

**The impact of a intervention program on the knowledge and behaviors of school-age
children in Alabama regarding nutrition and physical activity**

by

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DEDICATION

This dissertation is dedicated to Dr. Bernice Richardson.

She enabled me to envision that I could pursue a PhD.

Her constant words of wisdom inspired me to complete of this research.

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ABSTRACT

For many years, the prevalence of increased health problems due to unhealthy eating and physical inactivity has become a huge concern. In study after study, the residents in the state of Alabama have ranked high in such dubious categories as obesity, diabetes, and lack of exercise (Trust for America's Health, 2008). This concern has gained national attention. With this in mind, organizations such as the Boys and Girls Clubs of America and the Alabama Cooperative Extension System have begun developing and implementing programs for children and youth that focus on healthy eating and being active. Nevertheless, over the past few years little has been done to develop intervention programs centered on knowledge and behaviors of school-age children in Alabama. Therefore, the purpose of this study was to assess the impact of an intervention program on the knowledge and behaviors of school-aged children who participated in two North Alabama Boys and Girls Clubs for ages 10, 11, and 12. Specifically, the study examined the degree to which CHAMPION (Community Health Aerobic Motivational Program Initiating Optimal Nutrition) increases positive nutrition knowledge and healthy physical activity behaviors. Permission and assent were obtained from 82 school-age children in two North Alabama Boys and Girls Clubs (Control, $N=39$; Experimental, $N=43$). Findings of the study indicated a positive impact on knowledge and physical activity behaviors of those participants who received the intervention (Club 1). It is recommended that more intervention programs are implemented that mirror this study.

CHAPTER I. INTRODUCTION

Background and Rationale for the Study

Children's eating habits and physical activity patterns have changed over the last three decades (ADA, 2003). Each year, chronic diseases such as obesity, type II diabetes, and hypertension claim the lives of many children (Barroso, 2000). "Unhealthy eating habits and a sedentary lifestyle are resulting in an epidemic" (Ries & Tigerstorm, 2010, p. 687). The epidemic of childhood preventable health problems has risen at a rapid rate. Chronic disease is now a major public health challenge. Governments and experts around the world are calling for concerted action, including legislative measures, to promote healthier nutrition and physical activity (Canadian Medical Association Journal, 2010).

In the past, specific health-related problems leading to diseases were almost unheard of in school-age children. These diseases include: heart disease, stroke, cancer, diabetes, high blood pressure, and obesity (NANA, 2008). As these health problems have increased at such an alarming rate, many professionals have declared war on unhealthy eating and physical inactivity (CDC, 2003). Obesity adversely affects nearly every system of the human body and greatly increases the risk of numerous adverse health conditions, especially diabetes (Finkelstein & Strombotne, 2010).

"While obesity is a national concern, nowhere are waistlines expanding as rapidly as they are in the state of Alabama" (DeBallis, 2007, p. 1). With no surprise, the state of Alabama has been ranked as the second most obese state in the United States next to Mississippi (Wes, 2007). The 2007 National Survey of Children's Health ranked Alabama's children as fourteenth in the U.S. for obesity (Robert Wood Johnson Foundation, 2010).

Childhood obesity has reached epidemic proportions and is directly attributed to physical inactivity and diet (ADA, 2003). Alabama's school-age children have shown an epidemic increase in obesity (Aldridge, Alexander, Colon, Franklin, & Lee, 2002). Higher rates of obesity relate to higher rates of obesity-related diseases, such as diabetes and heart disease (Robert Wood Johnson Foundation, 2010). Scientists have associated the rapid rise in obesity related diseases to increased food consumption and reduced exercise.

Considering the circumstances of health-related problems school-age children face in Alabama, this population is, indeed, in need of more intervention programs that focus on increasing positive nutrition knowledge and healthy physical activity behaviors. According to officials associated with the Centers for Disease Control, an estimated 365,000 people die each year from health problems related to unhealthy eating and physical inactivity (CDC, 2006). There has been a lot of interest in developing effective treatments for obesity, with the overwhelming majority of this research focused on adults (Epstein, Myers, & Raynor, 1998).

Meanwhile, the number of school-age children suffering from obesity in Alabama is growing at an alarming rate. School-age children in Alabama are ingesting more calories than they are burning. Sugar drinks, also called sugar-sweetened beverages, are the greatest source of added sugars in the diets of U.S. youth (CDC, 2011a). According to the Dietary Intervention Study in Children (DISC), nutrition education programs for children can enhance health outcomes (ADA, 2006). While education is only part of the solution, community-level interventions to improve the environments where people make choices about what to eat and how to get active are essential to improving overall health and well-being (Prevention Institute, 2007).

Although school-age children can reduce the risk of developing many of these serious health problems through good nutrition and physical activity intervention programs, there must also be a lifestyle change. An individual who eats healthy foods and is physically active daily is adopting a healthy lifestyle, which helps to counteract chronic diseases (Warren, 2011). It is vitally important to establish appropriate health attitudes, knowledge, and skills in childhood for a number of reasons (Boys and Girls Clubs of America, 2011). Lifestyle changes can be accomplished through intervention programs that focus on knowledge and behavioral change across Alabama.

To help children become and remain healthy, nutrition and physical activity professionals should provide them with educational intervention programs for a healthy life. School-age children go through such a phenomenal growth period during adolescence. Therefore, it is very important that good, effective intervention programs be developed in the earlier years. It is equally important to note that children also begin to develop their own perceptions of nutrition and physical activity from knowledge they have gained. Intervention programs can help improve children's lives while promoting sound eating and physical activity habits. Children who eat healthy and are physically active on a regular basis have been said to have a greater chance of becoming healthy adults.

The health benefits of physical activity for children are supported by many studies (Amy & O'Dea, 2011). Alabama's children need model intervention programs to assist in bettering their health. Young people currently reside in an environment that de-emphasizes good health and nutrition, while reinforcing inactivity and poor eating habits (Akey, Furana, Gambone, & Osterman, 2009). This is seen as a challenge for all youth-serving organizations in Alabama, many that have a goal of ensuring the well-being of their participants. Several

organizations currently have developed and are implementing programs focused on eating healthy and physical activity in some capacity, such as the Boys and Girls Clubs of America and the Alabama Cooperative Extension System. The mission of the Boys and Girls Clubs of America (2011) is to “Enable all young people, especially those who need us most, to reach their full potential as productive, caring, responsible citizens” (p. 1). This organization takes pride in its reputation as having helped youth to create pathways for great futures for over a century. Its numerous clubs nationwide provide generation changing programs that support a commitment to learning, positive values, healthy habits, and high expectations for success as an adult (Boys and Girls Clubs of America, 2011).

There are 10 Boys and Girls Clubs in North Alabama. These clubs have a program called Health and Life Skills. The health and life skills initiative is designed to develop young people’s capacity to engage in positive behaviors that nurture their own well-being, set personal goals and live successfully as self-sufficient adults (Boys and Girls Clubs of North Alabama, 2012). Sports, Fitness, and Recreation are other programs implemented within the Boys and Girls Clubs of North Alabama. These programs help to develop fitness, a positive use of leisure, reduction of stress, appreciation for the environment, and social interpersonal skills (Boys and Girls Clubs of North Alabama, 2012).

