVER (20%)

II. RARELY (25%)

III. OCCASIONALLY (20%)

IV. OFTEN (25%)

V. USUALLY (5%)

VI. ALWAYS (0%)

VII. DON'T KNOW

* One parent did not answer this question.

8. PLEASE COMPLETE THE FOLLOWING STATEMENT. WITHIN THE PAST TWO MONTHS MY CHILD HAS ACTUALLY BEEN EATING MORE "HEALTHY FOOD" (FOR EXAMPLE, ACTUALLY CHOOSING AN APPLE INSTEAD OF CHIPS):

I. NEVER (5%)

II. RARELY (20%)

III. OCCASIONALLY (25%)

IV. OFTEN (20%)

V. USUALLY (15%)

VI. ALWAYS (0%)

VII. DON'T KNOW (0%)

PLEASE EXPLAIN:

"Requesting fruit instead of cookies for snacks".
"My child tried to make sure he had a balanced diet. He has reached for a healthy snack with much less prompting".
"She has talked about more healthy food but the will power has failed her on many occasions".

Two parents did not answer, but commented that their children normally chose 'healthy food' over 'junk food'. One parent circled, 'often and usually', commenting that their child always had healthy snacks.

"My child has always eaten healthy snacks yet like all children would go for junk food first, it is the parents responsibility to see that their child eats foods that are good for them."
"No change. Always wanted healthy food before."
"We usually eat healthy food."
"My child eats healthy things normally over junk food. prefers fruit to junk food."
"Same as usual. The health curriculum has not affected her eating habits."
"My child will choose healthy food after I suggest it. I always insist."

9. HAS YOUR FAMILY MADE ANY CHANGES IN EATING HABITS OVER THE PAST TWO MONTHS?

- | | | |
|------|---------------|-------|
| I. | NO CHANGE | (70%) |
| II. | A FEW CHANGES | (30%) |
| III. | MANY CHANGES | (0%) |

HAVE THESE CHANGES (IF ANY) BEEN RELATED TO YOUR CHILD'S COMMENTS?

- | | | |
|------|----------------|--------------------------------------|
| I. | YES | (THREE PARENTS SELECTED THIS CHOICE) |
| II. | NO | (ONE PARENT SELECTED THIS CHOICE) |
| III. | DON'T KNOW | (FOUR PARENTS SELECTED THIS CHOICE) |
| IV. | NOT APPLICABLE | (SEVEN PARENTS SELECTED THIS CHOICE) |

PLEASE EXPLAIN:

"We are already conscious of our eating habits."
"Less cookies and cakes and more fruit."
"I've always made a point of sending healthy lunches and after meals as I'm careful to follow the Canada food guide. I am very conscious of the dental aspects as well. I'm also concerned about the fact that, for a variety of reasons, childrens' lifestyles have become more sedentary."

10. IN GENERAL HAS YOUR CHILD SEEMED MORE "HEALTH CONSCIOUS" THAN USUAL OVER THE PAST TWO MONTHS?

- I. MUCH LESS THAN USUAL (0%)
- II. LESS THAN USUAL (0%)
- III. NO MORE THAN USUAL (40%)
- IV. A LITTLE MORE THAN USUAL (35%)
- V. MORE THAN USUAL (25%)
- VI. MUCH MORE THAN USUAL (0%)
- VII. DON'T KNOW (0%)

11. SOME OF THE ACTIVITIES IN THE NUTRITION LESSONS INVOLVED GOAL SETTING. HAS YOUR CHILD DISCUSSED THESE GOALS WITH YOU?

- I. YES (50%)
- II. NO (40%)
- III. DON'T KNOW (10%)

12. HAVE YOU NOTICED ANY RECENT CHANGES IN THE WAY YOUR CHILD ESTABLISHES GOALS FOR HIMSELF OR HERSELF?

- I. YES (10%)
- II. NO (65%)
- III. DON'T KNOW (25%)

PLEASE DESCRIBE THESE CHANGES, IF APPLICABLE:

"My child has made a conscious effort to eat more whole grain products and fruit and vegetables".

13. DO YOU THINK THE LESSONS AND ACTIVITIES OF THE HEALTH LESSONS HAVE AFFECTED YOUR CHILD?

- I. YES (60%)
- II. NO (15%)
- III. DON'T KNOW (25%)

PLEASE COMMENT:

"He has become more "healthy food" conscious. "Took more responsibility for eating without feeling that she was being nagged to."

"Better awareness of the effects of healthy foods".

"She has been very interested in the lessons, and is very enthusiastic when speaking of them. They have

provided her with valuable information however change can be slow. Let's hope she will retain the information and continue to try and lead a healthier life."

"My child is more aware of what he is eating and how different foods affect his body and growth."

"I know that it is odd given my responses above, but he has learned from the program - but, like most children, prefers to think about his immediate wishes rather than longer term implications. Somehow we should work on making the connection between what they do today and what happens down the road."

"More aware of the effects of good food."

"She was affected while working on the food log."

"He must know more about what food should be eaten each day to remain healthy."

"She did not find the information new. However she became more aware of specific food "no-no's". This was a bit confusing because everything became a "no-no" by the end of the program.

14. PLEASE LIST YOUR POSITIVE AND NEGATIVE COMMENTS ABOUT THE HEALTH CURRICULUM:

POSITIVE:

"My child learned about the importance of a balanced diet. He complains less now when asked to choose apples over chips".

"It taught him the right foods to eat. What is healthy and what is not".

"Improved awareness of their bodies and how they need healthy fuel to grow and get through the day's activities".

"Better knowledge of the different food groups".

"She did not find the information new. However she became more aware of specific food "no-no's". This was a bit confusing as everything became a "no-no" by the end of the program".

