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The Effects of Mutual Goal Setting on Fourth-Graders' Adherence to the Food Guide Pyramid Recommendations

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THE EFFECTS OF MUTUAL GOAL SETTING ON FOURTH-GRADERS' ADHERENCE TO THE FOOD GUIDE PYRAMID RECOMMENDATIONS

By

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ABSTRACT

THE EFFECTS OF MUTUAL GOAL SETTING ON FOURTH-GRADERS' ADHERENCE TO THE FOOD GUIDE PYRAMID RECOMMENDATIONS

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The purpose of this study was to determine if, at the conclusion of a two week nutrition program, students involved in mutual goal setting would exhibit more positive nutrition behaviors than students not involved in mutual goal setting.

Pre-test 24-hour dietary recalls were collected on the experimental group (n = 18) and the control group (n = 19). The experimental group and the investigator then mutually set goals related to dietary practices. Both groups received nutrition education (4 classes). At the conclusion of the education and the mutual goal setting intervention, post-test 24-hour dietary recalls were collected. The data were analyzed using Fisher's Exact Test and descriptive statistics.

The intervention of mutual goal setting did not have a significant effect on the student's dietary intake. Both groups' intakes of dairy, fruits and vegetables, and grains were found to be inadequate at both measurements. Five students (28%) met their food goal for both weeks of the intervention.

Dedication

To my husband, Ray for his support and patience. To my daughters, Liz, Gina, and Anna for their understanding when Mom was "too busy."

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CHAPTER 1

INTRODUCTION

Health promotion and education are primary roles of the pediatric nurse practitioner. Burns (1994, p. 29) noted that nurse practitioners (NPs) are vital to health promotion efforts in that NPs "translate science into practice" and enable patients and their families to integrate healthy practices into their daily lives. Health promotion and educational efforts directed at improving childhood and adolescent nutrition are especially important. Adequate nutrition is essential to a child's optimal physical and cognitive growth and development and to overall health. Nutritional concerns related to inadequate nutrition include hunger, growth retardation, and iron-deficiency anemia (Splett & Story, 1991). These authors also identified low calcium intake, unhealthy weight loss practices, and the rise in childhood and adolescent obesity as issues of concern among health care providers. Healthy People 2000 (U.S. Department of Health and Human Services, 1990) identified numerous nutritional objectives related to improving the health of American children. Objectives related to reductions in growth retardation, iron deficiencies, dietary fat intake, and obesity rates were outlined. Further objectives included increasing calcium intake and the use of sound dietary weight loss management stategies.

Numerous factors, including poverty, contribute to inadequate nutrition. It is estimated that 14 million children live in poverty. In 1995, the poverty rate for children under 18 years of age was 20%, with 42% of black children and 17% of white children living in poverty (U.S. Department of Health and Human Services, 1997).

Children who do not eat breakfast are also at risk for inadequate nutrition. Data from the Bogalusa Heart Study revealed that 16% (n = 467) of all 10-year-old children skipped breakfast, with black females having the highest incidence at 24% (Nicklas, Bao, Webber, & Berenson, 1993). The authors found that 40%-60% of the children who did not eat breakfast did not meet two thirds of the RDA for vitamins A, E, D, B-6, calcium, phosphorus, magnesium, and riboflavin as compared to those who ate breakfast at home (< 5% to 58%) or at school (< 5% to 30%). Children who skipped breakfast did not make up the nutrient intake at other meals during the day. This can impair school performance. Pollitt (1995) reported on numerous studies that demonstrated improved problem-solving ability among children who ate breakfast as compared to when the same subjects did not eat breakfast.

While the prevalence of iron deficiency anemia has declined among children, it persists among adolescent females. The Centers for Disease Control and Prevention's Pediatric Nutrition Surveillance System reported a decline in childhood anemia from 7.8% in 1975 to 2.9% in 1985 (Oski, 1993). Data from the second National Health and Nutrition Examination Survey (NHANES), 1976-1980, reveal the prevalence of impaired iron status, with or without anemia, to be 2.8% among females age 11-14 years and 7.2% among females age 15-19 years (U.S. Department of Health and Human Services, 1988).

Impairment of short-term memory (Groner, Holtzman, Charney, & Mellits, 1986) and poor exercise performance (Rowland, Deisroth, Green, & Kelleher, 1988) have been reported among iron deficient females.

Adolescent females with inadequate calcium intake are at risk for developing osteoporosis as adults. Critical bone mass is deposited during the adolescent years. In assessing 4,000 U.S. households, Albertson, Tobelman, and Marquart (1997) found that over 90% of adolescent females consumed less than 100% of the RDA (1200mg, at that time) for calcium when they reviewed 14-day food records. Four different 2-year time periods from 1980-1992 were examined with the adolescents grouped by age; 11-12 year-olds, 13-14 year-olds, and 15-18 year-olds. Calcium consumption declined over time and with age. Calcium intake among the 15-18 year-olds was significantly lower ($p < .01$) than that of the younger age groups for each time frame studied. The Healthy People 2000 Review 1997 (U.S. Department of Health and Human Services, 1997) reported that only 11% of females aged 11-24 years met the average daily goal of calcium consumption, which was defined as 1200mg or three or more servings. Current recommendations have increased the calcium RDA to 1200-1500mg for children ages 11-18 years old (American Academy of Pediatrics, 1999).

Unsafe weight loss practices also place adolescents at nutritional risk. In a survey of 1824 black and 2256 white females, aged 14-18 years, 28% of white adolescents and 13% of black adolescents reported dieting in the week prior to the survey. White females had 6.04 times (95% confidence interval (CI), 1.77, 20.67) the odds of using pills and vomiting and 3.76 times (95% CI, 2.99, 4.72) the odds of engaging in diet and exercise as

weight loss practices compared to the black females (Neff, Sargent, McKeown, Jackson, & Valois, 1997). In a secondary data analysis of the 1993 Massachusetts Youth Risk Behavior Survey (n = 3321), Middleman, Vasquez, and Durant (1998) reported that 61.6% of the females were trying to lose weight. While 80.1% reported weight loss methods of dieting, exercising, or both in the past week, 7.8% reported the use of diet pills, vomiting, or both as methods to lose weight.

Childhood and adolescent obesity is on the increase. Data from the National Health and Nutrition Examination Survey, 1988-1991 (NHANES III), revealed that the prevalence for obesity was 22% for children and adolescents (Troiana, Flegal, Kuczmarski, Campbell, & Johnson, 1995). This contrasts with a 17% prevalence of obesity among the same age groups in NHANES II, 1976-1980. Obesity was defined as a body mass index (BMI) at the 85th percentile. Prevention of childhood and adolescent obesity is fundamental to reducing the well documented morbidity and mortality associated with adult obesity.

The relationship between diet and obesity has been examined extensively with conflicting results. It has been postulated that today's children and adolescents consume diets higher in fat than previous generations. In a study conducted by Nguyen, Larson, Johnson, and Goran (1996), it was found that children of obese mothers consumed more fat in their diet than children of non-obese mothers. The same authors found a significant correlation between fat mass and fat consumption in boys. However, Albertson, Tobelman, Engstrom, and Asp (1992), in combining data on caloric and fat intake from three large surveys, found that the energy intake of 2-10-year-old children had decreased

slightly over a 10-year period and that the fat intake was relatively unchanged. A study conducted by Stephen and Wald (1990) examined fat content in diets from 1920-1984 and found that among 6 to17- year-olds, fat intake had decreased from 42.5% in the 1960s to 37.9% in 1980-1985.

It is clear that parents play a significant role in their children's nutrition. They are responsible for the types of food present in the home and the manner in which it is prepared. The beliefs of parents and their attitudes about nutrition impact their children's feelings toward nutrition. Oliveria et al. (1992) collected four sets of 3-day food diaries from a child and parents to compare nutritional intake. These authors found a statistically significant correlation for all nutrients, except potassium, between the child and parents' intakes. In a sample of 14 children, Klesges et al. (1983) found a strong correlation between parental prompts, encouragement to eat, and relative weight.

The Food Guide Pyramid (FGP) was developed by the U.S. Department of Agriculture and the U.S. Department of Health and Human Services to illustrate recommended nutritional guidelines (Center for Disease Control, 1996). The Food Guide Pyramid emphasizes the concepts of variety, moderation, and balance in planning nutritional intake. Promotion of optimal childhood and adolescent nutrition is vital to the health of our children. Educational programs based on the Food Guide Pyramid can assist children and adolescents to develop healthy lifelong eating habits. The importance of the family unit must be recognized for such programs to be successful.

Imogene King's General Systems Framework (1981) recognizes the interrelationships among personal systems (individuals), interpersonal systems (groups),

and social systems (society). King maintains that at the interpersonal systems level, individuals have the ability to set and achieve goals related to health. King's Theory of Goal Attainment identifies concepts that are instrumental in goal setting and attainment. One of King's propositions states "When mutual goals have been identified, means have been explored, and nurses and clients agree on means to achieve goals, transactions will be made and goals achieved" (Fawcett, 1995, p. 141).

Mutual goal setting has been utilized in mental health settings since the late 1960s. Kirusuk and Sherman (1968) developed Goal Attainment Scaling (GAS) as a tool to quantifiably measure patient outcomes. LaFerriere and Calsyn (1978) found that clients who participated in GAS had significantly more positive outcomes in a study of short-term outpatients at a mental health clinic. In a study of 572 patients in Veterans Administration (VA) Hospitals, Hefferin (1979) found that patients who were involved in the setting of goals, target dates, and the delineation of responsibility for goal achievement, achieved greater progress towards goals than patients not involved in such a process.

The aim of this study was to promote optimum nutrition for children and adolescents. The purpose of this study was to determine if, at the conclusion of a two week nutrition program, children involved in mutual goal setting would exhibit more positive nutrition behaviors than children not involved in mutual goal setting.

CHAPTER 2

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Conceptual Framework

Imogene King developed the general systems framework in the late 1960s in an effort to explain the "why" of nursing care versus the "how" of nursing care (Fawcett, 1995). King was concerned that nursing theory was being based on a technological framework rather than a theoretical one. In examining the "why" of nursing, King came to the fundamental belief that "the focus of nursing is the human being and human acts" (Fawcett, p. 114). An underlying assumption of King's (1981) general systems framework is that "human beings are open systems interacting with the environment" (p. 10). Three systems comprise King's framework; personal systems, interpersonal systems, and social systems, with each system being defined by concepts. King (1992), however, viewed the concepts in all three systems as interrelated in nursing situations. In the overview of King's general systems framework, only the concepts pertinent to this study will be discussed in length. The goal of King's (1992) conceptual system "is to help individuals, groups, and society maintain health as they interact in their environments" (p. 20). Health promotion and education are nursing actions that can assist individuals to maintain or improve their health status.

Personal systems are comprised of individuals. King (1981) defines individuals as "social beings who are rational and sentient" (p. 19). The concepts of perception, self, growth and development, body image, time, and space help define personal systems. The concept of perception is viewed by King as instrumental to an understanding of personal systems. King further noted that nurses must have a knowledge of perception "if they are to assess, interpret, and plan for a client's identification and achievement of goals to maintain health" (p. 24). Perception is defined as "a process of organizing, interpreting, and transforming information from sensory data and memory" (p. 24). Individuals' perceptions are influenced by their life experiences, concept of self, genetics, education, and socioeconomic factors; thus, they are unique to each individual. In a nurse-client dyad, both the nurse and client will have perceptions of their own and of each other. King believes that perceptual congruence occurs when "two interacting individuals have similar perceptions about the event in which they are interacting" and furthermore, that perceptual congruence between the nurse and client will facilitate their interactions (personal communication, December 20, 1999). To achieve perceptual congruence, nurses must explore their clients' perceptions as they relate to their interactions. For this study, the perceptions of children as they relate to nutrition, were examined. Further, the nutritional perceptions of black children were also reviewed, as the majority of the subjects were African-Americans.

Two or more individuals interacting is an interpersonal system (King, 1981). This system includes the concepts of interaction, communication, transaction, role, and stress. King views the process of interaction between two or more individuals as a series of "verbal and nonverbal behaviors that are goal directed...Each individual in the situation

brings personal knowledge, needs, goals, expectations, perceptions, and past experiences that influence the interaction" (King, 1981, p. 60). Through the interactive process, two individuals mutually identify goals and the methods to achieve them. When individuals agree to the means to implement the goals, they move toward transactions. King defines transactions as a predictor of goal attainment (I. M. King, personal communication, December 20, 1999).

Social systems are defined as "an organized boundary system of social roles, behaviors, and practices, developed to maintain values and the mechanisms to regulate the practice and rules" (King, 1981, p. 115). The concepts that lead to a better understanding of social systems include organization, authority, power, status, decision-making, and control. King (1981) believed that social systems "provide the framework for social interaction, define social relationships, and establish rules of behavior and modes of action" (p. 114). Families, schools, churches, and communities all help shape individuals' beliefs, attitudes, values, and customs.

King's (1981) theory of goal attainment is derived from the general systems framework. King believed that the goal of nursing is "to help individuals maintain their health so they can function in their roles" (p. 3). While King views all three systems as important in providing health care, the "major elements in a theory of goal attainment are derived from the personal and interpersonal systems..." (p. 142). Thus, the concepts which define the theory of goal attainment are derived from the personal and interpersonal systems. These concepts include: perception, communication, interaction, transaction, self, role, growth and development, coping with stress, time, and personal space (King, 1992).

King (1981) based the general systems framework and the theory of goal attainment on the underlying assumption that the "focus of nursing is human beings interacting with their environment leading to a state of health for individuals, which is an ability to function in social roles" (p. 143). Numerous assumptions about human beings also influenced King's theory of goal attainment. King maintained that human beings were social, sentient, rational, perceiving, controlling, purposeful, action-oriented, and time-oriented.

King (1981) also identified several assumptions related to nurse-client interactions. Some of the assumptions which have relevance to this study include:

> Perceptions of nurse and of client influence the interaction process. Goals, needs, and values influence the interaction process. Individuals have a right to knowledge about themselves. Individuals have a right to participate in decisions that influence their life, their health, and community services. Health professionals have a responsiblity to share information that helps individuals make informed decisions about their health care (p. 143).

King (1981, figure 1) developed a model of transaction which depicts the nature of nurse-client interactions that lead to goal attainment. This model illustrates the purposeful interaction nurses must have with clients to mutually set goals, identify the means to achieve goals, and agree on the means to achieve goals. King based the process of mutual goal setting on "(a) nurses' assessment of a client's concerns, problems, and disturbances in health; (b) nurses' and client's perceptions of the interference; and (c) their sharing information whereby each function to help the client attain the goals identified" (p. 28).

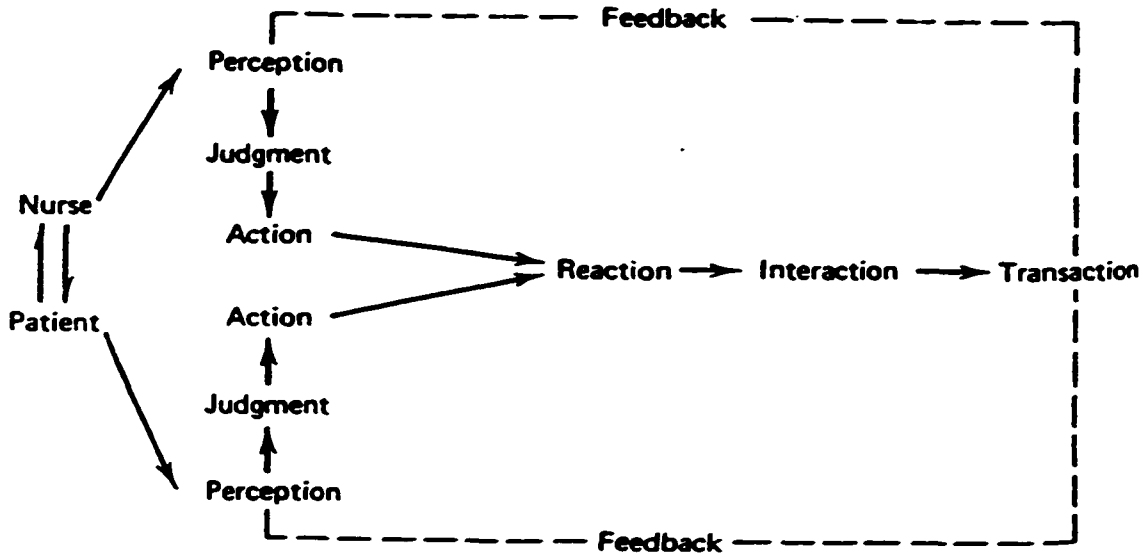


Figure 1. A Model of Transactions. From A Theory for Nursing: Systems, Concepts, Process (p. 145), by I.M. King, 1981. Albany, NY: Delmar. Copyright I.M. King. Adapted wtih permission.

Several hypotheses were stated in relationship to King's (1981) theory of goal attainment. The hypotheses relevant to this study include: (a) "Perceptual congruence in nurse-client interactions increases mutual goal setting" (I. M. King, personal communication, December 20, 1999), and (b) "Goal attainment increases patient learning and coping ability in nursing situations" (p. 156).

Review of Literature

The concept of perception is identified by King (1992) as an essential element to effective transaction, or goal attainment. The perceptions of children and adolescents towards nutrition served as a foundation in planning the education intervention and in the

mutual goal setting process. Therefore, the perceptions of children and adolescents towards nutrition, were examined extensively. While this study involved fourth-graders, the perceptions of adolescents towards nutrition were also reviewed as there are a limited number of studies examining the nutrition perceptions of fourth-graders. The perceptions of black children and adolescents towards nutrition were also examined to determine if cultural differences exist between white and black teens.

Dietary perceptions and food preferences were important factors to consider when planning the education intervention. A study by Hale-Benson (1986) did note food preference differences between black and white grandmothers who were interviewed on a variety of subjects in an attempt to learn more about black child-rearing practices and cultural influences on black children. Food preferences that were significantly favored ($p < .05$) by blacks included chitterlings, neck, bones, lamb, spices, okra, collard greens, broccoli, spinach, cabbage, corn bread, and rolls.

For the current study, research related to the intervention of nutrition education was also reviewed. The students' growth and development as it relates to psychosocial and cognitive development was also a factor in the planning of the education intervention, therefore studies that examined this issue were reviewed. The role of parents in educational programs was also examined.

Finally, studies related to the independent study variables of mutual goal setting and goal attainment were reviewed.

Perception

King (1981) hypothesized that perceptual congruence in nurse-client relationships leads to increased goal attainment. An understanding of the students' perceptions of

nutrition is imperative in mutual goal setting. A review of studies examining this issue provided some insight into childrens' perceptions related to nutrition.

Story and Resnick (1986) utilized small group discussions and content analysis to examine the dietary habits and level of nutrition knowledge among 900 Minnesota high school students. When asked if they agreed or disagreed with the adult assertion that "teenagers do not eat the right kinds of food" (*p.* 189), the students strongly agreed with the claim. Behaviors, identified by the students, such as skipping meals, excessive snacking, and unbalanced meals contributed to their support of the statement. Two general themes emerged when the students were queried on ways to improve their diets. The first theme centered on ways to 'balance their diet' and the second theme focused on the need to make time to prepare and eat meals. The students identified several barriers that led to poor dietary intake: a lack of time to worry about proper nutrition or to fix proper meals and snacks, the inconvenience and expense of improving their diet, and a lack of urgency to improve their diet. The authors recommended that nutrition education interventions be designed with these barriers in mind.

A qualitative study was undertaken by Lytle, et al. (1997) in an effort to understand childrens' perceptions, understandings, and interpretations of nutrition messages. Focus groups and one-on-one interviews were conducted among 141 white, middle-class students in grades kindergarten through sixth, living in Minnesota. One of the purposes of the study was to determine how children understand information from the Dietary Guidelines for Americans (DGFA) and the Food Guide Pyramid (FGP). Children were asked the question "What do you think you should eat if someone told you 'Eat a variety of foods?'" (p.130). While the children in kindergarten to second grade listed

specific foods, third and fourth graders made comments such as "to eat good/healthy food" or "to eat foods from the Food Groups or the Pyramid" (p. 130). Consuming foods from all of the food groups was the response of over half of the fifth and sixth graders.

Further probing revealed that when asked about a diet low in fat, the kindergarten to second graders associated high fat with treats. The 3rd to 4th graders indicated that they would "eat healthy" (p. 134) with the FGP and Four Food Groups as guidelines. Fifth and sixth graders responded that fruits and vegetables were the key to a diet low in fat. The majority of the 5th and 6th graders also correctly identified high and low fat foods. When asked to chose a diet with plenty of fruits, vegetables, and grain products, the kindergarten through second grade students again listed specific foods. About half of the 3rd and 4th graders listed appropriate foods while all the 5th and 6th graders gave correct answers. In evaluating the response to these and other nutrition-related questions, the authors concluded that cognitive development affects the understanding of nutrition messages, especially when abstract concepts are used. They recommended that educational efforts be simple, positive, behaviorally oriented, and developmentally appropriate to increase their effectiveness. While this study did demonstrate an increased understanding of nutritional messages with age, knowledge does not always translate to behavior, as the following study illustrates.

