

A DEMONSTRATION PROJECT USING VOLUNTEERS
IN THE DAY CARE SETTING TO PROVIDE
HEALTH EDUCATION TO PRESCHOOLERS

by
Joan C. Turner

A thesis
presented to the University of Manitoba
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requirements for the degree of
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Abstract

Four volunteers implemented a supervised and structured Health Education Curriculum for 15 weeks to four- five- and six-year old children attending an inner city daycare. Nineteen experimental subjects and seven control subjects were given a pretest and posttest of Health Knowledge and Language. A second control group ($n = 10$) was given a post test of Health Knowledge only. The effects of maturation and test - retest learning were controlled and eliminated as influencing factors. Results of the Health Knowledge test, using the Kruskal-Wallis one-way analysis of variance, revealed a significant (.05 level) increase in health knowledge for the experimental group, while the control group decreased. Two curriculum objectives were found to increase significantly during the implementation period. These objectives relate to nutritious food snacks and the effects of alcohol abuse. The conclusion reached based on these findings support the hypothesis that those children exposed to the health education curriculum as presented by the volunteers would reveal significant increases in health knowledge as compared to those children not exposed to the health education curriculum.

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Chapter 1

Introduction

Day Nursery Centre has served the needs of core area Winnipeg families and children since its inception in 1911. There are presently three locations, Gretta Brown, Kennedy and Broadway, with spaces for 50, 35, and 35 children, respectively. English is a second language for some of the children in attendance, and others have been designated as "special needs" by referring agencies. In order to meet the increased needs of these children the centre uses volunteers to provide additional opportunities for interaction, and to decrease the child/staff ratio.

Given the economic climate of the times, the amount of funding in all sectors of social service, including day care, is limited. Therefore, an active search for innovative ways of enhancing existing community resources must be implemented. Presently, Day Nursery Centre has the services of a volunteer coordinator. In this capacity a large number of volunteers from a variety of backgrounds, who share an

interest and dedication to children, have been recruited. In 1983 over 4000 volunteer hours were donated to provide staff with assistance during daily routines and specific skill instruction. The role of the volunteer is to augment and enhance the programs designed by the staff. Past research on volunteer activities in various settings (Garcia, Clark & Walfish, 1979; Karnes, Teska, & Hodgins, 1970; Karowe, 1967) has indicated that the services of volunteers can be extended beyond what is presently in effect at Day Nursery Centre.

Preliminary research indicates that the use of volunteers in a preschool setting is an area worthy of investigation at the local level. A study conducted at the University of Illinois (Karnes, Teska & Hodgins, 1970) illustrated that female volunteers were effective as implementors of a specific preschool instructional program. The provision of a structured program was considered to be critical to the success of the program and to the training of the volunteers. The commitment of the volunteers appeared to be strengthened for a number of reasons: a) the volunteer knew precisely what she was to do; b) the

volunteer was able to evaluate her own effectiveness as a teacher through observing the children's performance; and c) the volunteer could see the specific results of her own efforts in the day to day development of the children (Karnes et al., 1970). Findings such as those mentioned above support the use of volunteers in only one sector of social service, however, volunteers can be found in a variety of services.

Given the estimate that one out of seven adult Canadians are engaged in some type of volunteer work (McDonald, 1983), it can be assumed that volunteers are available for recruitment into programs such as that offered by Day Nursery Centre. In Canada volunteers are drawn chiefly from five major segments of the population: young people; senior citizens and people taking early retirement; professionals and business executives; unemployed professionals and business executives; and the housebound. Volunteers benefit in various ways through their volunteer work as do the agencies using their services:

By offering their particular talents, volunteers not only support staff but upgrade the calibre

and scope of the agency program.

(McDonald, 1983, p.2)

Based on this information, it would appear that Day Nursery Centre provides the opportunity to demonstrate the benefits of a coordinated volunteer program which makes use of a specific preschool instructional program.

The purpose of this project was to demonstrate the effects of a coordinated volunteer program on a specific area that would be of interest to, and benefit Day Nursery Centre children. The specific area of interest in this project is health education for four, five, and six year old children attending Day Nursery Centre.

Health education may be viewed as one of the many responsibilities of the preschool setting. Bruhn and Nader (1982) indicated a need for primary health education, promotion, and care by pointing out that health education and promotion are not common and that little material on preschool health programs has been published. Research on childrens' health knowledge, attitudes, and behavior over the past two decades has provided a base upon which preschool health programs

can be developed. Gochman (1971) conducted a study with children aged 7 to 17 years and found that few children perceive themselves as vulnerable to illness. In addition, Gochman found that preventive health behavior calls for some degree of perceived vulnerability. Work in the area of developmental theory (Natapoff, 1982) indicates that an understanding of the notion of prevention and causality is not usually reached until early adolescence. Pratt (1973) found that developmental child rearing methods were effective in the child's development of capacities and resources needed to cope effectively and take care of him/her self. Given the research cited above and the lack of information regarding children's adoption of health behaviors, the question emerges: "how can educators effectively approach health education for preschool children?".

One approach to preschool health education was developed for a population of Head Start children in the United States. "Hale and Hardy's Helpful Health Hints" was a product of careful research and expertise from individuals active in the area of health and/or preschool education (Hendricks, 1984). The health

curriculum was specifically designed for and developed within a preschool setting. The curriculum has been evaluated and found to be both appropriate and effective as a teaching tool for young children. Due to its style and content "Hale and Hardy's Helpful Health Hints" is considered to be applicable to any preschool setting (Hendricks, 1982). For all of the reasons mentioned above this particular health education curriculum was chosen as the specific preschool instructional program to be implemented by volunteers in this project.

Chapter 2

Review Of Literature

The following chapter presents a review of the literature on school health education and the role of volunteers, followed by a statement of the problem. The review of literature provides a rationale to support the research question posed in this study.

School Health Education

Current developments in school health education focus on the challenge of ways young children can learn and develop competence for their own health. Research on children's concepts of health and illness has been dominated by two theoretical approaches. The first has been concerned with the delineation of age related qualitative changes in children's concepts of health and illness, and is interpreted within the framework of Piagetian theory (Natapoff, 1978; 1982). The second approach is concerned with the perceptions of vulnerability to health problems and the relationship of these to health behavior (Gochman, 1971). Both of these approaches provide information

regarding what children know about health and illness. Although these issues are viewed as important, school health educators are concerned with discovering ways in which young children can learn and develop competence for their own health (Bruhn, 1982; Kalnins & Love, 1982; Nader, 1978).

Research on health education programs for young children has led to the development of a limited number of curricula. The programs developed for Head Start have been met with criticism (Hendricks, 1982; Livingood, 1984), and only a few acceptable comprehensive programs have been developed: Health Education Curricular Progression Chart (National Centre for Health Education, 1980); Hale and Hardy's Helpful Health Hints (Hendricks, 1982); and, Preschool Health Education Project (Bruhn & Nader, 1982).

Researchers, such as Bruhn and Cordova (1977), Parcel (1976), and Nader (1978), suggest that programs which integrate concept development with social learning would be the most effective for encouraging appropriate health behavior in children. However, instruments developed to measure various aspects and outcomes of children's learning of health knowledge

and health behavior are small in number. The research that has been done has yet to provide an answer as to how children might best learn and develop competence for their own health.

Theories of Children's Concepts of Health and Illness. Research on children's definitions of health and illness has indicated that children's concepts change qualitatively with cognitive development. This development reflects changes similar to the progression of cognitive development outlined by Piaget. Natapoff (1978; 1982) studied children's definitions of health and illness. Two-hundred and sixty-four first, fourth, and seventh grade children were asked to define health, state what it felt like to be healthy or not healthy, and to give criteria they would use to judge another person's health status. A comparison of age differences reflected characteristics of Piaget's pre-operational, concrete, and abstract stages of thought.

Natapoff (1978) noted that six year old children defined health as a concrete egocentric state. Health was seen as a positive attribute which allowed them to

play with friends, to go outside, and to be with their families. The fourth grade children believed that the health of another person could be judged only by external cues. The listing of the specifics of a visually healthy person reflects concrete thought characteristics. The older children revealed some abstract thought in their references to internal cues or feelings that were understood to indicate a healthy or non-healthy state. This characteristic was absent in the younger children who indicated that their health status was determined through the definitions of others.

Campbell (1975) reported the same developmental progression from concrete to more abstract reasoning in studies of children's definitions of illness. Children of different ages (6 - 12.11 years) shared a definitional consensus. However, those beginning to leave childhood revealed views of illness which approached those given by adults. With increasing maturity, children defined illness more precisely and placed more emphasis on role performance, as well as psychological dispositional states. Campbell (1975) contended that:

As children move toward adulthood, their fund of knowledge becomes enlarged, organized, and repeatedly transformed. General intellectual development and unique experiences contribute to changing conceptualizations. In the domain of illness concepts, children profit from experiences, but the extent to which they do so may be contingent on their level of development. (p. 100)

The development of children's understanding of health and illness was also related to their cognitive development. Natapoff (1978; 1982) found that six year old children separated the concepts of health and illness as if on opposite ends of a continuum. The idea of mental health could not be understood by the youngest children, but the twelve year old children indicated that mental health was another aspect of health that could be considered. The acceptance of health and illness as coexisting in an individual was comprehensible to the older children, but again the six year olds could not accept such an idea. Overall health was considered as a positive attribute which allowed the children to participate in desired

activities. These findings indicate the need to discuss health and/or illness concepts at a level that children can understand.

Kalnins and Love (1982) emphasized the importance of other interactional variables, including personality, family background, and the child's personal experience with health, which may also influence the development of health concepts. Kalnins and Love reviewed the few studies which have been done on psychosocial variables. Locus of control was shown to influence the accessibility of knowledge about the inside of the body (reliance on internal and external cues). Children with more internal control indicated a high usage of internal cues when judging concepts of illness, while cognitive level was found to influence the sophistication of an answer given regarding concepts of health and illness. According to Campbell (1975), there is an increasing correspondence between definitions provided by children and those of mothers as children mature. This finding supports the notion that substantial and systematic developmental variations can be identified in illness concepts. A study investigating children's personal health history

found that ill children may invoke the concept of imminent justice, and attribute their illness to personal misbehavior or fault (Brodie, 1974).