Developing and implementing programs that promote a healthy lifestyle across Alabama is a goal of the Alabama Cooperative Extension System. Aiding in the reduction of alarming statistics on childhood obesity, the Alabama Cooperative Extension System Urban Affairs and New Nontraditional Programs offer several nutrition and health programs. These include (Alabama Cooperative Extension System, 2010):

1. Black Entertainment Television Summer Camp for Girls (ages 10-12 years), an Extension partnership with the Black Entertainment Television Foundation.
2. Urban Nutrition Education Program.
3. Expanded Food and Nutrition Education Program.
4. Community Health, Aerobic and Motivational Program Initiating Optimal Nutrition, better known as CHAMPION (for youth).

The CHAMPION program was selected as the intervention program for this study.

Dr. Tamara Warren, a health and nutrition specialist, developed and implemented this program throughout many Alabama counties. This program provides education related to nutrition and chronic diseases in addition to physical activity:

To aid in the combat of chronic diseases in Alabama, a weight management program called “Community Health, Aerobic, and Motivational Program Initiating Optimal Nutrition” (C.H.A.M.P.I.O.N) was implemented to the target audience- teens, adults, and the elderly with limited resources living in the metropolitan inner cities that are at the highest risk for health related problems. The program’s goal is to improve the overall health of the target audience through lifestyle changes such as adopting obtainable and safe eating practices, daily physical activity, and improving behavioral habits. The goal was implemented through the following objective: 1) To increase knowledge through a pre and post assessment on health, nutrition, physical activities, and chronic disease information; 2) To increase flexibility and endurance to improve body image through regular physical activity; 3) Provide information for intervention/maintenance of chronic disease to aid in the reduction of doctor visits and health costs. During one time period, a study of 1115 youth (children and teens) were involved in once a week class conducted on nutrition, physical activity, and chronic diseases intervention/maintenance. (Warren, 2011. p. 2)

The CHAMPION intervention program for youth implemented by Warren included components that focused on accessing a nutrition and physical intervention program implemented on school-age children in North Alabama. Human subjects’ approval for this study was granted (Appendix B). The study used a modified version of CHAMPION in

which lessons: (a) focused only on 10-12 year olds; (b) were taught on consecutive days versus once a week; and (c) included daily physical activity. In addition, the program included an eight-day lesson plan (Appendix C). This modification was necessary based on the purpose of the research. With these types of programs in place and currently being implemented, it was appropriate to begin to assess their effectiveness regarding short- and long-term acquisition of nutrition knowledge and engagement in physical activities.

Purpose

The purpose of this study was to assess the impact of an intervention program on the knowledge and behaviors of school-aged children participating in two North Alabama Boys and Girls Clubs, ages 10, 11, and 12 as related to good health. Specifically, the study examined the degree to which CHAMPION (Community Health Aerobic Motivational Program Initiating Optimal Nutrition) increases positive nutrition knowledge and healthy physical activity behaviors. The intervention program implemented for this study was a part of the existing CHAMPION program. CHAMPION was developed as a weight management program to be implemented throughout Alabama. For the purpose of this study, the focus of the CHAMPION program that was designed for school-aged children was selected. The instructional materials designed especially for Alabama's children (ages 5-12) include interactive materials on chronic diseases, physical activity, and nutrition. The components are comprised of nutrition and physical activity aimed at knowledge and behavior change. The intervention program is a ten-day program. Educational materials are given daily during the program. The weight loss and instructional classes have revealed that participants who increase their knowledge of nutrition, physical activity, and chronic diseases can improve

behavior and eating habits, endurance, and aid with the intervention/maintenance of chronic diseases (Warren, 2008).

Theoretical Framework

Prochaska, Norcross, and DiClemente (1994) introduced a six-stages program in the publication, *Changing for good: A revolutionary six-stages program for overcoming bad habits and moving your life positively forward*. This program has been referred to as the transtheoretical model for change that is often integrated with other theories (iHealth 2011). The theoretical framework for the current study was based on one of the major theories in behavior change, known as the Transtheoretical Model of Behavior Change. The central premise of this theoretical model is that behavior change is a process, not an event, and that individuals have varying levels of motivation or readiness to change (iHealth, 2011). To better understand health habits, psychologists have developed health behavior theories to explain individual behavior changes (iHealth, 2011). This model reveals that interventions to change behavior are more effective if they are “stage-matched”, or “matched to each individual’s stage of change” (Prochaska & DiClemente, 1982, p. 278). Although the stages of change model was developed initially as a framework to understand smoking cessation programs, it has also been used with a number of other health behaviors, including eating and physical activity (iHealth, 2011). Health and education are areas in which behavior change theories have revealed potential effectiveness. Behavior changes require a person to proceed through the following six stages (Prochaska et al., 1994):

- Precontemplation (Not Ready) - People are not intending to take action in the near future, and can be unaware that their behavior is problematic (p.73).

- Contemplation (Getting Ready) - People are beginning to recognize that their behavior is problematic, and start to look at the pros and cons of their continued actions (p. 109).
- Preparation (Ready) - People are intending to take action in the immediate future, and may begin taking small steps toward behavior change (p. 145).
- Action – People have made specific overt modifications in modifying their problem behavior or in acquiring new healthy behaviors (p. 172).
- Maintenance – People have been able to sustain action for a while and are working to prevent relapse (p. 202).
- Termination – Individuals have zero temptation and they are sure they will not return to their old unhealthy habit as a way of coping (p. 274).

CHAMPION addresses behavior change theory that encourages participants to develop and maintain healthy lifestyles. Research has indicated that intervention programs centered around the stages of change can be effective. According to the Dietary Intervention Study in Children (DISC), nutrition education programs for children can enhance health outcomes (ADA, 2006). Kafatos and Manios (1999) conducted a study of 4,171 children in 24 schools over a six-year period and revealed the following:

The objective was to examine effects of a health and nutrition intervention, implemented in primary schools of Crete, on health knowledge, nutrient intakes and physical activity of the intervention population. Results showed that after the completion of the intervention period, the changes observed in health knowledge, nutrient intakes, and physical activity were in favor of the intervention group pupils. The encouraging findings of the study indicate the potential of the programme in health promotion and disease prevention without involving substantial new school resources and time. (p. 445)

Research Questions

The following research questions framed the study to identify the impact the intervention program on nutrition and physical activity knowledge and behavior of school-age children in North Alabama:

1. Does the CHAMPION program impact the knowledge of school-age children regarding nutrition and physical activity?
2. Does the CHAMPION program impact the behaviors of school-age children regarding nutrition and physical activity?
3. Does the CHAMPION program have a long-term effect on school-age children?

Assumptions

The study was conducted based on the following assumptions:

1. The school-age children who participated in this study showed positive gains in their knowledge of good nutritional benefits and physical activity as measured by their pre-test and post-test.
2. The school-age children who participated in this study showed positive gains in the behaviors into regards to making healthier food choices and being active.
3. The intervention program did have long-term effects on the school-age children who participated in this study.