Beech, Rice, Myers, Johnson, and Nicklas (1999) found that adolescents are consuming half of the servings of fruits and vegetables recommended per day as outlined in the goals of Healthy People 2000. The authors surveyed 2,213 high school parochial students in the New Orleans area to ascertain their knowledge, attitudes, and behaviors related to fruit and vegetable consumption. Dietary knowledge (about fruits and

vegetables), of this primarily Caucasian (83%) sample, was measured by a questionnaire. Data analysis (ANOVA) revealed that the Caucasian students had significantly higher knowledge scores than the African American students (39.4% versus 34.7%, $p < .001$), who represented only 5% of the sample. The data also revealed that girls scored significantly higher than boys (40.7% versus 36.6%, $p < .001$). There were no significant differences noted between Hispanic students (9%) and other ethnic groups, however. Fruit and vegetable consumption was measured by asking students to indicate their average daily intake of fruits and vegetables with response options ranging from 0 to 11 servings. Descriptive statistical analysis revealed significant differences ($p < .05$) between the mean intake of African Americans ($M = 2.31$ servings) and Caucasians ($M = 2.70$ servings). No significant gender differences were noted. The mean number of servings, regardless of ethnicity, was 2.53.

Beech et al. (1999) were also interested in variables associated with fruit and vegetable intake. Self-efficacy measurement demonstrated that a higher percentage of girls than boys (68%, $p < .05$) had a medium to high level of confidence that they could consume 5 servings of fruits and vegetables each day. The authors stressed the importance of school-based nutrition education programs as an effective means of improving the dietary intake of adolescents. It was also recommended that behavioral change theories be used to facilitate behavioral changes related to nutrition.

In today's culture, children receive numerous nutrition messages through a variety of mediums. Children are cognizant of the FGP and as children age, their ability to correctly interpret nutrition messages increases (Lytle et al., 1997). The research cited also demonstrates that knowledge does not necessarily translate to behavior. In planning

nutrition interventions, barriers to proper nutrition should be explored. Additionally, nutrition messages should be behaviorally oriented and developmentally appropriate to enhance their effectiveness.

In addition to perceptions related to nutrition, students have perceptions of their body that impact their nutrition. Several authors have noted a difference in body size perceptions among black and white populations. Utilizing a subset of five items from the 1991 and 1993 South Carolina Youth Risk Behavior Survey, Neff, Sargent, McKeown, Jackson, and Valois (1997) surveyed 4,080 adolescent females regarding their perceptions of their body size and weight-management practices. Although this study did not compare perceptions of body size to actual weight or body fat measurement, the survey revealed that 41% of the white adolescents perceived themselves to be overweight compared to 29% of the black adolescents. Logistic regression revealed that white adolescents had 3.76 times the odds of using diet and exercise and 6.04 times the odds of using pills and vomiting to control their weight than black adolescents. The authors concluded that black adolescents are not as consumed with thinness and are less likely to engage in unhealthy weight loss behaviors as their white peers. Several other studies support the authors' findings.

Parnell, et al. (1996) surveyed 344 adolescent females (89 black and 255 white) using Likert-type scales, body size silhouettes and closed-ended questions to examine perceptions of weight and factors which influence such perceptions. When evaluating responses to the body-size silhouette questions, the investigators found that the black females selected an ideal body size significantly larger than the white females ($p < .0001$). The black females also believed their male and female friends would select a significantly

larger ideal female body size than the male and female friends of white females ($p < .0001$). Magazines ($p = .003$) and best female friend ($p = .0003$) were also found to significantly influence white females' body perception, while black females were significantly more influenced by mother/grandmother ($p = .0044$), sister(s)/brother(s) ($p = .0181$), and teacher/administrator ($p = .0486$). While this study did measure body size and calculated body mass index (BMI), it did not examine the relationship between actual BMI and perceptions of body weight. Most (34%) BMI values were in the "appropriate weight" range, 6.7% of the subjects were in the obese range, and 18.6% were in the severely obese range. T-test analysis found no significant differences in BMI between races.

In a study that did compare actual weight to perceptions of weight, Desmond, Price, Hallinan, and Smith (1989) surveyed 138 black (70 males and 68 females) and 193 white (92 males and 101 females) students using a 22-item questionnaire. Chi-square analysis revealed a significant difference ($p < .01$) in how black and white females perceived their actual weight. Thin and normal weight black females correctly perceived their weight 64% and 73% of the time, respectively. In contrast, 58% of thin white females perceived themselves as thin, but 42% perceived themselves as normal weight. Of the normal weight white females, 43% considered themselves heavy. In the heavy weight category, 60% of black females perceived themselves as normal weight while 100% of the white females perceived themselves as heavy. The black females were also significantly more satisfied with their body size than the white females.

In the males of this study, significant differences ($p < .05$) were found in the heavy category with 78% of white males correctly perceiving their weight status as compared to

36% of black males. The survey also revealed that white females engaged in dieting more frequently than black females. Almost half (49%) of the white normal weight and 79% of the white heavy weight students dieted compared to 13% of the black normal weight and 35% of the black heavy weight students. Among the male heavy students, 68% of black and 75% of white students exercised to lose weight.

These studies support the belief that black and white adolescents have different perceptions of body size with black adolescents viewing larger body sizes as acceptable and even desirable. White adolescents view thinner body sizes as desirable, are less satisfied with their body size, and are more likely to engage in weight loss strategies than black adolescents. Black females were also more influenced by their immediate family than white females in their perceptions of an ideal body size. Melnyk and Weinstein (1994), in a literature review on obesity in black women, note that many black female role models are of large size, further reinforcing an acceptable image of larger body size than in the white culture. Nutritional education efforts should be made with these body size perceptions in mind.

There is an increased prevalence of obesity among children in our current society (Troiano, et al., 1995). A perception among health care providers is that children consume inadequate diets. Numerous studies have examined the dietary intakes of children in efforts to explore the increased prevalence of obesity among children and to examine the relationship of cardiovascular disease (CVD) and diet. Johnson, Guthrie, Smiciklas-Wright, and Wang (1994) reviewed data from 1,392 children, ages 1-10, collected during the U. S. Department of Agriculture 1987-1988 Nationwide Food Consumer Survey, to determine if children were consuming the recommended dietary

allowances. Nutrient intake was measured by three days of diet recall records. Nutrient adequacy ratios (NARs) were determined for 15 essential nutrients for each child by dividing the average intake of a nutrient by the child's age and recommended dietary allowance for the nutrient. Nutrients were considered significant if 20 percent or more of any age group had intakes with an NAR of .77 or less. Vitamins A, E, and C, calcium, iron, and zinc were the nutrients found to be significant. The majority of the children had intakes of total fat and saturated fat above the recommended level of 30% with mean actual intakes of 35.5% - 35.6%. Cholesterol intake was lower than the recommended intake for 72.7% - 89% of the children. The recommended intake of sodium, however, was met by only 50.9% of the 4-6-year-old children and by 28.8% of the 7-10-year-old children. The authors conluded that the low intake of sodium was related to the lower caloric intakes of the younger children. Multiple correlation regression analysis revealed that black children had the lowest intake of vitamin A (M NAR = 101, $F = 22.1$, $p < .01$) and the highest intakes of total fat (M = 37.1%, $F = 3.6$, $p < .001$), saturated fat (M = 14.9%, $F = 3.5$, $p < .001$), and sodium (M = 2,976 mg, $F = 10.8$, $p < .001$) when compared to the other children in the study. However, blacks represented only 13% of the sample, which was predominantly white (81%).

Kimm, Gergen, Malloy, Dresser, and Carroll (1990) reviewed data from the second National Health and Nutrition Examination Survey, 1976-1980 (NHANES II) to assess the diets of children. The means of single 24-hour diet recall records for 7,304 children, ages 1-17 years-old, were analyzed. The subjects were divided into three age groups: 12-23-months-old, 2-10 years-old, and 11-17 years-old. Chi-square analysis with weighted means revealed that in the male group aged 12-23 months, blacks had a

significantly higher consumption of total fat (38% versus 35%, $p = .0005$) and cholesterol (211 mg versus 173 mg/1000 kcal, $p = .0025$) than white males. The intake of total fat and cholesterol among the older males was not statistically significant. Among females, blacks had 1%-2% higher intake of total fat than white females, among all age groups. Black females consumed more cholesterol than white females (171 mg versus 147 mg/1000 kcal, $p = .007$) in the 2-10 year-old group. In reviewing the data as a whole, the authors concluded that 37% - 55% of children consumed total fat greater than the recommended amount. Saturated fat intake was relatively high with 55% - 69% of the children consuming greater than 125% of the recommended amount. Cholesterol intake was also high, especially among black children, with 42% - 69% of the black children compared to 41% - 49% of the white children, consuming greater than 125% of the recommended amount.

Nicklas, Bao, Webber, and Berenson (1993) examined the relationship between the consumption of breakfast and daily nutrient intake. Two cross-sectional surveys were combined from the Bogalusa Heart Study, 1984-1985 and 1987-1988, to study the breakfast and dietary intake patterns of 467 ten-year-old children. Dietary recall (24 hour) revealed that 16% of the children did not eat breakfast and 24% of black girls did not eat breakfast. More black children (58%) ate breakfast at school compared to white children. Data analysis utilizing ANOVA revealed that in comparing children who ate breakfast at school to children who did not eat breakfast, the mean daily intakes of total carbohydrates (302.8 grams versus 214.8 grams, $p = \leq .05$), sugar (176.3 grams versus 112.6 grams, $p \leq .05$), cholesterol (260 mg versus 205 mg, $p \leq .05$), and potassium (2.80 grams versus 1.87 grams, $p \leq .0001$) were significantly higher in children who ate breakfast at school.

Forty to sixty percent of the children who did not eat breakfast did not meet two thirds of the RDA for vitamins A, E, D, B-6, B-12, and the minerals calcium, phosphorus, magnesium, and riboflavin, as compared to those who ate breakfast at school (< 5% to 30%) or at home (5% to 58%). The study also found that children who skipped breakfast did not make up the nutrient intake at other meals during the day.

Instruction

Nutritional information was presented to the students in these studies in a variety of formats. Instruction is related to King's concept of interaction. "The process of interactions between two or more individuals represents a sequence of verbal and nonverbal behaviors that are goal-directed" (King, 1981, p. 60). A review of effective interventions related to black adolescents and nutrition education provided guidelines for the nutrition program developed for the reported study, however the number of studies dealing with this issue are small in number.

Because of the role parents play in a child's nutrition, it has been hypothesized that inclusion of parents in obesity prevention programs would lead to more significant outcomes of weight loss and decreased fat intake. Wadden et al. (1990) studied the effect of maternal involvement among 36 black female adolescents who attended a 16-week behavioral weight control program entitled Weight Reduction and Pride (WRAP), which was culturally specific. The adolescents either attended the sessions alone, with their mother, or in separate, but concurrent sessions. The authors found no significant difference in weight loss among the three treatment groups. Secondary analysis, however, revealed that the mothers' attendance at the sessions favorably influenced daughters' weight loss. Mothers who regularly attended the sessions, versus mothers with poor or no

attendance, had daughters who lost more than twice as much weight as the other daughters. Stolley and Fitzgibbon (1997) also examined the relationship of maternal participation in a culturally specific obesity prevention program. Low-income, inner-city black females and their mothers were randomly assigned to a 12-week program or to a placebo group which received general health information. Statistical analysis utilizing MANOVA demonstrated that the treatment group mothers were found to have significant reductions in saturated fat intake ($F = 6.7$, $p < .05$), daily cholesterol intake ($F = 3.1$, $p < .10$), and daily percentages of calories from fat ($F = 16.2$, $p < .001$). The daughters in the treatment group had a significant decrease in daily percentage of calories from fat (3.67, $p < .05$). Both studies concluded that parental involvement is supportive of dietary change.

Parental attendance at health promotion and educational programs requires a high level of motivation and commitment on the parent's part, especially if barriers, such as lack of transportation, lack of child care, or lack of time exist. School-based programs, with a parental component, can be an effective means of providing health education. Perry et al. (1989) studied the effect of parental involvement on efforts to reduce dietary fat and sodium consumption among third-grade students who lived in urban Minnesota and North Dakota. The students ($n = 2,250$), who were predominantly middle-class Caucasians, either participated in a school-based nutrition program or a home based correspondence program which required parental involvement. In comparing the parent involved group to the non-parent involved group, the authors found modest differences between the groups for percent of calories from fat ($p = .06$), percent of calories from saturated fat ($p = .04$), percent of calories from monosaturated fat ($p = .08$), and grams of complex carbohydrate per 1,000 calories ($p = .03$). The authors found a high participation rate (86%) and a 71%

completion rate (almost 1,000 families) when the information was geared to the busy schedules of families and utilized behavioral tip sheets and worksheets. Participants may have been motivated by the chance of winning the grand prize, a trip for four to Disneyland.

Nader et al. (1996) also examined the effect of parental participation in a school-based health promotion program entitled The Child and Adolescent Trial for Cardiovascular Health (CATCH). This study was conducted among more racially diverse students in California, Louisiana, Minnesota, and Texas from the third grade through the fifth grade. Home packets consisted of four to five information sets per year and reinforced the school-based content. Parental participation, as measured by the return of activity cards, ranged from 60% to 79%. Significant differences in parental participation were found by sex and race. Boys had a significantly lower dose of participation than girls ($M = 8.6$, $SD = 4.4$ vs $M = 11$, $SD = 3.7$, $F = 22.4$, $p = .0001$) and Caucasians had a significantly higher dose of participation than African-Americans or Hispanics ($F = 4.45$, $p = .0118$). As parental participation increased, 8 of the 11 attitude and knowledge measures in the health behavior questionnaire increased, either for all students or a subset of the students. However, parental participation was not found to have an effect on the self-reported behaviors of students related to diet and exercise. The authors concluded that more culturally specific health promotion programs are needed for specific cultures. While the short duration of the intervention (four to six weeks) may have contributed to the high participation rate, it may also have been a limitation of the study. More time intensive interventions however, appear to limit participation.

In examining just the school-based component of the CATCH study, Lytle, et al. (1996) found the nutrition intervention to be effective. Dietary recalls (24 hour) were collected on a subsample (n = 1,182) of the original CATCH subjects at baseline (third-grade) and again at the conclusion of the intervention (fifth grade). The purpose of the CATCH intervention was to improve children's dietary patterns and physical activity levels and ultimately reduce the incidence of cardiovascular disease (CVD). Students in grades three through five received fairly intensive instruction related to cardiovascular health. The course content was taught over 5, 12, and 8 weeks for grades three, four, and five, respectively. The investigator utilized mixed-model analysis of variance (ANOVA) to compare nutrient intake change between the intervention group and the control group. Data analysis revealed a significant decrease in energy ($p < .005$) from both total fat (2.4%) and saturated fat ((1.2%) for the intervention group, as compared to the control groups' decrease of total fat (0.04%) and saturated fat (0.3%). A significant difference in sodium intake was demonstrated with the control group decreasing sodium consumption (−38 mg/1,000 kcal) and the intervention group increasing sodium consumption (70 mg/1,000 kcal) ($p < .05$). There were no statistically significant differences in cholesterol intake between the two groups.

A school-based health promotion intervention was also found to be effective in a study conducted by Simons-Morton, Parcel, Baranowski, Forthofer, and O'Hara (1991). Students at two Texas elementary schools (kindergarten through fourth grade) took part in the Go For Health (GFH) program, which included a behaviorally-based health education curriculum, fitness-oriented physical education, and school lunches which were lower in fat and sodium. An additional two elementary schools served as the control. The

goals of the intervention were to promote healthy diets and regular, vigorous physical activity. Food service personnel received training and support in an effort to lower the fat and sodium content of the school lunches. The investigators conducted 24-hour dietary recalls among random subsamples at the conclusion of the intervention. Analysis of the data was performed by calculating the mean nutrient intakes. The intervention students, as compared to the control students, consumed fewer calories (2,094 versus 2,135), less total fat (77 grams versus 90 grams), less saturated fat (29 grams versus 34 grams) and less sodium (2,873 mg versus 3,378 mg). The intervention effect held true for both sack and tray lunches. The interventions related to both the school lunch program and physical activity level were positive. The authors concluded that school-based health interventions can be effective. They cautioned that school personnel need adequate support and training to plan and implement health education programs.

While parental participation may enhance a student's learning, educational efforts must be geared towards the student. A study conducted by Murphy, Youatt, Hoerr, Sawyer, and Andrews (1994) investigated students' knowledge, attitudes, and dietary practices as they relate to the Food Guide Pyramid (FGP) recommendations. A survey of 270 Michigan students in the 5th, 8th, and 11th grades was conducted. In addition, the students were surveyed as to their preferred learning methods related to nutrition education. The data revealed that the mean FGP knowledge score for the 5th graders was 48% and for both the 8th and 11th graders the mean knowledge score was 54%. When students were asked to indicate nutrition topics of interest, the three most frequently selected topics included: weight control (41%), diet improvements (31%), and nutrition and disease (30%). Students were also asked to identify three methods of nutritional

education that they preferred. Among the 5th graders, games (52%), food experiments (51%), and computer games (40%) were the preferred methods of learning. Food preparation (22%) was the preferred method for 8th graders, with low overall interest in other methods of learning. Videotapes (45%), food preparation (41%), and games (42%) were the preferred methods of learning among the 11th graders. Passive methods of learning, such as lectures, were the least favored method of learning for all the students. The authors concluded that the students were interested in actively learning about nutrition.

Growth and Development.

The growth and development of the targeted population was an important concept to consider when planning the educational interventions for this study. King (1981) defines growth and development as "continuous changes in individuals at the cellular, molecular, and behavioral levels of activities" (p. 148). King further states that growth and development is "a function of genetic endowment, meaningful and satisfying experiences, and an environment conducive to helping individuals move toward maturity" (p. 148). Both the psychosocial and cognitive development of the student play a role in their learning abilities. According to Erikson (Hanna, 1995) adolescence is a transitional period between childhood and adulthood when adolescents are establishing independence. Interpersonal relationships between adolescents and their peers become more important as dependence on parents decreases. Cognitive development is marked by a shift to formal operational thinking according to Piaget (Hanna, 1995). This development enables the adolescent to think in abstract terms and to envision the future. Young adolescents are also capable of understanding the risks and benefits of health-related practices.

Educational materials focused on health promotion should be based on the psychosocial and cognitive level of the participants. The study by Lytle, et al. (1997), demonstrated the role that cognitive development plays in understanding nutrition messages. As children aged, their knowledge related to nutrition increased.

Mutual Goal Setting and Goal Attainment.

The independent variable of the study was mutual goal setting. King (1981) defines transactions as goal attainment. There has been a great deal of research regarding mutual goal setting and goal attainment in the mental health field. Few studies have examined mutual goal setting and goal attainment among children, or as it relates to health promotion.

Kiresuk and Sherman (1968) developed Goal Attainment Scaling (GAS) in the 1960s as a tool to evaluate mental health services. In this model, goals were set for the patient by a member of the health care team or by a committee; there was no input from the patient. LaFerriere and Calsyn (1978) studied the effects of GAS on 65 Caucasians who received mental health services as out-patients. The clients assigned to the GAS group actively participated in goal setting with their therapist. The control group received therapy based on the therapist's preference. All clients completed posttests which measured anxiety, self-esteem, and depression approximately 5 weeks after the conclusion of their treatment. Data analysis utilizing ANOVA revealed that the GAS clients, as compared to the control clients, were less depressed ($F = 6.65$, $p < .02$, less anxious ($F = 6.29$, $p < .02$), and had higher self-esteem measurement ($F = 17.25$, $p < .01$).

A study by Hefferin (1979) also supports the practice of mutual goal setting. The sample included 572 patients from 14 various Veterans Administration facilities and

involved 50 nurses. In the experimental group, the patient and nurse mutually identified either organic or functional health goals and developed a plan to meet those goals. Nurses identified health goals for the control patients based on initial nursing and medical assessments. A modified version of GAS was used to calculate goal attainment change scores. Data analysis utilizing two-tailed t-tests revealed that the experimental group had significantly greater change scores ($p = .039$) as compared to the control group. In addition, patient satisfaction, as measured by a questionnaire, was significantly higher for the experimental group than the control group ($p = .04$). The study supported the use of mutual goal setting with patients. The author also noted that patient's goals are not always related to the medical regime prescribed by health professionals.

Alexy (1984) studied the effects of mutual goal setting among a sample of 152 adults who had at least one risk factor identified after completing a health risk survey. The subjects were placed in one of three treatment groups: provider goal setting, collaborative goal setting, or control. Risk categories were weighted to determine a difficulty of achievement (D/A) score for each risk category. Goal-met ratios were then calculated for each subject by dividing the sum of the D/A weights of the goals, either recommended or selected, into the sum of the D/A weights of the achieved goals. Paired t-test analysis revealed no significant differences between the provider goal setting group and the collaborative goal setting group in regards to the means of goal-met ratios. In analyzing specific risk categories, ANCOVA revealed that for the health behavior of weight reduction, the collaborative goal-setting group was more effective than the other two groups ($F = 27.11$, $p < .001$). Further data analysis, utilizing paired t-tests, revealed that the provider goal-setting group had the greatest amount of change with significant

differences noted for the behaviors of alcohol ($t = 2.50$, $p = .017$), seat-belt use ($t = 3.22$, $p = .011$), and exercise ($t -3.49$, $p = .001$). The collaborative goal-setting group had significant changes in the behaviors of weight loss ($t = 4.11$, $p < .001$) and exercise ($t = -4.76$, $p < .001$). The control group had significant changes in the behavior of exercise ($t = -3.23$, $p = .003$). In their analysis, the authors discussed the fact that the goals made were based on outcome measures versus specific intermediate behaviors. Recommendations were made that goals should be based on specific behavior change versus outcome criteria.

