Nutrition: knowledge, attitudes and eating habits of eighth grade adolescents

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Nutrition: Knowledge, Attitudes and Eating Habits of Eighth-grade Adolescents

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NUTRITION: KNOWLEDGE, ATTITUDES AND EATING HABITS OF EIGHTH GRADE ADOLESCENTS.

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CHAPTER 1

Introduction

Obesity is one of the leading causes of preventable deaths in the United States (Nelligan, 2004), and is blamed as a contributing factor in a number of other diseases such as heart disease, pulmonary diseases, insulin resistance, reproductive disorders, gallstones, certain cancers, bone, joint and skin diseases (Kasper, et al., 2004). Obesity is defined as a Body Mass Index (BMI) over 30 (McGraw-Hill’s Access Medicine, 2004a). The BMI is calculated by taking the weight of a person in kilograms and dividing it by their height in centimeters squared (McGraw-Hill’s Access Medicine). Over 5% of the nation’s annual healthcare costs are spent on obesity-related illnesses. The dollar amount is approximately $117 billion dollars per year (United States Food and Drug Administration [USFDA], 2004). The obesity epidemic is not only seen in adults. In 1980 the percentage of overweight adolescents was 5%. A dramatic increase of 10.3% was noted in 2000 giving America a total of 15.3% overweight adolescent and tripling the numbers from 1980 (Cline, Spradlin, & Plucker, 2005). There is a 70% chance that adolescents who are overweight will become obese (United States Department of Health and Human Services [USDHHS], n.d.). In 2003, of the 15,015 Americans surveyed, 65% were trying to lose weight. Only 20% of them reported being very or extremely successful (American Sports Data, Inc., 2004). The general feeling that is portrayed by these statistics is that America’s younger generation is becoming an older generation that is obese and unsuccessful when it comes to losing weight.

Where can America’s resources be focused to make the biggest impact? Education, income, age, gender, and race have been implicated as factors influencing
BMI by various studies (Eyler, Haire-Joshu, Brownson & Nanney, 2004; USFDA, 2004). Over two hundred twenty eight million dollars was approved in 2004 for the Food Stamp Nutrition Education program to help educate recipients of food stamps about healthy diets and physical education (United States Department of Agriculture [USDA], n.d.). Income levels and dietary intake of fats and sugars were shown to be inversely proportional in a study done by Eyler, et al. Obesity is a multi-factoral problem with the combinations of factors varying from person to person. For this reason it is difficult to effectively intervene in community directed efforts that are not tailored to the individual or group of similar individuals (Nelligan, 2004). Ultimately intervention comes down to lifestyle change and the only person who can decide to change one’s lifestyle is the individual themselves (American Dietetic Association, 2005).

Although lifestyle change is the surest form of treatment, there are medical treatments available. Since obesity is a multi-factoral disease, the most effective treatment is marked by a multi-factoral approach. Programs that include very low calorie diets, increase in physical activity and psychosocial support work best (McGraw-Hill’s Access Medicine, 2004b). There are medications available to help people who are interested in losing weight, but these are controversial. Surgery is another option, but usually only offered to those whose BMI is greater than 40. Many insurance companies will reimburse providers for performing bariatric procedures such as the vertical-banded gastroplasty or Roux-en-Y gastric bypass on severely obese patients. Some recipients of the Roux-en-Y gastric bypass have been shown to lose up to as much as 50% of their pre-surgery weight. However, up to 40% of those who undergo bariatric surgical procedures experience complications (McGraw-Hill’s Access Medicine). Treating obesity can be a
challenge, but the benefits of successful treatment can be seen in blood pressures, blood glucose levels and lipid profiles of the patients whose BMIs are decreasing.

*Problem Statement*

As obese children grow up to become obese adults, America’s population is directly experiencing the detrimental effects of obesity on health. What factors are involved in the escalating body mass indices of our younger generations? The goal of this research is to determine if the nutrition knowledge, attitudes and eating habits of eighth-grade adolescents from families with higher income levels are more positive than those of eighth-grade adolescents from families with lower income levels as measured by a nutrition survey. Therefore, the research question to be answered is, does higher socioeconomic status lead to healthier eating habits, more knowledge and more positive attitudes toward nutrition in eighth-grade adolescents? This question will be researched by comparing a lower income level junior high school eighth-grade student population to a higher income level junior high school eighth-grade student population in a Midwest city.

*Definition of Terms*

Nutritional knowledge, operationally defined, is the ability to answer age appropriate questions regarding food groups, healthy food choices, and healthy eating habits. The American Heritage Dictionary of the English Language, 4th edition (2000a), constitutively defined knowledge as “Familiarity, awareness, or understanding gained through experience or study” (¶2). The American Heritage Dictionary of the English Language, 4th edition (2000b), constitutively defined nutrition as “the process of nourishing or being nourished, especially the process by which a living organism assimilates food and uses it for growth and for replacement of tissues” (¶1).
Attitude is operationally defined as feelings that one holds concerning their own body habitus and health, and their ability to take action to change them. The American Heritage Dictionary of the English Language, 4th edition (2000c), constitutively defined attitude as “a state of mind or a feeling; disposition” (¶ 2a).

For the purposes of this study, behavior is defined as the choices that one makes in regard to eating habits. Merriam-Webster’s Medical Dictionary (2002) constitutively defined behavior as “the manner of conducting oneself” (¶ 7).

The American Heritage Dictionary of the English Language, 4th edition (2000d), constitutively defined adolescent as “a young person who has undergone puberty but who has not reached full maturity; a teenager” (¶ 3). Our study uses the same definition, but limits the group to eighth grade students.

Income level is operationally defined as the mean amount of money brought in by families living in the zip code area of each school and by the percentage of students from the respective schools that are eligible for the free or reduced lunch program. Merriam-Webster’s Dictionary of Law (1996) constitutively defines income as “the financial gain (earned or unearned) accruing over a given period of time” (¶ 3).

Justification of Study

Over 280,000 deaths per year in the United States are attributable to obesity (Breitkopf & Berenson, 2004). Risk of a decline in personal health is not the only concern that obesity presents to society today. With such an astounding number of deaths per year, obesity is partially responsible for the increasing costs of healthcare in the United States. Because of its ramifications on the public as a whole, many states are trying to find ways to prevent and combat this epidemic. Obesity has become such a problem that the National Governors
Association has issued a brief suggesting ways for states to ‘trim the fat’ (Fierro, 2002). There have been school programs instituted and government projects developed that have been aimed at children, and still “during the past two decades, the prevalence of overweight has more than doubled among children and adolescents” (Field, 2004, p. 1210). As previously mentioned, the obesity of the youngest generations in America is what lies at the heart of the problem. Goodman and Whitaker (2002) state “there may be factors operating during adolescence that predispose to obesity risk in early adulthood, making adolescence a critical period for development of obesity” (p. 497). The knowledge, attitudes, and behaviors that adolescents hold regarding nutrition, are one of the key pieces of information needed to derail this epidemic. The information from this study will help educators, healthcare professionals and government agencies to identify specific groups in America’s population where their limited resources and manpower can be utilized most effectively.

**Hypotheses**

RQ 1: Does income level affect the eating habits of eighth grade adolescents?

H 1: Adolescents from the higher income level school will have more positive eating habits than those from the lower income level school.

RQ 2: Does income level affect nutrition knowledge of eighth grade adolescents?

H 2: Adolescents from the higher income level school will score higher on the knowledge section of the survey (questions 30-34) than those from the lower income level school.

RQ 3: Does income level affect attitude toward one’s own health?

H 3: Adolescents from the higher income level school will score higher on questions 10-15 on the survey, indicating more health satisfaction, control over their own health and motivation to stay healthy and avoid unhealthiness.
RQ 4: Does weight status affect nutrition knowledge of eighth grade adolescents?

H 4: Normal weight adolescents will score higher on the knowledge section of the survey (questions 30-34) than obese/overweight adolescents.

RQ 5: Does weight status affect attitude toward one’s own health?

H 5: Normal weight adolescents will score higher on questions 10-11 on the survey, indicating more health satisfaction, control over their own health and motivation to stay healthy and avoid unhealthiness than obese/overweight adolescents.

RQ 6: Does weight status affect the eating habits of eighth grade adolescents?

H 6: Normal weight adolescents will have more positive eating habits than those who are obese/overweight.
CHAPTER II

Literature Review

Adolescent Obesity

Many school programs have been instituted in order to combat the epidemic of obesity. One such program, as described by Chomitz, Collins, Kim, Kramer, and McGowan (2003) in their article, *Promoting Healthy Weight among Elementary School Children via a Health Report Card Approach*, received positive parental response. This study consisted of a quasi-experimental field trial composed of three groups of subjects. One group received a personalized health report, another a general information report and the last group was a control group. The outcomes were measured by a telephone survey. The sample consisted of 399 ethnically diverse elementary school students from four schools in an urban area. The authors found that significantly more parents in the first and second groups knew their child’s weight status, $p = 0.02$, and were concerned about their child’s weight, $p = 0.055$, and “concerned parents were more likely to plan weight-control strategies” (Chomitz, et al., p. 770). The authors suggest that this reporting method may become an important way of informing parents of their child’s weight status and motivating them to take action in preventing further adiposity (Chomitz, et al.).

A project that researched effectiveness of special programs instituted by schools, *The Healthy for Life Project: Behavioral Outcomes*, was completed by Piper, Moberg, and King (2000). A random sample of 2,483 students from 21 Wisconsin middle schools located in suburbs, small cities and towns were surveyed during grades six through ten, annually in the fall. The students involved were predominantly white and fifty two percent were female. Three groups were designated: control, age appropriate and
intensive. Each group received three levels of intervention according to the group they were in. The authors suggest that adolescents make choices concerning their health, not based on what they know is good or bad for them, but based on social factors and contexts. This suggestion comes after the data from their longitudinal study, aimed at influencing the health behaviors of middle school students, revealed that only minimal positive effects were seen from the school-based project that they had implemented. For example, the eating frequency of the tenth graders who were in the age appropriate group were positively effected by the intervention, but only marginally, p < 0.10 (Piper, et al.). The authors identify a need for school programs to begin to address the combination of factors that influence adolescent behavior as opposed to the individual-based teaching that the schools have historically provided.