Limitations

This study was limited to school children who ranged from 10-12 years of age, at two locations within the Boys and Girls Club of North Alabama. There was no opportunity to collect baseline data such as height, weight, and blood pressure. A lack of control over extenuating variables, such as family and friend influences, were considered limitations. Motivation to participate in physical activities may have also played a part in the limitations of the study. Conducting the intervention program without assistance proved to be a

limitation. Some club members of different ages needed more-in-depth assistance and program explanation.

Definition of Terms

The following definitions were used for the purpose of this study:

Behavior: Consist of what one does or how one acts in response to a stimulus (Berns, 2004).

Calorie: A unit of energy supplied by food. A calorie is a calorie regardless of its source.

Whether you are eating carbohydrates, fats, sugars, or proteins, all of them contain calories (CDC, 2011b).

Caloric Balance: Like a scale. To remain in balance and maintain body weight, the calories consumed (from foods) must be balanced by the calories used (in normal body functions, daily activities, and exercise) (CDC, 2011c).

High Blood Pressure or Hypertension: A chronic disease that has a higher than normal pressure inside the arteries either during systolic (when the heart contracts and pumps blood through the body), or during diastolic (when the heart is at rest and is filling with blood) (American Heart Association, 2003a).

Intervention Program: Program designed for intervening, interfering, or interceding with the intent of modifying the outcome (LSI Center for Health Promotion, 2004).

Long-Term: Two months for the purpose of this study.

Knowledge: Awareness of the benefit (iHealth, 2011).

Nutrition: The study of nutrients in food and how the body uses them (Duyff, 2003).

Obesity: A condition characterized by excess body fat, typically defined in clinical settings as body mass index (BMI) \geq to 30 (Duyff, 2003).

Perception: How a person select, organize, and interpret information (Bailey, 2004).

Physical Activity: A muscular movement of the body that results in significant energy expenditure above the resting metabolism (Redican & Sparking, 2011).

Physical Inactivity: A sedentary state (Hellison, 2003).

Prevention Program: Program designed to keep something from happening (Prevention Institute, 2007).

School-Age Children: Students 10, 11, and 12 years of age who participated in the study.

Type II Diabetes: A condition in which the body cannot control levels of sugar in the blood properly. Insulin therapy can be used but often is not required; often associated with obesity (Duyff, 2003).

Organization

This dissertation includes five chapters that are organized in the following manner. Chapter 1 identifies the study's rational and background; purpose of the study; theoretical framework; research questions; assumptions; limitations; definition of terms; and organization of chapters. Chapter 2 provides a review of literature relate to nutrition and physical activity behaviors. It also, includes health problems facing school-aged children. These health problems include obesity, type II diabetes, and high blood pressure or hypertension. A discussion is also included concerning health care cost as it relates to these health problems, nutrition for school-aged children, physical activity for school-aged children, and intervention program.

Chapter 3 identifies the methodology applied to carry out the study. It includes the population and sample, research protocol, and data analysis. Chapter 4 provides the results,

which include a description and analysis of the sample, and results based on the research questions. Lastly, Chapter 5 provides the discussion, summary, limitations, findings, implications for action, and recommendations for future research.

CHAPTER 2. LITERATURE REVIEW

Nutrition and Physical Activity Behaviors

Not only are health professionals concerned with the knowledge school-age children have as it relates to the importance of good health but also, most importantly, their behaviors for which they exhibit. Many school-age children are developing serious health problems due to unhealthy eating and physical inactivity behaviors. Curbing the epidemic of childhood and adolescent obesity requires impact on multiple behaviors (Castle, Driskell, Dymont, Mauriello, & Sherman, 2008). Behavior can only be understood by identifying the goals to which it is attached (Eccles, Segar, & Richardson, 2011).

Caver and Scheier (1998), leading self-regulation theorists, posted that goals create the frame through which behavior is perceived, and that behavior can be understood only by identifying the goals to which behavior is attached. Moreover, a statistical modeling of behavior reveals that the motivation individuals feel toward a behavior is partially channeled through the desire one feels toward his or her reason or goal for doing that behavior (Eccles et al., 2011).

To this end, many school-age children are reluctant to change their negative behaviors when it comes to exercising and eating healthy. Obesity, type II diabetes, and high blood pressure in school-age children in Alabama is now a public health concern. Health behavior and self-regulation are influenced by culture (Contrada, Leventhal, & Leventhal, 1998). Culture has been revealed to play an integral role in the health problems being discussed. The most systematic and efficient means available to improve the health of America's youth is to establish healthy dietary and physical activity behaviors in childhood

by promoting positive lifestyles and developing effective decision-making skills (ADA, 2003).

The behaviors learned and exhibited at this age have been revealed to be harmful. Value Expectancy Model (EEVM) is a comprehensive model, and has yielded over 30 years of research suggesting that one's daily decisions and goals arise out of and are strongly influenced by socialization within the general culture milieu, especially related to gender roles and perceived priorities (Contrada et al., 1998). A CDC release added to the mounting evidence of the substantial gain in life associated with healthy behaviors, and underscored the need for the clinical and public health communities to work together to promote greater adoption of these behaviors (Health, Medical, & Sciences Updates, 2011). The Children's Food Environment State Indicator Report, 2011 National Action Guide highlights selected behaviors, environments, and policies that effect childhood obesity nationally. The national Action Guide provides an overview of four behavioral indicators for the nation: (CDC, 2011b):

- Percentage of high school students who drank ≥ 1 sugar-sweetened soda per day
- Percentage of high school students who watched television ≥ 3 hours per day
- Percentage of children, ages 6-17, with television in their bedroom
- Percentage of children, ages 12-17 who do not eat meals with their families most days of the week. (p. 2)

People can live longer if they practice one or more healthy behaviors—i.e., not smoking, eating a healthy diet, getting regular physical activity, and limiting alcohol—according to a study by the Centers of Disease Control and Prevention (Health, Medical, and Sciences Updates, 2011). The results of this study are not surprising to many health professionals.