Hanna (1993) examined the effects of mutual goal setting among 51 female adolescents who were seeking oral contraceptives. The theoretical framework for the study was King's theory of goal attainment. The investigator supported King's concept of perception by examining perceptions of barriers and benefits as outlined in the Health Belief Model. The hypothesis of the study was: "Female adolescents who experience a nurse-client transactional intervention about perceived oral contraceptive benefits and barriers will have greater levels of oral contraceptive adherence than female adolescents who do not experience a nurse-client transactional intervention about perceived oral contraceptive benefits and barriers" (p. 287). Nurse-client transactions were based on King's (1981) model of transactions: action, reaction, identified disturbance or problem, mutual goal setting, exploration of means to achieve goal and agreement on means to achieve goal. In this study the action and reaction phase involved the nurse and client identifying perceived benefits and barriers to oral contraception. The disturbance phase included identification of perceived barriers as potential interference to contraceptive adherence. Mutual goal setting between the nurse and client confirmed the adolescent's

goal of pregnancy prevention. The nurse and client then explored means to achieve the goal and agreed on a method of oral contraception. Data analysis using ANOVA revealed that the adolescents who engaged in the nurse-client transaction, or mutual goal-setting, had significantly higher levels of contraception use at a 3-month follow-up than adolescents in the control group ($F = 4.15$, $p = .049$). The study's hypothesis was accepted and supports King's theory of goal attainment. A potential limitation of this study was the adolescent's self-report of contraceptive adherence, however, the author felt over-estimation of adherence would be present in both the control and experimental groups.

Summary

Adequate nutrition is imperative to a child's cognitive and physical growth and development. Nutritional concerns related to an inadequate diet include hunger, growth retardation, dental disease, and iron-deficiency anemia but dietary excesses of sugar, fat, cholesterol, and sodium are also problematic (Splett & Story, 1991). Cardiovascular disease (CVD) is the leading cause of mortality in the United States (CDC, 1996). Diets high in fat and sodium have been linked to the incidence of CVD. In addition, the rates of childhood obesity have increased, especially among black children (Troiano, Flegal, Kuczmarski, Campbell, & Johnson, 1995). A number of factors have been implicated in the obesity rates among black children. Diets higher in fat, cholesterol, and sodium, and dietary practices such as skipping breakfast contribute to poor nutritional intake. In addition, body size perceptions among blacks leads to more social acceptance of individuals who are overweight and obese. Other chronic conditions that have been linked to inadequate nutrition include cancer, stroke, diabetes, high blood pressure, and

osteoporosis (CDC, 1996). It is important to target health promotion and nutrition education efforts at school-age children.

School-based health promotion efforts have been successful in changing dietary beliefs and behaviors (Lytle, et al., 1996; Simons-Morton, et al., 1991). Inclusion of parents in these efforts has shown some success (Nader, et al., 1996; Perry, et al., 1989). Programs aimed at black children must be culturally specific to be effective (Stolley & Fitzgibbon, 1997; Wadden, et al., 1990). In addition, the cognitive and psychosocial development level of the students must be considered in planning the dietary instruction (Lytle, et al., 1997).

Studies regarding the relationship between mutual goal setting and positive health outcomes have been conducted primarily on adult populations with mixed results. Few studies have examined mutual goal setting in the pediatric population. Hanna (1995) found a positive relationship among adolescents who had participated in mutual goal setting and contraceptive use. King's theory of goal attainment and model of transactions served as the theoretical framework for the study. King hypothesized that perceptual congruence in nurse-client interactions increases mutual goal setting (personal cimmunication, December 20, 1999). In an effort to enhance the perceptual congruence between the investigator and students, the students in this study were asked to identify the benefits and barriers they perceived to attaining their food goal during the mutual goal setting phase of the study.

This study examined the relationship between mutual goal setting and dietary behaviors at the conclusion of a culturally specific, school-based nutrition program among

predominantly black 4th graders. Informational packets highlighting the nutrition education were sent home with the students at the conclusion of the study.

Hypothesis

The hypothesis for this study was: students who participate in mutual goal setting will exhibit more positive dietary practices at the conclusion of a school-based nutrition program than students who do not participate in mutual goal setting.

Definition of terms.

Mutual goal setting: A process between the nurse and student that includes: "(a) nurses' assessment of a client's concerns, problems, and disturbances in health; (b) nurses' and clients' perception of the interference; and (c) their sharing information whereby each function to help the client attain the goals identified" (King, 1995, p. 28).

Instruction: Presentation of nutritional information, in a variety of formats: written, visual, verbal, demonstration, and active participation,
that is culturally specific and based on the students' psychosocial and cognitive development. The nutrition instruction will emphasize the Food Guide Pyramid recommendations.

Nutrition Intervention: The act of presenting the nutrition education over the course of two weeks (four classes) by a registered dietitian.

Goal attainment: The achievement of the student's goal as identified at the start of the nutrition program.

CHAPTER 3

METHODS

Research Design

The study's hypothesis was tested by utilizing a pre-test - post-test quasi-experimental design. Pre-test (or baseline) measurement of dietary intake of two elementary classrooms was taken. One classroom served as the intervention group and the second classroom served as the control group. Mutual goal setting related to dietary practices took place between the students in the intervention group and the investigator. Both classrooms received nutrition education (4 sessions) over two weeks, with an emphasis on the Food Guide Pyramid (FGP) recommendations. At the conclusion of the education, post-test (or outcome) measurement of dietary intake was conducted. Comparisons between the pre-test and post-test measurements were made to determine if the independent variable of mutual goal setting had an effect on the dependent variable of dietary intake.

The pre-test - post-test quasi-experimental design is appropriate for "testing hypotheses of cause-and-effect relationships between variables" (Polit and Hungler, 1995, p. 166). Experimental design lends greater confidence to causal relationships revealed in a study. The pre-test - post-test measures further strengthen the confidence in the correlation between the independent and dependent variables.

Sample and Setting

This study was conducted in an inner city public elementary school that had two classrooms of fourth graders. The sample was a convenience sample with 20 students in the experimental classroom and 21 students in the control classroom. Informed consent was received from 18 subjects (11 female and 7 male) in the experimental classroom and 19 subjects (9 female and 10 male) in the control classroom. Chi-square analysis revealed no significant differences in gender between the two groups. Both groups were predominantly African-American (83% of the experimental group and 89.5% of the control group). The remaining subjects were Caucasian with one Hispanic student in the control group. T-test analysis, calculated by separate variance estimate, demonstrated a significant difference in age between the experimental and control group ($t = 2.907$, $df = 33.975$, $p = .006$). The experimental group had a mean age of 10.00 years and the control group had a mean age of 9.47 years.

The data on household income was not available to the investigator. The school principal did report to the investigator that 81% of the student population qualified for free or reduced-price meals.

Recruitment

The investigator contacted a West Michigan school district and obtained the name of an elementary school which had two fourth-grade classrooms. Contact was made with one of the fourth-grade teachers, who was agreeable to the investigator's proposal. A letter to the school's principal was then sent, seeking permission to conduct the study at the school in the two fourth-grade classrooms. Upon approval from the principal (Appendix H), an application for approval was sent to the Grand Valley State University

Human Subjects Review Board, seeking their approval. Once approval was granted from the Review Board (Appendix I), a letter explaining the study and seeking informed consent from the legal guardians, was sent home with the fourth-graders (Appendix E). Informed consents were returned to the classroom teacher, via the student. A nominal incentive (pencil, eraser, etc.) was offered to all students whose legal guardians returned their consent form, whether permission was granted or denied. Consent forms that were received by a specific date were placed in a drawing for a $20 grocery store gift certificate. All consent forms were returned to school within three days. The students whose parents did not grant consent received only the nutrition education component of the study. Consent forms were held in confidentiality by the investigator and destroyed (via a shredder) after the data were analyzed.

Instruments

A 24-hour dietary recall was used to measure the student's intake, both pre-intervention and post-intervention. The students in the experimental group participated in mutual goal setting with the investigator. The education intervention was presented by a registered dietitian over a two-week period to students in both the experimental and control groups. At the conclusion of the education intervention and the mutual goal setting intervention, the student's dietary intake was again assessed. Comparisons were then made between the experimental and control group to determine if the experimental group, who participated in mutual goal setting, had more positive changes in their dietary intake, as measured by the FGP recommendations, than the control group. Demographic data was obtained and analyzed to determine if significant differences existed between the control and experimental groups.

Demographics

The students in the study were assigned to the control or experimental group based on which classroom they were in. Because of the lack of randomization, it was important to assess demographic variables, which may have impacted the results of the study. During their pre-intervention 24-hour recall interview the students for whom informed consent was obtained were asked to complete a questionnaire (Appendix A), asking basic demographic information. Ethnicity was based on the investigator's observation of the student during their dietary recalls. The school principal provided a figure on the number of students who qualified for free or reduced-price meals, as this data was not available from student records. These students were defined as low-income. Income status was an important variable to consider for two reasons. First, the investigator must plan nutrition interventions that were economically feasible for the students. In addition, significant differences in household income between the intervention and control group would weaken the causal relationship between the independent and dependent variables.

Nutrition Assessment

The dependent variable of dietary intake was assessed by utilizing an adaptation of the 24-hour recall method described by Frank, Berenson, Schilling, and Moore (1977). These authors developed a detailed protocol to be used by interviewers, when conducting 24-hour recalls, to limit interviewer variability and to maximize children's recall of their dietary intake. The same method was used to measure the children's pre-test and post-test dietary intake.

To obtain the recall, the nurse interviewed the student in a private area of the school. The purpose of the interview was explained to the student and the nurse followed

a script (Appendix B), using probing questions to obtain the diet information. The interview started with the most recent meal or snack eaten and progressed retrospectively until 24 hours had been covered. The investigator began the interview by asking, "When did you last eat or drink something?" Further questioning was aimed at prompting the student to associate daily activities with food intake and to enhance their recall (see Appendix B for script details). As the child relayed his/her dietary intake, the following information was recorded: (a) name of food, (b) method of preparation; homemade, commercial, ready to eat, fried, baked, or casserole, and (c) serving size (Appendix B). Graduated food models and measurements were used to assist the children to accurately depict serving sizes.

The child's intake was then classified according to the FGP categories of food groups and recorded on the recall instrument. The FGP is divided into five major food groups: (a) grains; which include bread, cereal, rice, and pasta, (b) fruits, (c) vegetables, (d) milk, yogurt, and cheese, and (e) meat, poultry, fish, eggs, dry beans, and nuts. The last category of the FGP contains fats, oils, and sweets and is not classified as a food group. When necessary, the Dietetic Exchange List (1995) was used to convert reported amounts eaten into serving sizes that corresponded with the FGP serving size classifications.

The validity of the 24-hour recall method described by Frank, Berenson, Schilling, and Moore (1977) was not reported. The use of protocols, standard procedures, graduated food models, food product identification notebooks, and structured dialogues reduce respondent and observer error and strengthen the recall method (Frank, 1991). Baranowski, et al. (1986) found an 83% agreement between 24 children in grades three

through sixth on self-reported food intake and observer's recordings of the children's intake. They also noted that, for a subset of food categories, there was higher agreement (84%) between the self-reports and observer reports on foods classified as "highly socially undesirable foods" than on "highly socially desirable foods" (74%), negating the belief that respondents will behave in a "socially desirable" way when being observed. While this study did not utilize the 24-hour recall method per se, the children did complete the self-report at the end of the day, thus "recalling" what they had eaten.

Frank, Berenson, Schilling, and Moore (1977) did report on the reliability of the method as measured by repeat interviews of ten children. Paired t-tests revealed no significant differences between the duplicate interviews for the mean intakes of selected nutrients. Prior to the study, the 24-hour recall method was pretested with four student volunteers, who were the same age as the student subjects, and who were acquaintances of the investigator. Informed consent was obtained from the volunteer's legal guardian (Appendix F) and the volunteers received a small incentive (movie pass) for their participation. The investigator and a registered dietitian interviewed each student at 30 minute intervals and found 96% agreement between the test-retest recalls. Three food items were not recalled to both interviewers. Between the interviewers, there was agreement on 92% (71 of 77) of the food items. The serving size on six items was not in agreement and may have been due to different food models being used by the two interviewers. The interviewers noted that the students' attention was drawn to the multiple food models and questions had to be reiterated. During the actual study, the investigator utilized the generic food models to depict serving sizes and used the more "lifelike" models to clarify serving sizes.

The 24-hour recall method has been deemed acceptable in children older than age 9 as they are viewed as reliable respondents (Frank, 1991). Advantages to using this method with children are that the 24-hour recall period requires only short term memory and that literacy does not become an issue (Barrett-Connor, 1991). Frank, Berenson, Schilling, and Moore (1977) cite further advantages of employing the 24-hour recall method in that it is practical, simple, time-saving, and acceptable for studying groups. It is also economically feasible in that the children serve as their own respondents and a small staff can manage the data collection.

Mutual Goal Setting

The independent variable of the study was mutual goal setting. Mutual goal setting occurred between the nurse and the students in the experimental group only. King's theory of goal attainment postulates that transactions between a nurse and patient lead to goal attainment (1992). King further states that "a transaction cannot be defined in and of itself but is defined when the six elements in the interaction are present" (p. 21). As depicted in the model of transactions (figure 1), these elements include action, reaction, disturbance, mutual goal setting, exploration of means to achieve the goal, and agreement on means to achieve the goal. In this study, the nurse-student transaction involved: (a) confirming the goal of improved nutrition, as measured by the FGP recommendations, (mutual goal setting), (b) identifying perceived nutrition benefits and barriers (action, reaction, and disturbance), and (c) developing a plan to achieve the nutrition goal (exploration and agreement on means to achieve goal). This interaction was recorded on the worksheet entitled "My Goal" (Appendix C) and placed in a folder that the student kept in his/her possession during the study.

Goal Attainment

As described in the previous section, the nurse and the students in the experimental group met individually to identify nutrition-related goals. Students then recorded their nutrition goal on the "My Goal" worksheet (Appendix C). The "Daily Food Record" instrument (Appendix C) was used to record progress related to the goal. The nurse met at least once more with each student in the intervention group, during the quasi-experiment, to assess the student's progression towards achievement of the goal. The students were allowed to revise their goal at this time, if they wished.

Procedure

Pretesting

Pretesting as described in the Instrument section of this report preceeded the activities of the formal study (see pp. 40 - 41). At the completion of the pretesting, the study commenced as follows.

Determination of Experimental Group

Before the data collection process began, one fourth grade class was designated as the experimental group and the second class served as the control group. This was determined by a coin toss. Both the experimental group and the control group, for whom parental consent was obtained, were interviewed to obtain 24-hour dietary recalls. Recalls were collected before (pre) and after (post) the education intervention and the mutual goal setting phase of the study.

Control group.

The control group was defined as those students whose legal guardians gave informed consent and whose teacher lost the coin toss. The control group was

interviewed for a pre-intervention 24-hour recall and, at the conclusion of the education intervention, a post-intervention 24-hour recall. These students received the nutrition education program as described in Appendix D. The control group did not engage in mutual goal setting with the investigator.

Experimental group.

The experimental group was defined as those students whose legal guardians gave informed consent and whose teacher won the coin toss. The experimental group was interviewed for a pre-intervention 24-hour recall and, at the conclusion of the education intervention, a post-intervention 24-hour recall. These students received the nutrition education program as outlined in Appendix D. The experimental group engaged in mutual goal setting with the investigator. Their goal was reviewed with the investigator a second time during the course of the education intervention.

Students for whom consent was not obtained.

These students were defined as those whose legal guardians did not grant informed consent for the student's participation in the study. No data were collected on these students and they did not participate in 24-hour recall interviews, nor did they participate in mutual goal setting. They did receive the same nutrition education curriculum as the control and experimental groups.

Diet Recalls

As the student's consent forms were returned to the school, the investigator began interviewing the students for whom consent was obtained, to collect their pre-intervention 24-hour dietary recall. The investigator met privately with each student in a quiet room to explain the purpose and to conduct the interview, which took approximately 15-20

minutes. Basic demographic information was also obtained from the student at this interview (Appendix A). A coded identification number which corresponded to the student's name appeared on the recall form. The investigator maintained a log with the student's name and code number in her possession to maintain confidentiality. The interviews took place during the student's science period and their free time after their lunch period, on Tuesdays through Fridays. The investigator followed the script outlined in Appendix B to assist the child in recalling their intake. The recall started with the most recent food or beverage consumed and proceeded retrospectively until a 24-hour time period had been covered. Graduated food and beverage models were used to assist the student in determining the correct portion size of foods and beverages consumed. The investigator recorded the name of the food and beverage consumed, the manner in which it was prepared, and the serving size (see Appendix B for details). The Dietetic Exchange List (1995) was used to convert serving sizes to the FGP serving sizes, if needed. The investigator then categorized the recall data into the FGP classifications of grains, vegetables, fruits, dairy, meats, or fats, oils, and sweets. The investigator consulted with the registered dietitian on questions related to serving size or classification of a food item. A second registered dietitian was available for consultation if there were disagreements between the investigator and registered dietitian.

In this study, the validity of the recall method was assessed by comparing the children's recall of lunch with actual observations. The investigator compared seven student's lunch recalls with direct observations by the investigator during the pre-intervention recalls. There was 100% agreement between the observations and the students' recall on six of the seven recalls. One student recalled drinking 1/4 cup of milk

versus an observation of 1/2 cup. During the post-intervention recalls, six students were observed with 100% agreement on five of the recalls. Again, one student recalled eating 1/2 of their salad as opposed to an observed intake of 3/4 serving.

To assess reliability, a registered dietitian analyzed 16 recalls at the conclusion of the study. Comparisons were made with the investigator's analysis to determine percent of agreement on food classification and number of servings. There was 100% agreement on food classification and agreement on on all but two serving size determinations. The registered dietitian counted a large piece of corn on the cob as two vegetables and french fries as a fat and a vegetable. All the recalls were re-examined for these two food items and adjustments made as necessary.

Instruction

The nutrition education began after the pre-intervention dietary recalls had been collected. Students in both the experimental and the control class received four nutrition education classes taught by a registered dietitian in 30-40 minute sessions. Children whose legal guardians did not grant consent for the data collection also received the nutrition education. The education supported the concepts taught in the fourth-grade Michigan Model nutrition curriculum and focused on the Food Guide Pyramid (FGP) recommendations. Additional materials found in the Pyramid Pursuit: Nutrition Curriculum for Grades 4-6 (National Food Service Management Institute, 1994, chap. 5) were also utilized. Class time consisted of a brief lecture followed by hands-on activities and games that reinforced the lecture. Nutritious snacks that complemented the message of the day were also provided to the classes. Appendix D details the nutrition education

plan. Informational packets, which supported the nutrition education, were sent home to the students' families at the conclusion of the study.

The first lesson was entitled "Building the Pyramid." The learning objectives included: (a) students will label the five food groups on the food pyramid, (b) students will explain the recommended number of servings for each food group, (c) students will recognize appropriate serving sizes for each food group, and (d) students will describe at least one health benefit from each food group.

The next lesson's focus was "What's in a Serving?" The learning objectives related to this class included a demonstration by the students to measure serving sizes of common foods from the five food groups. Students were also asked to estimate the number of servings in various portions of food from the five food groups.

"The Importance of Proportion" was the focus of the third class. The objectives of this class included understanding the importance of eating foods from all five food groups and that the majority of the student's food choices should come from the grain, vegetable, and fruit groups. The final objective of this lecture related to the accurate reading and interpretation of food labels.

The final class emphasized "Limiting Fats". Student objectives included: (a) listing health habits that reduce the risk of obesity, (b) comparing and contrasting the fats, oils, and sweets contained in different snack foods, (c) comparing and contrasting the fat content in common fast foods, and (d) selecting examples of nutritious snack foods. Fast food menus were reviewed with the students.

At the conclusion of the study, an informational packet geared to the parents, was sent home with the students (Appendix G). The packet contained information on the

FGP, the recommended number of servings for each group, and the serving sizes in each group. Additional facts related to fat intake and food labels were also included. Data on the role of breakfast and nutritious recipes completed the packet. While the role of parental support may be a factor in changing the student's dietary behaviors, it was not a variable being measured in this study. Therefore, the parental informational packet was sent home at the conclusion of the study.

Mutual Goal Setting

After the first education class, which was an introduction to the FGP, the investigator met one-on-one with the students in the experimental group to mutually set goals related to nutrition. A beginning knowledge of the FGP was essential for the students to set achievable goals. King's model of transactions (figure 1) served as the guide for mutual goal setting. The student and investigator compared the student's pre-intervention 24-hour recall to the FGP recommendations to identify dietary excesses or deficiencies. The student and investigator mutually set a goal, identified perceived benefits and barriers to the goal, and developed a plan to meet the goal. This information was then recorded on the "My Goal" worksheet (Appendix B). The student was allowed to select their goal from a list of pre-set goals or they could identify their own goal. Pre-set goals included: "I will increase the number of (list the food group) servings I eat a day to (number of servings)", "I will decrease the number of (list the food group) servings I eat a day to (number of servings)", or "I will eat breakfast every day." Students were asked to record their intake as it related to their goal on worksheets (Daily Food Record, Appendix C) in a folder provided for them, on a daily basis for two weeks. They used only the worksheet that related to their goal. For example, if their goal was to increase their fruit

consumption, they only received the Daily Food Record for fruits. They received a sticker for each day's recording.

During the nutrition education time period, the investigator met at least once with each student in the intervention group to review their goal notebook and to assess the progress they had made on their goal. If the student had encountered barriers to meeting their goal, the investigator and student discussed methods of overcoming the barrier, or revising the goal. Five students did chose to revise their goal.