Another prevention program aimed at obesity is KOPS (Kiel Obesity Prevention Study). This is an 8 year follow-up study of 1640 five to 7-year-old children randomly sampled from Kiel, a city in Northwest Germany. Upon intake into the study children’s nutritional state was assessed and surveys concerning their diet and physical activity were completed. The percent of children who were found to be obese or overweight was 20.7%, 67.6% were found to be of normal weight and 11.7% were found to be underweight (Muller, Asbeck, Mast, Langnase, & Grund, 2001). Two groups were formed, intervention and control. The groups alternate each year. The students will be reassessed after the fourth and eighth year. This study has not yet concluded. Muller, et al. suggest “the first results of KOPS is promising”. The authors found that “a low level of physical activity and high physical inactivity seem to be more important than diet” (Muller, et al., p. S73). They suggest that prevention be aimed at decreasing sedentary
behavior instead of diet modification. In addition to physical inactivity the authors also found parental fatness to be a risk factor for obesity in childhood. Like the authors of *The Healthy for Life Project*, these authors suggest that “conventional prevention strategies are of limited value,” especially “in high risk groups” (p. S73). They recommend promoting “a better school education and social support as strategies for future interventions” (Muller, et al., p. S73). Prevention strategies should target children with obese parents who are of low socio-economic status, according to their research.

Many times obesity is blamed on heredity. In his retrospective cohort study, *Predicting Preschooler Obesity at Birth: The Role of Maternal Obesity in Early Pregnancy*, of 8494 low-income children enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Whitaker (2004) asserts that “in low-income children, maternal obesity in early pregnancy more than doubles the risk of obesity at two to four years of age” (p. e29). He also states that children who have high birth weights, are the first born, or were born to a mother who smoked during pregnancy are at increased risk of becoming obese during the preschool years (Whitaker). Previous studies (Parsons, Power & Manor, 2001; Laitinen, Power, & Jarvelin, 2001; Stettler, et al., 2000) had linked children’s obesity to obese mothers, but this study suggests that the expression of obesity in children occurs at a younger age than previously suggested. The author recommends targeting prevention toward “children who are born to obese mothers and trying to develop interventions that begin at or before the birth of the child” (Whitaker, p.e35).

*Child and Parent Characteristics as Predictors of Change in Girls’ Body Mass Index* is a study done by Davison and Birch (2001). In this longitudinal study 197 5-
year-old girls participated in the initial assessment and 192 were reassessed at age seven. The authors conclude that the “family is central in the etiology of childhood overweight and that it is necessary to incorporate parents in the treatment of childhood overweight” (Davison & Birch, p. 1834). The factors cited as causing predictable change in the BMI of girls’ in the study were “parent weight status, parent physical activity, parent dietary intake, and girls’ dietary intake” (Davison & Birch, p. 1840). This study shows that risk-factors tend to co-occur within the family and highlights the importance of environmental factors in the etiology of obesity. The authors found that a change in BMI of girls can best be predicted by characteristics of the children while also considering characteristics of the parents. In light of these findings the authors suggest “that overweight parents may place their children at particular risk of overweight due to their genetic predisposition for weight gain and the eating and activity environment that they create” (Davison & Birch, p. 1840). The authors also point out the “futility of designing intervention programs that do not focus on all family members” (Davison & Birch, p. 1841).

In a 4-year longitudinal study, *Influence of Diet, Physical Activity and Parents’ Obesity on Children’s Adiposity*, by Maffeis, Talamini and Tato (1998), parents’ obesity was found to be the most powerful predictor of childhood obesity at the ages of eight and 12. The authors state, “parents provide genetic predisposition and the environment is where predisposition may manifest itself” (Maffeis, et al., p. 763). They also point out that sedentary behavior promotes and sustains obesity and that diet, especially a high fat diet, is associated with obesity; however, their study showed that, “nutrient and energy intake did not contribute to explaining the variance”, but they contribute the lack of this finding to underreporting of food intake. The final conclusion that the authors came to
was that “parents’ obesity is the most important risk factor for obesity in children. The effect of energy and nutrient intake is secondary to parents’ obesity and the child’s inactivity” (p. 763).

**Nutrition**

The International Food Information Council [IFIC], in Washington DC, released a review entitled *How Children Are Making Food Choices* (n.d.). In their review, they surveyed a random sample of 407 children ranging from fourth through eighth grade, and, in some instances, compared their results to an earlier survey, *How Americans Are Making Food Choices*. They found that “children have an excellent understanding of principles of nutrition and health” (IFIC, p. 1). The fact that exercise and dietary choices could affect future health was readily acknowledged by almost every child. Children surpassed adults in knowledge of the basic food groups (IFIC). The ideas and importance of moderation and variety were exhibited by most children. This article proposes that “children are learning about nutrition in school and are becoming one of the better nutrition-educated segments of society” (IFIC, p. 2).

The adult “all-or-nothing” (p. 2) behavior is pointed to as the model from which children are acquiring their attitudes about healthy-eating. They also point-out that “children may overreact physiologically to some messages” (IFIC, n.d., p. 2). For example 73% of the surveyed children worried about fat and cholesterol contents of food. “The fears and misperceptions held by adults appear to be influencing children” (IFIC, p. 2). The survey showed that the meal that children influenced most was breakfast and snacks (IFIC). Almost half of children make their own lunch choices and three-fourths said that dinner was decided by their mothers. “Family dining seems to have a positive
influence on how kids rate their own eating habits” (IFIC, p. 3) Three out of five of the children who rated their eating habits as excellent or good stated that they eat with their families every day (IFIC). Children were asked to give sources from which their information on nutrition was gained. They listed school, parents, doctors and nurses, and books, with school and parents being the most widely cited. When asked to rate these sources in terms of usefulness, the children rated doctors and nurses as very useful (IFIC).

How can our country put a stop to obesity and overweight? The seemingly best place to start is in the youngest generations since children who are found to be obese or overweight tend to continue this trend into their adult lives (Cline, Spradlin, & Plucker, 2005). Since “young people spend nearly 2,000 hours per year in school” (Cline, et al., p. 2) and eat most of their meals there, it is obviously a perfect setting to educate children about nutrition and attempt to improve eating habits. Although school is the most logical place to begin, there are many hindrances that have been encountered. Many schools have cut back on physical education (PE) requirements and foods of minimal nutritional value are easily purchased in most schools (Cline, et al.).

In 1991 42% of the nation’s schools required that children in grades K-12 participate in PE daily (Cline, et al., 2005). This percentage decreased to 25% in 1995 and had risen to 31% in 2001. Schools were being pressured to increase academic performance levels and in turn opted to cut PE requirements to spend more time on academics (Cline, et al.). Studies have shown that one hour per week of PE was enough to significantly lower the BMI of first grade girls who were categorized as overweight or at risk for overweight (Cline, et al.). Since leading a sedentary lifestyle is a major risk
factor for becoming obese it is essential to involve children in physical activity as a means of combating the problem. Even adding one hour of PE per week has been shown to be effective in combating obesity (Cline, et al.).

The National School Lunch Program (NSLP) and the National School Breakfast Program (NSBP) offer nutritionally balanced meals to children at school. When given a choice, children are more likely to choose items of minimal nutritional value from the a la carte menu (Cline, et al., 2005). The USDA found that a majority of school children do not eat the recommended number of servings of fruits, vegetables, grains, and dairy per day. Dairy was the food group that children were most likely to eat the recommended number of servings of and even then only 30% the percentage of children were in compliance with the recommendations (Cline, et al.). In a study entitled Dispensing Junk: How School Vending Undermines Efforts to Feed Children Well conducted by the Center for Science in the Public Interest [CSPI] (2004), “120 volunteers, primarily health professionals, employees of health organizations, and school employees, in 24 states surveyed the contents of 1,420 vending machines in 251 local middle and high schools” (p. 1). This study explored the nutritional value of snacks and beverages offered in school vending machines. The results showed that 75% of beverages and 85% of food selections were of minimal nutritional value (CSPI).

In a study done by the United States General Accounting Office 43% of elementary schools, 74% of middle schools and 98% of high schools were found to have vending machines, snack bars or other foods that were served outside of the national food programs for lunch and breakfast (Cline, et al., 2005). Seventy one percent of the schools surveyed by the National Dairy Council allowed students access to vending machines
during their lunch breaks (Cline et al.). A study done in Great Britain showed the removal of soft drink vending machines to be very effective in reducing the obesity among students (Cline, et al.). The solution would be to remove vending machines and other sources of food offering minimal nutritional value from schools across the nation. The problem then becomes replacing the money the school districts will lose from severing the contracts with the vendors. It has been reported that some school districts in Indiana earn up to $300,000 annually from such contracts (Cline, et al.). Some school districts are opting to replace soft drink vending machines with machines that offer water, sports drinks and juices. This can result in a loss for school districts, but this is a loss that some administrators are willing to take to help fight the obesity epidemic (Cline, et al.). Still other schools have made the switch to healthier vending machine choices without financial loss and one school even increased its income by switching (Cline, et al.).

Knowledge

The responsibility for combating the obesity epidemic does not lie solely on our nation’s schools. The American family is also a key player in this war. The meal that parents influence the most is dinner. Eating dinner together as a family has become less popular in more recent years (Gilman, et al, 2000). As children grow older they are less likely to eat dinner with their families. Studies have shown that eating dinner together provides a setting in which nutrition is discussed and nutritional knowledge is gained (Gilman, et al). As we have previously seen many children are not eating the number of servings from each food group that the USDA recommends. In a survey done in 1995 only 52% of the 9-15-year-old children surveyed had heard of the USDA’s food pyramid (Gilman, et al).
The National Center for Education Statistics issued a survey report in July of 1996 called *Nutrition Education in Public Elementary and Secondary Schools*. One thousand schools were asked to participate and the final response rate was 916. This survey found that 99% of public schools offer nutrition education in their curriculum; however, only 50% of students grades K through eight were required by the district or state to receive nutrition education (Celebuski, Farris & Carpenter, 1996). Most schools were found to focus on increasing the knowledge of the students and neglect topics related to motivation, attitude and eating habits. Of the nutrition topics that the students were educated about, the Food Guide Pyramid was the only topic covered thoroughly by more than 50% of the schools (Celebuski, et al.).