During the study period, people who engaged in all four healthy behaviors were 63 percent less likely to die early, compared to people who did not practice any of the behaviors (Health, Medical, and Sciences Updates, 2011). Evidence for the clustering of behavioral risks among adolescents revealed that approximately 80% of 11-to-15-year olds have multiple risk factors related to diet and physical activity (Castle et al., 2008). A preliminary study was conducted using 64 children aged 5-12 years. The participants were divided into four focus groups. In this study, participants had many views as it relates to what they felt was healthy and unhealthy:

First, participants viewed eating behavior as a key component of a healthy or unhealthy lifestyle, readily identifying foods that would contribute to or undermine healthfulness. Second, participants acknowledged the importance of a balanced diet and conceded that a limited amount of fat and sugar could be part of a healthy lifestyle. Third, participants identified physical activity as part of a healthful lifestyle. Fourth, the participants viewed being overweight as a potential health risk. Fifth, the finding that all participants viewed physical activity, as part of a healthy lifestyle is encouraging. Finally, the participants identified safety and social concerns as obstacles to participating in regular physical exercise points to the need for organized, adult-supervised physical activity events designed for youth residing in high-risk neighborhoods. This preliminary study yields insights about the ways in which elementary school-aged children think about and understand healthy and unhealthy lifestyles. (Baker, Butki, Carroll, Damhorst, & Ogle, 2007, p. 5)

When considering nutrition behaviors, school-age children in North Alabama need some guidance. As children grow up, sources of food and influences on eating behavior increase (Birch, Dennison, & Gidding, 2005). Children seem to model the behavior of over eating those foods they enjoy most. However, regarding nutrition, “all extremes are bad for you” (Munoz, as cited in Windsor, 2009, p. 12). According to the USDA, Americans have not met the 2010 Dietary Guidelines for Americans (Robert Wood Johnson Foundation,

2010) and have exhibited some unhealthy eating habits that have developed over the past few decades, including:

- Children ages 2-18 consume almost three snacks a day, and snacking accounted for up to 27 percent of children's daily caloric intake.
- From 1977 to 1998, portion sizes for selected popular food items and overall energy intake increased for foods purchased in restaurants or fast-food establishments and for foods prepared at home. The increase ranged from 49 to 133 calories for all selected popular foods, such as salty snack, soft drinks, and french fries.
- Children are eating less fruit and consuming more beverages, such as fruit drinks, sport drinks and fruit juice.
- "Added sugar" consumption is nearly three times the USDA recommended intake. (p. 106)

The maximum amount of refined sugar for toddlers is 100 calories (25g) per day based on a 1,000 calorie diet and 200 calories (50g) per day based on a 2,000 calorie diet for those weighing at least 80 pounds (Gittleman, 2008). Thus, there is a growing interest on the effects of sugar as it relates to children. "Many of the current theories about sugar are controversial" (Munoz, as cited in Windsor, 2009, p. 12).

When one talks about sugar, it is important to note that the average person does not know that there are many types of sugars, nor do most people realize sugar's effects when consumed inappropriate amounts. This may be due, in part, to the many different names by which sugar can be identified. Therefore, sugar can be tricky to identify. Sugar is a sweet crystalline or powdered substance; white when pure, consisting of sucrose obtained mainly from sugar cane and sugar beets and used in many foods, drinks, and medicines to improve their tastes (Answers Corporation, 2009).

Nevertheless, sugar is one behavior indicator discussed by the CDC in the 2010 Dietary Guidelines for Americans, limiting the consumption of added sugar among Americans (CDC, 2011b). Sugar has been identified as playing an important role in the

obesity of children (Windsor, 2009). As a whole, sugar is even preferred by most school-age children. However, it is an empty calorie. Empty calories from added sugars and solid fats contribute to 40% of daily calories for children and adolescences aged 2-18 years, affecting the overall quality of their diets (CDC, 2011c). In the 1800s, the average American consumed 12 pounds of sugar per year (Greene, 2011).

The total consumption of sugar has increased. By 1975, after the overwhelming success of the refined-food industry, 12 pounds had jumped to a world-leading 118 pounds per year, and consumption jumped again to 154 pounds per capita (for every man, women, and child) by 1997 (Greene, 2011). In 2006, Americans ate their way through slightly less than 139 pounds of cane sugar, corn syrup, and other natural sugars per person (Windsor, 2009). Approximately half of the empty calories consumed by young people come from six sources: soda, fruit drinks, dairy desserts, grain desserts, pizza, and whole milk (CDC, 2011b).

The leading source of added sugar among children is sugar-sweetened drinks (also referred to as sugar drinks) (CDC, 2011a). Many schools allow students to have soft drinks only during lunchtime or after school. Some have gone so far as to remove soda machines altogether. Windsor (2009) posited that Americans today would have eaten their body weight in sugar if their waistlines had not been increasing. Healthy sugars contain natural, unrefined sugars that come from some vegetables and fruits. Therefore, school-age children can still receive the healthy sugars required. These sugars contain nutritional components whereas the refined sugars found in some desserts and candies contain no nutritional components.

However, not all refined sugars are unhealthy for children when proper nutrition comes into play. Approximately 10% of those sugars come from simple sugars (Windsor,

2009). Whether refined or unrefined, sugars have an immediate effect on the body. The pancreas has to work extra hard to manufacture insulin (blood sugar-hormone), and whatever energy the body is unable to use is stored as fat, resulting in unhealthy weight gain and even insulin resistance, a precursor to diabetes (Rosen, 2008). Americans have changed their notion of sugar; what was once known in the past as a luxury has become something that is now looked at as a bittersweet, additive drug.

The problem people are facing today is that changes in our environment are happening too fast for our bodies to adapt (Windsor, 2009). Sugar has become addictive and is causing major health problems in children. Because of its simple structure, the body breaks down sugar very easily. Like a drug addiction, when increased consumption occurs and a dose is not available, the urge to relapse will occur even after [sugar] is completely removed. Parents may be partially to blame for the addiction children have developed with sugar. Food is everywhere, and most foods today have added sugar.

Sugar is a cheap source of energy, and parents often give sugar treats as a reward for almost everything. More often than not, parents encourage their children to eat all their food in order to receive a sweet treat. The following consequences can occur due to a poor diet (CDC, 2011b):

- Energy imbalance (e.g., eating more calories than one expends through physical activity) and an increased risk for overweight and obesity.
- Increased risk for lung, esophageal, stomach, colorectal, and prostate cancers.
- Individuals who eat fast food one or more times per week are at risk for weight gain, overweight, and obesity.
- Drinking sugar-sweetened beverages can result in weight gain, becoming overweight, and obesity.

Many studies have revealed alarming results, indicating that children with higher sugar consumption may have a higher risk later in life for obesity, diabetes, heart disease, Alzheimers, and cancer (Windsor, 2009). When considering performing physical activity on a regular basis, school-age children currently exhibit even worse behaviors such as inactivity and over consumption of food, particularly snacks. These behaviors can be due, in part, to their surroundings as well as their parent(s). Children whose parents are physically active have been reported to be nearly six times as likely to be more active than children whose parents are inactive, and there appears to be reasonable evidence of a sugar dose response between number of active parents (0,1,2) and activity levels of children (Hobbs & Kohl, 1998). Thus, establishing healthy attitudes and practices regarding physical activity and exercise in childhood is essential because they shape behaviors and attitudes in adulthood (Kohl & Hobbs, 1998).

The dominant message about exercise seems to have created a “Behavioral Branding” problem (Eccles, Segar, & Richardson, 2011). Branding is the process that purposefully aims to influence how individuals perceive, think about and expect from a particular product, service, organization, and even a country or a person (Ahmed, Allen, Anholt, Barwise, Blacket, & Clifton, 2009). Much as with formative influences on childhood behaviors, parents appear to be a strong influence on physical activity behaviors (Hobbs & Kohl, 1998). Simply put, these Alabama children are mimicking their parents’ physical activity behaviors.