At the conclusion of the nutrition education intervention and the goal recording, the investigator conducted post-intervention 24-hour recalls on all students who participated in the pre-intervention 24-hour recalls. The recall method was conducted in the same manner as the pre-intervention recalls. The goal notebooks were also collected. Comparisons between each student's pre-and-post-recalls were made to determine if changes occurred, either positive or negative, in each of the FGP categories. These data were then grouped into the experimental group or control group. Finally, the data were analyzed to determine if the experimental (mutual goal setting) group had more positive dietary changes, as measured by the FGP recommendations, than the control group. The students' goal notebooks were also reviewed to determine if goals were met, with a criterion of accomplishing the target nutrition behavior five out of seven days in a week. The demographic data were also analyzed to determine if there were significant differences between the control and experimental groups.

Potential Risks

There were no anticipated risks to the participants in the study. The nutrition education was material they would have received as part of the fourth-grade Michigan

Model curriculum. The time spent being interviewed for the 24-hour recalls and mutual goal setting was approximately 15 minutes per interview and was conducted during the student's science period and free time after their lunch period. There was potential for tension between the student and legal guardian if the student's goal was not supported in the home, however, no student identified this as a problem. The researcher was aware that a number of the families of the children in the study had low incomes. To make the goals feasible, the investigator offered suggestions on low-cost foods, such as purchasing in-season fruits and vegetables and maximizing the intake of nutritious foods in the subsidized school meals. The dietitian, who provided the nutrition education, had experience with the Women, Infant, and Child (WIC) program and was also familiar with low-cost foods. During the mutual goal setting process between the intervention students and the nurse, any barriers that the students identified were also addressed. There were no students on a medically prescribed diet or who had dietary restrictions related to religion.

CHAPTER 4

RESULTS

Statistical analysis of the data was conducted utilizing the Statistical Package for Social Studies (SPSS) for Windows. Fisher's Exact Test was used to determine if the independent variable of mutual goal setting had a significant effect on the dependent variable of dietary intake. Descriptive statistics were used to analyze dietary intake. The Food Guide Pyramid's (FGP) minimum number of recommended servings for each food group were used to calculate positive or negative changes in dietary intake. The minimum number of servings for each food group were as follows: (a) milk (dairy) = 3, (b) meat = 2, (c) fruits + vegetables = 5, and (d) grains = 6. Changes in the fats, oils, and sweets food category were based on an intake of six or less servings. The demographic variables were examined using a combination of Chi-square analysis, T-test analysis, and descriptive statistics. Significance was defined as $p \leq 0.05$.

Dietary Intake

Data from the student's 24-hour recalls were classified according to the FGP categories of food groups and recorded in number of servings. Serving sizes were recorded to the hundredth power. The number of servings were then totaled for each food group. The recalls collected before the intervention of mutual goal setting were identified as pre-test, or T1 recalls, while the recalls collected after the intervention were identified as post-test, or T2 recalls. Table 1 illustrates the mean intake (number of

servings) of each food group at T1 and T2 for the experimental and control group. The meat food group was the only food group in which mean intake was above the minimum number of recommended servings. The experimental group's mean intake of meat was above the minimum number of recommended servings at both T1 (2.51, SD = 1.38) and T2 (2.28, SD = 1.08), while the control group's mean intake was above the minimum number of recommended servings only at T2 (2.40, SD = 1.33). The mean intake of milk (dairy), vegetables, fruits, and grains was below the minimum number of recommended servings for both groups at both T1 and T2. The mean intake of fats, oils, and sweets was below the acceptable range of six servings for both groups at both times.

Table 1

Mean Intake at T1 and T2 by Group

	Experimental		Control	
	T1	T2	T1	T2
Fats, Oils, Sweets	4.20	3.38	2.20	4.01
(SD)	(2.29)	(2.23)	(1.32)	(2.29)
Milk	1.69	2.11	2.21	1.69
	(.90)	(2.11)	(1.01)	(1.05)
Meat	2.51	2.28	1.87	2.40
	(1.38)	(1.08)	(.92)	(1.33)
Vegetables	.73	1.14	1.21	1.22
	(.69)	(.97)	(1.14)	(.77)
Fruits	2.50	1.66	1.49	1.53
	(1.82)	(1.84)	(1.33)	(1.79)
Grains	4.54	4.87	4.70	4.61
	(2.57)	(1.97)	(2.30)	(2.80)

Adherence Results

To assess for changes in dietary intake, comparisons were made between the student's T1 and T2 recalls. Students were identified as adhering to a food group if they consumed the minimum number of servings as recommended by the FGP, with the exception of the fats, oils, and sweets food category. The minimum number of servings for each food group were as follows: (a) milk = 3, (b) meat = 2, (c) fruits + vegetables = 5, and (d) grains = 6. Students were identified as adhering to the fats, oils, and sweets food category if they consumed six or less servings. The registered dietitian deemed four servings of fats and oils plus two servings of sweets per day to be a reasonable expectation of intake for students of this age.

Comparisons were first made between the two groups' T1 intakes to determine if significant differences in food consumption between the groups existed before the intervention of mutual goal setting. A significant difference in the intake of fats, oils, and sweets was noted. Fisher's Exact Test ($x^2 = 4.73$, $df = 1$, $p = .046$) revealed that 100% of the control group consumed six or less servings of this food category as compared to 77.8% of the experimental group. There were no significant differences between the two groups in the consumption of the other food groups.

Comparisons were then made between each student's pre-test (T1) and post-test (T2) recalls to determine if a positive change had occurred. To calculate the change for the milk, meat, fruit + vegetable, and grain food groups, the T1 measure was subtracted from the T2 measure. A positive change was defined as a change from T1 to T2 greater

than zero, or if the student was consuming at least the minimum number of recommended servings for a food group at T2. In other words, a student who either increased their intake of a food group from T1 to T2, or who consumed the minimum number of recommended servings was viewed as making a positive change or as "adhering" to a food group.

The formula to calculate a positive change in the consumption of fats, oils, and sweets was more complicated for several reasons. First, while the FGP recommendations are to consume foods in this category "sparingly," fat is imperative to a child's growth and development, therefore some intake of fat is desirable. The desired or optimum fat intake for an individual is usually expressed as a percentage of their total caloric intake. Because this study did not entail micronutrient or caloric analysis, the number of servings identified as appropriate was established by the dietitian. However, there is a fine line between adequate and excessive intake of this food group. A positive change in the fats, oils, and sweets category was considered to occur if: (a) T1 intake equaled six servings and there was no change at T2, (b) T1 intake was less than six servings and T2 intake was less than or equal to six servings, (c) T2 intake was greater than six servings, but less than T1 intake, or (d) T1 intake was greater than six servings and T2 intake is less than T1 intake.

In comparing the student's pre-test (T1) and post-test (T2) recalls, data analysis revealed no significant differences in the consumption of the milk (dairy), meat, fruit and vegetable, or grain food groups between the experimental and control groups. While the pre-test recalls demonstrated a significant difference in the intake of fats, oils, and sweets

between the two groups, there were no significant differences between the two groups when comparing the change from pre-test to post-test.

Though there were no significant differences in the change from T1 to T2 between the experimental and control groups' intakes of milk, meat, fruit and vegetables, or grains, Table 2 illustrates that both groups had an increase, from T1 to T2, in the percentage of students who adhered to each food group, with the exception of the fats, oils, and sweets category. It should be noted that adherence at T1 indicates that the student consumed at least the minimum number of recommended servings. Adherence at T2 indicates that the student was consuming the minimum number of recommended servings at T2 or demonstrated an increase in intake from T1 to T2.

Table 2

Percentage of Students Adhering to a Food Group

	Experimental		Control	
	T1	T2	T1	T2
Fats, Oils, Sweets	77.8	88.9	100	78.9
Milk	16.7	55.6	21.1	37.5
Meat	66.7	72.2	47.4	78.9
Fruits/Vegetables	27.8	33.3	15.8	52.6
Grains	22.2	61.1	15.8	36.8

Mutual Goal Setting

The students in the experimental group were shown the results of their pre-intervention 24-hour recall and mutually established a goal with the investigator. Six of the students chose to increase their fruit intake, five to increase their vegetable intake, two

to increase their grain intake, and two to increase their milk (dairy) intake. Three students chose to decrease their fat intake. While the pre-intervention 24-hour recalls revealed that 27.8% of the experimental students did not eat breakfast, no student chose to eat breakfast as their goal. (For both groups combined, 70.3% ate breakfast and 29.7% did not).

At the end of week one, eight students (44%) had met their goal, eight students (44%) had not met their goal, and two students (12%) did not complete their food record. Students were given the option of revising their goal at the end of week one during a conference with the investigator. Five students chose to revise their goal, twelve students did not revise their goal, and one student was absent and therefore did not participate in the conference. At the end of the second week, eight students (44%) had met their goal, four (22%) did not meet their goal, and six students (34%) did not complete their food diaries. Five of the students (28%) met their goal for both weeks one and two. However, only two of these students continued to meet their goal intake on the post-24-hour recalls, which were collected approximately 4-6 days after the completion of the food record.

CHAPTER 5

DISCUSSION AND IMPLICATIONS

Discussion

At the conclusion of a two week (4 sessions) nutrition education program, no significant differences in dietary intake were noted between the experimental group (students who participated in mutual goal setting) and the control group. The dietary intakes for both groups of students were found to be inadequate for the milk (dairy), fruit and vegetable, and grain food groups, at both the pre-test and post-test measurements. Increases in the percentage of students adhering to a food group were noted from the pre-test to the post-test recalls and may reflect the influence of the nutrition intervention. Eighteen students participated in the mutual goal setting intervention, with only five (27%) students meeting their goal for both weeks of the intervention.

Dietary Intake

Data from the 24-hour recalls revealed inadequate dietary intakes at both the pre-test (T1) and post-test (T2) measures for both the experimental and control group. For both groups, their mean intake of milk, vegetables, fruits, and grains fell below the Food Guide Pyramid (FGP) minimum number of recommended servings. The meat food group was the only food group in which intake was adequate. The experimental group's mean intake of meat was 2.51 (SD = 1.38) servings at T1 and 2.28 (SD = 1.08) servings at T2.

The control group's mean intake of meat was adequate at T2 only, with a mean intake of 2.40 (1.33) servings. Both groups' mean intake of fats, oils, and sweets was in the acceptable range of six or less servings for both T1 and T2. There was a significant difference between the groups in the intake of fats, oils, and sweets noted for the pre-test recalls with 100% of the control group consuming six or less servings as compared to 77.8% of the control group consuming six or less servings of this food category. There were no significant differences found between the experimental and control groups for the intake of the other food groups at T1. The mean intakes remained below the FGP minimum number of recommended servings, even for those food groups with an increase in consumption, with the exception of the meat food group and the fats, oils, and sweets food category.

The students' inadequate dietary intakes may be related to a number of factors. Certainly, the low-income status of the sample affected their nutrition. Approximately 81% of the students at the school qualified for free or reduced-price meals. Poverty was identified by Splett and Story (1991) as a factor contributing to inadequate nutrition. The practice of skipping breakfast was also identified as leading to inadequate nutrition by Nicklas, Bao, Webber, and Berenson (1993), who found that children who skipped breakfast did not make up the nutrient intake in the other meals of the day. Almost a third (29.7%) of the students in this study did not eat breakfast at both the pre-test and post-test recalls. Inadequate consumption of specific food groups have been noted by other researchers. A study by Albertson, Tobelman, and Marquart (1997) revealed that over 90% of adolescent girls consumed less than 100% of the RDA for calcium. Beech, Rice, Myers, Johnson, and Nicklas (1999) found a mean intake of 2.31 servings for fruits and

vegetables for African Americans, half the recommended number of servings, and similar to the results of this study. In this study, the mean intake for fruits and vegetables for both groups combined was 2.74 servings.

Adherence

Although the students' pre-test (T1) and post-test (T2) 24-hour recalls revealed inadequate dietary intakes, the percentage of students adhering to a food group increased from T1 to T2 for the milk (dairy), meat, fruit and vegetable, and grain food groups for both groups. The increases in adherence ranged from a 5.5% increase in meat and fruit/vegetable adherence for the experimental group to a 38.9% increase in grain adherence for the experimental group. These data are indicative of a positive change in the students' nutrition. The students either increased their intake of a food group from T1 to T2, or were consuming the FGP minimum number of recommended servings at T2.

Because the intervention of mutual goal setting was not significant, this change in dietary intake may be explained by the education intervention. School-based nutrition programs have been found to be effective by other researchers. The Child and Adolescent Trial for Cardiovascular Health (CATCH) nutrition intervention resulted in significant decreases in total fat and saturated fat for a group of fourth-graders, who received intensive (12 weeks) education related to cardiovascular health (Lytle, et al., 1996). Simons-Morton, Parcel, Baranowski, Forthofer, and O'Hara (1991) found a behavior-based health education curriculum to be effective in lowering elementary students' caloric intake and total fat, saturated fat, and sodium consumption.

The nutrition education was developmentally appropriate (based on the Michigan Model nutrition curriculum for fourth-graders) and was taught by a registered dietitian

with a background in pediatric nutrition. Active participation, games, and hands-on food activities were teaching methods utilized to provide the instruction. Games and food experiments were found to be the preferred methods of learning among fifth-graders, in a study conducted by Murphy, Youatt, Hoerr, Sawyer, and Andrews (1994). In the current study, both of the classroom teachers expressed their appreciation for the nutrition education and stated that they did not feel qualified to teach the content.

Mutual Goal Setting

During the mutual goal setting intervention, less than half the students (8) in the experimental group were successful in meeting their food-related goal during week one (44%) of the study. Although five students (27%) revised their goal after week one, the same number of students (44%) met their goal for week two. Five students (27%) met their goal for both weeks one and two. As the study progressed, the number of students who did not keep daily food records increased, from two students (12%) at week one to six students (34%) at week two.

A number of factors, including the small sample size (n = 18), may have contributed to the small number of students who achieved goal attainment for both weeks one and two. The low-income status may have been a more significant barrier than the students identified or realized. The two week duration of record keeping may have been too long for the students, as evidenced by the increased number of students who did not keep their daily record during the second week. The record keeping also fell over a holiday weekend, which may have contributed to the decline. While the teacher reminded the students to complete their food record, they were not given specific time in the

classroom to do so. The students were asked to take their food record home over the weekend and some students did not return them to school.

While five students met their goal for both weeks of the intervention, over time, their goal-related food intake declined. The post-test 24-hour recalls revealed that of these five students, only two students continued to meet their goal. The post-test recalls were collected approximately 4-6 days after the conclusion of the mutual goal setting intervention.

Although studies by Hanna (1993) and Hefferin (1984) correlated mutual goal setting with positive health behaviors, the subjects in their studies were adolescents and adults. The demographic data did reveal that there was a significant difference in age between the groups in this study, with the experimental group having a mean age of 10.00 years as compared to the control group, who had a mean age of 9.47 years. While it might be expected that the increased age would be a positive variable, it appears that this difference did not affect the results, as the mutual goal setting intervention was not significant.

King's (1995) model of transactions (figure 1) served as the framework for the mutual goal setting intervention. All the students chose appropriate goals, based on their pre-test 24-hour recalls, and identified at least one health benefit related to their food goal. Six of the students identified barriers related to the achievement of their goal and 12 students did not. One student reported that she did not like milk and another student stated that there were "too many sweets at home." Two students reported that the foods would not be present at home (fruits and vegetables) and two students felt that their

friends would be a barrier to their efforts to decrease their intake of sweets. The students identified strategies to overcome the barriers and established a plan to attain their goal.

Although the students were instructed to record only the foods consumed that related to their food goal, it was noted during the student's goal conference, that many of the students recorded their entire dietary intake for the day or listed foods not related to their goal. These findings led the investigator to question the students' understanding of the FGP and nutrition messages in general. Lytle, et al. (1997) found that about half of third and fourth graders could correctly identify foods in specific food groups. More frequent feedback to the students related to their goal may have clarified misunderstandings and yielded more positive outcomes.

King (1992) identified the concept of perception as an essential element to effective transaction, or goal attainment. Perceptions related to childhood and adolescent nutrition include the belief that children are consuming inadequate diets. Behaviors such as skipping meals, excessive snacking, and unbalanced diets are some of the causes of poor nutrition (Story & Resnick, 1986). While the students in this study reported skipping meals and consuming unbalanced meals, the majority of students did not report eating between meals or excessive snacking. The low-income status of the sample may explain this finding. The student's reported intakes of fats, oils, and sweets were also below the acceptable range of six servings for both groups, however, micronutrient analysis was not conducted on the student's intakes, and their actual intakes of this food category may be higher.

Limitations

A potential limitation of this study was the Hawthorne effect (Polit and Hungler, 1995) which contends that subjects change their behavior when they know they are being observed or studied. The age of the subjects in this study may have limited the Hawthorne effect because children may not be as conditioned as adults to alter their dietary habits in order to be "nutritionally correct." The duration of the study (four weeks) may also have diminished the Hawthorne effect. It would be expected that the Hawthorne effect would have an equal effect on both groups of students.

A second limitation of the study was the lack of randomization of subjects. To facilitate data collection, the students were in the experimental or control group based on which classroom they were in. Data analysis revealed no significant differences between the groups in sex or race. There was a significant difference in age between the two groups with the experimental group being slightly older. Since the intervention of mutual goal setting among the experimental students was not found to be significant, the age difference is thought to be of no consequence. Because the setting was a neighborhood public school, it is assumed that household income levels were equally distributed between the two classrooms. The percentage of students who qualified for free or reduced-price meals was 81%.

The social support among students in a classroom setting was also an important factor to consider. In a study designed to promote cardiovascular health among black families, Baranowski, et al. (1990) found that the attendance declined over the course of a 14 week program with an average participation rate of only 28%. One of the reasons given by participants for their low attendance rates was the fact that, due to random

assignment to the experimental or control group, participants were not grouped with their friends. Participants had anticipated the social support of one another when they agreed to participate in the study. Thus, the lack of randomization may be viewed as a positive approach, in terms of participation, rather than as a limitation. Both classrooms had high participation rates, with 90% of both classroom's students partaking in the study.

Several threats to internal validity were considered. The threat of history was assessed prior to the study. The Michigan Model nutrition curriculum (State of Michigan, 1985) had not been taught in either classroom during the current school year and was therefore, not a threat to the internal validity of the study.

An additional potential threat to the internal validity of the study was that of instrumentation. The dietary recall process must be consistent for all the students and from pre-test to post-test. Specific guidelines were followed for both the dietary recall process and the goal setting process for the experimental students. Graduated food models and prompts were utilized to assist the student's recall efforts. Culturally specific food models were especially beneficial in the recall interviews. Food service personnel at the school provided the investigator with daily breakfast and lunch menus and with the serving size of each food. Sixteen recalls were analyzed by a registered dietitian at the conclusion of the study and compared to the investigator's analysis. There was 100% agreement on food classification and agreement on all but two serving size recordings.

The student's dietary recalls were self-reported measures and could be viewed as a limitation of the study. However, the recalls were obtained shortly after either the student's breakfast or lunch meal, which facilitated their recollections. To the investigator, it appeared as if the student's readily recalled their intake for the past 24-

hours. In comparing a subset of recalls with actual observations by the investigator, 100% agreement was found on 11 of 13 meals. The two discrepencies involved the student estimating slightly less consumption than the observer noted.

The experimental student's food records were also self-reported and are a llimitation of the study. Attempts by the investigator to observe the students' intake with their food records were unsuccessful. It would be expected however, for the students to report higher goal attainment if they recorded false information.

Implications

Several implications for the practice of nursing were highlighted by this study. Assumptions that clients are receiving adequate nutrition should not be made, especially when working with low-income populations. Nutritional assessments should be a routine part of a client's history and physical. A dietary history should be obtained from clients periodically. Appropriate referrals, such as home visits and nutritional services, should be made if warrented.

The mutual goal setting intervention was successful for five of the students and has been correlated with positive health behaviors in other studies. The process of establishing mutual goals with patients is a worthwhile endeavor and is similar to the process of establishing a plan of care. However, young children may need more intense feedback from health care providers to enable them to achieve their goal. Parental involvement and participation may lead to increased goal achievement.

The nutrition education intervention was found to be beneficial. This study demonstrates the importance of health promotion and education efforts by nurses and other health care professionals. The need for nutrition education was illustrated by the

students' inadequate dietary intakes. Nutrition education efforts should be directed toward increasing childrens' intakes of calcium, fruits and vegetables, and grains. The importance of breakfast consumption should also be stressed to students. Nurses should take advantage of any opportunities to provide nutrition education.

To improve childhood nutrition, nurses must act as community health advocates. Nurses should be aware of nutritional resources and programs offered in the community. Any identified barriers to such resources and services should be addressed. Nurses and other health care providers should be involved in community efforts to improve the nutrition status of their communities. Such involvement may include committee membership, whereby nurses can offer their expertise in nutrition. Nurses may volunteer to provide nutrition education services to a variety of clients and in a variety of settings, such as schools, churches, and numerous organizations. Efforts to ensure that school lunch programs are nutritious should also be made.

Health professionals should be aware of the local and state health departments' agendas related to nutrition education and support programs that are beneficial. Health care providers should be cognizant of current and pending legislation related to nutrition programs and services. Health professionals should ensure that beneficial programs are maintained by voicing their support to their legislators.

Recommendations

The mutual goal setting intervention met with limited success in this study. Further research related to mutual goal setting and children would be beneficial. A more intensive approach (such as daily feedback) to the mutual goal setting intervention may lead to more positive behaviors. It would be worthwhile to examine the effects of mutual

goal setting and education efforts on more specific behaviors, such as increasing calcium intake, consuming breakfast, or increasing fruit and vegetable consumption. The role of parental support in attainment of goals would also be important to examine.