The findings discussed above from research based on cognitive development theory can be supplemented by work done by Gochman (1970; 1970b; 1971). In general, expectancy theory proposes that an individual will take a certain action based on his/her subjective evaluation of whether the action will achieve a particular outcome. Expectancy is related to the idea of preventive action toward a desirable state of health, assuming that in order to take action the individual must value health and must be able to make rational choices with regard to preventing illness (Kalnins & Love, 1982). Over a number of years, Gochman analyzed relationships between the concepts, perception of vulnerability and potential health behavior.

Gochman (1970b; 1971) found that at least some children reveal health as a meaningful and inherent feature of personality and cognitive makeup. One of Gochman's measures of health involves the use of the Health Ideation Picture (HIP) instrument which

consists of eleven ambiguous pictures which can potentially elicit health-related verbal responses from children. Another is a perceived vulnerability questionnaire. Using these instruments, Gochman (1970b; 1971) discovered consistencies in children's projection of health, illness, safety content and perceived vulnerability. Based on this, and later longitudinal research, it was concluded that children and young adults do not perceive themselves as generally vulnerable to health problems (Gochman & Saucier, 1982).

Further research on perceived vulnerability revealed affective characteristics of health and illness concepts. Earlier research was based on the premise that perceived vulnerability was a cognitive conception, and therefore did not investigate affective health beliefs, such as health motivation, preventive attitudes, self-concept and anxiety. Perceived vulnerability was found by Gochman and Saucier (1982) to be negatively related to a variety of preventive health behaviors and to self concept, and positively related to anxiety. Based on this research, Gochman and Saucier concluded that the

developmental age-related changes in perceived vulnerability are not appreciable. The authors further conclude that:

In natural environments, where no specific attempts are made to alter them, these beliefs do not change appreciably by themselves. Perceived vulnerability must be considered to be a naturally stable personality characteristic, resistant to change. (1982, p. 55)

These findings have implications for health education for young children. Preventive health behavior calls for some degree of perceived vulnerability before preventive health action will be taken. Work in the area of developmental theory indicates that an understanding of the notion of prevention and causality will not be reached until early adolescence, or in the stage of formal thought. Due to the stability revealed in children's perceptions of vulnerability to health problems, Gochman and Saucier (1982) suggest that health education programs should be planned, developed and implemented for preschool children as young as two or three. Given this information, and the lack of

information regarding children's health behaviors, the question emerges "how can educators effectively approach health education for young children?".

The Wellness Process. Bruhn and Cordova (1977) expanded a concept known as the wellness process (Bruhn, Cordova, Williams & Fuentes, 1977) by attempting to translate the concept of wellness into practical components that can be taught, learned, and applied by individuals at various stages of development. Discussed within a framework of Erikson's early developmental stages, wellness tasks are identified which correspond to the developmental tasks of each of Erikson's stages (Figure 1). These wellness tasks must be completed along with the developmental tasks in order for wellness behavior to emerge and persist throughout an individual's lifespan. Bruhn and Cordova (1977) developed their theory based on a number of premises. First, an individual must develop an awareness of wellness from role models in the environment. Second, information must be presented at a level which is directed toward the level of cognitive development of the individual.

Figure 1

EXAMPLES OF MINIMAL WELLNESS TASKS FOR THE EARLY
CHILDHOOD AND LATE CHILDHOOD STAGES OF
ERIKSON'S DEVELOPMENTAL THEORY

(adapted from Bruhn, Cordova, Williams,
and Fuentes, 1977).

ERIKSON:	MINIMAL WELLNESS TASKS
<u>Early Childhood</u>	
Autonomy vs shame and doubt	Learning about proper foods, sleep, exercise. Learning dental hygiene.
<u>Late Childhood</u>	
Initiative vs guilt	Refining psychomotor and cognitive skills. Developing self-concept. Learning attitudes of competition and cooperation with others. Learning of social, ethical, and moral differences and responsibilities.

ERIKSON:

MINIMAL WELLNESS TASKS

Learning that health is an
important value.

Learning regulation (self) of
basic physiological needs -
sleep, rest, food, drink,
and exercise.

Learning risk-taking and its
consequences.

Third, the individual should be encouraged to actively participate in shaping the direction of his/her own life. In the forth premise, the need for reinforcement of the practice of wellness behaviors is emphasized.

Pratt (1973) examined parental child rearing methods in relation to children's health behavior. Pratt's investigation revealed data to suggest that the use of reasons and information by parents helps to develop the child's cognitive capacities so that he/she can behave competently. Reward was found to foster the development of a child's resources and capacities, while autonomy was found to produce competent performance and good health behaviors in children. This developmental pattern of child rearing method was contrasted with disciplinary methods. The contrast led Pratt to the conclusion that developmental child rearing methods are more effective than disciplinary methods in developing a child's capacities and resources so that he/she is able to cope effectively and take care of him/herself. This effectiveness of parental influence and child rearing methods was also emphasized by Bruhn and Cordova

(1977). The impact of a particular child rearing method on the development of children's competence should be considered when aspects of children's learning are discussed (Bruhn & Cordova, 1977).

A summary of the theories of children's concepts of health and illness indicates that children of various ages reveal their understanding and knowledge of the concepts of health and illness in a way that can be interpreted within the framework of developmental theory (Bruhn & Cordova, 1978; Natapoff, 1978; 1982). While children as young as six years reveal the presence of the concepts of health and illness in their responses to health/illness related questions or stimuli (Gochman, 1970b; 1971; Natapoff, 1978; 1982), the degree of perceived vulnerability to illness was found by Gochman and Saucier (1982) to be age related in a very complex way. Developmental changes were demonstrated but were not found to be consistent or appreciable. Bruhn and Cordova (1978) and Pratt (1973) suggested that wellness behaviors or good health behaviors can be taught, learned, and revealed at various stages of development.

Health Education Curricula. The ways in which children are likely to learn and be interested in the learning experience can be gathered from educational research. Nader (1978) stressed the importance of active participation, content that is related to real life experience, content that is appropriate for age level and student needs, and specified objectives. Parcel (1976) emphasized a skills approach as a method which requires the identification of skills, a consideration of content and process necessary to develop the identified skills, and the provision of opportunities to practice these skills. Both Nader and Parcel promote an approach to health education which combines conceptual learning and social learning.

The underlying assumption to this approach is that 'competence' is the primary outcome of health education. If one is competent, then one will be able to assume responsibility for one's individual health which will include self-directing health behavior and the ability to make appropriate use of available health resources. (Parcel, 1976, p. 403).

Bruhn and Cordova (1978), Parcel (1976), and Nader (1978) have all expressed the need to develop approaches to health education curriculum design that will effectively integrate conceptual learning and social learning.

A health education curriculum structured around age appropriate types of behavior that enable children to assume more responsibility for their own health behavior was developed, taught, and evaluated by Parcel, Bruhn, and Murray (1984). The curriculum targeted 13 health and safety behaviors and used social learning theory framework and techniques. One hundred, four year olds were taught the Preschool Health Education Program (PHEP) and 73 four year olds were used as a control group. Eight assessment tools were developed to evaluate the impact of the PHEP curriculum on educational and behavioral outcome. It was concluded that the PHEP curriculum may have had some effect on children's preferences for health and safety behaviors. Both the treatment and comparison groups showed a significant change in health and safety behavior preference scores. The amount of change was found to be greater in the treatment group,

suggesting that a "combination of maturation and effects of the curriculum may be influencing the results", (Parcel, Bruhn & Murray, 1984, p. 167). The PHEP curriculum provided support for the effective use of the social learning framework in a health education curriculum for preschoolers.

Earlier developments in health education for children were brought about by the Head Start experimental programs which were established by the Economic Opportunity Act of 1964. Health education has been a component of the Head Start programs since its inception. A recent development in health education curriculum design was the "Health Education Curricular Chart" (1980) developed by the National Centre for Health Education, also known as the Berkeley Project or SHCP. Livingood (1984) reviewed the implementation of the package and found it inadequate in a number of areas. Livingood (1984) stated:

A planned curriculum should include the following characteristics: planning, purpose, structure or organization, selected learning activities, and related resources. (p. 10)

Based on this definition, SHCP was criticized for a lack of defined goals, that involvement of parents or teachers in planning was discouraged, and that the curriculum was not flexible. Regardless of these flaws, Livingood suggested that SHCP would be appropriate as a supplement to a health education curriculum, rather than a health education curriculum in itself.

Hendricks (1982) developed a comprehensive health education program for Head Start children based on the Health Education Curricular Chart. The development of this curriculum involved a committee of experts in the area of school health education and elementary school health. Consultation with the committee led to the development of 29 defined objectives which were later supplemented with a composite of activity suggestions and resource materials. This curriculum has several strong points:

It is applicable for any structured preschool program; the activities and ideas can be utilized in non-structured teaching; expensive materials and supplies are not necessary; teaching concepts apply to any preschool population without

restriction such as geographic location or socioeconomic status; and it was developed through co-operative efforts of individuals with experience in health and/or preschool education. (Hendricks, 1984, p. 31).

This curriculum was used with four and five year old children enrolled in a Head Start program. Formally known as "Hale and Hardy's Helpful Health Hints" the curriculum was produced in 1980-81 by the Bowling Green - Warren County Health Department, Kentucky, under the direction of Charlotte Hendricks, health educator.

The original evaluation of the curriculum (Hendricks, 1982) involved a pretest/posttest design to determine the effects of a six month curriculum on 108 four and five year old children's health knowledge. Children's health knowledge was determined through modified use of the testing instrument used in the Longitudinal Study of Primary Grades Health Curriculum Project. Two separate t tests were conducted to determine any significant change within the experimental and control groups over the six month period. The t value for the experimental group was

4.63 and significant at the .05 level, thus showing a significant increase in health knowledge. The t value of 0.49 for the control group was not significant at the .05 level, showing no significant change in health knowledge. A t value, based on the mean of the pretest/posttest difference score calculated for each group, revealed a t value of 4.00 significant at the .05 level of significance. This final t value showed a difference in health knowledge scores between the two groups at the conclusion of the six month period. Hendricks (1982) concluded that the health education curriculum did have a positive effect upon the health knowledge of the children.