A variety of factors serve as potential determinants of physical activity behaviors in school-age children and adolescents: physiologic, environmental, and psychosocial/ sociodemographic factors (Hobbs & Kohl, 1998). It is no secret that many issues do affect a

child's behavior toward nutrition and physical activity. Some include (Robert Wood Johnson Foundation, 2010):

Food Choices and Changes:

- Greater consumption of low nutrient, energy dense foods.
- “Portion distortion” or the rise of bigger portions.

Schools:

- Reduction in the amount of physical education, recess, and recreation time.
- Limited opportunities for health education that includes health topics on nutrition and physical activity and fitness.

Community Design:

- Lack of public transportation options.
- Limited park and recreation space, including indoor facilities.

Marketing and Advertising:

- More advertising and marketing of unhealthy foods, particularly to kids.
- Newer forms of marketing to kids, including online promotions and text messaging, which take place out of the view of parents.

Economic Constraints:

- Health insurance coverage for obesity-prevention services often has been limited or unavailable.
- “Value sizing” of less nutritious foods and the higher costs of many nutritious foods.

Family and Home Influences:

- Influences of other family members' habits on eating and exercise patterns.
- “Electronic culture” options for entertainment and free time, including TV, video games and the internet. (p. 99)

Children must become and stay active. Physical activity is a key component of energy balance and is promoted in children and adolescents as a lifelong positive health behavior (Kohl & Hobbs, 1998). However, promoting healthy behaviors really needs to take place in a variety of ways alongside the parent(s):

Measurement scales for children's attitudes toward physical activity have been produced. It has been generally thought that children will participate in physical activities for which they hold positive attitudes. One study reported attitudes toward physical activity and reports of behavior, although results

have been inconsistent. The role of attitudes in determining physical activity behavior deserves more attention. (Hobbs & Kohl, 1998, p. 549)

Physical activity intervention programs should be administered through a few different mechanisms. The mechanisms can be either direct (by providing a supportive, nurturing environment), indirect (through modeling), or, more likely, an interaction of the two (Hobbs & Kohl, 1998). Not only are parents a huge influence when it comes to the behaviors they exhibit but also their peers exert influence as well. Peer influences for physical activity behavior among adolescents may actually replace the substantial parental influences observed in younger children (Hobbs & Kohl). This is disturbing considering the health of the state as well as Alabama's school-age children.

While some scientists and public health officials have speculated that the data reflect the effectiveness of recent public health campaigns to raise awareness about the obesity and importance of increased physical activity and healthy eating among children and adolescents, others have noted that the prevalence of high BMI in children remains high and has not declined (Robert Wood Johnson Foundation, 2010). Longshore, a personal trainer in Gold's Gym, in Auburn Alabama, said that she believed that obesity is a major problem in schools and that most kids do not know how important it is to stay in shape. "I think most people are inactive, and the education for exercise and nutrition is not where it needs to be. It's just now getting to the point where people realize that fitness is a necessity and not just a luxury" (Sinor, 2007, p. 1). Physical activity is to be encouraged among children and adolescents based largely on the assumption that the behavior will become part of the person's life and carry into adulthood, where it will help lower risk of several chronic diseases as well as of premature mortality (Hobbs & Kohl, 1998).

A study was conducted, which sought to review all studies that examined the relationship between behavior and a specific health outcome in children and youth (aged 5-17 years). The purpose was to provide an evidence base to inform clinical practice sedentary behavior guidelines for children and youth. Six health indicators were chosen based on the literature, expert input, and a desire to have relevant measures from a range of holistic health indicators (i.e. not only physical health, but also emotional, mental and intellectual health). The six eligible indicators in this review were:

- 1) Body composition (overweight/obesity measured by body mass index (BMI), waist circumference, skin folds, bio-impedance analysis (BIA), dual-energy x-ray absorptiometry (DXA or DEXA);
- 2) Fitness (physical fitness, physical conditioning, musculoskeletal fitness, cardiovascular fitness);
- 3) Metabolic syndrome (MS) and cardiovascular disease (CVD) risk factors (unfavorable lipid levels, blood pressure, markers for insulin resistance or type 2 diabetes);
- 4) Self-esteem (self-concept, self-esteem, self-efficacy);
- 5) Behavioral conduct/pro-social behavior (child behavior disorders, child development disorder, pro-social behavior, behavioral conduct, aggression);
- 6) Academic achievement (school performance, grade-point average).

In conclusion, the researchers found that physical inactivity and sedentary behavior are pervasive and persistent public health challenges to overcome. It was determined that increased sedentary time was associated with negative health outcomes in both boys and girls; this was true across all study designs with the majority of studies (85.8%) reporting similar relationships. (Colley et al., 2011, p. 98)

It is no secret that long-term behavioral changes in school-age children need to take place. However, in order for an impact to take place in the near future, more intervention programs must begin now. This would be the best way to combat the obesity epidemic. To impact the epidemic of obesity, effective multiple behavior interventions focusing on physical activity, diet, and sedentary behavior among youth are necessary (Castle et al., 2008).

Health Problems Facing School-age Children

According to the American Heart Association (AHA), adults and kids are both at risk for heart disease, stroke, and other cardiovascular diseases (AHA, 2003b). The National Association of Children Hospital and Related Institutions are encouraging the nation to raise awareness on most children's health problems due to a lack of physical inactivity and unhealthy eating (Center of Disease Control and Prevention, 2003). Many school-age children have developed some serious health problems that are directly related to unhealthy eating and physical inactivity. Obesity, type II diabetes, and high blood pressure have become the three main health problems increasing at an alarming rate for school-age children every year (Hellison, 2003). To combat these health problems, behavioral changes must be made. Physical inactivity and sedentary behaviors are pervasive and persistent public health challenges to overcome (Colley et al., 2011). Thus, Alabama youth need more intervention programs that focus on knowledge and behavior lifestyle changes.

Sedentary behavior in young people has been linked with adverse health outcomes including increased metabolic risk and adiposity (Foley et al., 2011). Overweight children and adolescents are at risk for physical health problems and psychological vulnerabilities (U.S. Department of Health and Human Services, 2005). A child's future depends on the nutrition and physical activity behaviors he or she makes very early in life. Hence, governments and experts are calling for action to combat the medical, economic and social costs of rising rates of preventable conditions like obesity, diabetes, cardiovascular disease and some cancers, states an article in CMAJ (Canadian Medical Association, 2010).

Currently, one in three adults has some form of heart disease, more than 80 million Americans have type II diabetes or are pre-diabetic, and obese children are more than twice

as likely to die prematurely before the age of 55 compared with children who maintain a healthy weight (Robert Wood Johnson Foundation, 2010). These simple facts have caused health problems to increase for school-age children in Alabama. Research has indicated that children and adolescents are not engaging in obesity prevention behaviors at recommended levels, contributing to increasing prevalence of overweight and obesity (U.S. Department of Health and Human Services, 2000). Therefore, it may be reasonable to say that children in Alabama may be the first generation with a shorter life expectancy than their parents.