Summary

The intervention of mutual goal setting did not have a significant effect on fourth-graders' dietary intake. Dietary recalls revealed that the students' mean intakes of milk (dairy), fruit and vegetables, and grains were below the FGP minimum number of recommended servings at both the pre-intervention and post-intervention recalls. The experimental group's mean intake of meat was adequate at both recall measures and the control group's intake of meat was adequate at only the post-intervention measure. Both groups' intake of fats, oils, and sweets was in an acceptable range for both recall measures. The nutrition education intervention was beneficial. The post-intervention recalls revealed increases in the number of students who were either increasing their intake of a food group or who were consuming the minimum number of recommended servings of a food group, as compared to the pre-intervention recalls. The mutual goal setting intervention met with limited success. Five (27%) students met their goal for both weeks of the intervention. The two week duration of the intervention may have been too lengthy for the students as two students did not complete their food record for week one and six students did not complete their food record for week two. While the mutual goal setting intervention was not significant, the education intervention was effective in improving the dietary intakes of both the experimental and control groups.

School-based nutrition education programs can be effective in improving the dietary intake of students. Educational programs should be developmentally appropriate

and utilize a hands-on approach to learning. The inclusion of school personnel (teachers, kitchen staff, and administrators) may lead to more positive dietary outcomes. Parental support should also be sought and may be beneficial. While the intervention of mutual goal setting did not have a significant impact on the students' dietary intake, it would be worthwhile to examine the effect of a more intensive approach to the mutual goal setting process. More intensive approaches might include daily feedback sessions between the student and investigator and/or the inclusion of parents in the mutual goal setting process. The importance of adequate nutrition for children has been well documented. This study documented the inadequate dietary intakes of a small sample of fourth-graders. Optimum nutrition for children and adolescents should be a health priority for all health care providers.

APPENDICES

APPENDIX A

APPENDIX A

Demographics

What is your name?_____
When were you born? Month_____Day_____Year_____
Are you a: Boy?_____Girl?_____(check one)
Who is your teacher?_____

Think about the people you live with. Please check the line next to the names that show who you live with.

I live with....

___ my mother

___ my father

___ my stepmother

___ my stepfather

___ at least one grandmother

___ at least one grandfather

___ fosterparents

___ another woman who is like a mother to me

___ another man who is like a father to me

___ at least one brother

___ at least one sister

THANK-YOU!

APPENDIX B

APPENDIX B

24-Hour Recall Interview Protocol

The interviewer will explain the purpose of the interview to the student by stating the following:

> My name is Jacquie Kiefer and I am a nurse and a graduate student at Grand Valley State University. I am doing a study on fourth-graders and their eating habits. I am going to ask you to tell me what you have eaten for the past 24-hours. You will be learning about proper nutrition and the Food Guide Pyramid in your classroom. At the end of these classes, I am going to ask you again to tell me what you have eaten in the past 24-hours.

The interview will take place in a quiet environment. Graduated food models and household cups will be present for estimating serving sizes. The interviewer will ask the student to recall their most recent meal or snack and proceed retrospectively until a 24-hour time period has been covered. The interviews will take place after the student's lunch on Tuesdays through Fridays to obtain dietary data from a school day. The following questions will be used to stimulate the student's memory.

1. When did you last eat or drink something?
2. Tell me what you ate or drank (ask probing questions related to food eaten, such as did you have butter or mayonaise on your sandwich?)
3. Did you have a midmorning break or recess?
4. Did you have a snack or drink then? If so, what was it?
5. Did you have a midmorning snack at school? If so, what was it?
6. Did you have a midmorning drink at school? If so, what was it?
7. Did you eat or drink something before you came to school this morning? If so, what was it?

8. If you didn't eat or drink something before you came to school, did you have something to eat or drink when you got to school or on your way to school? If so, what was it?
9. Did you get up in the night for a snack or drink? If so, what was it?
10. When do you usually go to bed? Did you have a bedtime snack or drink? If so, what was it?
11. What did you do last night? Did you have something to eat or drink there? If so, what was it?
12. Did you watch tv last night? Did you have something to eat or drink while watching tv? If so, what was it?
13. Did you have dinner last night? What did you have for dinner?
14. What time did you get home from school yesterday? Did you stop on the way home for a snack or drink? If so, what was it?
15. Did you have a snack or drink once you got home? If so, what was it?
16. Yesterday at school, did you have an afternoon snack or drink? If so, what was it? Was it anyone's birthday or a celebration?

APPENDIX B

24-hour Dietary Recall

Date _____
ID NO._____

Name of Food Item	Preparation	Serving Size	Comments	FGP Classification					
				G	F	V	MT	MK	F/O/S

APPENDIX B

Serving Sizes

Bread, Cereal, Rice, and Pasta Food Group
1 serving is equal to:
*1 slice of bread
*1/2 cup of cooked cereal, rice, or pasta
*1 ounce of ready-to-eat cereal

Vegetable Food Group
1 serving is equal to:
*1 cup of raw, leafy vegetables
*1/2 cup of cooked or chopped vegetables
*3/4 cup of vegetable juice

Fruit Food Group
1 serving is equal to:
*1 medium apple, orange, or banana
*1/2 cup of chopped, cooked, or canned fruit
*4 oz. cup fruit juice

Milk, Yogurt, & Cheese Food Group
1 serving is equal to:
*1 cup (8 ounces) milk
*1 & 1/2 ounces of natural cheese
*2 ounces of processed cheese

Meat, Poultry, Fish, Dry Beans, Eggs, & Nuts Food Group
1 serving is equal to:
*2-3 ounces of cooked meat
*3 eggs
*1 & 1/2 cups cooked dry beans
*6 tablespoons of peanut butter
*1 cup nuts

Fats, Oils, & Sweets
1 serving is equal to:
*8 oz. pop, juice box
*2 Tablespoons dressing
*1 Tablespoon butter, mayonaise
*Per food label

APPENDIX C

APPENDIX C

My Goal

My Nutrition Goal Is:

_____

_____

_____

Benefits to My Goal:

_____

_____

_____

Barriers to My Goal:

_____

_____

My Plan To Meet This Goal Is:_____

_____

_____

I will meet my goal if I do the above on 5 days in the next week.

My week is from _____ to _____.

I will write down the foods I eat to meet my goal in this notebook every day.

I will write down how much of the food I ate to meet my goal every day.

If I do not eat any foods for my goal on a certain day, I will write "none."

If I am unable to do the above on 5 days in the next week, my goal will not be met.

Daily Food Record

Bread, Cereal, Rice, Pasta Group

One serving equals:
1 slice of bread
1/2 cup of cooked cereal, rice, pasta
1 ounce of ready-to-eat cereal

Food Eaten _____ Number of Servings _____

Today is_____
(day)

Daily Food Record

Fruit Group

One serving equals:
1 medium apple, orange, or banana
1/2 cup chopped fruit, cooked or canned
1/2 cup fruit juice

Food Eaten _____ Number of Servings ____

Today is_____
(day)

Daily Food Record

Vegetable Group

One serving equals:
1 cup of raw, leafy vegetables
1/2 cup cooked vegetables
1/2 cup chopped, raw vegetables
3/4 cup vegetable juice

Food Eaten _____ Number of Servings _____

Today is_____
(day)

Daily Food Record

Milk, Yogurt, Cheese Group

One serving equals:
1 cup (8 oz.) milk
1 & 1/2 oz. of natural cheese
2 oz. of processed cheese

Food Eaten _____ Number of Servings _____

Today is _____
(day)

Daily Food Record

Meat, Poultry, Fish, Dry Beans, Eggs, & Nuts Group

One serving equals:
2-3 ounces of cooked meat, fish, or poultry
3 eggs (1 egg = 1 ounce of meat)
1 & 1/2 cups of cooked dry beans (1/2 cup = 1 oz. meat)
6 tablespoons of peanut butter (2 TBS = 1 oz. meat)
1 cup nuts (1/3 cup = 1 oz. meat)

Food Eaten _____ Number of Servings _____

Today is_____
(day)

Daily Food Record

Fats, Oils, Sweets

One serving equals:
Must Read Label!

Foods Eaten _____ Number of Servings _____

Today is_____
(day)

Daily Food Record

Breakfast

Foods Eaten _____ Number of Servings _____

Today is _____
(day)

APPENDIX D

APPENDIX D

Education Plan

Lesson 1: **Building the Pyramid**

Student Learning Objectives:

1. Students will label the five food groups on the food pyramid.

2. Students will explain the recommended number of servings for each food group.

3. Students will recognize appropriate serving sizes for each food group.

4. Students will describe at least one health benefit for each food group.

Materials:
1. Overhead projector
2. Transparency Master: Sketch of a Pyramid
3. Transparency Masters (set of five): Building the Pyramid
4. Student Worksheets (five): Building the Pyramid

Lesson Procedure:

1. Introduction:
    1. State:

    Today we are going to learn about a new topic. If you know what a pyramid looks like, raise your hand.

    Who can describe the features of a pyramid? (an object with a square base and four sides that are triangles that meet in a point at the top)

    Display the transparency, Sketch of a Pyramid, and state:

    Today we are going to put together some puzzles to create the food guide pyramid.

Activity 1: Labeling the five food groups.

    1. Distribute the puzzle pieces of the Building the Pyramid transparencies so that each student, or group of students, has a piece.

Do not give any of the top, or peak, pieces to the students. These represent the Fats, Sweets, and Oils, which are not a recommended food group. You will place these pieces on the puzzle after the Five Food Groups have been addressed.

2. Share with the students:

There are four sides to the pyramid that we are building. The first side is titles Naming the Five Food Groups. Many of you may have learned about four food groups in the past. As we assemble this puzzle, we will now discuss five important food groups. Soon you will see there's not much difference.

3. Display Transparency 1: Outline from the set, Building the Pyramid. On the transparency, place the title, Naming the Five Food Groups.

4. Share:
We will start at the base. Who has the piece that names one of the food groups and fits the base of the Five Food Groups?

As the student places the correct puzzle piece, ask:

What do we call this food group which forms the base of the pyramid? (Bread, Cereal, Rice, and Pasta group)

5. Share:

To build the next level, we need two more food groups. Who has one food group that fits on this level? What do we call this food group? (the Fruit group or the Vegetable group)

Who has the other food group that belongs on this level? What do we call this food group? (the Fruit group or the Vegetable group) Where do the first three food groups come from? (They all come from plants)

Foods that come from plants tend to be lower in fat and rich in vitamins and minerals. In general, it is healthiest to limit the amount of fat in your diet. Of course the vitamins and mineral you get from foods that come from plants are important for maintaining your health.

6. Share:

Let's look at the next level. Who has a food group that fits? What is the name of the group? (the Milk, Yogurt, Cheese group, or the Meat, Poultry, Fish, Eggs, Dry beans, Nuts group) What's the other group in this level called? (the Milk, Yogurt, Cheese group. or the Meat, Poultry, Fish, Eggs, Dry Beans, Nuts group) Where do these products come from? (They represent animal products)

7. Complete the puzzle by placing Fats, Oils, Sweets at the top of the puzzle. Share:

Notice that we already have five food groups, and we are still missing a piece of the puzzle. I will complete the puzzle with a piece marked Fats, Oil, Sweets. It is NOT one of the basic five food groups, because these foods, such as salad dressings, butter or margarine, soft drinks, and candy, provide little nutrition other than calories. Most people should use these sparingly. That's why it's the smallest piece of the puzzle.

Activity 2: Discuss the recommended number of servings for each of the five food groups.

1. Remove the pieces to Naming the Five Food Groups, and continue to display the outline transparency from the set, Building the Pyramid. On the transparency, place the title, Recommended Number of Servings for the Five Food Groups.

2. Share:

Now that we can name the Five Food Groups, we will put together the puzzle that will tell us the recommended number of servings for each of the five groups.

If you think that your puzzle piece fits on this triangle, please bring it to the front of the room and place it in the right place on the outline now. Allow the students to complete this task and return to their seats.

3. Discuss the range of recommended servings.

You will notice that six to eleven servings from the Bread, Cereal, Rice, and Pasta group are recommended. The actual number of servings that is right for you may vary depending on your age, size, and activity level. Most students your age need about nine servings.

Write "9" on the transparency in the area belonging to the Bread, Cereal, Rice, and Pasta group.

The range for the Vegetable group is three to five servings. Four servings is a good average for your age.

Write "4" on the transparency in area belonging to the Vegetable group.

The range for the Fruit group is two to four servings. Three servings is a good average for your age group.

Write "3" on the transparency in area belonging to the Fruit group.

The range for the Milk, Yogurt, Cheese group is four or more servings. At least four servings are needed by most students your age.

Write "4" on the transparency in the area belonging to the Milk, Yogurt, Cheese group.

The range for the Meat, Poultry, Fish, Eggs, Dry Beans, Nuts group is two to three servings. Unless you are growing very fast right now, two (three ounce) servings should satisfy your needs.

Write "2" on the transparency in area belonging to the Meat, Poultry, Fish, Eggs, Dry Beans, Nuts group.

4. Add the top puzzle piece yourself and share:

There are no recommended servings for the Fats, Oils, Sweets group. Who can guess why? (There is already plenty of fat, oil, and sweets (sugars) that exist naturally in the other five food groups).

Activity 3: Reviewing the health benefits of eating foods from each of the five food groups.

1. Remove the pieces to the set, Recommended Number of Servings for the Five Food Groups, and display the outline transparency from the set, Building the Pyramid. On the transparency, place the title, Health Benefits of the Five Food Groups.

2. Share:

Next, we need to complete the Health Benefits puzzle. If you think your puzzle piece fits on this triangle, please bring it to the front of the room, and, one at a time, place it in the right place on the outline. As you put your piece on the overhead, read what it says to us. Allow the students time to complete this task and return to their seats before continuing the discussion.

3. Share:

Look at the health benefits for each of the five food groups. You may remember these facts from studying nutrition in an earlier grade.

4. Add the top puzzle piece, and share:

It comes as no surprise that there are very few health benefits to the Fats, Oils, and Sweets group.

Activity 4: Introduce the appropriate serving sizes for the common foods from each of the five food groups.

1. Remove the pieces to the set, Health Benefits of Five Food Groups, and display the outline transparency from the set, Building the Pyramid. On the transparency, place the title, Serving Sizes for the Five Food Groups.

2. Share:

Finally, we need to complete the Serving Sizes puzzle. If you think your puzzle piece fits on this triangle, please bring it to the front of the room, and, one at a time, place it in the right place on the outline. As you put your piece on the overhead, read what it says to us. Allow the students time to complete this task and return to their seats before continuing the discussion.

3. State:

This fourth side of the pyramid is a bit more complicated. For this reason, our next lesson will give you the opportunity to see what actual serving sizes look like. We will be measuring some different foods from each of the five food groups.

4. Add the top piece and state:

There are no serving sizes recommended for the Fats, Oils, and Sweets group.

Activity 5: Hands-On Activity: Building a Pyramid

1. Distribute the four student worksheets so that each student receives one of each of the four sides of the pyramid. Each student will need scissors, glue, crayons, or markers to color, decorate, and create a pyramid. If magazine pictures of food are available, these can be used to decorate the pyramid.

Activity 6: Taste-testing

Activity 7: Summarize by asking:

Today we pieced together a pyramid of five food groups.

Who can name a food group, tell its health benefit, and give the recommended number of servings for most students your age?

Gather responses until all the food groups have been named.

Who has a guess about how the basic four food groups became the basic five food groups? (The Fruit and Vegetable group in the basic four food groups became two groups: the Fruit group and the Vegetable group)

State: In our next lesson, we will study the serving sizes of a variety of foods from each of the five food groups.

Lesson 2: What's in a Serving?

Student Learning Objectives:

1. Students will demonstrate measuring serving sizes of common foods from the five food groups.

2. Students will estimate the number of servings in various portions of food from the five food groups.

Materials:
1. Foods from the five food groups
2. Scales
3. Measuring cups
4. Serving dishes

Lesson Procedure:

1. Introduction:

    1. Share with the students:

    In our last nutrition class, we pieced together a Food Guide Pyramid. We talked about the five food groups and recommended number of servings for each group. Who can tell me how many servings of bread, cereal, rice, or pasta are recommended for most students your age? (9) Vegetables? (4) Fruits? (3) Milk, Yogurt, and Cheese? (4) Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts? (2) Fats. Oils, and Sweets? (0)

    We briefly reviewed the amounts of food that may comprise a serving. Today you will have the opportunity to see individual servings of various foods. In some instances, you will be able to measure or weigh some of the foods.

    Once you are familiar with the approximate serving sizes, you will be able to estimate the number of servings that you eat each day.

    2. State:

    We will be handling different foods today. Before we handle food, what is one very important thing that we all must do? (wash our hands) Why is this important? (to reduce the spread of germs) As you weigh and measure the food, use utensils to avoid touching the food whenever possible. Allow children to wash hands.

Activity 1: Demonstrate measuring serving sizes for different foods.

1. Divide the class into five groups. Designate a beginning station for each group. Ask students to go to their first station.

2. Explain the order of rotation from station to station.

3. Indicate that you will be the timekeeper and you will let the students know when they have one minute left and when their time is up at each station. They will have approximately five minutes at each station.

4. Briefly describe what will be done at each station.

Instruct the first group at each station to do the weighing and measuring. Foods can be left in/on the plates/bowls/glasses for the other groups to observe during the group rotations. It will be the job of the last group to replace foods back into the storage containers. At each station ask the students:

Are these serving sizes larger or smaller than you expected?

5. rotate the groups until each group has completed each station activity. Have the students return to their seats when they have completed all stations.

Activity 2: Estimate the number of servings in different portions of food.

1. Distribute a copy of the Student Worksheet to each student and explain that they can work on this alone or in pairs.

2. Supply the correct answers to the Student Worksheet, How Many Servings?, by calling on different students to share their answers.

Activity 3: Taste-testing

Activity 4: Summarize by stating:

Raise your hand if some of the serving sizes surprised you by being larger or smaller that you expected.

As you completed your worksheet, you probably noticed that sometimes we get more than one serving from a portion of food. For example, a sandwich with two slices of bread provides two servings from the Bread, Cereal, Rice, and pasta group.

Remember that these are estimates to assist you in making healthy food choices. Healthy eating means eating enough and not too much of a variety of foods.

In our next lesson, we will look at the five food groups and the importance of eating foods from all the major food groups.

STATION I CARD–Directions

Bread, Cereal, Rice, Pasta Group

REMEMBER:
One serving of Bread, Cereal, Rice, Pasta equals...
...1 slice of bread
...1/2 cup of cooked cereal, rice, or pasta
...1 oz. of ready-to-eat cereal

1. Notice that a single slice of bread is one serving. A sandwich made with 2 slices of bread would give you 2 servings from this food group.

2. A student volunteer from your group will measure cooked rice, cereal, or pasta.
   Step 1: Spoon or pour the food into the measuring cup to the 1/2 cup mark.
   Step 2: Pour the food from the measuring cup to a serving dish or plate.
   Step 3: Allow all students in your group to observe the serving size.
   Step 4: After all of the students have observed the serving, scrape the food back into the storage container.

3. Two student volunteers from your group will weigh 1 ounce of ready-to-eat cereal.
   Step 1: Volunteer #1 will weigh an empty bowl and leave it on the scale.
   Step 2: On a sheet of paper, volunteer #2 will record the weight of the bowl; add 1 ounce; and calculate the total weight of the bowl plus cereal.
   Step 3: As volunteer #1 gradually spoons cereal into the bowl volunteer #2 will watch the scale until it reaches the total weight as calculated in step #2.
   Step 4: After all of the students have observed the serving, put the food back into the storage contained.

4. Can you explain why we weighed the empty bowl first?

STATION II CARD–Directions

Vegetable Group

REMEMBER:
One serving of Vegetables equals...
...1 cup of raw, leafy vegetables
...1/2 cup cooked vegetables
...1/2 cup chopped raw vegetables
...3/4 cup vegetable juice

1. A student volunteer from your group will measure chopped, raw vegetables.
   - Step 1: Spoon or pour the food into the measuring cup to the 1/2 cup mark.
   - Step 2: Pour the food from the measuring cup to a serving dish or plate.
   - Step 3: Allow all students in your group to observe the serving size.
   - Step 4: After all of the students have observed the serving, scrape the food back into the storage container.

2. A student volunteer from your group will measure cooked vegetables.
   - Step 1: Spoon or pour the food into the measuring cup to the 1/2 cup mark.
   - Step 2: Pour the food from the measuring cup to a serving dish or plate.
   - Step 3: Allow all students in your group to observe the serving size.
   - Step 4: After all of the students have observed the serving, scrape the food back into the storage container.

3. A student volunteer from your group will measure raw, leafy vegetables.
   - Step 1: Use tongs to put leafy greens into the measuring cup to the 1 cup mark.
   - Step 2: Pour the food from the measuring cup to a serving dish or plate.
   - Step 3: Allow all students in your group to observe the serving size.
   - Step 4: After all of the students have observed the serving, scrape the food back into the storage container.

4. A student volunteer from your group will measure vegetable juice.
   - Step 1: Pour the juice into the measuring cup to the 3/4 cup (6 ounce) mark.
   - Step 2: Pour the juice from measuring cup to the glass.
   - Step 3: Allow all students in your group to observe the serving size.
   - Step 4: After all of the students have observed the serving, pour the juice back into the storage container.

STATION III CARD–Directions

Fruit Group

REMEMBER:
One serving of Fruit equals...
...1 medium apple, orange, or banana
...1/2 cup chopped fruit, cooked or canned
...3/4 cup fruit juice

1. Notice that one medium-sized apple, orange, or banana is one serving.

2. A student volunteer from your group will measure chopped fruit, cooked or canned.
   Step 1: Spoon or pour the food into the measuring cup to the 1/2 cup mark.
   Step 2: Pour the food from the measuring cup to a serving dish or bowl.
   Step 3: Allow all students in your group to observe the serving size.
   Step 4: After all of the students have observed the serving, scrape the food back into the storage container.