An Australian study of 185 fifth-graders done by Roncolato, Huon, Braganza and Ritchie (1998) showed that children scored highest in their ability to choose the healthiest meal followed by functions of foods and nutrients, diets for specific or age-related needs, and choosing the best source of nutrients. When questioned about their attitudes toward eating, there were no items that the children agreed on 50% of the time (Roncolato, et al.). The highest percentage of agreement, 47.6%, came from the item stating that a person should eat diet food in order to lose weight. Almost 42% of the children surveyed believed that the best way to remain the same weight was to eat familiar foods (Roncolato, et al.). The children were found to have a “moderate degree of positive feelings about their bodies, and on average had a low to moderate drive for thinness and body dissatisfaction scores” (Roncolato, et al., p.198).

This study also compared groups of lower socioeconomic status (SES) with groups from middle and upper middle socioeconomic status. It was found that the lower
SES group had a higher average BMI than the middle and upper middle SES groups. The nutritional knowledge of the lower SES group was also found to be considerably less than the nutritional knowledge of the middle and upper middle SES groups (Roncolato, et al.). Another striking difference was found in the eating attitudes. The upper middle SES group was found to have more positive eating attitudes than the lower and middle SES groups. This study also found that the desire to lose weight was higher in the lower SES group than the other groups (Roncolato, et al.). The authors state that the lower SES areas could be best served by improving nutritional interventions, citing previous studies that have stated that “lower social classes are a nutritionally vulnerable group and that even thought nutritional knowledge and eating patterns are not strongly correlated, knowledge has been reported to be a predisposing factor for eating behavior” (Roncolato, et al., p.201).

Attitudes

Knowledge is only one of many factors needed to reach or maintain a healthy weight. Attitudes and behaviors also play a very important role in this pursuit. A study done by Story, et al. (2001) involving a survey administered to 1441 Native American second and third-graders found that both male and female “children are concerned about their weight and that weight modifications efforts are common among overweight children” (p. 362). In a survey administered by the North Carolina State Department of Public Instruction it was found that 24% of the surveyed students thought of themselves as overweight (1996) and 40% of them were trying to lose weight. This indicates that Story et al. confirmed the findings from this previous study.
Children in the study done by Story, et al. (2001) also completed a physical activity self-efficacy section of the survey to assess their confidence to participate in physical activity. They found that girls had lower physical activity self-efficacy than did boys. The authors state that this could be part of the reason that a decrease in the physical activity of girls is seen in the adolescent years (Story, et al). No significant difference in physical activity self-efficacy was seen by weight status. This study also surveyed the children’s self-efficacy for healthy eating, meaning the children’s ability to choose foods low in fat and sugars. There were no differences found across genders or weight status in this category (Story, et al).

Story, et al. (2001) also state that 48% of female students and 30% of male students have previously attempted to lose weight. Their study showed that 70% of the overweight children surveyed had tried to lose weight previously and that 63% were trying to lose weight at the time of the survey (Story, et al). Exercise was the most common method of weight reduction, however; 50% of the children surveyed admitted to skipping meals for a whole day in order to lose weight (Story, et al). Story and colleagues remind us that although educating the public about health risks of obesity is important, it is also important that children do not become preoccupied with their weight or dissatisfied with their body to the point that they feel forced into unhealthy dieting and weight modification techniques (Story, et al). According to the authors, “public health messages for children should focus on promoting lifelong healthy eating and regular physical activity . . . and care must be taken not to label or stigmatize overweight children” (Story, et al, p. 362).
Hesketh, Wake and Waters (2004) performed a longitudinal study of 1157 children, ages five through ten, and discovered that obesity and low self-esteem are related especially by late elementary school years. The authors even suggest that there is a causal relationship between the two. Hesketh and colleagues point out that self-esteem tends to be lower in older children than in their younger counterparts. They also note that lower self-esteem was seen in overweight and obese children at both times of measurement, but they found that there was a much more prominent correlation when the children were surveyed the second time. These authors suggest that obesity interventions focus on decreasing BMI and increasing self-esteem (Hesketh, et al.).

A similar study completed by Strauss (2000) consisted of longitudinal follow-up of 1090 13 to 14 year olds who were enrolled in the project at nine to ten years of age. His study showed a significant decrease in self-esteem in obese white and Hispanic girls from nine to ten years of age to follow-up at 13 to 14 years of age (Strauss). Strauss states that the causal relationship between obesity and self-esteem is speculative. He cites many other factors that could be involved in the development of low self-esteem and suggests that further studies on the effects of weight loss or weight gain on self-esteem should be done (Strauss).

Another study examining the influence of obesity on self-esteem was done by Phillips and Hill (1998). They surveyed 313 British girls with a mean age of about 10 years old. The study found that at this age, obese children did not view social acceptance to be as important as did normal weight children. The author points out that this could be self-protective due to previous social rejections (Phillips & Hill). Neither overweight nor underweight children viewed athletic skills to be as important as their normal weight
peers. It was also found that the aspirations to succeed of the overweight girls who were surveyed were not influenced by their weight (Phillips & Hill). A questionnaire to determine the popularity and attractiveness of the participating girls was developed. The results from this questionnaire showed that there was no significant difference in the scores of the obese girls and their normal weight peers, however; the authors found a significant difference between the two groups in the nominations for attractiveness (Phillips & Hill).

**Eating behaviors**

The eating behaviors of adolescents were surveyed by the North Carolina State Department of Public Instruction [NCSDPI] (1996) in 1995 by using the Youth Risk Behavior Survey Middle School Questionnaire, developed by the National Centers for Disease Control and Prevention. The survey was administered to 2,227 middle school students in North Carolina. The students were questioned about their consumption of fatty meats, fat-fried potatoes, high-sugar foods, vegetables and fruits. When questioned about their intake of fatty meats, meaning hamburger, hot dogs, sausage, bacon or barbecue, 59% admitted to eating at least one of the given choices the previous day (NCSDPI). Sixty eight percent of the students surveyed admitted to eating high-fat potato foods, French fries or potato chips, the previous day (NCSDPI). The high-sugar foods category consisted of candy, cookies, doughnuts, pie and cake. When the students were questioned about their previous day’s consumption of foods from this category 77% of the surveyed students reported having eaten at least one of the listed foods (NCSDPI). When questioned, 57% of the surveyed students admitted to eating vegetables the previous day. Raw or cooked vegetables or green salad were the foods specifically asked
about on the survey (NCSDPI). Fruits and fruit juices comprised the fruit category. The percentage of students who reported eating fruit the previous day was 78% (NCSDPI).

There has been an increase in consumption of carbonated beverages and in foods high in fat and sugar. “In a span of ten to 12 years, dietary energy intakes of adolescents have increased by 300 kilocalories” (Templeton, Marlette & Panemangalore, 2005, p. 216). A study by Stockman, Schenkel, Brown, and Duncan (2005) concerning eating habits of adolescent males surveyed 180 healthy adolescent males between the ages of 14 and 18 showed that most of the energy, protein, carbohydrate, total fat, saturated fat, cholesterol, dietary fiber and sodium came from the dinner meals that these young men consumed. The breakfast and dinner meals both contributed the most calcium and iron of any meal (Stockman, et al.). The adolescents surveyed received the least amount of energy, carbohydrate, total fat and saturated fat from breakfast. Twenty five percent of dietary energy and nutrients came from lunch, which was significantly more than breakfast and less than dinner (Stockman, et al.). Snacks contributed the least amount of nutrients than any other meal with only cholesterol and iron being significantly lower (Stockman, et al.). Breakfast and lunch were meals most likely to be skipped, but 74% of those surveyed did not miss breakfast any of the days that were reported on in this study. It was also found that the BMI of this group was significantly lower than those who skipped breakfast at least one of the reported days (Stockman, et al.).

A study done by Berkey, Rockett, Gillman, Field and Colditz (2003) found that adolescents of normal weight were more likely to gain weight if they skipped breakfast, but adolescents who were overweight were more likely to lose weight. This study also reports that “children who skipped breakfast had higher daily percentage of energy from
fat and lower intakes of energy, protein, vitamins, and minerals, consumed snacks that were higher in fat, and had higher plasma total cholesterol levels” (Berkey, et al., p. 1263). Berkey and colleagues cite the fact that dinner is the meal to contribute the highest amount of energy as a potential area of concern since a previous study involving younger children cited high energy intake at dinner to be an independent risk factor for obesity (Berkey, et al.). This study also found an inverse relationship between eating frequency and BMI, suggesting that adolescents who eat more frequently have lower BMI’s. The authors also point out that previous research has also shown that children who participate in school lunch programs are more consistent in their meal patterns (Berkey, et al.). They suggest that nutrition education programs should stress the importance of frequent and consistent nutrient intake and school lunch programs should consider adding more opportunity for nutrient intake (Berkey, Rockett, et al.).

Templeton, et al. (2005), in their study of 488 sixth-grade students ranging in age from 11 to 13, found that despite efforts of the National School Lunch Program to ensure that meals served at school provide one third of the recommended daily allowance for energy, nutrients and essential micronutrients, sixth-grade adolescents consumed significantly less than that due to the competitive foods that one third of the students purchased (Templeton, et al.). These foods decreased the amount of energy, nutrients, minerals and vitamins that the children ate from the school lunch and constituted greater than one third of the total energy that the students consumed during that meal and decreased the consumption of essential minerals and vitamins, except for iron (Templeton, et al.).
Nielsen, Siega-Riz and Popkin (2002) compared the data from three nationally representative surveys from 1977 to 1996 with a total participant number of 16,810 people between the ages of 12 and 29, divided into two groups, adolescents and young adults. The authors found that the total energy intake had increased in both age groups most dramatically between the years of 1989 and 1996. Most of this increase was found to be due to snacks in the adolescent group (Nielsen, et al.). In adolescents, foods eaten at home and at school were found to contribute less to the daily percentage of energy intake while foods eaten at restaurant/fast food places contribute more. In 1977 one third of the calories consumed by adolescents came from desserts, low- and medium-fat milk and milk products, and beef and pork dishes as compared to 1996 when less than one fifth of the calories consumed came from those foods and a large increase in the consumption of soft drinks, pizza and salty snacks was seen (Nielsen, et al.). The authors state that energy-dense foods are more commonly becoming the type of food eaten outside of the home and contributing most to the energy intake of adolescents and young adults (Nielsen, et al.).