Obesity

Obesity is attributed to an excess of accumulated body fat (Duyff, 2003). Obesity can be measured by the height and weight of a child and measured in terms of body mass index (BMI). “A child is defined as ‘obese’ if their body mass index-for-age (or BMI-for-age) percentile is greater than 95 percent. A child is defined as ‘overweight’ if their BMI-for-age percentile is greater than 85 percent and less than 95 percent” (Obesity Action Coalition, 2009). Weight issues in children are important not only because of health risk, but also because of potential emotional consequences of practices such as stigmatization (Amy & O’Dea, 2011). Obesity is one of the greatest concerns for Alabama’s youth. “The current obesity epidemic is the result of many factors and may not be resolved by any single action. Rather, resolution of the childhood obesity epidemic will require concerted action across many sectors and settings such as childcare facilities, communities, and schools” (CDC, 2011a).

In a majority of cases, most facilities offer little or no focus on teaching the importance of eating healthy, and being physically active. It is a general perception that

eating healthy and being physically active is the parent's responsibility. Too often, excess weight is blamed on the genetics of the parent(s). "Although science has shown that genetics do play a role in obesity, it does not always predict future health. Genes and behavior may both be studied to understand why a person is overweight. In some cases, multiple genes may increase one's susceptibility for obesity and require outside factors; such as abundant food supply or little physical activity" (CDC, 2011c).

Obesity is becoming the number one public health issue that is rapidly growing in the United States. More than one third of children ages 10-17 are obese (16.4%) or overweight (18.2%) (Robert Wood Johnson Foundation, 2010). Of greatest concern is that the probability of childhood obesity persisting into adulthood increases from 20% at age 4 to 80% by adolescences (Grethe, Klepp, & Kvaak, 2003). This is disturbing considering school-age children often imitate adult behaviors.

In the 2005 report, "F" as in Fat: How Obesity Policies are failing in America, by Trust for America's Health (TFAH), Alabama was ranked as the second most obese state in the United States (Wes, 2006). "Mississippi has the highest rate of adult obesity at 32.5 percent and Alabama the second, at 31.2 percent (Neergaard, 2009. Obesity is one of the greatest concerns for school-age children because it in turn is related to type II diabetes and high blood pressure.

Nearly 32 percent of U.S. children and adolescents ages 2-19 are overweight or obese (Robert Wood Johnson Foundation, 2010). This demonstrates how obesity has reached epidemic proportions. It is the most rapidly growing health problem for these children. Therefore, obesity is also the most serious health problem which children face (CDC, 2003). Since 1970, the number of obese children ages 6-11 has quadrupled, and the number of obese

adolescents ages 12-19 has tripled (Robert Wood Johnson Foundation, 2010). It has been said that only tobacco use causes more preventable deaths than unhealthy eating and physical inactivity in the United States (Janz, 2003).

This upward trend in childhood overweight and obesity has roused concern among health professionals, moving them to make calls for government, industry, and families to work toward the prevention of childhood obesity and the promotion of healthy lifestyles among children (Baker et al., 2007). American voters overwhelmingly agree that childhood obesity is a serious problem (81 percent), and one that is getting worse (80 percent) (Robert Wood Johnson Foundation, 2010).

“Overall there are a variety of factors that play a role in obesity. This makes it a complex health issue to address” (CDC, 2011a). Therefore, the greatest areas for prevention and treatment actions are as follows:

- Overweight and obesity result from an energy imbalance. This involves eating too many calories and not getting enough physical activity.
- Body weight is the result of genes, metabolism, behavior, environment, culture, and socioeconomic status.
- Behavior and environment play a large role causing people to be overweight and obese (CDC, 2011a).

According to a 2003 special report by the *Birmingham News*, 340,000 children in Alabama are overweight and are in danger of serious health problems (Sinor, 2007). Excess pounds are costly to the health of individuals and to the nation. Moreover, obese children often remain obese in adulthood (Sanders, 2002).

A study was conducted using school-age children in Jefferson County, Alabama, to learn when school-age children become obese (Aldridge et al., 2002). This study was comprised of 5,953 children, ranging in age from 5 to 11 years. The children were first

screened for weight, height, and blood pressure using standardized techniques. Findings revealed that 120% of ideal body weight for height was prevalent in five-year-old children. The study also revealed that the prevalence of obesity was significantly higher in black than white children are and significantly greater in girls than boys (Aldridge et al., 2002). Children who are obese after the age of six are 50 percent more likely to be obese as adults, regardless of parental obesity status (Robert Wood Johnson Foundation, 2010). Intervention programs that focus on healthy eating and physical activity can be the key. The damage of an obesity epidemic can be reversed. If we do not reverse the childhood obesity epidemic, today's youth may be the first generation in American history to live shorter, less healthy lives than their parents (Robert Wood Johnson Foundation, 2010).

Individuals and families make food choices every day that often lead to eating too much and moving too little (USDA, 2011b). This is why MyPlate can be so useful to everyone. MyPlate reminds Americans to think about healthier choices (USDA, 2011b). The key messages for MyPlate are (USDA, 2011a):

- Make half your plate fruits and vegetables.
- Enjoy your food, but eat less.
- Avoid oversized portions.
- Make at least half your grains whole.
- Drink water instead of sugary drinks.
- Compare the sodium in your foods.
- Switch to fat-free or low-fat (1%) milk.

Obesity is related to more than 20 major chronic diseases (Robert Wood Johnson Foundation, 2010). Obesity also greatly increases the risk of developing hypertension, high cholesterol, and heart disease (Finkelstein & Strombotne, 2010). "Obesity and type II diabetes are diseases that can substantially decrease life expectancy, diminish quality of life

and increase healthcare cost. The term “diabetes” has been coined to describe obesity-dependent diabetes” (Rogers & Still, 2009).

Type II Diabetes

“Obesity is a gateway to diabetes, heart disease, and a host of other diseases,” said Parris N. Glendening, former two-term Governor of Maryland, president of the Smart Growth Leadership Institute, and co-author of the report (TFAH, 2008). Diabetes is a disease characterized by high levels of blood glucose resulting from defects in insulin production, insulin action or both (Rogers & Still, 2009). During type II diabetes, blood sugar (glucose) becomes elevated due to absolute or relative insufficiencies of insulin (Agron et al., 2002). The first stage is the condition called resistance; although insulin can attach normally to the liver and muscle cells, certain mechanisms prevent insulin from moving glucose (blood sugar) into these cells where it is used (Finck et al., 2002). This disease is not difficult to diagnose for physicians. More disturbing are the increasing amount of cases in school-age children. Experts from the American Diabetes Association and American Academy of Pediatrics are noting alarming increases in the frequency of type II diabetes in children (Finck, Johannesten, & Specker, 2002). The increase has been attributed to nothing other than the rise in obesity and physical inactivity.

Based on current trends, the World Health Organization expects that 36 million people will have diabetes by 2030, and because of the increasing prevalence of childhood obesity, an increasing percentage of new cases will occur among youth (Finkelstein, & Strombotne, 2010). Most causes of type II diabetes produce variable, even normal amounts of insulin, and in the beginning, this amount is sufficient to overcome such resistance (Agron

et al., 2003). Over time, the child's pancreas becomes unable to produce enough insulin to overcome such resistance. Health professionals feel that through good nutrition and physical activity school-age children can reduce their risk of type II diabetes. Where does Alabama stand in terms of diabetes?