Research on children's concepts of health and illness, perceived vulnerability to illness, and the wellness process that has been done over the past two decades has served to provide various theoretical bases upon which educators have developed health education curricula. As mentioned above, a number of preschool health education curricula have been developed, none of which are reported to have been used extensively. The curriculum written and evaluated by Hendricks (1982; 1984) is the most recent

development in preschool health education reported to not only have a positive effect on the health knowledge gains of preschool children, but has also been used by health educators working in the field of preschool education (Hendricks, 1984).

Evaluation Instruments. Evaluation tools for use in measuring the effects of health education on young children are limited. The success of early curricula was measured through information regarding the implementation of the programs. Studies measuring change in children vary in terms of the instruments used. An instrument was designed and evaluated by Jubb (1982) to assess the health knowledge of children in the first grade. This picture test was found to be valid, but due to low variability was not considered reliable. A health knowledge instrument developed by Andrews for the Longitudinal Study of Primary Grades Health Curriculum was reported to have a reliability coefficient of .73 to .93 (Hendricks, 1982). This instrument was modified for use by Hendricks (1982) and was found to be both valid and reliable in the measurement of change in health knowledge after the implementation of a specific health education program.

Summary. Work in the area of health education for preschool children is developing slowly. Over the past two decades research in the area of children's health knowledge and understanding has led toward the development of curriculum designed to enhance these concepts in children. However, research and curriculum development have yet to lead to an understanding of how children's health knowledge and understanding is transferred into health behaviors. The challenge of health educators at this point appears to involve the design of programs that will encourage young children to develop skills and attitudes necessary for the development of a healthy lifestyle early in life.

The Role of Volunteers

Historically volunteers have played a significant role in social service delivery. Volunteers, also referred to as volunteer paraprofessionals, have been given a number of positions in various school systems: classroom aides, counsellor aides, community aides, library aides, audio-visual aides, and office aides (Hale and Ulmer, 1972). As well as gaining wider

acceptance in the educational field, volunteers have been used in the fields of health services, law enforcement, housing services, recreational agencies, and community action agencies. Numerous reasons exist which have prompted agencies and schools to consider the use of volunteers. The lack of funds to support the employment of professionals is a common explanation.

A number of studies support the movement toward the use of volunteers as a viable alternative to the use of paid professionals during times of economic restriction. Karnes et al. (1970) investigated the use of paraprofessional teachers in a preschool setting and found that staff variables (professional, adult paraprofessional, and teenage paraprofessional) did not produce significantly differential performances.

The results of this study clearly endorse the feasibility of alleviating preschool staffing problems through employing paraprofessional teachers who receive sustained in-service training and daily supervision. (Karnes et al., 1970, p. 8).

Alden, Rappaport, and Seidman (1975) had results consistent with the study by Karnes et al. (1970). The study by Alden et al. addressed the general issue of program effectiveness for children from low-income families. Forty-eight children from four public elementary schools were assigned randomly to either a companionship, a structured academic, or a no-contact program. Twenty-four university undergraduate students were assigned to participate in the 12 week, 24 session program which involved working with children, as well as attending weekly meetings with the project supervisors. Results of the study revealed that the structured academic program was successful in increasing reading readiness skills of first-grade children from poverty-level backgrounds. However, the structured academic program did not increase the reading readiness skills of kindergarten children. The authors suggest that the academic structured language program and the companionship program were not successful for kindergarten children because they interfered with the socialization of the child in the classroom setting.

It seems possible that the kindergarten year for this population might serve as a socialization year in which the child learns to listen to the teacher, follow instructions, attend to classwork, and complete assignments, as well as become accustomed to middle class culture.

(Alden et al., 1975, p. 269).

These findings indicate that while volunteer programs can produce desirable changes in children the actual program being applied must be compatible with the overall program.

The recruited volunteers must also be compatible with the needs of the persons with whom they work. Karowe (1965) discussed the qualities that volunteers may have which can be used in ways that can benefit disadvantaged children. The element of empathy, or an understanding of the child from the child's own frame of reference is considered an important element in a helping relationship. The volunteer should also have a respect for, or caring for, the child as unconditionally as possible, as revealed through compassion, understanding, and showing a genuine regard for the child's individual development.

Trustworthiness is the third element to which Karowe referred. Trustworthiness means being genuine, dependable, and consistent in the relationship with a child. Karowe offered these important volunteer characteristics as an elementary guide for those working with disadvantaged children.

A review of changes and trends in student volunteer activities was presented by Garcia, Clark, and Walfish (1979). Garcia et al. revealed the importance of the participation of student paraprofessionals in a variety of activities and settings. The authors cited Alden, Rappaport, and Seidman (1975) as an example of the effective use of supervised college students in the tutoring of children from lower socioeconomic families, and as a demonstration of a "variable alternative in filling the void for the much-needed 'person power' in this area" (Garcia et al., 1979, p. 267). Changes in student voluntarism between 1965 and 1977 revealed a drop in student voluntarism. Participation in one particular program (Community and University Service Encounter, University of South Florida) fell from an estimated 1800 volunteers during the 1969-1970 year,

to an average of 1200 volunteers in the years between 1973-1977. This figure dropped to an average of 500 student volunteers by 1979 (Garcia et al., 1979). The drop in student participation was believed to be influenced by a number of factors. Garcia, et al., suggested that increased support and encouragement for the use of student volunteers would help to revitalize student participation in volunteer activities.

Volunteer participation has been encouraged in a variety of social sectors. Coordinated and supervised use of volunteers in the area of education for young children has resulted in two important findings. First, volunteers have been found to be effective as implementors of a structured preschool program (Karnes et al., 1970). Second, volunteers have been successful in increasing reading readiness skills of first grade children (Alden et al., 1975). These findings indicate that volunteers can be used in ways that can be of benefit to an organization and to the client population given a structured and supervised program to implement. While volunteer participation has been found to be an area of decreasing activity (Garcia et. al., 1979) it has also proven to be an area worthy of investigation and development.

Statement of the Problem

The purpose of this study was to measure the effectiveness of a health education curriculum facilitated by volunteers in a daycare setting. Research questions addressed in the study are the following: Will the presentation of a health education curriculum increase the health knowledge of four- five- and six-year old children participating in the program? Can a health education curriculum be implemented effectively by volunteers?

Goals of the Study

The goals of the study were as follows:

1. To plan and organize a volunteer training workshop.
2. To supervise and direct volunteers throughout the implementation of the health curriculum.
3. To administer a pretest and posttest to the subjects and conduct appropriate analysis of the data generated.
4. To collect the volunteers' diaries after the "fifteen week implementation" period to review the presentation of the curriculum as recorded by the volunteers.

Delimitations of the Study

The following delimitations exist for the study:

1. Experimental subjects were those four- five- and six-year old children enrolled in the Day Nursery Centre Gretta Brown Unit for the year 1984-85.
2. Control subjects were those four- five- and six-year old children enrolled in the Day Nursery Centre Broadway or Kennedy Unit for the year 1984-85.
3. Only those volunteers who participated in the volunteer training workshop or an individual briefing with the researcher were used as implementors of the health education curriculum.

Limitations of the Study

The following limitations exist for this study:

1. There are no matched controls in the study, so maturity, educational experience, and learning abilities of the children may differ between groups.
2. The short term nature of the project and the small sample size available for this study are limiting factors.

Assumptions of the Study

The following assumptions were made for this study:

1. The children were able to comprehend the picture identification statements of the health knowledge test.
2. The children responded to the statements as completely and truthfully as possible.
3. The volunteers used the health education curriculum according to the training they received.

Definition of Terms

The following definitions of terms were used for this study:

1. Coordinated volunteer program. Refers to a program in which volunteers are supervised and trained by an individual whose responsibilities include the implementation and direction of volunteers programs and activities.

2. Specific preschool instructional program.

Refers to a particular curriculum designed for use in educational preschool programs.

3. Health education. Refers to the process of teaching particular health and safety concepts and behaviors within a structured setting.

4. Testing instrument. The instrument used to measure the health knowledge of the children.

5. Volunteer training. The session(s) conducted to familiarize the volunteers with the project and the implementation of the health education curriculum.

Hypothesis of the Study

Based on theory and a review of the literature it was hypothesized that there will be statistically significant differences between those children exposed to the health education curriculum and those children not exposed to the health education curriculum when compared on the basis of health knowledge gain. Those children exposed to the health education curriculum

will reveal significant increases in health knowledge as compared to those children not exposed to the health education curriculum.

Research Design and Analysis of the Data

The research was conducted in a natural social setting which limits the possibility of true randomization. Therefore, a non-equivalent control group design was used. The design involves an experimental group and a control group, both given a pretest and a posttest using a health knowledge instrument and a language test. As the matching of subjects was not feasible due to the small sample size, an additional control group was introduced at the posttest measure of health knowledge to control for the effects of learning. The data from the pretest and posttest measures of health knowledge and language were analyzed using the following procedures:

1. For the purposes of this study, non-parametric statistics were used to analyze the data. The non-parametric statistics, known as the

Kruskal-Wallis one-way analysis of variance and the Mann-Whitney test, were applied to the data in order to test the null hypothesis. The null hypothesis states that the groups have the same distribution of scores. The assumption was made that the distributions of data were not normal due to the small sample size. Therefore, the less powerful statistical procedure which did not require a normal distribution of scores was applied to the health knowledge test scores and language test scores. Significance levels determined by these statistics are based upon the ranks of scores, rather than the shape of the distribution. Small observed significance levels (.05) suggest that the distribution of scores is not the same for all groups tested under the Kruskal-Wallis and Mann-Whitney procedures.

The Kruskal-Wallis statistic was calculated to examine possible differences between the experimental and control groups in terms of the subjects' performance on the health knowledge test in relation to each of the objectives presented in the curriculum. This statistic was also applied to the

health knowledge test scores to examine possible differences between the experimental and control groups. The Mann-Whitney statistic was calculated to examine possible differences between the experimental and control groups on the language test. The Kruskal-Wallis test is an extension of the Mann-Whitney test and is used to determine possible differences among three groups.

2. Item analysis was performed on the Health Knowledge test posttest scores to determine which of the statements were the most difficult for the children. The item difficulty index was calculated based on the percentage of subjects who selected the correct response to a given test item. A high difficulty index score indicates a more difficult test statement.