Thompson, et al. (2004) conducted a longitudinal study of 101 girls with a median baseline age of nine years old and a median follow-up age of 15 years old looking at the frequency of purchasing food away from home as a predictor of change in BMI. “Americans spent close to 50% of their food dollar on food obtained away from home and, in 1994, 56% of Americans ate away from home at least once a day” (Thompson, et al, p. 282). The study found an increase of 15% from baseline (71%) to follow-up (86%) in participants who ate food away from home. The girls who ate fast food two or more times a week consumed 303.8 kcal whereas the girls who ate fast food once a week or not
at all consumed 212.9 kcal, however, this difference was not significant (Thompson, et al). With that said, girls from the prior group were more likely to have a BMI that was a higher number of standard deviations away from the mean for their age group than were the girls from the latter group (Thompson, et al).

*Socio-economic status*

“Studies have consistently demonstrated that low socioeconomic groups are the least likely to comply with dietary guideline recommendations. Similarly, a large body of evidence exists which shows that low socioeconomic groups are least knowledgeable about food and nutrition” (Turrell, 1997, p.1). Turrell’s study of 413 Australian men and women confirms these findings.

In their study involving 654 Australian adolescents, ages 13-17 years, and 7695 Australian adults, ages 18-64, Giskes, Turrell, Patterson and Newman (2001) showed that there was a direct correlation between consumption of fruits and vegetables and income. The same was true for the correlation between the variety of fruits and vegetables consumed and income. (Previous studies have shown that this trend in variability is observed not only in fruits and vegetables, but for the diet in general.) The differences seen in both comparisons were more apparent in adults than in adolescents (Giskes, et al.). Although low socio-economic groups are less likely to have a diet consistent with recommended dietary guidelines, research has shown that they believe that their diet is healthy. Prior research has been done examining reasons given by people of low socio-economic status for their decreased intake of fruits and vegetables (Giskes, et al.). Some common reasons for decreased consumption of fruits and vegetables were decreased availability, poor quality, difficulty in storing and cost.
Vereecken, Inchley, Subramanian, Hublet and Maes (2005), in their study of 114,558 European adolescents aged 11, 13 and 15, found that children of higher socio-economic status ate more fruits and drank fewer soft drinks than those of lower socio-economic status in most areas of Europe surveyed.

Guenther, Jensen, Batres-Marquez, and Chen (2005), surveyed 4,802 children and 15,109 adults. In this study they were attempting to describe the eating habits of their sample with regard to meat consumption and also determine how the attitudes and knowledge of those surveyed impacted their meat consumption. Most of the population surveyed (97%) consumed meat of some type within a 2 day period, but the types of meats consumed varied within certain demographic groups. The authors state, “the above-average consumption of pork and processed pork products by individuals in low-income households suggests the greater relative importance of these meats in their diets” (Guenther, et al, p. 1268). Those who consumed more pork products also consumed more vegetables and fat and “were more likely to think that their diet was too high in fat, saturated fat, and cholesterol” (Guenther, et al).

Kaiser, Melgar-Quinonez, Lamp, Johns, Sutherlin, and Harwood (2002), surveyed 211 low-income Mexican-American families with regard to the relationship between food security and nutrition in their preschool aged children (ages 3 to 6). The study found that children who in families that were classified as food insecure were more likely to be lacking in the daily consumption of the nutrients recommended. It was also found that these children tended to have higher weight for their height and incidences of overweight, but this was not found to be significant (Kaiser, et al).
McNutt, Hu, Schreiber, Crawford, Obarzanek, and Mellin (1997), carried out a longitudinal study of nine- and ten-year-old black and white girls to determine if the eating behaviors differed between the two groups. The study set forth 11 “weight related” food practices and determined how often each girl participated in these practices. The practices being monitored were eating while doing homework, while watching TV, eating alone, eating in the bedroom, eating big helpings, eating alone, eating between meals even when not hungry, buying snack food, sneaking food when no one is looking, and the frequency of fast food per week, snacks per day and meals skipped (McNutt, et al). Data was collected annually for five years. “There were substantial differences between household income, parental education levels, and number of parents or guardians living in the household, between the two racial groups. The median household income category was $20,000 to $39,999 for black households and $40,000 to $49,000 for white households” (McNutt, et al, p. 31). Black and white girls who reported participating in the behaviors more often than not had higher levels of energy intake than those who did not participate in the behaviors. Overall what was seen in this study regarding income level was that the frequency of a girl engaging in these 11 eating habits decreased as parents’ income increased (McNutt, et al).

In conclusion, adolescent obesity and overweight is a growing problem that is complex and multi-factoral with such factors as inadequate nutrient and excessive energy intake, timing and frequency of meals, socioeconomic status, and education, to name a few, impacting the increasing BMIs of our children. Children are one of the most nutritionally educated segments of our society yet obesity-related diagnoses are being made at increasingly younger ages. The current study will examine the differences in
knowledge, attitude and eating behaviors of two groups of adolescents, one classified as higher income and the other classified as lower income. It will also examine the differences in knowledge, attitude and eating behaviors of obese and overweight adolescents as compared to normal weight students.
CHAPTER III

Methods

This study is comprised of subjects from three junior high schools, Byrnedale Junior High (BJH) and McTigue Junior High (MJH), in the Toledo Public School (TPS) district of Toledo, Ohio and Springfield Middle School (SMS) in Holland, OH. The schools were selected because of the economic dissimilarities of the surrounding neighborhoods and the student populations. The median household income for the zip code that BJH is located in is $42,080 (Public School Review, 2000b). The median household income for the zip code that MJH is located in is $39,442 (Public School Review, 2000c). The median household income for the zip code that SMS is located in is $53,145 (Public School Review, 2000a). The percentage of children who attend BJH who are eligible to receive free or reduced lunch is 31% (Public School Review, 2000b). The percentage of children who attend MJH who are eligible to receive free or reduced lunch is 64% (Public School Review, 2000c). The percentage of children who attend SMS who are eligible to receive free or reduced lunch is 42% (Public School Review, 2000a). The United States Department of Agriculture (USDA) annually revises the requirements for eligibility in the free and reduced lunch programs. See Appendix A for requirements for the 2005-2006 school year.

The response rate from Springfield Middle School was lower than expected, 22 surveys were returned. Three hundred fourteen eighth grade students attend SMS. This means that our surveys that were returned only represent seven percent of the student population at SMS and therefore it was determined that the sample was not representative of the population that was being surveyed and the data was not used in any further way.
TPS Chief Academic Officer was approached for permission to distribute our survey in the selected schools. After receiving permission, each school was approached. The principal at MJH and the guidance counselor from BJH agreed to assist in distribution of the surveys to the students. An information sheet explaining the research project and the students’ right to decline participation in the project was attached to the survey. See Appendix B for the instrument used and a copy of the cover sheet the students received. All forms, surveys and letters were approved by Medical College of Ohio’s Institutional Review Board. Four hundred surveys along with 400 pencils to serve as incentives to complete the surveys, and four votive candles as a thank you gift for the guidance counselor were delivered to the office at BJH the week that the survey was to be distributed. Three hundred and fifty surveys along with 350 pencils to serve as incentives to complete the surveys, and four votive candles as a thank you gift for the principal were delivered to the office at MJH the week that the survey was to be distributed. The surveys delivered to BJH and MJH were each labeled with a number one or two, respectively, to identify which school the data acquired from the survey came from. There were no individual identifiers asked of the students so as to maintain anonymity. The surveys were then distributed in one single day which was chosen at the convenience of the teachers. Directions for the administration of the survey were also given to the schools. See Appendix D. After the surveys had been completed the student researcher then retrieved the surveys from the schools. Each completed survey was numbered individually starting with number one and ending with the number representing the total number of completed surveys collected in order to group all of the answers from a single student. The number of surveys completed and returned was 190, 114 from BJH and 76
from MJH. The data was then entered into Microsoft Excel using a chart format with the survey number in the first column on the left hand side and the question numbers running across the top of the chart.

Questions one and two asked the height and weight of the students. This data was entered into excel and used to calculate Body Mass Index (BMI). The equation used to calculate BMI is as follows: BMI = \( \frac{wt}{(ht)^2} \) x 703, where “wt” = weight in pounds and “ht” = height in inches (Department of Health and Human Services Center for Disease Control and Prevention, n.d., ¶ 2).

The questions three through nine were scored using the following conversion:
a=1, b=2, c=3, d=4, e=5.

Each question that appeared on the survey in the table labeled number ten was numbered individually as six separate questions, see Appendix C, (numbered ten through 15) with the responses recorded as follows: “Not at all like me” = 1, “Slightly like me” = 2, “Somewhat like me” = 3, “Moderately like me” = 4, “Very like me” = 5. Each question represents a different subscale from the Multidimensional Health Questionnaire. A higher score on the question represents a higher tendency to poses that certain health characteristic. Question ten represents the Health Satisfaction subscale, 11 represents the Internal Health Control subscale, 12 represents the Health Illness Management subscale, 13 represents the Motivation to Avoid Unhealthiness subscale, 14 represents the Health Illness Self-Blame subscale, and 15 represents the Motivation for Healthiness subscale.

Each question that appeared on the survey in the table labeled number 11 was numbered individually as six separate questions, see Appendix C, (numbered 16 through 21) with responses to questions 19 and 20 recorded as follows: “Almost always” = 1,

Each question that appeared on the survey in the table labeled number 12 was numbered individually as three separate questions, see Appendix C, (numbered 22 through 24) with responses recorded as follows: “0 days” = 1, “1-2 days” = 2, “3-4 days” = 3, “5-6 days” = 4, “Everyday” = 5. The higher scores represent healthier more consistent eating patterns.

Each question that appeared on the survey in the table labeled number 13 was numbered individually as five separate questions, see Appendix C, (numbered 25 through 29) with questions 25 and 26 recorded as follows: “No” = 1, “Yes, once only” = 2, “Yes, two times” = 3, “Yes, three times” = 4, “Yes, four or more times” = 5. Questions 27, 28, and 29 were reverse scored with “No” = 5, “Yes, once only” = 4, “Yes, two times” = 3, “Yes, three times” = 2, “Yes, four or more times” = 1. The higher scores represent healthier eating habits.