Once again, Alabama has one of the nation's highest rates of type II diabetes, which is actually the fourth highest in the nation (TFAH, 2008). Type II diabetes is the second greatest concern for children who eat unhealthy diets and are physically inactive. Alabama, Kentucky, Louisiana, Oklahoma, Tennessee, and West Virginia also rank in the top 10 for the highest rates of diabetes, physical inactivity, and hypertension (Robert Wood Johnson Foundation, 2010). Type II diabetes accounts for some 90 to 95 percent of all diagnosed cases of diabetes (Rogers & Still, 2010).

More than 80 percent of the people with type II diabetes are overweight or obese (Robert Wood Johnson Foundation, 2010). The twin epidemics of obesity and type II diabetes will continue to fuel an explosion in heart failure, already the world's most prevalent chronic cardiovascular disease, according to John McMurray (European Society of Cardiology, 2009). At all ages, the risk of type II diabetes rises with increasing body weight (Rogers & Still, 2010).

"More than 20 million adult Americans have diabetes. Approximately 176,000 individuals under the age of 20 have diabetes. Two million adolescents ages 12-19 have pre-diabetes" (Robert Wood Johnson Foundation, 2010). Therefore, "there is much to be done to help people make healthy choices about nutrition and exercise. For instance, decisions about where we build new houses and highways or schools and sidewalks can mean the difference between giving people more or less opportunity to participate in physical activity" (TFAH,

2008). Promoting a healthy lifestyle in children and adolescents will put them on a path that will decrease their risk of diabetes and its complications (Rogers & Still, 2010).

High Blood Pressure, or Hypertension

High blood pressure, or hypertension, is the third most common concern for school-age children. Hypertension is known as the “silent killer” because it may not cause symptoms until the patient has suffered serious damage (AHA, 2003c). Each time the heart beats; it pumps blood into the arteries, resulting in the highest blood pressure as the heart contracts. Both systolic and diastolic pressures are recorded as “mm Hg” (millimeters of mercury). This recording represents how high the mercury column is raised by the pressure of the blood (CDC, 2003).

High blood pressure means that there is higher than normal pressure inside the arteries, either during systolic (when the heart contracts and pumps blood through the body), or during diastolic (when the heart is at rest and is filling with blood pressure). Diagnosing high blood pressure in kids is trickier than in adults (Higgs, 2009). Even so, parents must make sure that they are having their child’s blood pressure checked properly. Blood pressure can be measured with a blood pressure cuff and a stethoscope.

Blood pressures vary depending on the age of your child, as well as according to height and weight, and the gender of the child (Palande, 2011). Physicians use a table that was prepared by the National High Blood Pressure Education Program (NHBEP) that determines when the child’s blood pressure is higher than other children’s blood pressures (Appendix E).

Kids that are 10 to 12 years old have an upper limit of normal systolic pressure that ranges from 114 to 127, depending on height and gender, and a

diastolic pressure that ranges from 77 to 83. A 10-year-old boy has a systolic pressure range of 114 to 123 and a diastolic range from 77 to 82. At 11, he has a systolic range of 116 to 125 and a diastolic range of 78 to 83. At 12, his systolic pressure ranges from 119 to 127 while his diastolic pressure ranges from 79 to 83. For girls, a 10-year-old has a normal systolic pressure between 116 and 122, and a normal diastolic pressure between 77 and 80. At 11, her systolic range is 118 to 124 and her diastolic range 78 to 83. At 12, her systolic pressure ranges from 120 to 126, while her diastolic pressure ranges from 79 to 82. (Goss, 2011, p. 1)

According to the U.S. Department of Health and Human Services, if your child has a blood pressure that is higher than 90 to 95 percent of other boys or girls, his/her age and height, then he or she may have high blood pressure (USDHHS, 2011). It is important to note that research has shown that blood pressure can be affected by many factors. Some of these factors include the time of day, physical activity, being overweight, emotional moods or stress, and some illnesses (Agron et al., 2002).

Who is at risk for high blood pressure (Palande, 2011)?

- Primary hypertension (with an unknown cause) is the most common cause of high blood pressure in adolescents and adults, but is less common in children.
- Many children with high blood pressure also have adult relatives with hypertension, indicating there may be a hereditary aspect to the disease.
- There is a higher incidence of high blood pressure in African-American children after the age of 12 and into adulthood. (p. 1)

It is estimated that 75% to 90% of the cardiovascular disease epidemic is related to dyslipidemia, hypertension, diabetes mellitus, tobacco use, physical inactivity, and obesity; the principle causes of these risk factors are adverse behaviors, including poor nutrition (Birch, Dennison, & Gidding, 2005). Some children inherit the tendency from a parent who has high blood pressure (AHA, 2003a). This is why intervention programs are even more important for the children in Alabama. By adhering to a healthy diet and physical activity, these health problems can be reduced for school-age children. Early coronary atherosclerosis

or precursors of atherosclerosis can begin in childhood and adolescents (Arbeit, Berenson, Nicklas, & Srinivasan, 1991). The most important determinant of childhood blood pressure is obesity (Alexander, et al., 2002).

Therefore, more intervention programs need to focus on reducing the obesity epidemic in Alabama. Children who are overweight usually have higher blood pressure than those who are not overweight. Acknowledged CV risk factors for adults such as obesity, positive family history, high serum cholesterol levels, and high saturated fat intake have been documented in some groups of children (Arbeit et al., 1991). Longitudinal studies have shown that children who increase in relative body size also increase their blood pressure relative to their peers, and conversely those who have decreased body size have decreased blood pressure levels (Alexander et al., 2002).

Although the literature demonstrates that CV risk factors exist in early childhood, little is known about the promotion CV health in young children (Arbeit et al., 1991). There are many good reasons to exercise as part of an everyday life style. Patients with hypertension have an increased risk of certain diseases of the heart and circulatory system (*Science Daily*, 2010). Today, more and more children are being diagnosed with hypertension, diabetes, and other co-morbid conditions associated with obesity and morbid obesity (OAC, 2009).

Obesity and type II diabetes are both major factors in a child developing high blood pressure (AHA, 2003). About 70 percent of youth have at least one additional risk factor for cardiovascular disease such as elevated total cholesterol, triglycerides, insulin, or blood pressure (Robert Wood Johnson Foundation, 2010). Strokes, heart attacks, and kidney failure are more common in people with hypertension than in those without (*Science Daily*, 2010). A

healthy diet and physical activity can reduce these health problems in school-age children.