Chapter 3

Methods of Procedure

The demonstration project took place at the three Day Nursery Centre units. The existing volunteer program at Day Nursery Centre operated at the Gretta Brown and Kennedy units. The Broadway unit did not yet have an operational volunteer program. To avoid any reduction of services in the Gretta Brown and Kennedy units, the Broadway unit was chosen as the control group for the project. As an additional control, children at the Kennedy unit participated in a posttest administration of the health knowledge test. The Kennedy unit was involved in a language enrichment program parallel to the time frame of this project, leaving the Gretta Brown unit available to serve as the experimental group for the project. Based on a comparison of the pretest and posttest health knowledge test scores, which reveal a similarity between the experimental group and the Kennedy control group scores, it can be concluded that the language program had no significant impact on the findings of this study.

Volunteers were recruited to present a health education curriculum to four- five- and six-year old children attending the Gretta Brown unit. The health education program ran for 15 weeks. A pretest and posttest of children's health knowledge and language was given to participating children at the Gretta Brown unit and the Broadway unit. Children at the Kennedy unit received a posttest only of the health knowledge test.

Sample

Subjects in the study were four, five and six year old children who attended Day Nursery Centre. The experimental group, drawn from the Gretta Brown unit, originally consisted of 27 subjects, 21 male and 6 female. Nineteen subjects were available at the posttest, 14 male and 5 female. Attrition was due to withdrawal from the daycare (five subjects) and absence during the testing period (three subjects). The control groups were drawn from the Broadway and Kennedy units. The original control group from the Broadway unit (Control Group I) consisted of 10 subjects, six male and four female. Seven subjects

were available at the posttest, five male and two female. Attrition was due to withdrawal from the daycare. The Kennedy control group (Control Group II) consisted of 10 subjects, five male and five female. The final sample used for the data analysis consisted of 19 experimental subjects, 7 control group I subjects, and 10 control group II subjects.

The range, mean, and standard deviation were calculated for age as measured in months at the pretest date. The experimental group had a range of 48 to 71 months, a mean age of 59.11 months, and a standard deviation of 6.03 months. Control group I had a range of 48 to 57 months, a mean age of 51.14 months and a standard deviation of 3.56. Control group II, at the pretest date, had a range of 46 to 67 months, a mean age of 54.8 months and a standard deviation of 6.96 months. The experimental group had the highest mean age, followed by control group II, and control group I.

Recruitment and Training of Volunteers

Seven potential volunteers were recruited by the Volunteer Coordinator of Day Nursery Centre, approximately eight weeks prior to the implementation date. Criteria for recruitment were based upon the

volunteer description prepared by the researcher (Appendix A). The individuals were contacted and arrangements were made for training. Three volunteers attended an evening meeting, three volunteers attended an afternoon meeting, and one volunteer was met individually. Each volunteer received the following: a copy of the health education curriculum manual, a notebook to keep a diary, and a curricular time sequence. During the meetings the volunteers were introduced to the project, and exposed to instructional materials, games, and activities that are included in the curriculum (Appendix B). Equality of training was controlled through ensuring that identical packages and presentations were provided for the volunteers.

Four of the seven originally recruited volunteers committed themselves for the duration of the program. These four had participated in the group training sessions. The participating volunteers included one retired school teacher, two university students, and one substitute daycare worker. Attendance of the volunteers is shown in Table 1. An average of 10.25 days out of a possible 15 days of participation was calculated for the volunteer's attendance. Only one volunteer participated in less than one-half of the scheduled sessions.

Table 1

Attendance of Volunteers

Volunteer	<u>Sessions attended</u>
1	6 (40 %)
2	13 (87 %)
3	10 (67 %)
4	12 (80 %)

Implementation of the Curriculum

The Health Education curriculum was implemented from late November 1984 until mid-March 1985. The curriculum program ran for 15 weeks, and was presented to small groups of four- five- and six-year old children attending the Gretta Brown unit. The expected number of children was approximately twenty-five. In order to keep group sizes down, the curriculum was presented to small groups of children at different times each day. The program was implemented on Mondays, Wednesdays, and Fridays by the volunteers. Each volunteer was scheduled to present an assigned curriculum objective on a specific day of the week, either morning or afternoon, to small groups of children. Each child was to attend one curriculum objective each day that the program was implemented.

Active participation by the children was encouraged through activities designed to integrate curriculum ideas and learning opportunities. Ten activities were provided for each curriculum objective in the curriculum guide. Each volunteer selected an activity in which to present an objective. The curriculum guide provided curriculum cards which gave

instructions for activities; book lists, song lists, and a list of poems, rhymes, and finger plays. Activity instructions called for materials generally found in the preschool setting: paper, crayons, magazine pictures, and food items. Volunteers were responsible for the selection of an activity, the gathering or development of materials, and the presentation of the objective to the day care children. Day care staff were always in the general area while volunteers presented the activities.

Presentation of the Health Education Objectives

The Health Education curriculum contained the sixteen health objectives that were presented (Appendix C). Over the course of the program each curriculum objective was presented at least once. In Table 2, each objective and the frequency that the objective was presented by the volunteers is listed. The objectives related to emotions, the five senses, and food groups were presented most often, with frequencies of 8, 5, and 5, respectively. The remaining objectives, related to community helpers, cleanliness, safety rules, food and non-food items,

smoking and alcohol, were presented from one to three times each. Some objectives overlap in theme or content. The volunteers took advantage of this and combined a few topics into one presentation, although their focus was on one particular objective. For example, the concept of alcohol abuse was brought into presentations focusing on food and non-food items, advertising, and emotions.

Table 2

Presentation of Curriculum Objectives

Curriculum objective	Frequency of <u>Presentation</u>
1. Children should be able to identify the body parts primarily associated with the five senses.	5
2. Children should be able to identify people and places that contribute to good health.	2
3. Children should be able to describe what they can do to help keep their classroom, playground and home clean.	1
4. Children should be able to demonstrate how to wash their hands.	1
5. Children should be able to tell their parents or teachers if they hurt.	2
6. Children should be able to demonstrate correct tooth brushing techniques.	2
7. Children should be able to identify the roles of community safety personnel.	1
8. Children should be able to describe the school safety rules correctly.	2
9. Children should be able to identify various food and non-food items.	3
10. Children should be able to identify nutritious snacks when given a choice.	1
11. Children should be able to identify the various foods in relation to the basic four food groups.	5

Curriculum objective	<u>Frequency of Presentation</u>
12. Children should be able to select products from advertising pictures which are harmful to one's health.	3
13. Children should be able to describe the emotions of anger, happiness, sadness, love, and fear.	8
14. Children should be able to explain when it is appropriate to take medicines.	2
15. Children should be able to identify the harmful effects of smoking.	3
16. Children should be able to identify the harmful effects of alcohol abuse.	1

Instrumentation of the Health Knowledge Test

The health knowledge of the Day Nursery Centre children was determined through modified use of the testing instrument used in the Longitudinal Study of Primary Grades Health Curriculum Project. The original instrument was prepared by R.L. Andrews for the American Lung Association specifically to measure the cognitive and affective impact of the project. The modified version was used by Hendricks (1982) in order to evaluate the health knowledge of preschool children. Hendricks (1982) reported the reliability co-efficient of the original instrument, when used on the designated populations of the Longitudinal Study of Primary Grades Health Curriculum Project, as .72 to .93. The modified instrument allows for the measurement of changes relative to the cognitive objectives of Hale and Hardy's Helpful Health Hints (Appendix C).

The Health Knowledge instrument contained 30 items (Appendix D), each with three possible choices, so each correct item was assigned a value of one. The possible range of scores for any subject was 0 to 30. Subjects were asked to put their finger in the

appropriate picture box to indicate the choice of response. Questions were read verbatim and children were encouraged through praise.

Instrumentation of the Language Test

The Peabody Picture Vocabulary Test (PPVT) was administered to both the experimental and control groups as an additional control variable. The PPVT is "designed to provide an estimate of a subject's verbal intelligence through measuring his hearing vocabulary", (Dunn, 1965, p. 25). The reliability is reported by Dunn (1965) as .77. From this test a standardized score equivalent was obtained. Testing materials included in the PPVT are: a) 150 numbered picture plates used for form L and form M; b) a manual, and c) individual score sheets for form L and form M of the test. Children were asked to place their finger in the box of the word given. Directions were read verbatim. Children were encouraged to look carefully at all four pictures and were motivated by praise.

Administration of the Pretest and Posttest

The testing was given only to subjects from whom parental permission was obtained (Appendix E). The testing was administered by an individual experienced in one-to-one testing of young children. The tester did not have prior knowledge as to which children were in the experimental group and which children were in the control group. Subject confidentiality was insured through the use of coded numbers, instead of names, on the score sheets. Approximately 20 minutes was required for the individually administered tests. The posttest was administered after the completion of the Health Education curriculum, in late March 1985.

Each child was tested individually. The testing took place at the Day Nursery Centre units in an enclosed area away from other children. Test instrument instructions were adhered to for both the experimental and control groups. The tests were introduced to each child, followed by trial items. The PPVT test was administered prior to the Health Knowledge test. The PPVT scale was administered only over the critical range of items for a particular subject as the starting point, basal, and ceiling vary

from testee to testee. Both tests involve reading the directions, statements and/or questions verbatim. Children were encouraged with praise in the form of statements, such as "Good, you are doing well!" and "That was a good answer!".

Chapter 4

Results

Descriptive Statistics

The range, mean, and standard deviation were calculated for each group at the pretest and posttest on the health knowledge and PPVT scores. The health knowledge test scores at the pretest ranged from scores of 15 to 27 for the experimental group, and from scores of 11 to 26 for control group I. The pretest means for the health knowledge test were 22.79 for the experimental group and 18.00 for control group I. The standard deviations were 3.61 and 5.18 for the experimental and control group I, respectively.

The health knowledge test scores at the posttest ranged from scores of 21 to 29 for the experimental group, 14 to 26 for control group I, and 19 to 27 for control group II. The posttest means for the health knowledge scores were 26.26 for the experimental group, 20.86 for control group I, and 24.7 for control group II. Standard deviations were 1.86, 3.64, and 8.08 for the experimental, control group I and control group II, respectively.

The PPVT scores at the pretest ranged from 70 to 102 for the experimental group, and 60 to 105 for control group I. The pretest means for the PPVT were 87.63 for the experimental group and 86.14 for control group I. Standard deviations were 9.94 and 14.75 for the experimental and control group I, respectively.