3. A student volunteer from your group will measure fruit juice.
   Step 1: Pour the juice into the measuring cup to the 3/4 cup (6 ounce) mark.
   Step 2: Pour the juice from the measuring cup to the glass.
   Step 3: Allow all students in your group to observe the serving size.
   Step 4: After all students have observed the serving, pour the juice back into the storage container.

STATION IV CARD–Directions

Milk, Yogurt, Cheese Group

REMEMBER:
One serving of Milk, Yogurt, Cheese equals...
...1 cup (8 oz.) milk
...1 and 1/2 ounces of natural cheese
...2 ounces of process cheese

1. A student volunteer from your group will measure the milk.
   Step 1: Pour the milk into the measuring cup to the 1 cup (8 ounces) mark.
   Step 2: Pour the milk from the measuring cup to a glass.
   Step 3: Allow all students in your group to observe the serving size.
   Step 4: After all of the students have observed the serving, pour the milk back into the storage container.

2. Two student volunteers from your group will weigh 1&1/2 ounces of natural cheese.
   Step 1: Volunteer #1 will weigh an empty plate and leave it on the scale.
   Step 2: On a sheet of paper, volunteer #2 will record the weight of the plate; add 1 and 1/2 ounces; and calculate the total weight of the plate plus the cheese.
   Step 3: As volunteer #1 uses tongs to place slices of cheese (one by one) on the plate, volunteer #2 will watch the scale until it reaches the total weight as calculated in step #2.
   Step 4: After all of the students have observed the serving, scrape the food back into the storage contained.

3. Two student volunteers from your group will weigh 2 ounces of process cheese.
   Step 1: Volunteer #1 will weigh an empty plate and leave it on the scale.
   Step 2: On a sheet of paper, volunteer #2 will record the weight of the plate; add 2 ounces; and calculate the total weight of the plate plus the cheese.
   Step 3: As volunteer #1 uses tongs to place slices of cheese (one by one) on the plate, volunteer #2 will watch the scale until it reaches the total weight as calculated in step #2.
   Step 4: After all of the students have observed the serving, scrape the food back into the storage contained.

STATION V CARD–Directions page 1

Meat, Poultry, Fish, Dry Beans, Eggs, Nuts Group

REMEMBER:
One serving of Meat, Poultry, Fish, Dry Beans, Eggs, Nuts equals...

...2 to 3 ounces of cooked, lean meat, fish, or poultry
...3 eggs (1 egg=1 oz. meat)
...1 and 1/2 cups of cooked dry beans (1/2 c=1oz. meat)
...6 tablespoons of peanut butter (2 T.=1 oz. meat)
...1 cup nuts (1/3 cup = 1 oz. meat)

1. Two student volunteers from your group will weigh 3 oz. lean meat, poultry or fish.
   - Step 1: Volunteer #1 will weigh an empty plate and leave it on the scale.
   - Step 2: On a sheet of paper, volunteer #2 will record the weight of the plate; add 3 oz.; and calculate the total weight of the plate plus 3 oz. meat, poultry, or fish.
   - Step 3: As volunteer #1 uses tongs to place slices of meat (one by one) on the plate, volunteer #2 will watch the scale until it reaches the total weight as calculated in step #2.
   - Step 4: After all of the students have observed the serving, scrape the food back into the storage contained.

2. Notice that one egg is equal to one ounce of lean meat. A serving is 2-3 eggs.

3. A student volunteer from your group will measure the beans.
   - Step 1: Pour the beans into the measuring cup to the 1 cup mark.
   - Step 2: Pour the food from the measuring cup to a bowl. This is equal to 2 oz. meat.
   - Step 3: Pour additional beans into the measuring cup to the 1/2 cup mark and add this to the 1 cup of the beans measured in step # 1.
   - Step 4: Allow all of the students in your group to observe the serving size (1 and 1/2 cups beans). This is equal to 3 oz. meat.
   - Step 5: After all of the students have observed the serving, scrape the food back into the storage container.

STATION V CARD–Directions page 2

Meat, Poultry, Fish, Dry Beans, Eggs, Nuts Group (continued)

4. A student volunteer from your group will measure peanut butter.
   - Step 1: Measure 6 level tablespoons of peanut butter. Using the spatula, scrape each tablespoon of peanut butter onto a single plate.
   - Step 2: If you wish, spread peanut butter on a slice of bread.
   - Step 3: Allow all of the students in your group to observe the serving size.
   - Step 4: After all of the students have observed the serving, scrape the food back into the storage container.

5. A student volunteer from your group will measure nuts.
   - Step 1: Spoon or pour the nuts into the measuring cup to the 1 cup mark.
   - Step 2: Pour the food from the measuring cup to a bowl.
   - Step 3: Allow all of the students in your group to observe the serving size.
   - Step 4: After all of the students have observed the serving, scrape the food back into the storage container.

NOTE: Foods high in fat, such as eggs and peanut butter, should not be eaten in the usual full serving. About two tablespoons of peanut butter (a generous sandwich) has 16 grams of fat. In addition, it is best to eat only 3-4 eggs a week. So, choosing another source of food from the Meat, Poultry, Fish, Dry Beans, Eggs, Nuts Group is recommended.

NAME _____

How Many Servings?

Record the number of servings you think there are in the following foods:

	Food	Number of Servings
1.	Hamburger roll	
2.	Tortilla shell (small)	
3.	3-4 plain crackers	
4.	Bagel	
5.	*Doughnut (medium)	
6.	Cookies (2 medium)	
7.	1 cup macaroni	
8.	*French fries (20)	
9.	Large banana	
10.	Large glass of orange juice	
11.	Tomato sauce on 2 slices of pizza	
12.	2 cups hot chocolate	
13.	*3 cups of ice cream	
14.	1 cup of frozen yogurt	
15.	1 medium chicken leg	
16.	1 medium hamburger patty	
17.	1 cup refried beans	
18.	2 cups popcorn	

*NOTE: Foods high in fat should not be eaten frequently. Number and sizes of servings are determined by the nutrients the foods contain, but not by other health considerations such as the amount of fat. For instance, the usual recommended intake of ice cream would be 1/2 cup. However, if ice cream were the only way a person ate calcium, they would need to eat 1 and 1/2 cups (21 grams fat) to be equal to 1 cup low fat milk or yogurt (3-5 grams fat). Eating a minimum amount of fat is the healthiest choice. So, a choice other than ice cream for your only source of calcium is best.

Lesson IV-2
Teacher Key

NAME _____

How Many Servings?

Record the number of servings you think there are in the following foods:

	Food	Number of Servings
1.	Hamburger roll	2
2.	Tortilla shell (small)	1
3.	3-4 plain crackers	1
4.	Bagel	2
5.	*Doughnut (medium)	2
6.	Cookies (2 medium)	1
7.	1 cup macaroni	2
8.	*French fries (20)	2
9.	Large banana	2
10.	Large glass of orange juice	2
11.	Tomato sauce on 2 slices of pizza	1
12.	2 cups hot chocolate	2
13.	*3 cups of ice cream	2
14.	1 cup of frozen yogurt	1
15.	1 medium chicken leg	1
16.	1 medium hamburger patty	1
17.	1 cup refried beans	2
18.	2 cups popcorn	1

*NOTE: Foods high in fat should not be eaten frequently. Number and sizes of servings are determined by the nutrients the foods contain, but not by other health considerations such as the amount of fat. For instance, the usual recommended intake of ice cream would be 1/2 cup. However, if ice cream were the only way a person ate calcium, they would need to eat 1 and 1/2 cups (21 grams fat) to be equal to 1 cup low fat milk or yogurt (3-5 grams fat). Eating a minimum amount of fat is the healthiest choice. So, a choice other than ice cream for your only source of calcium is best.

Lesson 3: The Importance of Proportion

Student Learning Objectives:

1. Students will understand the importance of eating foods from all five major pyramid groups.

2. Students will understand the importance of eating more servings from the grain, vegetable, and fruit groups than the other pyramid groups.

3. Students will demonstrate accurate reading and interpretation of food labels.

Materials:
1. Overhead projector
2. Transparency Master: Building the Pyramid
3. Food Labels

Lesson Procedure:

1. Introduction:

    1. State:

    At our last class, we looked at the serving sizes of the five food groups. In our first class, we examined the FGP and the five food groups. Today, we are going to return to the FGP and look at it more closely. Place Transparency Master, Building the Pyramid on the overhead.

    Review the recommended number of servings for each food group. Does anyone notice what happens to the recommended number of servings as you climb the pyramid? (the number of servings gets smaller)

    You may also remember that we talked about the health benefits of each food group. It is important to eat a variety of foods from the five food groups. But based on the pyramid, what food groups should we eat most of our foods from? (grains, vegetables, and fruits)

Activity 1: Diet Recall

    1. We are going to look at what you ate for breakfast today to see what food groups you are eating the most of.

    2. Hand out pyramid proportion worksheet, have students complete the worksheet. Ask entire class how many servings of each food group they consumed and record numbers on overhead. Review results with class.

3. Remind class that we are looking at just one meal in the day, there are many opportunities to eat foods from the grain, vegetable, and fruit groups.

4. Discuss ways students can increase their consumption of grains, vegetables, and fruits.

Activity 2: Reading food labels

State:

1. Now that we have reviewed the recommended number of servings in each food group, let's talk about serving sizes again. At our last class, you measured out serving sizes. What's another way to learn about serving sizes? Hold up a food label.

2. Review the important information on a food label, point out how to read what constitutes a serving size and how many servings are in a container.

3. We will come back to food labels in our next class when we talk about the top category on the FGP.

Activity 3: Pyramid Concentration

1. Have children break up into groups of 3-4, pass out game to each group.

2. The object of the game is to match pictures of food with the correct food group.

Activity 4: Taste-testing

Activity 5: Summarize

Who can tell me which food groups you should eat the most foods from? (grains, vegetables, and fruits) Is it important to eat foods from all the food groups? (yes)

At our last class, we will talk about the point of the pyramid, the Fats, Oils, and Sweets, how many servings of this group should you have a day? (none)

Lesson 4: Limiting Fats

Student Objectives:

1. Identify health habits that reduce the risk of obesity.

2. Compare the fats, oils, and sweets contained in different snack foods.

3. Students will select examples of nutritious snack foods.

4. Compare the fat in common fast food items.

Materials:
1. Food labels from snack foods
2. Food containers from fast-food restaurants

1. Introduction:

    1. Share with students:

    In our previous classes, we talked about the FGP. Who remembers the name of the food group at the top of the pyramid? (Fats, Oils, and Sweets) If you think this is one of the five recommended food groups, raise your hand. If you think it is NOT one of the five food groups, raise your hand. No, it isn't.

    Why not? (We want to avoid too many of these foods in our diet, because these foods add calories without adding nutrients we need for healthy bodies)

    2. State:

Today we will learn now to recognize nutritious, low fat snack foods and how to use what we know about foods to stay healthy and maintain healthy body weight.

Activity 1: Identify health habits that reduce the risk of obesity.

1. Share:

The Fats, Oils, and Sweets food groups doesn't necessarily make us fat, nor does it need to be eliminated from our diets. But, there are more than twice the calories in fat than in the same amount of protein or carbohydrate.

If your body receives more calories than it needs for growth and energy, your body may begin to store that extra energy as fat.

Those excess calories come from too much of any food, but most often excess calories come from fats, oils, and sweets. Foods high in fats and oils should be eaten less often.

No one wants to weigh more than he/she should. There are a number of ways to avoid weighing more than you should. Who can describe one way?

2. Record the students' answers on the board. Be sure the following ideas are included:
*eat at least the minimum number of servings from each of the five food groups daily
* pay attention to the serving size
*limit foods with excess fats, oils, and sweets
*get 30 minutes of exercise a day

3. Share:

Each of us is different. Some of us are tall, others are short. Some of us have a large body structure, others have a small body structure. No matter how different we are, each of us can look our best and be our healthiest. The two things that we do every day that greatly affect our health and our looks are what we eat and how physically active we are.

Activity 2: Compare the fats, oils, and sweets contained in different snack foods.

1. Divide the class into groups of 3-4. Students will be asked to compare two snacks and record which snack they think has the least amount of fat in a serving. The group with the most correct answers will be the winner.

Activity 3: Reading food labels

1. Share:

We talked briefly about food labels at our last class. We were interested in the serving size of a food then. Now we will look at the food labels of the foods you just talked about and look at the information on the fat content.

Activity 4: Compare the fats, oils, and sweets in common fast-food items.

1. Fast-food containers will be shown to the students. Comparisons will be made as to the amount of fat and oil in common fast-foods.

2. Students will review fast-food menus. Discuss how students can select foods lower in fat.

Activity 5: **Taste-testing**

Activity 6: Conclusion

Share:

Today we have spent our time talking about the point of the pyramid, the Fats, Oils, and Sweets. We have talked about why it's important to eat these foods sparingly. Who can share some ideas on other ways to have a healthy body?

APPENDIX E

APPENDIX E

Consent Form

Dear Parent(s) or Guardian(s),

My name is Jacquie Kiefer and I am a nurse and a graduate student at Grand Valley State University. I have received permission from _____ School to conduct a study with your child's fourth-grade classroom, and a second fourth-grade classroom, regarding children's eating habits. I will ask each student in the study to remember what he or she has eaten for the past 24-hours, both at the beginning of the study and, at the end of the study. I will watch some of the students while they eat lunch to compare their recall with what I see. The students in one classroom will also sit down with me and make a goal for improving what they eat. This is called mutual goal setting. The classroom that takes part in mutual goal setting will be decided by a flip of a coin. The students who make goals will be asked to keep a diary of their goal for about 2 weeks, which they will work on at school. A registered dietitian will teach 4 classes on nutrition to all the fourth-grade students. The classes will focus on the Food Guide Pyramid recommendations.

This research is expected to help nurses and other health educators learn ways to help children eat a healthy diet. The children will learn which foods and the amounts of the foods needed to stay healthy. The amount of time your child will spend telling me about his or her food intake will total about 40 minutes, and it will take about 10 minutes for your child to set a food intake goal. The students who make food goals will be asked to write about their goal every day for about 2 weeks. This should not take more than 2-3 minutes per day. The majority of these activities will take place at school during your child's science period and free time after lunch. Your child will be asked to write about his or her food goal during one weekend at home. Your child will not be graded on these activities, and it is not expected that this study will lead to any physical or emotional harm to your child.

Your child will receive a small prize for the return of this form, whether you want them to participate in the study or not. All students who return the form by **May 3** will be eligible for a drawing for a $20 Meijer gift certificate, whether you want them to participate in the study or not. The students who set goals will also receive stickers for writing in their goal diary every day. Students who do not set goals may receive stickers for completing worksheets about proper nutrition.

The information taught in the nutrition classes is the information the state of Michigan approves for health education in the schools. All of the students, in both classrooms, will receive the same nutrition education even if they do not have permission to participate in the study. This is because it is the health information usually learned in the fourth grade.

All of the information your child gives to me will be kept private and in my possession during the study. Your child's name will be coded on the diet recalls. I will be reviewing your child's school record to note their ethnic background and household income. This information will also be coded and kept confidential. All the information will be destroyed after the study has been published. The results of the study will be printed in a final thesis report. You may have a copy of the study results of the group data, if you wish.

Your child's participation in this study is voluntary. Both you, as the parent/guardian, and your child are free to decide not to participate in this study or to withdraw at any time without any negative effects to you or your child. Your child may be excluded from the study if he or she does not read and write English. If your child is on a medically prescribed diet, please let me know on the bottom of this form. The dietitian will make sure that your child's prescribed diet is followed. If your child is on a special diet for religious reasons, please let me know on the bottom of this form.

You have the right to have any questions about this study answered and may call the investigator, Jacquie Kiefer at _____, to have these questions answered. If you have any questions about your child's rights that have not been answered by the investigator, you may contact the Grand Valley State University, Human Subjects Review Committee Chair, Professor Paul Huizenga at _____.

Thank-you for your time.

Please Have Your Child Return This Section to Their Teacher By May 3

I, _____, the legal guardian of _____,
(legal guardian's name) (child's name)
_____give permission, _____do not give permission (check one)
for him/her to participate in the study on nutrition and mutual goal setting.

Please indicate if your child has:
Medically prescribed dietary restriction? _____
If "Yes," please describe: _____
_____
Dietary restrictions because of religious beliefs? _____
If "Yes," please describe: _____
_____

All Forms Returned By May 3 Will Be Entered in a Drawing For a $20 Meijer Gift Certificate, Whether Consent is Received or Denied

Each student will also receive a small prize for the return of this form, whether you give permission for him or her to participate in the study or not.

APPENDIX F

APPENDIX F

Pretest Consent Form

My name is Jacquie Kiefer and I am a nurse and a graduate student at Grand Valley State University. I am doing a research study on fourth-graders to learn if goal setting, related to their nutrition, has an effect on what they eat. I would like to confirm the way I will be gathering dietary information from the fourth-graders. I will be asking your child to remember what he or she has eaten for the past 24-hours in an interview at my home. This should take about 20 minutes. A registered dietitian will ask your child to repeat the same information about 1 hour later, this should take about 20 minutes. The information I learn will help me identify any problems with the method.

It is not expected that this interview will cause your child any harm.

Your child will receive a small incentive for taking the time to be interviewed.

All of the information your child gives to myself and the dietitian will remain confidential. The information will be destroyed at the end of the study. You may have a copy of the results of the study, if you wish.

You have the right to have any questions about this interview answered and may call the investigator, Jacquie Kiefer at _____, to have these questions answered.

If you have any questions about your child's rights that have not been answered by the investigator, you may contact the Grand Valley State University, Human Subjects Review Committee Chair, Professor Paul Huizenga at _____.

Your child's participation in this interview is voluntary. Both you, as the parent/guardian, and your child are free to decide not to participate or to end the interview at any time without any negative effects to you or your child.

Thank-you for your time.

I, _____, the legal guardian of _____,
(legal guardian's name) (child's name)

_____give permission, _____do not give permission (check one)

for him/her to be interviewed twice, for a diet history.

APPENDIX G

APPENDIX G

Parent Handout

Dear Parent(s) or Guardian(s),

For the past few weeks, your child has been learning about the Food Guide Pyramid. This information was given to your child as part of a study I am doing on fourth-graders and their eating habits. I am sending you these materials so you may see the kind of information your child received.

There is information on the:

*Food Guide Pyramid
*Recommended number of servings
*Serving sizes
*Limiting fat intake
*Reading labels
*The importance of breakfast
*Recipes

I have also included a food pyramid worksheet. You may have your child record their diet for a day to see how well they meet the recommendations of the Food Guide Pyramid.

If you have any questions related to this information or to nutrition, please feel free to contact me or your child's teacher.

Thank-you,

Jacquie Kiefer, RN

Good for You!

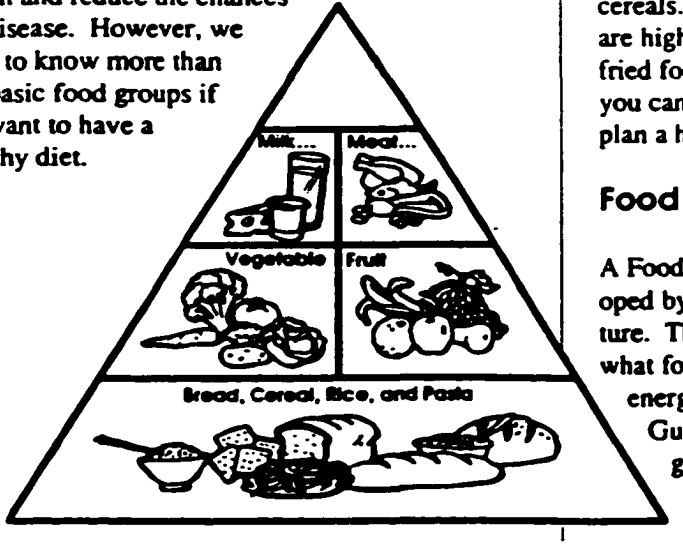
Working Together to Keep Our Youth Healthy
Family Resource

Eating Healthy— More Than the Basic Food Groups

Did you know...

- Michigan's children are overweight – 34% of the boys and 33% of the girls ages 5 to 18.
- Parents can help children be more physically active by walking with them. Exercise helps to maintain a healthy body weight.
- Children can learn to eat healthy, low fat snacks instead of candy, chips, and rich cookies.
- We no longer have four food groups.

All of these statements are true! We have been learning about food and what to eat to stay healthy. Your child knows about the five food groups! He or she also knows that eating foods from the five food groups each day will promote health and reduce the chances for disease. However, we need to know more than the basic food groups if we want to have a healthy diet.



Dietary Guidelines for Americans

In order to help people have healthy eating habits, the U.S. Department of Agriculture has developed the "Dietary Guidelines for Americans." These Guidelines are for people 2 years of age or more. Dietary Guidelines are:

- Eat a variety of foods.
- Maintain healthy weight.
- Choose a diet low in fat, saturated fat, and cholesterol.
- Choose a diet with plenty of vegetables, fruits, and grain products.
- Use sugars only in moderation.
- Use salt and sodium only in moderation.
- If adults drink alcoholic beverages, do so in moderation.

In general, children in Michigan eat too few fruits, vegetables, breads, and cereals. They eat too many foods that are high in fat, such as cakes, candy, and fried foods. Keep reading to see how you can help your child and your family plan a healthier diet!

Food Guide Pyramid

A Food Guide Pyramid has been developed by the U.S. Department of Agriculture. The Food Guide Pyramid shows what foods are needed for growth, energy, and good health. The Food Guide Pyramid, pictured at left, will give you a general idea of what to eat each day.

Good for You!