"A general awareness of salt, sugar etc. levels in food was heightened. She was more aware of what she ate-how much or how little. More instruction in measuring these amounts is essential for her evaluation of her own eating habits to be accurate and valuable however".

"I approve".

"Good for kids to know - what is healthy for them to eat".

"Maybe a longer time".

"In our opinion the Health Curriculum have positive influence on our children it increases their awareness about healthy style of life."

"Great start on introducing healthy living, hope to see their curriculum expanded".

"I think we need a lot more of it. Kids need to understand, not just learn, about the connection between what we eat, what we do, how we feel, and ultimately, why this all matters. An occasional unit of information can't accomplish this. They (we) need a "Health" subject in the curriculum".

"It is important that children learn about food and actually study and realize things about their own intake what they are eating".

"It has obviously been at a comprehensive level for the

children..."

"*inspired an eagerness to learn..."

"Has reinforced in an enjoyable manner things that before were just plain old info. stored in their heads".

NEGATIVE:

"Would have preferred emphasis on protein sources other than "meat". She was not clear on counting things like beans as a meat".

"I was concerned that foods evaluated were always packaged and processed foods. We make a lot of our food ourselves and moderate levels of salt and sugar. We buy peanut butter without sugar /salt. I do not want my child thinking peanut butter is unhealthy (ie. too salty) as an example. There were other foods which became labelled as unhealthy". Children need to be instructed how to measure "one vegetable" allotment etc. My daughter thought two small celery sticks were equal to "two vegetables". As a result her total vegetable intake was so high she developed the goal "To eat less fruits and vegetables". This was not appropriate as she barely gets by as it is with vegetables. Confusion resulted. Most children are so picky with food in terms of likes and dislikes that to label some foods (in the child's eyes) as high in salt/sugar/fat may make the child less likely to choose them at all. (ie. cheese, my daughter could stand to eat some, but she may not now). Possibly emphasize reducing certain foods and balancing others.

"No negative".

"None".

"I think it might be helpful to children to begin learning about "emotional" health. This is an age where style, acceptance, belong, peer pressure really begins to influence children".

15. WHAT OTHER ASPECTS OF HEALTH DO YOU FEEL SHOULD BE INCLUDED IN A COMPLETE HEALTH CURRICULUM FOR THIS AGE LEVEL?

"Food hygiene" -ie. washing hands, clean counters, hamburgers not being pink, etc."

"Body-image, not going on diets."

"Exercising activities".

"The importance of sleeping-resting hours".

"How to avoid constant TV watching, and the bad effects of it (healthwise)".

"Talk about exercise and activity".

"More challenging issues like vitamins, metabolism etc. to grab kids. Teeth, Exercise. Emphasize which peanut butter is healthy, which kind of pizza is good (ie. homemade) etc. and stress moderation not elimination."

"No more".

"Maybe you could get them to try new food in the classroom. Peer pressure will maybe help them not 'gag' (I have given up trying to get them to eat healthier). Some tips on how to get them to eat different foods and like them".

"Effects of exercise on health".

One parent listed the following three topics:

1. Dental hygiene.
 2. Teaching on the connection between what we eat, and health, ie. vitamins, proteins, etc.; eating and exercise.
 3. They need to understand that there is a connection between exercise levels and food consumption, cardiovascular activities."
- "I know with my child it is her emotional health that I worry most about. Many times kids problems are ignored as "unimportant" when something simple as not having someone to play with at recess is a major major blow to self-esteem and sense of worth.Maybe discussing these emotions with other children in a class setting will help alleviate their sense of "oddness".



Université d'Ottawa - University of Ottawa

Faulté des sciences de la santé
Ecole des sciences infirmières

Faculty of Health Sciences
School of Nursing

Appendix Q

Parent Questionnaire Reminder

Sandra J. Graham R.N.
MSc.N.student
University of Ottawa,
School of Nursing

Dear Parents:

You may have recently received a questionnaire asking for your opinions about a series of Nutrition lessons which have been taught in your child's class. It is expected that children may have discussed some of the work they have done in class with other family members. As a parent you might have unique insights which would assist in the evaluation of the new lessons.

Your child's teacher kindly sent the original survey home with your child on my behalf. If you have completed and returned the survey, I would like to thank you for your time. If you have not yet had the opportunity to do so, I would be most grateful if you would take a few minutes to do so now. Please return the questionnaire to the school within the next few days. All information will remain strictly confidential and will not affect your child's grades in any way.

Please find enclosed another copy of the original questionnaire. Feel free to contact me if you have any questions. I may be reached through ...(name)... School at ...(phone number)...

Thank-you,

Sandra Graham, R.N.

Appendix R

Neuman-keuls Calculations

Multiple Comparison for Knowledge Scores.

MS=9.07

df=76

$$= \sqrt{\frac{sw^2}{n}} = \sqrt{\frac{9.07}{76}} = .349$$

Studentized Range Table of Q

	I	II	III
I		3.67*	4.93*
II			1.26

* = Statistically significant at $p < .05$.

Criterion values for k of 2= 2.83 and a k of 3=3.40. (where K =number of means or steps between ordered means). obtained using the Critical value of the Studentized range statistic table, if the .05 significance level is adopted, and $df=76$.

Multiple Comparison for Attitude Scores

MS=5.49

df=76

$$= \sqrt{\frac{sw^2}{n}} = \sqrt{\frac{5.49}{76}} = .268$$

Studentized range Table of Q

	I	II	III
I		.939	4.135*
II			3.19*

* = Statistically significant at $p < .05$

Criterion values for k of 2=+2.83 and k of 3=3.40 (76 df, two means, $1 - \alpha = .95$)