The PPVT test scores at the posttest ranged from 70 - 115 for the experimental group and 63 - 106 for control group I. The posttest means for the PPVT were 93.89 for the experimental group and 85.57 for control group I. Standard deviations were 11.54 and 14.31, respectively.

Figure 2 shows a bar graph of the Health Knowledge pretest and posttest mean scores. Both the experimental and control group I increased in their health knowledge test mean scores. The experimental group increased from a mean of 22.79 to 26.26, a difference of 3.47 points. The control group increased from a mean of 18.00 to 20.26, a difference of 2.86 points. The mean score for control group II of 24.7 was greater than both the experimental and control group I on the pretest mean scores. This same

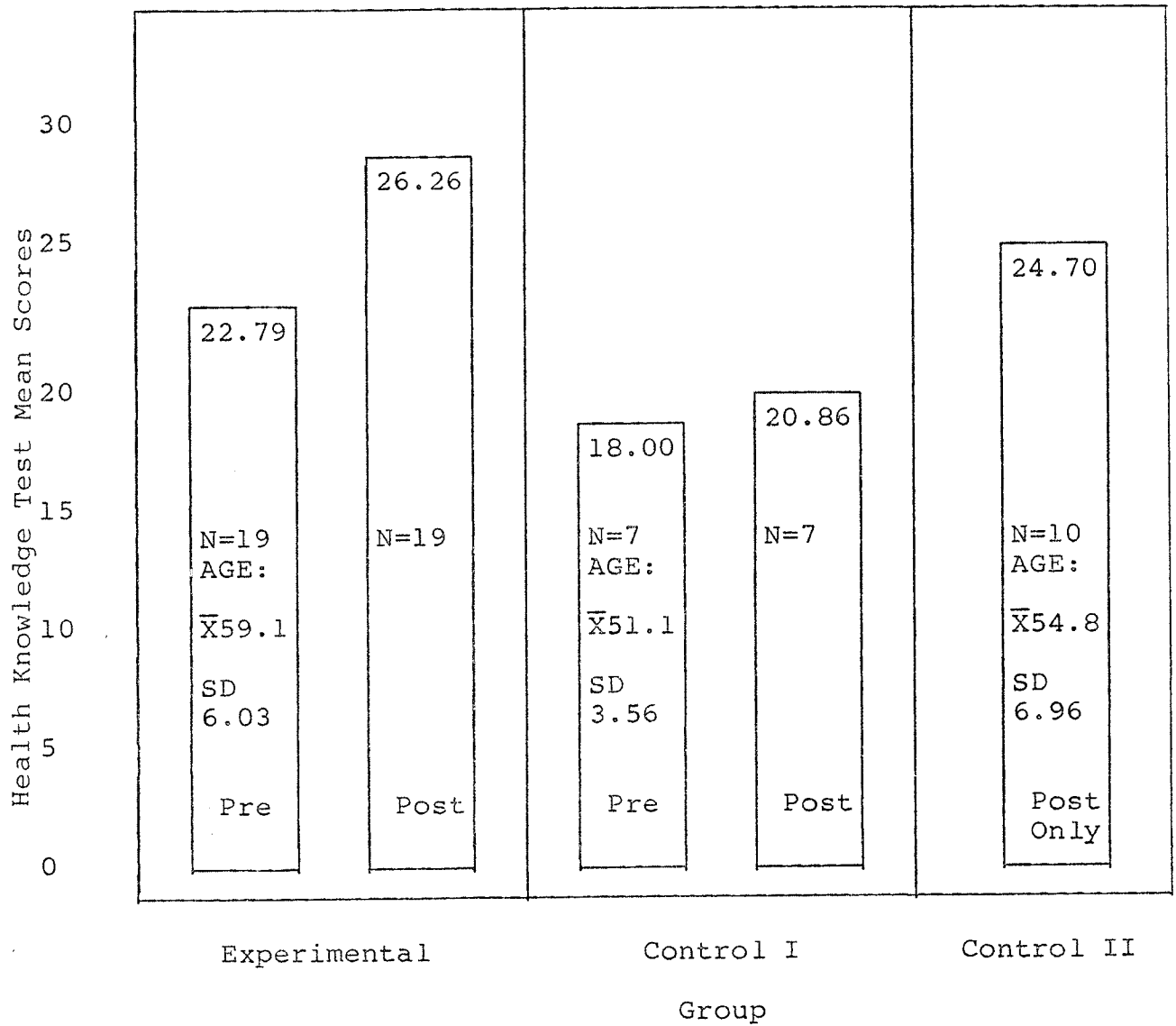


Figure 2. Health knowledge test mean scores by group at the pretest and posttest.

mean score was greater than the posttest mean score of control group I and less than the posttest mean score of the experimental group.

Figure 3 shows a bar graph of the PPVT pretest and posttest scores. The experimental group increased in the PPVT mean score from 87.63 to 93.89, a difference of 6.26 points. Control group I decreased in PPVT mean score from 86.14 to 85.57, a difference of 1.43 points.

The range, mean, and standard deviation were calculated for the change in health knowledge test scores and PPVT scores. Change was calculated by subtracting the pretest score from the posttest score. Change could be either an increase or decrease in score. Table 3 shows the results of these calculations.

The range of change on the Health Knowledge test for the experimental group was from -2 to 11, while control group I had a range from -1 to 8. The mean change and standard deviation for the experimental group was 3.53 and 3.25, and for control group I, 3.43 and 3.33, respectively. The range of change on the PPVT for the experimental group was from -8 to 27.

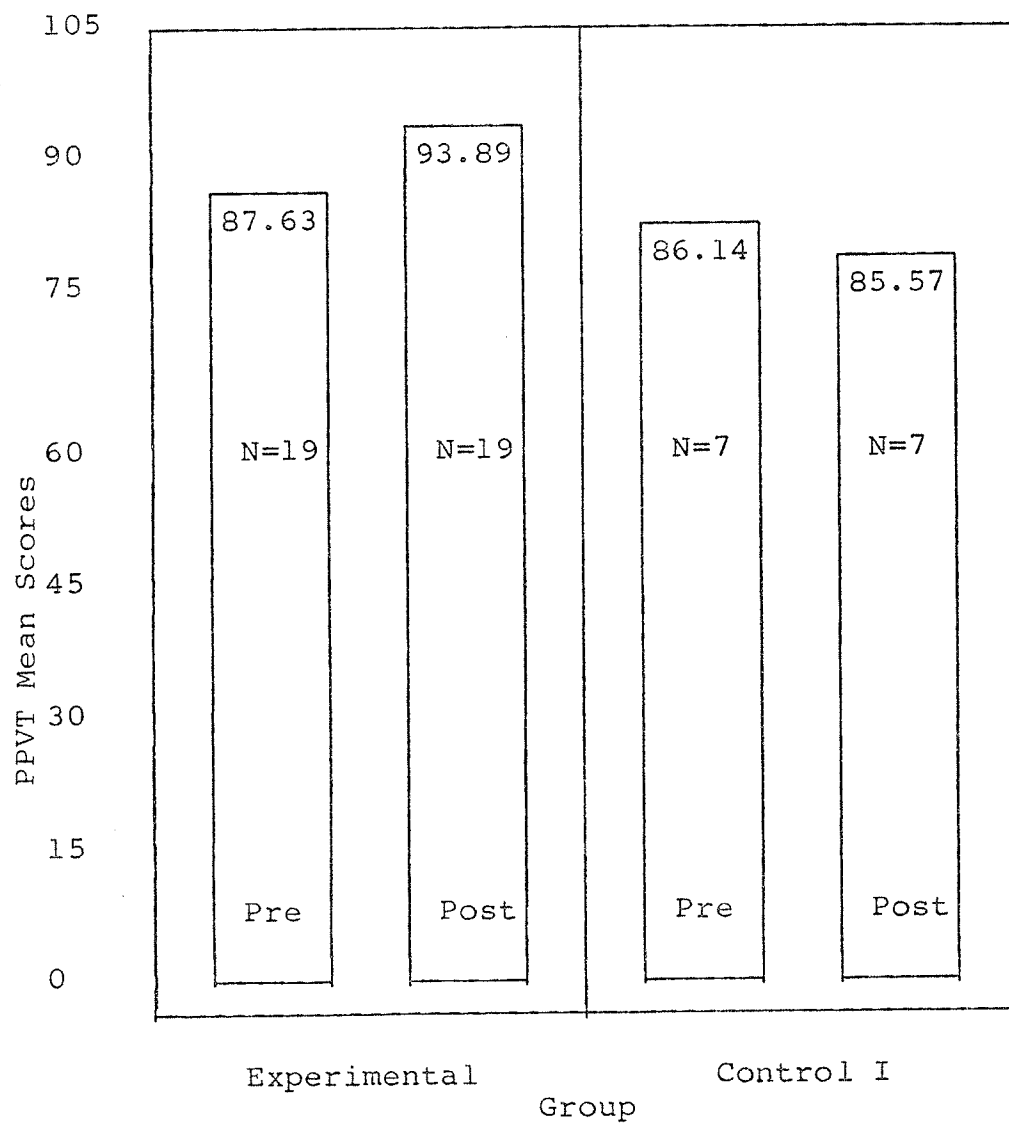


Figure 3. PPVT mean scores by group at the pretest and posttest.

Table 3
 Range, Mean, and SD for Change in Health Knowledge Test Score and PPVT Score

Group	Statistic			
	N	Range	Mean	SD
Health Knowledge Test Score				
Experimental	19	-2 to 11	3.53	3.25
Control I	7	-1 to 8	3.43	3.33
PPVT Score				
Experimental	19	-8 to 27	8.56	9.52
Control I	7	-17 to 21	2.90	11.65

Control group I had a range from -17 to 21. The mean change and standard deviation for the experimental group were 8.56 and 9.52 and control group I had a mean change and standard deviation of 2.9 and 11.65, respectively. The mean change in the Health Knowledge test score was greater for the experimental group when compared to control group I by 0.10. The mean change in the PPVT score was greater for the experimental group when compared to control group I by 5.66.