Questions 14 through 18 were renumbered 30 through 34 respectively, see Appendix C, for the purposes of data analysis. These questions had right and wrong answers. The responses were scored as 1 if correct and 0 if wrong. The higher scores represent higher knowledge scores.

Identification of Variables

The independent variable in this study is SES. The dependent variables are knowledge, attitudes and behaviors. Since there are more than two possible responses or outcomes for each of these variables, they are all continuous.
Summary

One hundred ninety students from two junior high schools in the Toledo Public School district were involved in this study. The responses to the survey that were received from Springfield Middle School were not used in comparison of data because they were determined to be a non-representative sample. The schools were chosen because of their dissimilarities in the number of students receiving free or reduced lunch and the mean income in the zip code within which the school buildings were located. The data collected from these surveys was analyzed using Microsoft Excel.
CHAPTER IV

Results

The goal of this study was to determine if there is a difference in the nutrition knowledge, attitudes and eating behaviors of eighth grade students attending two junior high schools. The two schools compared were Byrnedale Junior High (BJH), which is located in a higher income neighborhood with a lower percentage of children who are eligible for the National School Lunch Program, and McTigue Junior High (MJH), which is in a lower income neighborhood with a higher percentage of students who are eligible for the National School Lunch Program. The hypotheses were that the BJH group would have more nutrition knowledge and more positive nutrition attitudes and eating behaviors than the MJH group and that the obese and overweight students would have less nutrition knowledge and less positive nutrition attitudes and eating behaviors than the normal weight kids.

The nutrition survey distributed to the schools was a compilation of five separate surveys. A total of 1025 surveys were distributed to three different schools. A total of 212 surveys were returned from the schools. Out of 372 students at BJH who were eligible to take the survey, 114 surveys were returned, giving us 30.6% returned. Out of 336 students at MJH who were eligible to take the survey, 76 surveys were returned, giving us 22.6% returned. Out of 314 students at Springfield Middle School (SMS) who were eligible to take the survey, 22 surveys were returned, giving us 7.0% returned. The demographics of the students who responded from SMS are as follows. Eleven of the students were male and eleven were female. Three of the students were underweight, 11 were normal weight and seven were overweight. Of the 212 surveys returned 25 surveys,
in total, were not included in the study. Twenty two surveys from SMS were excluded because the researcher determined that this sample was not representative of the population of students at SMS. Two surveys from BJH were excluded because every answer to all of the questions was chosen by the students. One survey from BJH was excluded because the answers to the height and weight were 5.10 and 9000 respectively. The researcher determined that the student was not answering the survey honestly and decided to exclude the survey from the data analysis.

Of the students at BJH who responded to the survey 49 were female and 65 were male. Of the students at MJH who responded to the survey 55 were female and 21 were male. When disaggregated into groups by weight status, at BJH, eight respondents were obese, nine respondents were overweight, 73 respondents were normal weight, and 12 respondents were underweight. Seven respondents at MJH were obese, 12 respondents were overweight, 40 respondents were normal weight, and four respondents were underweight. Some respondents from both schools were excluded from the classifications into weight class because the information needed to calculate their BMI was not completed on their survey.

The data in this study were analyzed by computer using the Excel data analysis tool pack® from Microsoft® corporation. The researcher hoped to determine two things by analyzing this data. First, the researcher looked at the respondents’ eating behaviors and how the eating behaviors were influenced by the respondents’ knowledge and attitudes regarding nutrition. Second, the researcher wanted to determine if differences existed between the groups and where they existed. Spearman-Brown Prophecy Formula, Kurtosis, factor analysis, correlations, covariance, and validity were computed.
in order to support the assumption of reliability and validity and determining significance of relationships. The Spearman-Brown Prophecy Formula was used to determine correlations between the data and to establish reliability. A Kurtosis test was done to measure the extent in which the questions asked clustered around the three main concepts, knowledge, attitudes and behaviors. A factor analysis was also carried out to identify the principal components within the survey, again to assure that the questions clustered around the concepts and to identify the significant relationships among the data. This was also done to help explain the pattern of correlations within a set of observed variables. Multiple ANOVA’s were employed to determine the difference between and within the variables. Finally, simple t tests were conducted to analyze the responses from each group on each question thereby confirming the statistical significance. The items not shown below were determined to have responses which were not statistically significant.

Data analysis

Income levels.

Comparisons were made between BJH and MJH to see if income level influenced the way the students responded to the survey. The items in Table 1 are the questions/statements that the two groups of students answered significantly different. The survey questions/statements not mentioned in Table 1 were found to have no significant difference in the answers given. The significance was determined by running a t-test comparing the responses from the two schools for all of the questions/statements listed in Table 1.
Table 1: Significant responses when comparing BJH and MJH

<table>
<thead>
<tr>
<th>Statements and Questions</th>
<th>mean responses BJH</th>
<th>mean responses MJH</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>1.57</td>
<td>1.11</td>
<td>187</td>
<td>$8.87 \times 10^{-14}$</td>
</tr>
<tr>
<td>8.</td>
<td>1.22</td>
<td>1.01</td>
<td>138</td>
<td>$7.90 \times 10^{-7}$</td>
</tr>
<tr>
<td>9.</td>
<td>1.47</td>
<td>1.20</td>
<td>182</td>
<td>$2.00 \times 10^{-5}$</td>
</tr>
<tr>
<td>10.</td>
<td>3.42</td>
<td>3.75</td>
<td>170</td>
<td>0.027</td>
</tr>
<tr>
<td>13.</td>
<td>3.97</td>
<td>4.33</td>
<td>165</td>
<td>0.028</td>
</tr>
<tr>
<td>15.</td>
<td>2.92</td>
<td>3.49</td>
<td>152</td>
<td>0.004</td>
</tr>
<tr>
<td>17.</td>
<td>2.02</td>
<td>1.73</td>
<td>162</td>
<td>0.001</td>
</tr>
<tr>
<td>20.</td>
<td>1.87</td>
<td>2.11</td>
<td>165</td>
<td>0.014</td>
</tr>
<tr>
<td>23.</td>
<td>3.93</td>
<td>4.27</td>
<td>170</td>
<td>0.024</td>
</tr>
<tr>
<td>27.</td>
<td>3.14</td>
<td>4.13</td>
<td>176</td>
<td>$4.9 \times 10^{-9}$</td>
</tr>
<tr>
<td>30.</td>
<td>0.49</td>
<td>0.63</td>
<td>165</td>
<td>0.028</td>
</tr>
<tr>
<td>33.</td>
<td>0.34</td>
<td>0.49</td>
<td>155</td>
<td>0.025</td>
</tr>
</tbody>
</table>

The results for question seven showed that significantly more students surveyed at MJH reported that they had learned about calories in school. The results for question eight showed that significantly more students surveyed at MJH reported that they had learned about the food groups in school. The results for question nine showed significantly more students surveyed at MJH reported that they had learned about balanced diets in school. Students surveyed at MJH scored significantly higher on the Health Satisfaction Subscale of the Multidimensional Health Questionnaire, seen in the results for question ten. Students surveyed at MJH scored significantly higher on the Motivation to Avoid Unhealthiness Subscale of the Multidimensional Health Questionnaire.
Questionnaire as seen by the results for question 13. Students surveyed at MJH scored significantly higher on the Health Illness Self-Blame Subscale of the Multidimensional Health Questionnaire, as seen by the results for question 15. The results for question 20 showed that significantly more students surveyed at BJH order a value meal combination when choosing fast food. The results for question 23 showed that significantly more students surveyed at MJH ate lunch more often throughout the week prior to the survey. The results for question 27 showed that students surveyed at BJH ate hamburger, hot dogs, sausage or barbecue on significantly more occasions throughout the day prior to the administration of the survey. Significantly more students surveyed at MJH answered question 30 correctly. Significantly more students surveyed at MJH answered question 33 correctly.

*Weight status.*

The BMI was calculated for each student surveyed. The data was then disaggregated by weight class into obese, overweight, normal weight, and underweight groups. These weight classes were formed by using the following criteria: BMI of 30 or more = obese, BMI of 25.0 to 29.9 = overweight, BMI of 18.5 to 24.9 = normal weight and BMI of 18.5 or less = underweight (Department of Health and Human Services Center for Disease Control and Prevention). The following data analysis applies to the data disaggregated by weight class. The items shown in Table 2 were determined to have responses which were statistically significant by running a t-test on all of the listed items. The items not shown in Table 2 were determined to have no statistical significance.
Table 2: Significant responses when comparing normal weight students to overweight and obese students

<table>
<thead>
<tr>
<th>Statements and Questions</th>
<th>Normal Weight mean responses</th>
<th>Overweight and Obese mean responses</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>2.86</td>
<td>2.37</td>
<td>0.0008</td>
</tr>
<tr>
<td>5.</td>
<td>3.86</td>
<td>3.19</td>
<td>4.13 x 10^{-7}</td>
</tr>
<tr>
<td>7.</td>
<td>1.22</td>
<td>1.43</td>
<td>0.007</td>
</tr>
<tr>
<td>10.</td>
<td>2.94</td>
<td>3.77</td>
<td>6.61 x 10^{-5}</td>
</tr>
<tr>
<td>19.</td>
<td>2.69</td>
<td>2.46</td>
<td>0.023</td>
</tr>
<tr>
<td>22.</td>
<td>2.47</td>
<td>2.96</td>
<td>0.035</td>
</tr>
<tr>
<td>27.</td>
<td>3.94</td>
<td>3.47</td>
<td>0.026</td>
</tr>
<tr>
<td>28.</td>
<td>4.14</td>
<td>3.68</td>
<td>0.015</td>
</tr>
<tr>
<td>29.</td>
<td>4.22</td>
<td>3.70</td>
<td>0.005</td>
</tr>
</tbody>
</table>

The results for question four showed that overweight and obese students described their health less favorably. The results for question five showed that overweight and obese students were more likely to describe themselves as slightly overweight or very overweight. The results for question seven showed that significantly more overweight and obese students reported learning about calories in school. Overweight and obese students scored significantly lower on the Health Satisfaction Subscale of the Multidimensional Health Questionnaire as seen by the results for question ten. Significantly more normal weight students reported super sizing their orders when choosing fast food as seen by results for question 19. Significantly more normal weight students reported eating breakfast more frequently during the week prior to the survey as seem by the results for question 22. The results for question 27 showed that normal
weight students ate hamburger, hot dogs, sausage or barbecue on significantly more occasions throughout the day prior to the administration of the survey. The results for question 28 showed that normal weight students ate French fries or potato chips on significantly more occasions throughout the day prior to the administration of the survey. The results for question 29 showed that normal weight students ate cookies, doughnuts, pie or cake on significantly more occasions throughout the day prior to the administration of the survey.