How to Make the Pyramid Work for You

Number of Servings

The Pyramid shows a range of servings for each major food group. The number of servings that are right for you depends on how many calories you need. The number of calories you need depends on your age, sex, size, and how active you are. The following calorie level suggestions are based on recommendations of the National Academy of Sciences:

1,600 calories
Needed for many women who are not very active and some older adults

2,200 calories
Needed for most children (over 2 years of age), teenage girls, active women, and many men who are not very active–women who are pregnant or breast feeding may need somewhat more

2,800 calories
Needed for teenage boys, many active men, and some very active women

The following chart tells you the recommended number of servings for each food group at the three calorie levels:

Serving Sizes

The amount of food that counts as a serving is listed below. If you eat a larger portion, simply estimate how many servings you had. You need not measure your food. A combination food, such as macaroni and cheese, will contribute servings from two different food groups.

Bread, Cereal, Rice, and Pasta

1 slice of bread
1 oz. of ready-to eat cereal
1/2 cup of cooked cereal, rice, pasta

Vegetable

1 cup of raw leafy vegetables
1/2 cup of other vegetables, cooked, or chopped raw
3/4 cup of vegetable juice

Fruit

1 medium apple, orange, banana
1/2 cup of chopped, cooked, or canned fruit
3/4 cup of fruit juice

Milk, Yogurt, and Cheese

1 cup of milk or yogurt
1 and 1/2 oz. of natural cheese
2 oz. of processed cheese

Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts

2-3 oz. of cooked lean meat, poultry, or fish (1 ounce of lean meat equals 1/2 cup cooked dry beans, 1 egg, 2 tablespoons of peanut butter, or 1/3 cup nuts)

	Calorie Level		
	1,600	2,200	2,800
Bread Group Servings	6	9	11
Vegetable Group Servings	3	4	5
Fruit Group Servings	2	3	4
Milk Group Servings	2-3*	2-3*	2-3*
Meat Group (ounces)**	5 oz.	6 oz.	7 oz.

**Women who are pregnant or breast feeding, teenagers, and young adults to age 24 need three servings.*
***One serving of meat is two to three ounces of lean meat, fish, poultry. A substitute for one ounce of meat is 1/2 cup cooked dry beans, one egg, two tablespoons of peanut butter, or 1/3 cup of nuts.*

Good for You!

Working Together to Keep Our Youth Healthy
Family Resource

How to Limit Fat, Saturated Fat, and Cholesterol

In the Dietary Guidelines for Americans, the U.S. Department of Agriculture recommended that Americans limit fat in their diets to 30 percent of calories. This means:

53 grams of fat each day in a 1,600-calorie diet
73 grams of fat each day in a 2,200-calorie diet
93 grams of fat each day in a 2,800-calorie diet

If you don't want to count fat grams each day, these guidelines might help you:

Choose	Avoid
Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Food Group	
• Lean beef or ham • Skinless turkey or chicken • Fish or shellfish • Dried beans	• Hot dogs or lunch meats • Sausage and bacon • Regular ground beef • Breaded fried meats or fish
Milk, Yogurt, and Cheese Food Group	
• Non fat or low fat milk, yogurt, frozen yogurt, cottage cheese, ice milk • Low fat cheeses	• Whole milk • Regular cheeses • Cream • Ice cream
Fruit Food Group	
• All (except coconuts and avocados) when eaten plain or raw • All fruit juices	• Fruit salads with whipped cream or high fat dressings • Fruit pies
Vegetable Food Group	
• All when baked, grilled, steamed, broiled • Any eaten raw, without cheese, margarine, butter, cream or high fat dips, mayonnaise, or salad dressings	• All when fried or deep fried, such as French fries, breaded fried zucchini or mushrooms • Any with cream cheese, butter or margarine • Salads with high fat dressings
Bread, Cereal, Rice and Pasta Food Group	
• Breads • Cereals • Pastas • Rice	• Pastas with rich sauces • Croissants • Butter-topped bread • Some pastries • Some crackers

When you think about snacks, choose angel food and other low fat cakes, low fat crackers, plain popcorn, or pretzels. Try to avoid pies, cakes, pastries, cheesecakes, cookies, brownies, popcorn with butter or margarine, potato and corn chips, and candy bars.

Good for You!

Working Together to Keep Our Youth Healthy
Family Resource

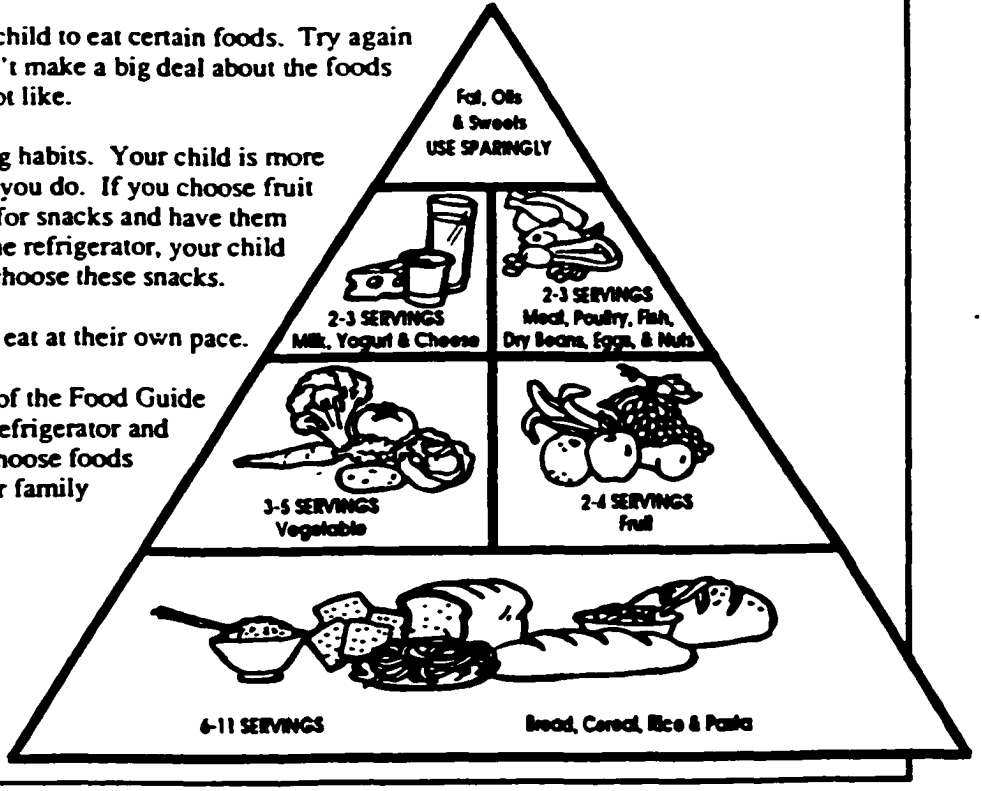
Just a few more tips for cutting down on fat...

- Use unsaturated vegetable oils and margarines that list a liquid vegetable oil as first ingredient on the label.
- Read nutrition and ingredient labels on food packages to check the kinds and amounts of fat the product contains.
- Limit the use of products that contain a large amount of saturated fats, such as nondairy creamers, pie crusts, other pastries, cake, and cookies.
- Limit your intake of egg yolks to 3-4 per week if you are concerned about cholesterol (including those in packaged/prepared foods).

Make Mealtime More Enjoyable

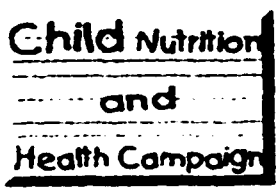
Here are some ideas that can help mealtime be more relaxed and fun!

- Let your child help plan the menu. Children are more likely to eat fruits and vegetables when they have helped choose them.
- Don't force your child to eat certain foods. Try again another day. Don't make a big deal about the foods your child does not like.
- Model good eating habits. Your child is more likely to eat what you do. If you choose fruit or low fat yogurt for snacks and have them in plain view in the refrigerator, your child is more likely to choose these snacks.
- Allow children to eat at their own pace.
- Tape this picture of the Food Guide Pyramid to your refrigerator and have your child choose foods that will help your family be healthier.



Breakfast--Still Kids Most Important Meal of the Day

Breakfast is the most important meal of the day. It fuels your child with enough energy to learn and play. Encouraging good breakfast eating habits early in life provides good nutrition for the short haul and good eating habits for a lifetime. However, if you're like many of today's parents, mornings are hectic--getting yourself and your children dressed and ready for the day and taking care of morning chores often mean little or no time for breakfast for the family. What can you do?



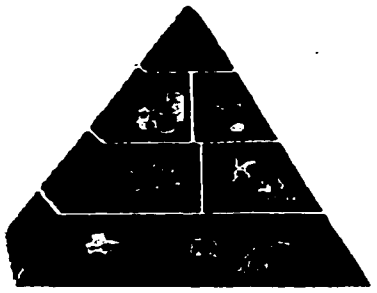
The best laid plans . . .

With a little planning the night before, you can be sure that your kids begin the next day with the best nutrition start possible. Before bed, put out plates, bowls, utensils, cereal boxes, and bagels or bread. In the morning add a serving of fruit, such as bananas or peaches, and low-fat milk to the cereal or pop the bread in the toaster and add a spread of margarine or preserves. You have a quick and nutritiously balanced breakfast.

But don't forget yourself and your own breakfast. You, too, will have a better, more nutritious day if you sit down and eat breakfast with your children. It can be an enjoyable start to the day. However, if you find yourself running out of time for breakfast, at least grab a granola bar and a box of juice or milk for your own burst of energy!

Tips for those who skip breakfast

If you have a breakfast skipper in your home, try instilling new habits by offering quick and nutritious choices, like a granola bar and juice, yogurt with fresh fruit, or even a slice of pizza left over from last night's dinner with a glass of juice. A balanced and healthful breakfast can include two servings from the bread, cereal, rice, and pasta group, a serving from the fruit group, and a serving from the milk, yogurt, and cheese group of the Food Guide Pyramid.



Breakfast provides the get up and go

Breakfast is important because it provides a major part of a child's daily energy supply. Children who eat breakfast are better nourished than those who skip breakfast. Also, children who eat breakfast are more likely to meet their daily need for certain essential vitamins and minerals than breakfast skippers.

Healthy, nutritious breakfast choices can include cereal, toast, bagels, or English muffins. Children who eat breakfast consisting of a bowl of ready-to-eat sweetened cereal, skim milk, and a glass of juice start their day the low-fat way and meet some of their iron and B-vitamin requirements for the day. Pancakes, waffles, or a veggie omelet served with a glass of juice and milk is also nutritious fare, providing a good balance of protein, vitamins, and minerals to begin the day.

The calories supplied by breakfast provide children with energy to get through the morning until snack or lunch time. Studies show that children who eat breakfast

learn better,
are more alert and attentive,
are more likely to participate in activities.

For more information

The American Dietetic Association/National Center for Nutrition and Dietetics Consumer Nutrition Hotline
For food and nutrition information or for a referral to a registered dietitian in your area, call 800/366-1655. For customized answers to your food and nutrition questions by a registered dietitian, call 900/CALL-AN-RD (900/225-5267). The cost of the call will be $1.95 for

the first minute and $.95 for each additional minute.

This fact sheet is supported by a grant from Kellogg USA.

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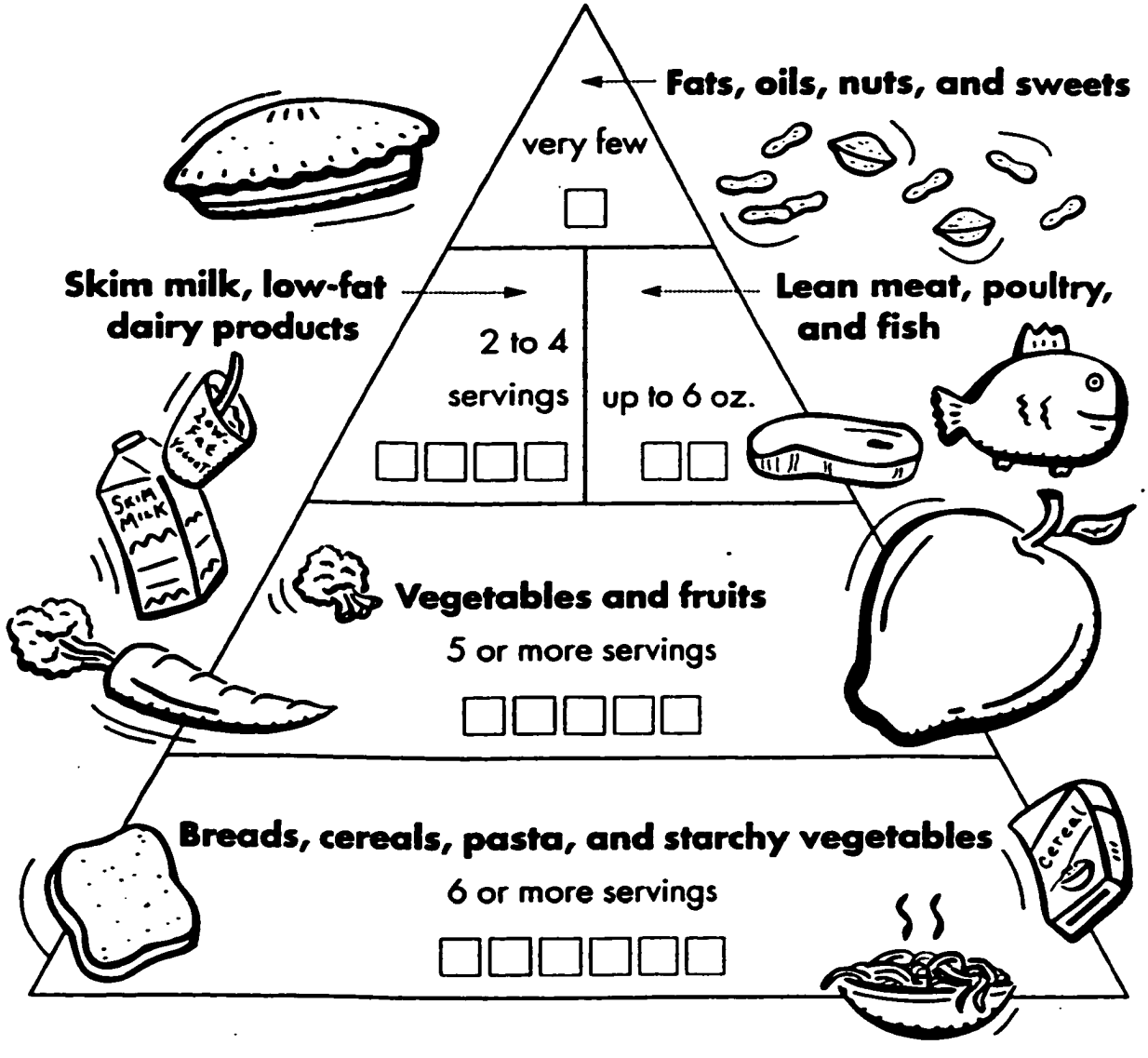
Activity Sheet 1

NAME _____

American Heart Association.

Build Your Own Pyramid

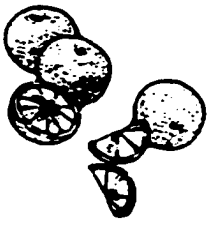
Keep a record of the foods you eat in a day. Each time you eat a food, check off a box in the food's category. Draw in other boxes as needed.



NO. 3 **ORANGE FIZZ FLOAT** Serves 20

INGREDIENTS:

1/2 gal. + 1 pt. ice milk or ice cream
1 gal. orange juice (from concentrate)
4 12 oz. bottles of lemon-lime beverage



- Dip scoop of ice milk/cream into an 8 ounce glass.
- Fill the glass 3/4 full with orange juice.
- Pour in enough lemon-lime beverage to fill the glass.

Nutrition Information Per Serving

	ICE MILK	ICE CREAM		ICE MILK	ICE CREAM
Calories	201	243	Vitamin A	253	417
Fat	2.9	7.2	Vitamin C	73.5	73.5
Sat. Fat	1.7	4.4	Sodium	60.3	66.3
Cholesterol	9	28	Calcium	106	106
Fiber	0	0	Iron	.31	.28

MARKET ORDER	EQUIPMENT
ice milk or ice cream, 1/2 gal. + 1 pt. frozen orange juice concentrate, to make 1 gal. 12- oz. bottles of lemon-lime beverage, 4	ice cream scoop bottle opener can opener 20 glasses, 8-oz. *straws* *napkins*

NO. 4 **PINEAPPLE COOLER** Serves 8 (1 cup)

INGREDIENTS:

6 c.	pineapple juice
2 Tbsp.	lemon juice
6 oz.	orange juice concentrate, frozen
12 oz.	club soda, chilled
	mint sprigs (as desired)

- Mix juices and orange juice concentrate.
- Chill.
- Add chilled club soda immediately before serving.
- Serve over ice with mint sprigs.

Nutrition Information Per Serving

Calories	115		Vitamin A	56	I.U.
Fat	.2	gm	Vitamin C	33	mg
Sat. Fat	0	gm	Calcium	36.6	mg
Cholesterol	0	mg	Sodium	12	mg
			Iron	.5	mg

MARKET ORDER	EQUIPMENT
pineapple juice, 48 oz. can	can opener
lemon juice, 2 Tbsp.	pitcher
orange juice concentrate, frozen, 6-oz. can	spoon
club soda, 12 oz. bottle	*serving cups*
mint	*napkins*
ice	

NO. 5 SPICED PERCOLATOR PUNCH

Serves 32 (1/4 cup)

INGREDIENTS:

- 3/8 cup brown sugar
- 6 whole cloves
- 3 inch cinnamon stick
- 4 cups unsweetened pineapple juice
- 1 cup apricot nectar
- 2 cups apple juice
- 1 cup orange juice

- Pour juices in 8-10 cup automatic percolator.
- Place sugar and spices in basket of the percolator.
- Allow to go through the perk cycle.

Serves 16 punch cups.

Nutrition Information Per Serving (1/4 cup)

Calories	39		Vitamin A	110	I.U.
Protein	.1	gm	Vitamin C	6.6	mg
Fat	0	gm	Sodium	.05	mg
Sat. Fat	0	gm	Calcium	9.7	mg
Cholesterol	0	mg	Iron	.4	mg

MARKET ORDER	EQUIPMENT
pineapple juice, unsweetened, 1 qt. apricot nectar, 1 c. apple juice, 2 c. orange juice, 1 c. brown sugar, 3/8 cup whole cinnamon whole cloves	tray coffee pot liquid measuring cup dry measuring cups measuring spoons *cups for serving* *napkins*

NO. 6 **FRUIT KABOBS** Serves 20

INGREDIENTS:

1/2	cantaloupe	1	apple
1/4	honeydew melon	10	cherries
1/8	watermelon	8	grapes
1	peach	1	banana
8	strawberries		

- Cut fruit into 1-inch pieces, remove pits and seeds
- Place cubes of assorted fruit on spears or toothpicks, approximately 4 per toothpick.
- Enjoy!

NOTE: Good with fruit dip.

Nutrition Information Per Serving

Calories	16		Vitamin A	311	I.U.
Protein	.2	gm	Vitamin C	7.6	mg
Fat	.1	gm	Calcium	3.3	mg
Sat. Fat	0	gm	Sodium	1.4	mg
Cholesterol	0	mg	Iron	.1	mg

MARKET ORDER	EQUIPMENT
cantaloupe	knife
honeydew melon	melon baller, optional
watermelon	cutting board
peaches	*toothpicks or spears*
strawberries	*napkins*
apples	
cherries	
grapes	
bananas	

NO. 7 BANANA BATTER FRENCH TOAST

Serves 20

INGREDIENTS:

- 4 ripe bananas, well mashed
- 4 whole eggs
- 4 egg whites
- 1 cup low-fat milk
- 2 tsp. vanilla
- 3 Tbsp. vegetable oil
- 20 slices whole grain bread

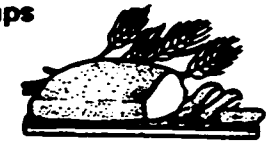
- In a shallow dish beat together the banana, egg, egg whites, milk and vanilla.
- Warm the oil in a non-stick skillet over medium-high heat.
- Dip each piece of bread into the batter, turning the to coat both sides.
- Fry the French toast until brown on both sides.
- Serve with low-fat yogurt and fresh fruit.

Nutrition Information Per Serving*

Calories	124		Vitamin A	95	I.U.
Fat	4.5	gm	Vitamin C	2	mg
Sat. Fat	.8	gm	Sodium	185	mg
Cholesterol	55	mg	Calcium	41	mg
			Iron	0	mg

MARKET ORDER

- eggs, 8
- low-fat milk, 1/2 pint
- vanilla
- vegetable oil
- whole grain bread, 1 sandwich loaf
- bananas, 4
- low-fat yogurt, 3 cups
- fresh fruit



EQUIPMENT

- electric skillet
- mixing bowl, shallow
- wire whisk
- blender or potato masher
- tongs or fork
- spatula
- *paper plates*
- *napkins*
- *plastic forks*
- *plastic spoons*

NO. 8	**ENERGY SNACKS**	Serves 36 (1/4 cup)

INGREDIENTS:

2 cups Cheerios	4 Tbsp. margarine
2 cups Corn Chex	1/2 tsp. Worcestershire Sauce
2 cups Rice Chex	1/4 tsp. garlic powder
1 cup nuts, unsalted	1/4 tsp. celery salt
2 cups pretzels	3 dashes Tabasco Sauce

- Melt margarine in electric skillet at 300° F.
- Stir in Worcestershire sauce, garlic powder, celery salt and Tabasco sauce.
- Mix cereals, nuts and pretzels together.
- Add cereal mixture to skillet.
- Stir frequently for 20 minutes.
- Serve as finger food snacks.