Health Knowledge Test Item Difficulty Index

Item analysis was conducted on the Health Knowledge test using the posttest responses of the experimental and control groups. Table 4 presents analysis according to an item difficulty index. Item difficulty is defined as the percentage of subjects who selected the correct response on a given item. The easy item showed a large number of correct responses (over 75%) or a low difficulty index. Conversely, a high difficulty index indicated a more difficult item. The experimental group revealed four items with a high difficulty index which indicated difficult items. Those items were related to foods that are not good for your teeth, cigarette smoking,

healthy teeth, and washing. The control groups (combined for a larger n, n=17) revealed six difficult items of which three overlap with the experimental group. Those items related to food/non-food items, cigarette smoking, healthy teeth, washing, dentists, and the effects of alcohol. Aside from giving a view of each individual health knowledge test item, this item difficulty analysis contributes information which will help explain the research findings.

Table 4

Item Difficulty Index

Health Knowledge Test Item General Topic	Experimental Group (n = 19) %	Control Group (n = 17) %
1. senses:hearing	100	88
2. senses:feeling	100	88
3. senses:smelling	100	100
4. senses:seeing	100	88
5. safety:fire	100	100
6. emotions:happy	100	100
7. non-food items:pencil	79	*53
8. not good for your teeth:cupcake	*63	76
9. emotions:sad	100	88
10. emotions:scared	100	88
11. healthy teeth	90	76
12. smoking	84	94
13. safety:poison	100	88
14. smoking	95	76
15. smoking	100	88
16. smoking	*63	*59
17. healthy teeth	100	100
18. healthy teeth	*53	*35
19. foods:vegetable	95	76
20. health care:washing	*63	*47
21. safety:matches	100	76
22. emotions	100	100
23. emotions:anger	100	88
24. health care:medicine	90	82
25. doctor	95	88
26. firemen	95	82
27. dentist	84	*47
28. alcohol	90	*71
29. alcohol	100	82
30. alcohol	95	76

* Items with a high difficulty index.

Health Knowledge Test Performance in Relation to the
Health Curriculum Objectives

The Kruskal-Wallis one-way analysis of variance was calculated to examine possible differences between the experimental and control groups in terms of the subjects' performance on the Health Knowledge test in relation to the 16 objectives presented in the curriculum. Each objective in the curriculum corresponds to at least one item on the Health Knowledge instrument (Appendix F). A score was calculated for each curriculum objective based upon the pretest and posttest scores on each individual item from the Health Knowledge instrument. The calculated score for each objective was then applied to the Kruskal-Wallis test.

Results of the Kruskal-Wallis test revealed three curriculum objectives to have different distributions of health knowledge test scores (Table 5). The mean rank for the experimental group on objective 8, relating to safety rules, was 11.37, while the control group had a mean rank of 19.29. The Kruskal-Wallis statistic was 9.27, and significant at the .05 level, which indicated that control group I scored better

than the experimental group on the health knowledge test question relating to safety rules. The mean rank for the experimental group on objective 10, relating to nutritious food snacks, was greater than for the control group I. The respective mean ranks were 15.34 and 8.50 and the Kruskal-Wallis statistic of 5.7593 was significant at the .05 level of significance. The mean rank of 15.97 for the experimental group was greater than the mean rank of 6.79 for control group I on objective 16, relating to the effects of alcohol abuse. The Kruskal-Wallis statistic of 8.5818 was significant at the .05 level of significance, indicating that the experimental group scored better than control group I on the Health Knowledge test questions relating to the effects of alcohol abuse. The remaining relationships were not found to be statistically significant.

The mean rank of the curriculum objective scores was greater in the experimental group for two out of three curriculum objectives found to be statistically significant by the Kruskal-Wallis one-way analysis of variance. The mean rank of the experimental group was greater than the mean rank of the control group for

Table 5

Health Knowledge Test Performance by Health Curriculum Objective

Curriculum objective topic	Experimental Mean Rank	Statistic		K - W Statistic
		Control Mean Rank	Statistic	
1. Five senses	15.50	12.76	.7332	
2. People contributing to good health	14.79	10.00	2.4977	
3. School and home cleanliness	13.39	13.79	.0170	
4. Handwashing	14.71	10.21	2.2384	
5. Tell others when hurt	13.34	13.93	.0407	
6. Tooth brushing	15.11	9.14	.0779	
7. Community safety personnel	12.74	15.57	1.4946	
8. Safety rules	11.37	19.29	.0192 *	
9. Food non-food items	14.05	12.00	.6075	
10. Nutritious food snacks	15.34	8.50	5.7593 *	
11. Four food groups	14.61	10.50	2.1287	
12. Harmful advertising	13.39	13.79	.0170	
13. Emotions	12.82	15.36	.8532	
14. Appropriate medicine use	13.34	13.93	.8623	
15. Effects of smoking	12.45	16.36	1.6947	
16. Effects of alcohol abuse	15.97	6.79	8.5818 *	

* $p > .05$

curriculum objective 10, related to nutritious food snacks, and curriculum objective 16, related to the effects of alcohol abuse. The mean rank of the control group was greater than the mean rank of the experimental group for curriculum objective 8, related to safety rules. The remaining 13 objectives were not found to differ significantly in terms of health knowledge test scores between groups.

PPVT Test Results Compared by Group

The Mann-Whitney statistic was calculated to examine possible differences between the experimental and control groups on PPVT scores. Table 6 presents the Mann-Whitney test results which determine the existence of significant differences between the experimental and control groups, both prior to and after treatment, on the PPVT scores.

The mean rank for the experimental group pretest on PPVT score was 13.37, while the control group's pretest mean rank PPVT score was 13.86. The Mann-Whitney statistic of 0.3177, not significant at the .05 level, indicates that the two distributions of scores were similar. The mean ranks for the

experimental and control group PPVT scores of the pretest were 14.55 and 10.64, respectively. The Mann-Whitney statistic of 0.2471, not significant at the .05 level indicates that the two distributions of scores were not significantly different. The mean rank order for the experimental and control groups on the PPVT scores changed from the pretest to the post-test, with the experimental group ranking higher at the post-test. The experimental group increased in mean rank (1.18), while the control group decreased (-3.22). The Mann-Whitney results for the pretest and post-test scores on the PPVT indicated that the two groups were homogeneous on PPVT scores.

Table 6

PPVT Test Results Compared by Group

<u>Group</u>	<u>n</u>	<u>Mean Rank</u>
PPVT pretest		
Experimental	19	13.37
Control	7	13.86
PPVT posttest		
Experimental	19	14.55
Control	7	10.64

Test of the Hypothesis

The hypothesis of the study, that those children exposed to the health education curriculum will reveal significant increases in health knowledge as compared to those children not exposed to the health education curriculum, was tested using the Kruskal-Wallis one-way analysis of variance. The Kruskal-Wallis one-way analysis of variance statistic was calculated to examine possible differences between the experimental and control groups on health knowledge test scores. Table 7 presents the K-W test results which determine the existence of significant differences between the experimental group and the control groups, both prior to and after treatment, on the health knowledge test scores.

The first K-W test was applied to the pretest health knowledge test scores. The mean rank for the experimental group pretest was 15.45 and 8.21 for control group I. The K-W statistic of 4.62, significant at the .05 level, indicates that the distribution of health knowledge test scores were different for the two groups, with the experimental group revealing the greater mean rank score.

Table 7
Health Knowledge Results Compared by Group

		Statistic	
Group	N	Mean Rank	K-W
Health Knowledge Pretest			
Experimental	19	15.45	4.6206 *
Control I	7	8.21	
Health Knowledge Post-test			
Experimental	19	23.42	12.5072 **
Control I	7	7.50	
Control II	10	16.85	

* $\underline{p} < .03$
 ** $\underline{p} < .01$

The mean rank for the experimental group posttest was 23.42, for control group I the mean rank was 7.50, and for control group II it was 16.85. The K-W statistic of 12.58 was significant at the .05 level. The distribution of health knowledge posttest scores were different for all three groups, with the experimental group revealing the greatest mean rank.

The mean rank of the experimental group health knowledge test score increased from 15.45 at the pretest to 23.42 at the posttest. Control group I had a mean rank of 8.21 at the pretest and 7.50 at the posttest. The experimental group increased by 7.97, while control group I decreased by .71. Control group II, which received the posttest only of the health knowledge test, had a mean rank of 16.85, a figure similar to the pretest mean rank of the experimental group. The experimental group ranked highest at the posttest followed by control group II, and control group I.

The research design of the present study allowed for parallel testing of the children's language. The experimental group increased in mean language score

from the pretest to the posttest, while the control group decreased slightly. This language test was introduced as a control for the effects of maturation. Given that both groups increased in health knowledge mean score, while only the experimental group increased in language mean score, the effects of maturation can be discounted.

An additional control group was included to control for the effects of test-retest learning on the health knowledge test. Control group II received the health knowledge test at the posttest only. The mean score was similar to the experimental group's pretest mean score, but lower than the experimental group's posttest mean score. Control group II had a health knowledge test mean score greater than both the pretest and posttest mean scores of control group I. These findings indicate that the potential influence of learning as a factor increasing the health knowledge posttest mean score is negligible.

The findings of the present study indicate that the effects of the health education curriculum on the health knowledge of the children participating in the program were positive. The results of the

Kruskal-Wallis one-way analysis of variance indicated a significant increase in health knowledge mean rank score for the experimental group and revealed a slight decrease in the score for control group I. These findings were significant at the .05 level.

The hypothesis of the study, that those children exposed to the health education curriculum will reveal significant increases in health knowledge as compared to those children not exposed to the health education curriculum has been supported by the data presented in the study.

Chapter 5

Discussion

Effects of Curriculum Implementation on Health

Knowledge

The results of the present study indicate that children tested revealed a high level of health knowledge prior to the presentation of the curriculum. This finding is in accord with the literature that suggests children's concepts of health and illness change qualitatively with cognitive development. Natapoff (1978; 1982), Campbell (1975), Gochman (1970; 1970b; 1971), and Gochman and Saucier (1982) found that children close in age reveal characteristics or beliefs regarding health and illness concepts which are similar in nature. Campbell's contention that children's definitions are influenced by both general intellectual development and unique experiences is supported by the results of this study. The mean scores on the health knowledge test for both the experimental and control group increased at the posttest, with the experimental group gaining more than the control group. The similarity of the pretest mean scores may indicate the

general intellectual stage of development of the subjects at the time of testing. However, the gap between the experimental and control group after the implementation of the health education curriculum may be attributed to the children's exposure to the health education curriculum as a "unique experience" to the experimental group.