**Gender:**

The data was further disaggregated into male and female groups using the answers to question number three. Question number three asked, “What is your sex?” Answer “female” was scored as 1 and answer “male” was scored as 2. The following data analysis applies to the data disaggregated by weight class and gender. The items shown in Table 3 were determined to have responses which were statistically significant by running a t-test on all of the listed items. The items not shown in Table 3 were determined to have no statistical significance.

**Table 3: Significant responses when comparing obese boys and obese girls**

<table>
<thead>
<tr>
<th>Statements and Questions</th>
<th>Obese Boys mean responses</th>
<th>Obese Girls mean responses</th>
<th>Significance df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>4.5</td>
<td>3.43</td>
<td>10</td>
<td>0.040</td>
</tr>
<tr>
<td>16.</td>
<td>1.62</td>
<td>2.43</td>
<td>13</td>
<td>0.032</td>
</tr>
<tr>
<td>19.</td>
<td>2.12</td>
<td>2.86</td>
<td>12</td>
<td>0.009</td>
</tr>
</tbody>
</table>
The results for question 14 showed that obese boys scored significantly higher than the obese girls on the Health Illness Self-Blame Subscale of the Multidimensional Health Questionnaire. The results for question 16 showed that significantly more obese girls chose milk or juice instead of soda when choosing fast food. The results for question 19 showed that significantly more obese boys reported super sizing their orders when choosing fast food.

Table 4: Significant responses when comparing overweight boys and overweight girls

<table>
<thead>
<tr>
<th>Statements and Questions</th>
<th>Overweight Boys</th>
<th>Overweight Girls</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean responses</td>
<td>df</td>
<td>p value</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>2.63</td>
<td>3.00</td>
<td>7</td>
</tr>
<tr>
<td>20.</td>
<td>2.38</td>
<td>1.75</td>
<td>17</td>
</tr>
</tbody>
</table>

Significantly more overweight boys reported super sizing their orders when choosing fast food as seen by the results for question 19. Significantly more overweight girls reported ordering value meal combinations when choosing fast food as seen by the results for question 20.

Table 5: Significant responses when comparing normal weight boys and normal weight girls

<table>
<thead>
<tr>
<th>Statements and Questions</th>
<th>Normal Weight Boys</th>
<th>Normal Weight Girls</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean responses</td>
<td>df</td>
<td>p value</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>3.07</td>
<td>3.29</td>
<td>111</td>
</tr>
<tr>
<td>13.</td>
<td>4.00</td>
<td>4.42</td>
<td>98</td>
</tr>
<tr>
<td>19.</td>
<td>2.21</td>
<td>2.69</td>
<td>91</td>
</tr>
</tbody>
</table>
The results for question five sowed that significantly more normal weight girls saw themselves as slightly or very overweight. The results for question 13 showed that normal weight girls scored significantly higher on the Motivation to Avoid Unhealthiness Subscale of the Multidimensional Health Questionnaire. The results for question 19 showed that significantly more normal weight boys reported super sizing their orders when choosing fast food. Significantly more normal weight boys reported ordering value meal combinations when choosing fast food as seen by the results for question 20.

Normal weight girls ate fruit or drank fruit juice on significantly more occasions throughout the day prior to the administration of the survey as seen by the results for question 25. Normal weight boys ate hamburger, hot dogs, sausage or barbecue on significantly more occasions throughout the day prior to the administration of the survey as seen by the results for question 27.

Question number six asked what the respondents were trying to do about their weight. The data was analyzed by direct observation.

Table 6: Results of question number six

<table>
<thead>
<tr>
<th>Obese boys (n=8)</th>
<th>Obese girls (n=7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>Percentage</td>
</tr>
<tr>
<td>Lose weight</td>
<td>62.50%</td>
</tr>
<tr>
<td>Gain weight</td>
<td>12.50%</td>
</tr>
<tr>
<td>I am not trying</td>
<td>25.00%</td>
</tr>
<tr>
<td>anything about</td>
<td></td>
</tr>
<tr>
<td>my weight</td>
<td></td>
</tr>
<tr>
<td>Overweight boys (n=8)</td>
<td>Overweight girls (n=13)</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Percentage</strong></td>
</tr>
<tr>
<td>Lose weight</td>
<td>62.50%</td>
</tr>
<tr>
<td>Stay the same weight</td>
<td>25.00%</td>
</tr>
<tr>
<td>I am not trying to do</td>
<td>12.50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Normal weight boys (n=54)</th>
<th>Normal weight girls (n=59)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response</strong></td>
<td><strong>Percentage</strong></td>
</tr>
<tr>
<td>Lose weight</td>
<td>31.48%</td>
</tr>
<tr>
<td>Gain weight</td>
<td>16.67%</td>
</tr>
<tr>
<td>Stay the same weight</td>
<td>14.81%</td>
</tr>
<tr>
<td>I am not trying to do</td>
<td>37.04%</td>
</tr>
<tr>
<td>anything about my weight</td>
<td></td>
</tr>
</tbody>
</table>

Summary

The results of a 34 question survey distributed to junior high students at Byrndale Junior High and McTigue Junior High were compiled and compared. The data was analyzed using descriptive statistics, ANOVA and t tests to determine statistical significance.

When the data was compared by income level, the findings suggest that students from MJH, the lower income school, had more positive eating habits, more knowledge and more positive attitudes toward their own health than did the students from BJH, the higher income school.

The data was also compared by weight status. The findings suggest that overweight/obese students have poorer attitudes toward their own health, but have learned more about nutrition in school and have more positive eating habits than normal weight students.
CHAPTER V

Discussion

The hypotheses proposed by the researcher were as follows: 1) the students from the higher income school would have more positive eating habits than the students from the lower income school. 2) The students from the higher income school would have more knowledge than the students from the lower income school. 3) The students from the higher income school would have more positive attitudes than the students from the lower income school. 4) Normal weight students would have more knowledge than obese and overweight students. 5) Normal weight students would have more positive attitudes than obese and overweight students. 6) Normal weight students would have more positive eating habits than obese and overweight students.

Hypothesis number one was rejected. The data analysis showed that significantly more students at BJH ordered a value meal combination when choosing fast food and ate hamburger, hot dogs, sausage or barbecue on significantly more occasions throughout the day prior to the administration of the survey. Students from MJH ate lunch more often throughout the week prior to the survey.

Hypothesis number two was rejected. Questions 30-34 on the survey were designed to assess the nutritional knowledge of the students. Significantly more students from BJH answered questions number 30 and 33 correctly.

Hypothesis number three was rejected. Questions 10-15 on the survey were designed to evaluate each student’s health satisfaction, control over their own health and motivation to stay healthy and avoid unhealthiness. Students surveyed at MJH scored significantly higher on the Health Satisfaction Subscale, Motivation to Avoid
Unhealthiness Subscale and the Health Illness Self-Blame Subscale of the Multidimensional Health Questionnaire.

Hypothesis number four was rejected. The null hypothesis for this research question was accepted. There was no significant difference found between the normal weight and obese/overweight students on questions number 30-34.

Hypothesis number five was accepted. Overweight and obese students scored significantly lower on the Health Satisfaction Subscale of the Multidimensional Health Questionnaire. This is seen in the results for question number ten.

Hypothesis number six was rejected. Significantly more normal weight students reported super sizing their orders when choosing fast food, ate hamburger, hot dogs, sausage or barbecue, French fries or potato chips, cookies, doughnuts, pie or cake on significantly more occasions throughout the day prior to the administration of the survey.

Results

When the data from the higher income school (BJH) and the lower income school (MJH) was compared, significantly more students from MJH reported having learned about calories, food groups and balanced diets in school. Significantly more students from MJH were able to identify nutritious, low-fat snacks and knew that if certain nutrients were not eaten at meal time it was possible to make up for the missing nutrients by choosing the right snacks. MJH students were significantly less likely to have eaten hamburger, hot dogs, sausage or barbecue the day prior to administration of the survey and were less likely to have ordered value meals when choosing fast food. However, students from BJH were significantly more likely to chose grilled instead of fried food when choosing fast food. MJH students reported eating lunch significantly more often
the week prior to the survey than did the students at BJH. Students from MJH also
scored significantly higher on the Health Satisfaction, Motivation to Avoid
Unhealthiness, and Health Illness Self-Blame Subscales of the Multidimensional Health
Questionnaire. A high score on the Health Satisfaction Subscale indicates, “the
respondent’s health needs are currently being met in a pleasing and satisfying manner.
People who endorse these items are highly satisfied with their physical health” (Snell,
1996, ¶14). The Motivation to Avoid Unhealthiness Subscale “measures people's
motivational tendency to avoid poor physical health. People who endorse these items are
those who are concerned about becoming unhealthy; they are motivated to avoid
behaviors and activities which undermine their physical health” (Snell, ¶4). The items on
in the Motivation for Healthiness Subscale, “refer to the motivation to pursue positive
physical health. More specifically, these items were designed to measure people's
motivation to keep in excellent physical health. People who endorse these items are those
who are motivated to attend to the physical health of their body, to engage in activities
which promote their physical health, and to strive to maintain the wellness and integrity
of their physical health (Snell, ¶11). As a whole, the students surveyed from the lower
income school were more educated with respect to nutrition and had more positive
attitudes and eating behaviors. This does not support the first hypothesis proposed by the
researcher, “The students from the higher income school would have more knowledge,
more positive attitudes and more positive eating habits than the students from the lower
income school.” There are no studies that support these findings. It is possible that the
sample was not representative of the population or perhaps the students surveyed did not
answer honestly or an intervention program may have already been implemented in the lower income junior high school.