Nutrition Information Per Serving

Calories	67		Vitamin A	111	I.U.
Fat	4.5	gm	Vitamin C	1.5	mg
Sat. Fat	.5	gm	Sodium	80	mg
Cholesterol	0	mg	Calcium	7.4	mg
Fiber	tr		Iron	.4	mg

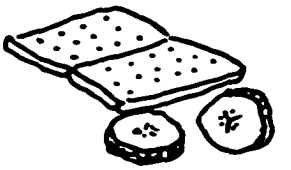
MARKET ORDER	EQUIPMENT
Cheerios, box	electric skillet
Corn Chex, box	measuring spoons
Rice Chex, box	measuring cups, dry
pretzels, 1 pkg.	wooden spoon
nuts, unsalted, 1 pkg.	bowl
margarine, 1 stick	*napkins*
Worcestershire sauce	*paper plates*
garlic powder	
celery salt	
Tabasco sauce	

NO. 10 GRAHAM CRACKER SANDWICHES

Serves 20

INGREDIENTS:

40 graham crackers
1 1/4 cups peanut butter
ground cinnamon
7 small bananas



- Break the graham crackers into two squares.
- Spread about 1 tablespoon of peanut butter on one graham cracker square.
- Sprinkle with cinnamon.
- Peel and cut one half of a banana into 1/4 inch slices.
- Place banana circles on the peanut butter.
- Top with other graham cracker square.

Nutrition Information Per Serving

Calories	210		Vitamin A	30	I.U.
Fat	11.4	gm	Vitamin C	3	mg
Sat. Fat	1.5	gm	Sodium	73.3	mg
Cholesterol	0	mg	Calcium	14.5	mg
Fiber	.5	gm	Iron	.97	mg

MARKET ORDER	EQUIPMENT
graham crackers, 1 box peanut butter, 18 oz. jar small bananas, 7 cinnamon, ground	cutting board knives *napkins*

NO. 11 PERSONALIZED PANCAKES

Serves 20 (2-inch)

INGREDIENTS:

1 cup pancake mix
1 cup milk, skim
1 egg
1 Tbsp. oil

- Combine ingredients for pancakes. Mix only until all dry ingredients are wet. Do not over-mix. (Mix in a 2-4 cup liquid measure to save cleanup.)
- Pour batter into liquid measuring cup. Dribble batter in hot skillet to form initial of the student in mirror image or backwards.
- Allow initial to brown slightly, then pour pancake batter over the initials. Continue to cook until bubbles appear in the pancake. Turn only once!
- Serve hot with margarine and syrup.

Nutrition Information Per Serving

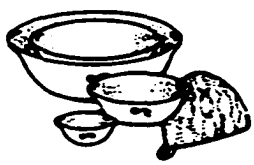
Calories	41		Vitamin A	38	I.U.
Fat	1.3	gm	Vitamin C	.1	mg
Sat. Fat	.2	gm	Sodium	57	mg
Cholesterol	14	mg	Calcium	96	mg
			Iron	.3	mg

MARKET ORDER

pancake mix, 1 box
skim milk, 1/2 pint
egg, 1
oil, bottle
syrup, bottle
margarine

EQUIPMENT

liquid measuring cup
set dry measuring cups
set measuring spoons
mixing bowl
mixing spoon
spatula
skillet or griddle
plates
forks
napkins



NO. 12 OVEN BARBECUED CHICKEN — Serves 16

INGREDIENTS:

- 4 chicken breasts, skinned
- 1/4 cup water
- 1/4 cup vinegar
- 3 Tbsp. vegetable oil
- 1/2 cup chili sauce or catsup
- 3 Tbsp. Worcestershire sauce
- 1 tsp. dry mustard
- 1 1/2 tsp. salt
- 1/2 tsp. pepper
- 2 Tbsp. chopped onion (optional)

- Combine all ingredients except chicken in saucepan, place over heat, and simmer for 5 to 10 minutes.
- Pre-heat oven to 350° F.
- Place chicken in large baking pan.
- Pour half of the barbecue sauce over chicken and bake, uncovered for about 45-60 minutes, basting with remaining barbecue sauce every 15 minutes.

Nutrition Information Per Serving

Calories	81		Vitamin A	82	I.U.
Fat	3.6	gm	Vitamin C	1.2	mg
Sat. fat	.6	gm	Sodium	.3	mg
Cholesterol	24	mg	Calcium	8	mg
Fiber	N/A		Iron	.4	mg

MARKET ORDER	EQUIPMENT
chicken breast, 4 boneless	measuring cups, dry and liquid
vinegar	measuring spoons
vegetable oil, 1/4 cup	knife
chili sauce or catsup	cutting board
Worcestershire sauce	mixing spoon
dry mustard	saucepan
salt	baking pan
pepper	*paper plates*
onion	*plastic forks*
	napkins

NO. 13	**PIZZA**	Serves 6

INGREDIENTS:

1 pkg. canned biscuits OR
English muffins
8 oz. mozzarella cheese, shredded
1/4 lb. pepperoni, sliced
1 can tomato paste
2 Tbsp. vegetable oil
1/4 tsp. oregano

- Put lid on electric skillet and pre-heat at 425° with vent closed.
- Open refrigerator biscuits; place on heavy foil and press each with finger tips until approximately 4" in diameter.
- Mix tomato paste, oil, and oregano in small bowl.
- Spread tomato sauce mixture on each biscuit OR English muffin.
- Sprinkle with mozzarella cheese and place pepperoni slices on each.
- Bake biscuits 10-15 minutes in electric skillet OR muffins 5 minutes.
- Cut into fourths and serve.

Nutrition Information Per Serving

	Biscuit	Muffin			Biscuit	Muffin	
Calories	336	312		Vitamin A	154	154	IU
Protein	21.5	18.6	gm	Vitamin C	20.2	20.1	mg
Fat	11.5	11.75	gm	Calcium	179	219	mg
Sat. Fat	7	7	gm	Sodium	599	432	mg
Cholesterol	22	22	mg	Iron	2.4	2.5	mg
Fiber	0	0	gm				

MARKET ORDER

canned biscuits or English muffins, 1 pkg.
tomato paste, 6-oz. can
mozzarella cheese, 8 oz. shredded
pepperoni, 1/4 lb. sliced
vegetable oil
oregano

EQUIPMENT

electric skillet
spatula
small bowl
can opener
measuring spoon
spoon
knife
foil
paper plates
napkins

NO. 15 CHEESE WAFERS

Serves 24 (1 cookie)

INGREDIENTS:

- 1/4 c. or 4 Tbsp. cheddar cheese, grated
- 4 Tbsp. margarine
- 1/4 c. white flour
- 1/4 c. whole wheat flour
- 2 tsp. sesame seeds

- Preheat oven to 375° F.
- Combine in large bowl: cheddar cheese, margarine, white flour, and whole wheat flour. Mix well.
- Divide dough into 24 portions and roll into small balls, then roll in sesame seeds.
- Place balls on cookie sheets, 2 inches apart. Flatten using a glass.
- Sprinkle with sesame seeds.
- Bake for 6-8 minutes.
- Remove immediate from cookie sheet and place on on cooling rack.

Nutrition Information Per Serving

Calories	47		Vitamin A	139	I.U.
Fat	3.6	gm	Vitamin C	0	mg
Sat. Fat	1.3	gm	Calcium	38	mg
Cholesterol	4.7	mg	Sodium	51	mg
Fiber	N/A	gm	Iron	.1	mg

MARKET ORDER	EQUIPMENT
cheddar cheese, 1/4 c. grated margarine, 1/2 stick white flour, 1/4 c. whole wheat flour, 1/4 c. sesame seeds, 2 tsp.	grater measuring spoons dry measuring cup large bowl cookie sheets (2) mixer flat bottom glass cooling racks *napkins*

NO. 17 CHILI BEAN DIP

Serves 34 (1 Tbsp.)

INGREDIENTS:

- 15 oz. can kidney beans, drained
- 3 Tbsp. bean liquid
- 1 Tbsp. vinegar
- 1 tsp. chili powder
- 1/8 tsp. cumin
- 2 Tbsp. onion, grated
- 2 sprigs parsley, chopped

- Drain kidney beans; save liquid.
- Place drained beans, bean liquid, vinegar and seasonings in blender.
- Blend until smooth.
- Serve with raw vegetables.

Nutrition Information Per Serving

Calories	18		Vitamin A	45.8	I.U.
Fat	.1	gm	Vitamin C	1.3	mg
Sat. Fat	0	gm	Calcium	6.2	mg
Cholesterol	0	mg	Sodium	1.5	mg
Fiber	.5	gm	Iron	.47	mg

MARKET ORDER	EQUIPMENT
kidney beans, 15 oz. can	can opener
vinegar	blender
chili powder	rubber spatula
cumin	measuring spoons
onion	grater
parsley	knife
raw vegetables to dip	cutting board
	mixing bowl
	serving bowls or cups
	plastic spoons
	napkins

NO. 18	GORP	Serves 24 (2 Tbsp.)

INGREDIENTS:

1 c. raisins
1 c. peanuts
1 c. sunflower nuts

- Combine ingredients in bowl
- Serve

Nutrition Information Per Serving

Calories	96		Vitamin A	4	I.U.
Fat	7	gm	Vitamin C	.2	mg
Sat. Fat	.8	gm	Calcium	15	mg
Cholesterol	0	mg	Sodium	2	mg
			Iron	.8	mg

MARKET ORDER	EQUIPMENT
raisins, box peanuts, pkg. sunflower nuts	bowl dry measuring cups serving spoon *napkins*

NO. 20 CARROT RAISIN SALAD

Serves 24 (1/4 c.)

INGREDIENTS:

- 2 lb. carrots
- 1 cup raisins
- 2 Tbsp. mayonnaise or vinegar and oil dressing

- Wash carrots.
- Cut off ends and peel.
- Grate carrots onto wax paper or in a bowl. (You may grate or grind carrots with peeling, if you wish.)
- Add desired dressing.
- Add raisins and mix well.

VARIATION: You may use quartered apples to grind or grate with carrots for a different taste and color combination.

Nutrition Information Per Serving

Calories	37		Vitamin A	10,126	I.U.
Fat	1.1	gm	Vitamin C	3.7	mg
Sat. Fat	.2	gm	Calcium	10.6	mg
Cholesterol	.7	mg	Sodium	21.6	mg
Fiber	.6	gm	Iron	.3	mg

MARKET ORDER	EQUIPMENT
carrots, 2 lbs raisins, 1 cup mayonnaise or oil and vinegar dressing	graters carrot peelers (4) mixing bowl waxed paper cutting boards sharp knives mixing spoon *serving bowls or cups (24)* *plastic forks* *napkins*

NO. 21 **SPINACH SALAD** Serves 36 (1/4 cup)

INGREDIENTS:

1 lb. fresh spinach
1 green pepper
1 cup fresh mushrooms, sliced
2 Tbsp. sesame seeds, toasted
1/2 cup vegetable oil
1/4 cup vinegar

- Wash spinach and mushrooms well. Drain on paper towels.
- Tear spinach in bite size pieces into a bowl.
- Slice pepper and mushrooms.
- Toast sesame seeds at 350° F. for 3-4 minutes. Stir and look at them frequently.
- Add peppers, mushrooms and sesame seeds to the spinach and toss.
- Combine oil and vinegar and sprinkle over spinach salad.
- Serve with crackers.

Nutrition Information Per Serving

Calories	36		Vitamin A	790	I.U.
Fat	3	gm	Vitamin C	5	mg
Sat. Fat	0	gm	Sodium	11	mg
Cholesterol	0	mg	Iron	.4	mg

MARKET ORDER	EQUIPMENT
spinach, fresh, 1 lb. green pepper, 1 mushrooms, fresh, 1 small pkg. sesame seeds, 1 box vegetable oil, 1/2 cup vinegar, 1/4 cup crackers	cutting board colander paring knives toaster oven liquid measuring cups measuring spoons large salad bowl spoons to toss and serve salad *paper towels* *paper bowls* *plastic forks* *napkins*

NO. 23 **VEGETARIAN CHILI** Serves 40 (1/4 cup)

INGREDIENTS:

- 1 Tbsp. vegetable oil
- 1 med. onion
- 2 carrots, finely chopped
- 4 cloves garlic, minced
- 1 sweet red pepper, chopped (optional)
- 1 green pepper, chopped
- 1 jalapeño, fresh or canned, finely chopped
- 1 Tbsp. chili powder
- 1 tsp. cumin
- 1 14-15 oz. can kidney beans (or 1 3/4 cups)
- 1 14-15 oz. can pinto beans (or 1 3/4 cups)
- 1 28 oz. can of chopped tomatoes (or 3 1/2 cups)
- 1 tsp. salt
- 1/2 tsp. freshly ground pepper
- 2 Tbsp. fresh cilantro, finely chopped (optional)

- Warm the oil over low heat. Add onion, carrots, garlic, red and green peppers and saute slightly
- Add jalepenos and cover the kettle and simmer vegetables until soft.
- Remove lid, add chili powder and cumin and cook an additional 2 to 3 minutes.
- Add the beans and the tomatoes and their juice. Increase the heat to medium and bring the chili to a simmer.
- Adjust the heat to maintain a simmer and let the chili cook for 20 minutes.
- Stir in the salt, pepper and cilantro and serve.

Nutrition Information Per Serving

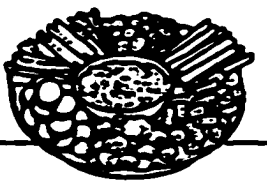
Calories	26		Fiber	.3	mg
Fat	.6	gm	Sodium	9.8	mg
Sat. Fat	0	gm	Calcium	0	mg
Cholesterol	0	mg	Iron	.3	mg

NO. 24 VEGGIES

Serves 33 (1/4 cup)

INGREDIENTS:

1/2 lb. broccoli
1/2 lb. celery
1/2 lb. carrots



1/2 lb. cauliflower
1/2 lb. tomatoes
1/2 lb. green peppers

- Wash vegetables, peel and cut into relish size pieces.

Nutrition Information Per Serving

Calories	8		Vitamin A	1798	I.U.
Protein	.4	gm	Vitamin C		mg
Fat	.1	gm	Sodium	11	mg
Cholesterol	0	mg	Calcium	8	mg
Fiber	.4	gm	Iron		

NO. 25 VEGGIE DIP

Serves 32 (1 Tbsp.)

INGREDIENTS:

1/2 cup mayonnaise
1 3/4 cup low-fat cottage cheese
3 Tbsp. lemon juice
1 tsp. dill weed
1 tsp. Beaumonde Spice
1 Tbsp. parsley
1 Tbsp. minced onion or
1/2 tsp. onion juice

- Mix cottage cheese and mayonnaise in a blender.
- Add spices and mix well. Refrigerate 24 hours if possible.

Nutrition Information Per Serving

Calories	36		Vitamin A	9	I.U.
Fat	3	gm	Vitamin C	.78	mg
Cholesterol	2.7	mg	Sodium	70	mg
Fiber	N/A	gm	Calcium	1.7	mg
			Iron	.04	mg

APPENDIX H

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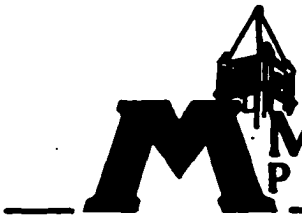

Muskegon MI 49442
231-720-2600
FAX 231-720-2658
TTY 231-720-2696

Jacquie Kiefer
410 Mid Oak
N. Muskegon, MI 49445

February 24, 2000

Dear Ms. Kiefer,

I received your request to conduct your study related to nutrition and goal-setting at School. I understand you will be working with two of our fourth-grade classes. Your request has been approved. Please contact Mrs. Duplissis to make further plans for your study.

Sincerely,

[redacted]

Mrs. Saundra Johns
Principal,

Muskegon, MI 49442

APPENDIX I

APPENDIX I

GRAND VALLEY
STATE UNIVERSITY
1 CAMPUS DRIVE • ALLENDALE, MICHIGAN 49401-9403 • 616/895-6611

April 28, 2000

Jacquelyn Kiefer
410 Mid Oak
North Muskegon, MI 49445

Dear Jacquelyn:

The Human Research Review Committee of Grand Valley State University is charged to examine proposals with respect to protection of human subjects. The Committee has considered your proposal, **The Effects of Mutual Goal Setting on Fourth Graders' Adherence to the Food Guide Pyramid Recommendations**, and is satisfied that you have complied with the intent of the regulations published in the Federal Register 46(16)8386-8392, January 26, 1981.

Sincerely,

[redacted]

Paul A. Huizenga, Chair
Human Research Review Committee

APPENDIX J

APPENDIX J

Imogene King
7400 Sun Island Drive S.
South Pasadena, Florida 33707

November 3, 1999

Dear Ms. King,

I am a graduate nursing student at Grand Valley State University in Allendale, Michigan. I am doing my thesis work on childhood nutrition and mutual goal setting, specifically utilizing your Theory of Goal Attainment as my theoretical framework. I am requesting permission to reproduce the diagram depicting your Model of Transactions as illustrated on page 145 in your text, A Theory for Nursing: Systems, Concepts, Process in my published thesis work. Full acknowledgment for the diagram will be given to you as the author. Thank-you for your consideration.

Sincerely,

[redacted]

Jacquie Kiefer
410 Mid Oak
N. Muskegon, MI 49445

11-17-99

Dear Jacquie:
Please send me the total context in which you are using the above Model and I will be happy to give you permission. Also, I will respond immediately.

Sincerely

[redacted]

Dec. 20, 1999

Jacqui Kiefer
410 Mid Oak
N. Muskegon, MI 49445

Dear Jacqui:

Please excuse the delay in responding to your letter and information you sent me. I am returning it with marks on several pages. Please do not use Jacqui Fawcett's perception of my work as I DO NOT HAVE SUBCONCEPTS. I HAVE CONCEPTS which I placed within each system (although the knowledge is used in each system) I do not have MAJOR concepts as Fawcett has suggested. These concepts represent basic knowledge that every RN should know. Also, I made a grave error in my first book in 1971 and again in 1981 by stating that there is something called "perceptual accuracy". Your perception and my perception are just that and there is nothing accurate about it. Therefore, I have tried to tell individuals who use these ideas to replace the word accuracy with the word congruence which means that two interacting individuals have similar perceptions about the events in which they are interacting. I hope this helps clarify things for you. You have interpreted my work as I perceive it and am pleased. Also, I have been hoping some nurse would see the value of this transaction process within the theory of goal attainment and use it with school children. It is my concern today that we do not help the young children set goals for themselves and I believe goal setting would eliminate some of the violence we see today. When one is working toward positive goals, one's time, energy, and thought is given to means to achieve goals and that brings satisfaction.
Thank you for the work you are doing. Please let me know the results and continue to communicate with me when you can as I am very interested in what you are doing. Also, try to publish your results in Nurs. Sc. Quarterly as well in a Pediatric Journal and in Nutrition as I believe you are doing something that is valuable and should be shared.
Thank you.

Sincerely,

[redacted]

Imogene M. King, RN, EdD, FAAN

APPENDIX K

APPENDIX K

STATE OF MICHIGAN

JOHN ENGLER, Governor

DEPARTMENT OF COMMUNITY HEALTH

LEWIS CASS BUILDING
LANSING, MICHIGAN 48913
JAMES K. HAVEMAN, JR., Director

March 13, 2000

Jacquie Kiefer
410 Mid Oak
N. Muskegon, MI 49445

Dear Ms. Kiefer:

This letter is to authorize your use of the Michigan Model for Comprehensive School Health Education materials as part of your thesis work. The State Steering Committee, who provides direction to the project, has a long standing policy of making the Michigan Model materials available for any non-commercial educational use.

Best of luck with your project.

Sincerely,

[redacted]

Don Sweeney, Manager
School Health Unit

APPENDIX L

APPENDIX L

Subj: Re: thesis
Date: 5/2/00 6:51:05 PM Eastern Daylight Time
From: ksukanek@sunset.backbone.olemiss.edu (Kathy Sukanek)
Reply-to: ksukanek@sunset.backbone.olemiss.edu (Kathy Sukanek)
To: JK101657@aol.com
CC: jlogan@sunset.backbone.olemiss.edu (Jane Logan)

Dear Ms Kiefer,

The National Food Service Management Institute will allow you to use its copyrighted program, Pyramid Pursuit, for your graduate thesis,The Effect of Mutual Goal Setting on Fourth-Graders' Adherence to the Food Guide Pyramid Recommendations," as described in your email below.

Good Luck with your research project.

Sincerely,

Kathleen L. Sukanek

—— Original Message ——
From: <JK101657@aol.com>
To: <ksukanek@olemiss.edu>
Sent: Tuesday, May 02, 2000 9:36 AM
Subject: thesis

> Dear Ms. Sukanek,
>
> I talked with you briefly on the phone last week. I am writing to seek
> permission to reproduce the recipes and some of the materials in the
Pyramid
> Pursuit program. I am a graduate nursing student at Grand Valley State
> University in Allendale, MI. I am doing my thesis on "The Effect of
Mutual
> Goal Setting on Fourth-Graders' Adherence to the Food Guide Pyramid
> Recomendations" I would like to send some of the recipes home with the
> students and use some of the materials in class presentations. The
material
> would be referenced as coming from the Pyramid Pursuit program. It would
> also be referenced in my published thesis. Thank-you for your
consideration.
> Please call me with any questions (231)- 744-8634 or email me at
> JK101657@aol.com.
>
> Sincerely,
> Jacquie Kiefer
>

LIST OF REFERENCES

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