The research design of the present study allowed for the control of the potential influencing factors of maturation and learning effects. The pretesting and posttesting of children's verbal abilities was introduced as a control for the effects of maturation. Results indicate that the experimental group increased in language test score while the control group decreased slightly. Given that only the experimental group increased significantly in health knowledge mean rank score, while only the experimental group increased in language score, the effects of maturation can be discounted.

The effects of test - retest learning on the health knowledge test was controlled for through the inclusion of an additional control group. Control group II received the health knowledge test at the posttest only. The mean score for this group was

similar to the experimental group pretest mean score, but lower than the experimental group posttest score. Control group II had a health knowledge test mean score greater than both the pretest and posttest mean scores of control group I. The mean age of control group II was slightly higher than control group I. This age factor could have influenced the posttest health knowledge test scores. These findings indicate that the potential influence of test-retest learning as a factor increasing the health knowledge posttest mean score is negligible. However the posttest only mean score could have been positively influenced by the Language Enrichment project at the control group II unit.

These findings have important implications for the main finding that the health knowledge of the experimental group was positively influenced by the health education curriculum as implemented by the volunteers. The control for the potential influencing factors of maturation and test - retest learning, and the resulting data which indicates negligible influence of these factors on the health knowledge or language scores of the children support the findings of this study. The effects of maturation would not be

negated had control group I language scores revealed a significant increase from the pretest to the posttest comparable to the experimental group. Similarly, the effects of learning would not have been ruled out had the health knowledge test results of control group II shown a mean score differing greatly from the experimental and control group pretest scores.

Item Analysis

The item difficulty index used in the present study revealed a number of test items which were difficult for both the experimental and control subjects at the posttest. The experimental group revealed four difficult items, the control group six, three of which overlapped with the experimental group. All of the items found to be difficult (less than 75% of the subjects answered correctly) were health, rather than safety related. According to research by Parcel et al., the PHEP curriculum appeared to have had more influence on safety behavior than on health behavior, using mother's reports of children's behavior.

Data from the present study using the Kruskal-Wallis one-way analysis of variance applied to health knowledge test performance in relation to the

health education curriculum objectives indicate mixed results. Three objectives revealed significance at the .05 level, indicating a significant difference between the experimental group and the control group. Two health related objectives were found to have health knowledge test scores significantly higher for the experimental group. Those objectives related to nutritious food snacks and the effects of alcohol abuse. These findings are contrary to those of Parcel et al., which indicated that the PHEP curriculum influenced change in safety behavior more than health behavior. The objective related to school safety rules was found to have health knowledge test scores significantly higher for the control group, a finding contradictory to the majority of findings in this study.

Limitations on the collection of data, and the lack of previous research on these specific items influence the interpretation presented for these findings. The data from the volunteers' diaries on frequency of presentation of the curriculum objectives does not suggest any notable emphasis on the objectives found to be significant. However, record keeping of the volunteers was minimal and perhaps did

not reveal the volunteers' combination of a few topics into one presentation and, therefore, the children's increased exposure to a topic. An example of this would be the inclusion of the concept of the effects of alcohol abuse in presentations relating to food and non-food items, advertising, and emotions. These findings may differ from those of Parcel et al. (1984) due to differences in the design of the study, the curriculum used, the testing instruments, and results which focused on health and safety preferences and behaviors, rather than health knowledge. The objective relating to school safety behavior, found to be significant for the control group, is curious given the fact that the staff of the control group units were instructed to avoid health and safety curriculum activities during the research project. However, the control daycare centre may have inadvertently presented school safety to the children during daily routine activities.

Contribution of the Present Study to the Prevailing Body of Literature

The present study revealed similar findings to Hendricks (1982) and Parcel, Bruhn, and Murray (1984). Hendrick's study was developed to evaluate

the Hale and Hardy's Helpful Health Hints curriculum using the testing instrument used in the Longitudinal Study of Primary Grades Health Curriculum Project. As in the present study, the experimental group increased significantly in health knowledge. However, where Hendricks found no significant change in the control group the present study revealed a statistically significant decrease. Parcel et al. (1984) found the experimental and control group to increase in health and safety preferences in their evaluation of the Preschool Health Education Project (PHEP). The experimental group revealed a greater increase which led Parcel et al., to suggest that a combination of maturation and the effects of the curriculum made a significant difference in the subject's performance.

A possible explanation for the variation in research findings relating to the control groups could be the length of the implementation period of the curriculum and, therefore, the length of time between the pretest and posttest. The PHEP curriculum was implemented over 12 months, Hale and Hardy's Helpful Health Hints over 6 months, and the present study over 3 months. Changes in health knowledge/preference scores for the control groups varied with length of

implementation period. Where the PHEP study found an increase in the control group score Hendricks found no significant change in score, and the present study found a decrease. A possible interpretation of these findings could be that given a substantial amount of time between testing, the effects of maturation on health knowledge/preference become apparent.

This interpretation lends support to the explanation of the PHEP results given by Parcel et al. suggesting the influence of maturation on the health knowledge/preference of young children. This in turn follows the developmental theories of children's concepts of health and illness as outlined by Natapoff (1982) and Campbell (1975).

While the present study did not reveal any apparent effects of maturation it did demonstrate that a three month implementation period is sufficient to manifest change in children's health knowledge. Given the restrictions of the present study relating to sample size and implementation period, it is notable that significant change in children's health knowledge was evident, especially in the areas of nutritious foods and the effects of alcohol abuse. These findings contribute to the body of literature as it

presently exists, and raise further questions for future investigation.

Implementation of the Health Education Curriculum
by Volunteers

Four volunteers committed themselves to the project for the 15 weeks requested. Two of the volunteers participated in 80% or more of the required days, and only one volunteer participated in less than 50% of the required days. Commitment to the project was greatest for the two university students. This commitment to the project may be an indication of the qualities that these individuals possess in terms of compatibility to the project, and concern for the young children in the project. Karowe (1965) emphasized the importance that the personal qualities of volunteers have to those that they work with. The remaining two volunteers also showed commitment and concern for the project and children. However, volunteers have other commitments that may interfere with their volunteer activities. For example, the substitute daycare worker would spend time at a paid position, rather than at the volunteer position.

The implementation of the curriculum was presented as discussed in Chapter III. Volunteers

attended the volunteer training workshop and delivered the curriculum activities as planned. Due to lack of 100% attendance of the volunteers, all of the curriculum objectives were not presented as often as scheduled. Regardless, each curriculum objective was presented a minimum of one time. Results of the data analysis show that the health education curriculum, as implemented by the volunteers, did positively influence the overall health knowledge of the children participating in the study. However, a connection between the number of times an objective was presented and positive change in a specific objective was not evident. Given the controls built into the research design it appears that the volunteer's implementation of the health education curriculum was effective in influencing the health knowledge of the children.

The findings of the present study follow those of Karnes, Teska, and Hodgins (1970) and Alden, Rappaport, and Seidman (1975). These studies indicate that volunteers can be used in ways that can be of benefit to an organization and to the client population, given a structured and supervised program to implement. This demonstration project has shown that a coordinated volunteer program for Day Nursery

Centre can benefit the children. The implications for this project relate to the commitment of Day Nursery Centre to, not only the recruitment and placement of volunteers, but also the supervision and provision of a structured program for the volunteers to implement.

Chapter 6

Summary

The purpose of this study was to demonstrate the effects of a coordinated volunteer program on the health knowledge of preschool children. The purpose of this study was to measure the effectiveness of the program and address the following research questions:

1) Will the presentation of a health education curriculum increase the health knowledge of four- five- and six-year old children participating in the program?, and 2) Can a health education curriculum be implemented effectively by volunteers?

The present study reveals some data consistent with previous research findings. Health education programs for preschool children have been found to increase the health knowledge of children (Hendricks, 1982; Parcel, Bruhn, & Murray, 1984). As well, health knowledge has been found to increase with maturation (Parcel et al., 1984). The present study found significant increases in the health knowledge of the four- five- and six-year old children who participated in the curriculum presentations. The effects of maturation and learning were controlled and eliminated as influencing factors. Based on these research

findings the researcher concludes that the presentation of the health education curriculum by volunteers made a significant difference in the subject's performance on a health knowledge test.

The volunteers were found to be capable of implementing the health education curriculum effectively. Diaries kept by the volunteers contained information which indicated that the implementation of the curriculum followed the instructions and training provided by the researcher. Further evidence of the volunteer's abilities to effectively present the curriculum were found in the results of the health knowledge test which revealed a significant increase in health knowledge test score from the pretest to the posttest.

The implications of these findings are limited. However, the results of the study did add to the present body of knowledge in a number of ways. First the health education curriculum, as presented by the volunteers, did affect positive change in the children's health knowledge. As well, the three month implementation period, somewhat shorter than in previous research studies, did prove to be sufficient for changes in health knowledge to be revealed at the posttest. While the three month implementation

period was not sufficient for any effects of maturation to become apparent, the finding does raise an interesting question for researchers working from a developmental perspective. Future research on health education for preschool children should focus on ways in which health knowledge can be translated into attitude and behavior. Kalnins and Love (1982), while noting that health education is important, pointed out "there is (also) no evidence that correct knowledge or increased knowledge is related to the ultimate adoption of health behaviors among children". (p.13). Research projects developed on a larger scale, for example greater sample size, variations in curriculum content and conditions, varied testing instruments, and of longitudinal nature, would add greatly to this current body of research.

The findings of the present study which indicate that volunteers can effectively implement the health education curriculum to preschool children should be of interest to those whose role is to provide social services, such as day care, to young children. The use of volunteers in the area of day care can enhance the ways in which programs are implemented, for example, providing a health education curriculum where

one did not previously exist. The present body of research provides positive encouragement for the use of volunteers in numerous sectors of society. Future developments should be focused on the actual placement of volunteers and the implementation of supervised and structured programs.

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Appendix A

Volunteer Description

HEALTH EDUCATION VOLUNTEER

September 1984 - February 1985

Gretta Brown Unit

336 Flora Avenue

Winnipeg, Manitoba

Tel: 586-3763

PURPOSE:

To implement a health curriculum to 4 to 6 year old children at the Day Nursery Centre Gretta Brown Unit.