When comparing the data by weight status, the responses from obese and overweight students (BMI > 25) were compared with those from the normal weight students (BMI from 18.5 to 24.9). The normal weight students scored significantly higher on the Health Satisfaction subscale of the Multidimensional Health Questionnaire. A high score on the Health Satisfaction Subscale indicates, “the respondent’s health needs are currently being met in a pleasing and satisfying manner. People who endorse these items are highly satisfied with their physical health” (Snell, 1996, ¶14). Normal weight students ate breakfast significantly more frequently the week prior to the survey. This finding correlates with the findings of Stockman, et al concerning BMI and breakfast consumption stating that a lower BMI was associated with more frequent breakfast intake (2005). Obese/overweight students were significantly more likely to describe themselves as overweight and describe their health in general less favorably.

The following findings were unexpected. Significantly more students from the obese/overweight group reported having learned about calories in school. Significantly more normal weight students reported supersizing their orders when choosing fast food and were significantly more likely to have eaten hamburger, hot dogs, sausage or barbecue, French fries or potato chips and cookies, donuts, pie, or cake the day prior to administration of the survey. The finding that the normal weight students have significantly worse eating habits than the obese/overweight students could be due to under-reporting of intake by the obese/overweight students. Studies have shown that it is not uncommon for adolescent or obese subjects to under-report their energy intake.
These findings do not support the second hypothesis proposed by the researcher that normal weight students would have more positive eating behaviors than the obese/overweight students.

The male and female students from each respective weight class were compared. It was interesting to find that males, regardless of weight status, reported supersizing their orders when choosing fast food significantly more often than females. Obese girls, 100% of whom were currently trying to lose weight as compared to 62.5% of obese boys in the same weight category, were significantly more likely than obese boys to choose milk or juice instead of soda when ordering fast food. Obese boys scored significantly higher than obese girls on the Self-Blame Subscale of the Multidimensional Health Questionnaire. Twenty-five percent of the obese boys were not trying to do anything about their weight and 12.5% were trying to gain weight. One hundred percent of the overweight girls were trying to lose weight as compared to 62.5% of the overweight boys; however, overweight girls were significantly more likely than overweight boys to order value meals when choosing fast food. Twenty-five percent of the overweight boys were trying to stay the same weight and 12.5% were not trying to do anything about their weight. Almost 51% of the normal weight girls were trying to lose weight as compared to 31.48% of the normal weight boys. Normal weight girls were significantly more likely than normal weight boys to see themselves as slightly or very overweight and scored significantly higher on the Motivation to Avoid Unhealthiness Subscale of the Multidimensional Health Questionnaire. Normal weight girls also reported eating eat fruit or drinking fruit juice on significantly more occasions than the normal weight boys on the day prior to the study. While normal weight boys were significantly more likely to
order value meals and reported eating hamburger, hot dogs, sausage or barbecue on significantly more occasions than the normal weight girls on the day prior to the study.

*Intervening variables*

There were a few assumptions made in this study. The researcher assumed that the answers received on the surveys were honest and accurate responses and representative of the entire population of the school from where they were collected. It was also assumed that the instrument used to collect data was reliable and valid and that the environment in which the data was collected was conducive to administration of the survey following the guidelines distributed.

*Limitations*

There were also some limitations of the study. The difference in income levels between the two schools could have been better thought out so that a more dramatic difference would have existed. A problem with small sample size was realized when the respondents from the two schools were grouped by weight status and gender, notably so in the comparisons between the obese and overweight groups. There was also a return rate of 30% at BJH and 27% at MJH which was less than expected.
Conclusion

The results of this study show that of the students surveyed those attending the lower income school (MJH) had a more positive knowledge base concerning nutrition than did the students from the higher income school. It is also interesting that the students from MJH were more likely to be satisfied with their health, more motivated to stay healthy and more likely to blame themselves if they were to become unhealthy. These findings seem to coincide with the finding that the MJH students were making better food choices and were more able to identify nutritious low-fat snacks. These findings suggest that the students from MJH were more concerned about what they ate and were better equipped with the knowledge to make health food choices.

The results of comparing the obese/overweight students and the normal weight students suggest that obese/overweight students are consuming healthier foods and making healthier choices when eating fast food. The normal weight students are more satisfied with their health, but they do not appear to be making food choices that will enable them to maintain their normal weight status throughout adulthood. Part of the reason behind this could be that fewer of them have learned about calories in school.

Normal weight girls are more likely than normal weight boys to see themselves as overweight, with the majority of them, 50.85%, reporting to be currently trying to lose weight. These girls were also more motivated to avoid unhealthiness as evidenced by their eating habits. The majority of normal weight boys, 37.04%, were currently not trying to do anything about their weight. These results show that normal weight girls are more concerned about their weight and are trying harder than normal weight boys to maintain or lose weight.
Current research does not support the findings of this study. Further investigation should be done to find out if nutritional interventions had been implemented in the lower income school or in the obese/overweight population prior to the administration of the surveys. Further research should be done making the comparisons that have been made in this study but with a larger population. Additionally, the results of a comparison between adolescent males and females regarding their knowledge, attitudes and eating habits would be interesting.
## Appendix A

### INCOME ELIGIBILITY GUIDELINES

**Effective from July 1, 2005 to June 30, 2006**

<table>
<thead>
<tr>
<th>HOUSEHOLD SIZE</th>
<th>FEDERAL POVERTY GUIDELINES</th>
<th>REDUCED PRICE MEALS - 185%</th>
<th>FREE MEALS - 130%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ANNUAL</td>
<td>MONTHLY</td>
<td>MONTH</td>
</tr>
<tr>
<td>1</td>
<td>9,570</td>
<td>17,705</td>
<td>1,476</td>
</tr>
<tr>
<td>2</td>
<td>12,630</td>
<td>23,736</td>
<td>1,978</td>
</tr>
<tr>
<td>3</td>
<td>16,250</td>
<td>29,797</td>
<td>2,481</td>
</tr>
<tr>
<td>4</td>
<td>20,650</td>
<td>35,755</td>
<td>2,984</td>
</tr>
<tr>
<td>5</td>
<td>25,600</td>
<td>41,850</td>
<td>3,486</td>
</tr>
<tr>
<td>6</td>
<td>30,680</td>
<td>47,860</td>
<td>3,989</td>
</tr>
<tr>
<td>7</td>
<td>35,590</td>
<td>53,890</td>
<td>4,491</td>
</tr>
<tr>
<td>8</td>
<td>40,540</td>
<td>59,922</td>
<td>4,994</td>
</tr>
</tbody>
</table>

For each add'l family member, add 602

### ALASKA

<table>
<thead>
<tr>
<th>HOUSEHOLD SIZE</th>
<th>FEDERAL POVERTY GUIDELINES</th>
<th>REDUCED PRICE MEALS - 185%</th>
<th>FREE MEALS - 130%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ANNUAL</td>
<td>MONTHLY</td>
<td>MONTH</td>
</tr>
<tr>
<td>1</td>
<td>11,990</td>
<td>22,108</td>
<td>1,983</td>
</tr>
<tr>
<td>2</td>
<td>16,030</td>
<td>28,956</td>
<td>2,472</td>
</tr>
<tr>
<td>3</td>
<td>20,110</td>
<td>37,204</td>
<td>3,101</td>
</tr>
<tr>
<td>4</td>
<td>24,190</td>
<td>44,712</td>
<td>3,730</td>
</tr>
<tr>
<td>5</td>
<td>28,270</td>
<td>52,300</td>
<td>4,359</td>
</tr>
<tr>
<td>6</td>
<td>32,350</td>
<td>60,848</td>
<td>4,998</td>
</tr>
<tr>
<td>7</td>
<td>36,430</td>
<td>67,396</td>
<td>5,617</td>
</tr>
<tr>
<td>8</td>
<td>40,510</td>
<td>74,944</td>
<td>6,246</td>
</tr>
</tbody>
</table>

For each add'l family member, add 580

### HAWAII

<table>
<thead>
<tr>
<th>HOUSEHOLD SIZE</th>
<th>FEDERAL POVERTY GUIDELINES</th>
<th>REDUCED PRICE MEALS - 185%</th>
<th>FREE MEALS - 130%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ANNUAL</td>
<td>MONTHLY</td>
<td>MONTH</td>
</tr>
<tr>
<td>1</td>
<td>11,010</td>
<td>20,309</td>
<td>1,698</td>
</tr>
<tr>
<td>2</td>
<td>14,760</td>
<td>27,306</td>
<td>2,276</td>
</tr>
<tr>
<td>3</td>
<td>18,510</td>
<td>34,244</td>
<td>2,854</td>
</tr>
<tr>
<td>4</td>
<td>22,360</td>
<td>41,181</td>
<td>3,432</td>
</tr>
<tr>
<td>5</td>
<td>26,010</td>
<td>48,119</td>
<td>4,010</td>
</tr>
<tr>
<td>6</td>
<td>29,760</td>
<td>55,066</td>
<td>4,598</td>
</tr>
<tr>
<td>7</td>
<td>33,510</td>
<td>61,994</td>
<td>5,197</td>
</tr>
<tr>
<td>8</td>
<td>37,260</td>
<td>68,931</td>
<td>5,745</td>
</tr>
</tbody>
</table>

For each add'l family member, add 575

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Add少年营养 50
Information Sheet regarding the research entitled:

Nutrition: Knowledge, Attitudes and Behaviors of Eighth Grade Adolescents

Date: May 17, 2005

Dear Students:

You are being asked to take part in a research project entitled "Nutrition: Knowledge, Attitudes and Behaviors of Eighth Grade Adolescents". This research is being conducted by a student in the Physician Assistant Program at the Medical College of Ohio. This letter explains the details of this research. Please be sure to read it carefully before completing the attached questionnaire.

The purpose of this research is to find out more about the knowledge, attitudes and behaviors that eighth graders have about nutrition. You were selected as a possible participant in this study because you are an eighth grader and your parent(s) have agreed to let you take part in this study.

If you decide to take part in this research, you will be asked to complete the attached questionnaire. This should take about 30 minutes to complete. If you come across any questions that you do not want to answer or that you feel uncomfortable answering, please leave these blank. If, after beginning to answer the questions, you decide that you do not want to be a part of this research at all, you can simply destroy the form by tearing it into pieces and placing it in the envelope or box provided.