RESPONSIBILITIES:

1. To present a 20 minute health activity to small groups of children once a week for 15 consecutive weeks. The health activity will be provided based on a previously developed health education curriculum.
2. To provide a brief written record of the activity, the attendance of children, and any notable occurrences during the activity, once per week for 15 weeks.

QUALIFICATIONS:

1. Some knowledge of child development.
2. Previous experience working with preschool age children.
3. Health care delivery experience would be a welcome qualification.

TIME COMMITMENT:

One morning (9:00 to 11:30) or one afternoon (1:30 to 4:00) on either Monday, Wednesday, or Friday per week, with FIRM commitment from early September 1984 until February 1985.

NUMBER OF VOLUNTEERS NEEDED:

One volunteer for each slot of time: Total = 6.

Monday: morning/afternoon
Wednesday: morning/afternoon
Friday: morning/afternoon.

Appendix B

GENERAL HEALTH OBJECTIVE: The children should be able to select products from advertising pictures which are harmful to one's health.

DISCUSSION: The purpose of this objective is to help children realize that since advertisements are to sell products, people need to learn to examine products and ideas and then make a decision, rather than just believing everything they hear. Discuss with the children different products that are sold, their purpose, and the effect on one's health and safety. Topics for discussion should include different toys with sharp edges, tobacco products*, junk food, and others.

* Tobacco products is a requirement and must be included in discussion.

ACTIVITIES:

1. Survey for safe and unsafe things... See Curriculum Card #13, Suggestion 4.
2. Where Does It Go?... See Curriculum Card #23, Suggestion 5.
3. Spinning Wheel... See Curriculum Card #44, Suggestion 4.
4. Brainstorm products that are not healthy or good for you... See Curriculum Card #33, Suggestion 4.
5. Moving Game... See Curriculum Card #39, Suggestion 2.
6. Survey people about advertisements... See Curriculum Card #13, Suggestion 5.
7. Collage of advertisements... See Curriculum Card #4, Suggestion 11.
8. Examine products and discuss findings.
9. Look for advertisements of products which are good for you.
10. Circle Talk about products... See Curriculum Card #11, Suggestion 3r.

Appendix C

Topics and Objectives

1. The children should be able to identify the body parts that are primarily associated with the five senses.
2. The children should be able to identify people and places that contribute to good health.
3. The children should be able to describe what they can do to help keep their classroom, playground and home clean.
4. The children should be able to demonstrate how to wash their hands.
5. The children should be able to tell their parents or teachers if they hurt.
6. The children should be able to demonstrate correct tooth brushing techniques.
7. The children should be able to identify the roles of community safety personnel.
8. The children should be able to describe the school safety rules correctly.
9. The children should be able to identify the various food and non-food items.

10. The children should be able to identify nutritious food snacks when given a choice.
11. The children should be able to identify the various foods in relation to the basic four food groups.
12. The children should be able to select products from advertising pictures which are harmful to one's health.
13. The children should be able to identify the emotions of anger, happiness, sadness, love, and fear.
14. The children should be able to explain when it is appropriate to take medicines.
15. The children should be able to identify harmful effects of smoking.
16. The children should be able to identify harmful effects of alcohol abuse.

Appendix D

Health Knowledge Test Instrument Items

1. Put your finger at the box which shows lips, an ear, and an eye. Point to the one which lets you hear what someone said. Point to the one which lets you hear what someone said.
2. Put your finger at the box which shows a hand, an eye, and an ear. Point to the one which lets you feel if something is smooth or cold or prickly. Point to the one which lets you feel if something is smooth or cold or prickly.
3. Put your finger at the box which shows lips, a hand, and a nose. Point to the one which lets you smell things. Point to the one which lets you smell things.
4. Put your finger at the box which shows pictures of a hand, a nose, and an eye. Point to the one which lets you look at and see things. Point to the one which lets you look at and see things.
5. Put your finger at the box which shows a flower, a teddy bear, and a fire. Point to the one which you should not touch. Point to the one which you should not touch.

6. Put your finger at the box which shows three different faces. Point to the face that is happy. Point to the face that is happy.
7. Put your finger at the box which shows pictures of a cup cake, a pencil, and a carrot. Point to the picture of something you should not chew. Point to the picture of something you should not chew.
8. Put your finger at the box which shows pictures of the cupcake, the apple, and the carrot. Point to the one which shows a snack that is not good for your teeth. Point to the snack that is not good for your teeth.
9. Put your finger at the box which shows three faces. Point to the face which is sad. Point to the face which is sad.
10. Put your finger at the box which shows three faces. Point to the face which is scared. Point to the face which is scared.
11. Put your finger at the box which shows pictures of a glass of water, an apple, and a banana. Point to the one which helps you clean your teeth. Point to the one which helps clean your teeth.

12. Put your finger at the box which shows pictures of an eye, a heart, and an ear. Point to the part of the body which smoking is bad for. Point to the part of the body which smoking is bad for.
13. Put your finger at the box which shows a box with a smiling face, a glass of water, and a bottle with a yucky face. Point to the one which is a poison. Point to the one which is a poison.
14. Put your finger at the box which shows a bat and baseball, a shoe, and a package of cigarettes. Point to the one which a good athlete or sports person would not use. Point to the one which a good athlete or sports person would not use.
15. Put your finger at the box which shows an apple, a toothbrush, and a cigarette. Point to the one which shows something you should not use because it is not good for your body and your health. Point to the one that you should not use because it is not good for your body and your health.
16. Put your finger at the box which shows a flower, a cigarette, and a glass of water. Point to the picture of something which causes air pollution. Point to the one which causes air pollution.

17. Put your finger at the box which shows a boy brushing his hair, polishing his shoes, and brushing his teeth. Which boy is showing what you should do after eating. Point to the one which you should do after eating.
18. Put your finger at the box which shows three teeth. Point to the picture of the healthy tooth. Point to the picture of the healthy tooth.
19. Put your finger at the box which shows an apple, a carrot, and a banana. Point to the one which is a vegetable. Point to the one which is a vegetable.
20. Put your finger at the box which shows a boy brushing his teeth, brushing his hair, and washing his hands. Point to the one which shows what you should do before eating. Point to the one which shows what you should do before eating.
21. Put your finger at the box which shows a pencil, a hairbrush, and some matches. Point to the one which shows what you should never play with. Point to the one which shows what you should never play with.

22. Put your finger at the box which shows four faces. Point to the one which shows how you feel today. Point to the one which shows how you feel today. Are you happy, sad, scared, or angry?
23. Put your finger at the box which shows pictures of three faces. Point to the face which is angry. Point to the face which is angry.
24. Put your finger at the box which shows three people. Point to the person who might need medicine. Point to the person who might need medicine.
25. Put your finger on the doctor at the top of the page. Now look at the pictures of the burning house, the tooth with a cavity, and the girl sick in bed. Point to the picture which shows when you need a doctor. Point to the picture which shows when you need a doctor.
26. Put your finger on the fireman at the top of the page. Now look at the pictures of the burning house, the tooth with a cavity, and the girl sick in bed. Point to the picture which shows when you need a fireman. Point to the picture which shows when you need a fireman.

27. Put your finger on the dentist at the bottom of the page. Now look at the picture of the burning house, the tooth with a cavity, and the girl sick in bed. Point to the one which shows when you need a dentist. Point to the picture which shows when you need a dentist.
28. Put your finger at the box which shows an apple, a hamburger, and a bottle of beer. Point to the one which is not a food that is good for you. Point to the one which is not a food that is good for you.
29. Put your finger at the box which shows a carton of milk, a glass of water, and a bottle of beer. Point to the one which can make you sick if you drink too much. Point to the one which can make you sick if you drink too much.
30. Put your finger at the box which shows a carrot, a bottle of beer, and an apple. Point to the one which shows a snack that is not good for you. Point to the one which shows a snack that is not good for you.

Appendix E

Letter of Permission

REQUEST FOR PERMISSION

November 9, 1984

Dear Parent:

As you may know, Day Nursery Centre has utilized volunteer workers in their centres to supplement the care provided by Day Nursery Centre staff. As of September, 1983, Bruce Tallman was hired to co-ordinate volunteer services. In order to demonstrate the benefits to the children of Day Nursery Centre, it is necessary to carry out research so that it may be passed on to others working in the area of child care.

It is for this reason that researchers from the University of Manitoba, Department of Family Studies, under the direction of Dr. Nancy Kingsbury, request your permission for the participation of your child in this research project. As a research subject, your child would be participating in two short testing sessions (one in November, one in March) designed to assess your child's learning. The testing sessions will involve your child sitting down with an experienced tester and responding to her questions regarding a series of picture cards. Each session will average one half hour in length and will deal with the language development and health knowledge of your child. Please bear in mind that your refusal to participate can in no way interfere with the provision of your child's accessibility to day care. However, we would like as many children as possible to participate in the research in order to make the results more reliable. The responses and observations will be held in strict confidence. A summary of the research results will be available to Day Nursery

Centre staff and parents upon completion of the project. Individual test scores will not be available to Day Nursery Centre staff or parents in order to ensure confidentiality of results.

Please take this letter home to read. We would appreciate that your prompt reply be dropped off at the day care centre where an envelope for deposit will be provided. Please keep in mind that your child's participation in this study can aid in the design of future preschool programs. Thank you for your time and consideration.

Sincerely,

Dr. N. Kingsbury, PhD.
Assistant Professor

AS A PARENT OF A CHILD AT DAY NURSERY CENTRE, I
HEREBY AGREE TO ALLOW MY CHILD TO PARTICIPATE IN
THE RESEARCH PROJECT CONDUCTED BY THE DEPARTMENT
OF FAMILY STUDIES AT THE UNIVERSITY OF MANITOBA.

CHILD(REN'S) NAME(S)

DATE OF BIRTH

Signed _____

Date _____.

Appendix F

Instrument - Objective Correspondence

The following list presents the correspondence of specific test items with the curriculum objectives.

<u>Curriculum Objective</u>	corresponds with	<u>Instrument Item Number</u>
1		1, 2, 3, 4, 5
2		25, 27
3		16
4		20
5		24
6		8, 11, 17, 18, 20
7		26
8		21
9		7, 13
10		30
11		19
12		16
13		6, 9, 10, 22, 23
14		24, 25
15		12, 14, 15
16		28, 29, 30