The researchers at Medical College of Ohio do not need to know your name or any other information about you that can be used to identify you. If you choose to take part in this research, you will be asked not to put any identifying marks (such as your name or student number) on the questionnaire. You are being asked to place the completed questionnaire into an envelope or box that will be available in your classroom. This is so that the person collecting the questionnaires will not know what questionnaire was returned by you in particular. If you decide that you do not want to continue with the questionnaire after beginning to answer the questions, you can simply tear the form and place it in the designated envelope or box in your classroom.

Taking part in this research is voluntary. If you decide not to take part in this research, your decision will not affect your future relations with the Medical College of Ohio, its personnel, and associated hospitals, nor will it affect your relationship with your school. If you decide to take part, you are free to withdraw your consent and discontinue your participation at any time (until the questionnaire is turned in) without penalty. Once the completed questionnaire is turned in, since each questionnaire will not have personal identifying information on it, the researcher will no longer be able to withdraw your responses.

If you have any questions about taking part in this research at any time, you may ask your teacher or your principal Mr. Geha. If you have any questions about the research itself, your or your parents may contact Patricia Hogue (MCO Faculty Advisor) and Heather Sandifer (MCO student researcher) at hsandifer@mco.edu or call (419) 383-4807.

Thank you for helping us find out more about the nutrition of eighth grade students by taking part in this research.

Heather Sandifer, PA-S
Physician Assistant Program Student
Medical College of Ohio

Patricia Hogue, MSPA-C
Faculty Advisor, Physician Assistant Program
Medical College of Ohio

APPROVED BY MEDICAL UNIVERSITY
OF OHIO AT TOLEDO IRB
The following is a survey. There are no right or wrong answers. Please pick the choice that most closely applies to you or how you feel. Choose only one answer unless you are instructed to choose more than one. Your answers will not be linked to you in any way. The information you provide is strictly confidential. Thank you for your participation.

1. How tall are you (in feet and inches) without your shoes on?
2. How much do you weigh (in pounds)?
3. What is your sex?
   a. Female
   b. Male
4. How do you describe your health in general?
   a. Excellent
   b. Very good
   c. Good
   d. Fair
   e. Poor
5. How do you think of yourself?
   a. Very underweight
   b. Slightly underweight
   c. About the right weight
   d. Slightly overweight
   e. Very overweight
6. Which of the following are you trying to do?
   a. Lose weight
   b. Gain weight
   c. Stay the same weight
   d. I am not trying to do anything about my weight
7. Have you learned about calories in school?
   a. Yes
   b. No
8. Have you learned about the food groups in school?
   a. Yes
   b. No
9. Have you learned about balanced diets in school?
   a. Yes
   b. No
10. The following table contains statements concerning feelings about health. Read each item and decide whether it describes you or not. Rate each statement as not at all like me, slightly like me, somewhat like me, moderately like me, or very like me by placing a mark under the corresponding column.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at all like me</th>
<th>Slightly like me</th>
<th>Somewhat like me</th>
<th>Moderately like me</th>
<th>Very like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am very satisfied with my own physical health.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel like my physical health is something that I myself am in charge of.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My own behavior determines whether I become overweight or not.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I really want to prevent myself from getting out of shape.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I were to start gaining weight, then it would be my own fault for letting it happen.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I strive to keep myself in tip-top physical shape.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. When you choose “fast-food”, how often do you do the following: (Place a check in the most appropriate box.)

<table>
<thead>
<tr>
<th>Action</th>
<th>Always</th>
<th>Sometimes</th>
<th>Almost Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose milk or juice instead of soda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order grilled menu items instead of fried</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choose a side dish other than fries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Super size your order</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order a value meal combination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share a meal or portion of a meal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. During the past WEEK, how many days did you eat the following meals?

<table>
<thead>
<tr>
<th>Meal</th>
<th>0 days</th>
<th>1-2 days</th>
<th>3-4 days</th>
<th>5-6 days</th>
<th>Everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. Yesterday, did you eat any of the following foods?

<table>
<thead>
<tr>
<th>Food</th>
<th>No</th>
<th>Yes once only</th>
<th>Yes, two times</th>
<th>Yes, three times</th>
<th>Yes, four or more times</th>
</tr>
</thead>
<tbody>
<tr>
<td>fruit (or drink fruit juice)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>green salad, raw or cooked vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hamburger, hot dogs, sausage, barbecue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French fries, potato chips</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cookies, doughnuts, pie, cake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The following questions have right and wrong answers. Please choose the best answer for each question.

14. Snacking can be a good way to get important nutrients that you missed during meals.
   a. True
   b. False

15. If a person is trying to lose weight, they should do the following:
   a. Eliminate all fat from your diet
   b. Reduce the calories you consume and exercise regularly
   c. Skip meals in order to save calories
   d. All of the above

16. From which food group should you eat the most servings each day?
   a. Dairy – milk, cheese, yogurt
   b. Meat, eggs, beans
   c. Fruits
   d. Vegetables
   e. Grains – bread, cereal, pasta, rice

17. Which of these foods is considered to be a nutritious, low-fat snack food?
   a. Air-popped popcorn
   b. Apple slices
   c. Oatmeal
   d. All of the above

18. It is possible to find healthy eating options when dining out.
   a. True
   b. False

THIS COMPLETES THE SURVEY. THANK YOU FOR YOUR PARTICIPATION.
This Appendix is included so that there is no confusion with the numbering of the questions. The survey seen below shows the questions numbered as described in the Methods section of this paper.

The following is a survey. There are no right or wrong answers. Please pick the choice that most closely applies to you or how you feel. Choose only one answer unless you are instructed to choose more than one. Your answers will not be linked to you in any way. The information you provide is strictly confidential. Thank you for your participation.

1. How tall are you (in feet and inches) without your shoes on?

2. How much do you weigh (in pounds)?

3. What is your sex?
   a. Female
   b. Male

4. How do you describe your health in general?
   a. Excellent
   b. Very good
   c. Good
   d. Fair
   e. Poor

5. How do you think of yourself?
   a. Very underweight
   b. Slightly underweight
   c. About the right weight
   d. Slightly overweight
   e. Very overweight

6. Which of the following are you trying to do?
   a. Lose weight
   b. Gain weight
   c. Stay the same weight
   d. I am not trying to do anything about my weight

7. Have you learned about calories in school?
   a. Yes
   b. No

8. Have you learned about the food groups in school?
   a. Yes
   b. No

9. Have you learned about balanced diets in school?
   a. Yes
   b. No
The following table contains statements concerning feelings about health. Read each item and decide whether it describes you or not. **Rate each statement as not at all like me, slightly like me, somewhat like me, moderately like me, or very like me** by placing a mark under the corresponding column.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at all like me</th>
<th>Slightly like me</th>
<th>Somewhat like me</th>
<th>Moderately like me</th>
<th>Very like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. I am very satisfied with my own physical health.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I feel like my physical health is something that I myself am in charge of.</td>
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<tr>
<td>12. My own behavior determines whether I become overweight or not.</td>
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<td></td>
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<tr>
<td>13. I really want to prevent myself from getting out of shape.</td>
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<tr>
<td>14. If I were to start gaining weight, then it would be my own fault for letting it happen.</td>
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<td></td>
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</tr>
<tr>
<td>15. I strive to keep myself in tip-top physical shape.</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When you choose “fast-food”, how often do you do the following: **(Place a check in the most appropriate box.)**

<table>
<thead>
<tr>
<th>Action</th>
<th>Almost Always</th>
<th>Sometimes</th>
<th>Almost Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Choose milk or juice instead of soda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Order grilled menu items instead of fried.</td>
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<td></td>
<td></td>
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<tr>
<td>18. Choose a side dish other than fries.</td>
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<td></td>
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<tr>
<td>19. Super size your order.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>20. Order a value meal combination.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>21. Share a meal or portion of a meal.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

During the past **WEEK**, how many days did you eat the following meals?

<table>
<thead>
<tr>
<th>Meal</th>
<th>0 days</th>
<th>1-2 days</th>
<th>3-4 days</th>
<th>5-6 days</th>
<th>Everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. Breakfast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Dinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Yesterday**, did you eat any of the following foods?

<table>
<thead>
<tr>
<th>Food</th>
<th>No</th>
<th>Yes, once only</th>
<th>Yes, two times</th>
<th>Yes, three times</th>
<th>Yes, four or more times</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. fruit (or drink fruit juice)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>26. green salad, raw or cooked vegetables</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Hamburger, hot dogs, sausage, barbecue</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
The following questions have right and wrong answers. Please choose the best answer for each question.

30. Snacking can be a good way to get important nutrients that you missed during meals.
   a. True
   b. False

31. If a person is trying to lose weight, they should do the following:
   a. Eliminate all fat from your diet
   b. Reduce the calories you consume and exercise regularly
   c. Skip meals in order to save calories
   d. All of the above

32. From which food group should you eat the most servings each day?
   a. Dairy – milk, cheese, yogurt
   b. Meat, eggs, beans
   c. Fruits
   d. Vegetables
   e. Grains – bread, cereal, pasta, rice

33. Which of these foods is considered to be a nutritious, low-fat snack food?
   a. Air-popped popcorn
   b. Apple slices
   c. Oatmeal
   d. All of the above

34. It is possible to find healthy eating options when dining out.
   a. True
   b. False

THIS COMPLETES THE SURVEY. THANK YOU FOR YOUR PARTICIPATION.
Date: May 27, 2005
Re: Administration of nutrition survey
To: Teachers administering the survey

DIRECTIONS FOR SURVEY ADMINISTRATION

Teachers: You will be provided with surveys for your students to complete. Please review the list of students who have returned a permission slip to ensure that each student who is given a survey is on the list. The students should be instructed to place the survey in the envelope provided when finished.

Thank you very much for taking the time out of your schedule to administer this survey. I would also like to thank you in advance for your help in ensuring that the identity of the students is protected. Should you have any questions or need anything further please contact me at (419) 908-0640.

Sincerely,

Heather Sandifer, PA-S
Physician Assistant Student
Medical College of Ohio

Patricia Hogue, MSPA-C
Faculty Advisor, Physician Assistant Program
Medical College of Ohio
References


Templeton, S. B., Marlette, M. A., Panemangalore, M. (2005). Competitive foods increase the intake of energy and decrease the intake of certain nutrients by adolescents consuming