High blood pressure in school-age children is a concern for many reasons. High blood pressure directly increases the risk of coronary heart disease (heart attack) and stroke (brain attack):

A study was done on school-age children in Jefferson County, Alabama; to learn when school-aged children become obese; to determine the susceptible groups; and to study the association between obesity and blood pressure. During the school year 5,953 children ranging in age from 5 years to 11 years, were screened for weight, height, and blood pressure, using standardized techniques. One of the results found that systolic and diastolic blood pressures (mm Hg) were significantly higher among obese than in non-obese children. (Aldridge et al., 2002, p. 24)

Studies have revealed that some young adults with high blood pressure had the condition as a child. By their 20s, these young adults exhibit high blood pressure's harmful effects on the heart and blood vessels, even with mild hypertension (AHA, 2003). Since the American Heart Association last presented nutrition guidelines for children, significant changes have occurred in the prevalence of cardiovascular risk factors and nutrition behaviors in children (Birch et al., 2005).

Major areas of intervention include dietary management, physical activity, avoidance of known preventable risk (i.e., smoking, alcohol use), and general good health practices, including periodic monitoring of identified CV risk factors (Arbeit et al., 1991). Increasing physical activity and a healthy diet can be used to lower hypertension in children. It is important to remember that obesity, type II diabetes, and high blood pressure or hypertension where at one point very rare in school-age children. Therefore, when it comes to high blood pressure, intervention studies are needed to explore the effectiveness of strategies to decrease identified CV risk factors in young children (Arbeit et al., 1991).

Health Care Cost

Medical care in the United States is very expensive (iHealth, 2011). Being overweight or obese and their associated health problems have a significant economic impact on the U.S. health care system (USDHHS, 2001). The medical care costs of obesity in the United States are staggering (USDHHS, 2001). Economics is at the heart of the obesity epidemic (Finkelstein, & Strombotne, 2010). Officials have begun trying to think of ways to reduce health care cost. It has been estimated that the annual cost of overweight and obesity in the U.S. is \$122.9 billion (Rogers & Still, 2010).

Childhood obesity alone is responsible for \$14.1 billion in direct costs (Trasande & Chatterjee, 2009). More than double in past years. In 1998, the medical costs of obesity were estimated to be as high as \$78.5 billion, with roughly half financed by Medicare and Medicaid (Cohen, Dietz, Finkelstein, & Trogdon, 2009). The rise of obesity rates, both nationally and internationally, results from changes in the environment that have simultaneously lowered the cost of food production, lowered the time and monetary cost of food consumption, increased the real cost of being physically active at work and at home, and decreased the health consequences that result from obesity by bringing a host of new drugs and devices to the market to better manage the adverse health effects that obesity promotes (Finkelstein, & Strombotne, 2010).

According to Cohen et al. (2009), the increased prevalence of obesity is responsible for almost \$40 billion of increased medical spending through 2006, including \$7 billion in Medicare prescription drug costs. Economic forces have made it easier and cheaper to consume high-energy, tasty, affordable foods and have allowed us to be increasingly sedentary at work, at home, and in between (Finkelstein, & Strombotne, 2010).

“Annually, the average total health expense for a child treated for obesity under Medicaid is \$2,446. The average total health expenses for a child treated for obesity under private insurance is \$3,743, while the average health cost for all children covered by private insurance is \$1,108” (Chang & Marder, 2010). The hospital cost for children with obesity increased from \$35 million in 1979 to \$127 million in 2002 (CDC, 2002).

The medical cost for treating obesity-related diseases in Alabama are staggering. Obesity related medical cost total \$147 billion a year, or nearly 10 percent of all annual medical spending is generated from treating obesity related diseases such as diabetes (Robert Wood Johnson Foundation, 2010).

A team of researchers led by the University of Chicago constructed a model of diabetes costs accounting for trends in risk factors (such as obesity), the natural history of the disease and the effects of treatments, all of which helped to improve upon forecasts previously used by government budget analysts, who had not previously taken such factors into account. The study concluded that, over the next 25 years, the number of Americans with diagnosed and undiagnosed diabetes would soar from 23.7 million—nearly doubling. During the same period, (in 2007 dollars) annual spending related to diabetes would climb from \$113 billion to \$336 billion. (ADA, 2009, para. 3)

Weight-loss is an important goal for overweight or obese persons, particularly those with type II diabetes (Rogers & Still, 2010). By 2034, the number of Americans living with diabetes will nearly double and diabetes spending will nearly triple to \$336 billion, even if the prevalence of obesity in this country remains stable, according to a study published in the November issue of Diabetes Care (ADA, 2009). The direct and indirect cost of diabetes in the U.S. in 2002 was estimated at \$132 billion (Rogers & Still, 2010).

Obese people spend 42 percent more on health care costs than healthy-weight people (Robert Wood Johnson Foundation, 2010). Hospitalizations of children and youths with a

diagnosis of obesity nearly doubled between 1999 and 2005, while total costs for children and youth with obesity-related hospitalizations increased from \$125.9 million in 2001 to \$237.6 million in 2005 (Fryer, Liu, & Trasande, 2005).

According to a 2008 study, if obesity prevalence continues to rise following current trends, total health care costs attribute to obesity and overweight will more than double every decade by 2030 (Beydoun, Caballero, Kumanyika, Liang, & Wang, 2008). To assist with the reduction of health care cost due to unhealthy eating and physical inactivity, the CDC has made some suggestions in the National Action Guide (CDC, 2011b, pp. 2-4):

School Food Environment (Potential Actions):

- Work with school districts to enroll elementary, middle, and high schools in USDA's Team Nutrition program and apply for certification through the Healthier US School Challenge.
- Collaborate with state and district school officials to establish school wellness and nutrition policies to increase free drinking water access and eliminate the sale of sugar drinks on school grounds, including vending machines, concessions, and fundraisers.
- Support school districts in implementing strong nutrition standards that restrict the availability of less healthy foods and sugar drinks.
- Work with school districts to revise existing food and beverage contracts so that only healthier food options are available to students.
- Collaborate with the state and school district officials to redefine or eliminate beverage "pouring contracts" in schools.

Community Food Environment (Potential Actions):

- Provide incentives for small food store owners in underserved areas to carry healthier, affordable items (e.g. tax breaks/credits, loans, and grants to purchase equipment to store produce and fat free/low fat dairy; or facilitate linkages to wholesale distributors).
- Create incentive programs to attract supermarkets and grocery stores to underserved neighborhoods (e.g. tax breaks/credits, loans, and grants to cover start-up and investment costs; economic development programs; supportive zoning, negotiation assistance).
- Target public transportation and public safety efforts to ensure community residents can access healthy food retailers easily and affordably.
- Promote farmers' markets, farm stands, mobile markets, and community gardens as venues for healthy foods.

- Support restaurant programs that offer and promote healthier food options.

Nutrition for School-age Children

Nutrition can be defined as the way our bodies take in and use food (ADA, 2002). Healthy eating in childhood and adolescence is important for proper growth and development and can prevent health problems such as obesity, dental caries, iron deficiency, and osteoporosis (CDC, 2011a). Nutritional needs are higher during adolescence than at any other time in the life cycle (Dyuff, 2003). Unbelievably, the nutritional needs of children have not changed in the last past 20 years (Hand, 2011). With the high prevalence of childhood obesity in the U.S., supporting healthy food environments is a key strategy to reach the public health goals of reducing childhood obesity and improving nutrition (CDC, 2011c).

In order to meet them, Americans would need to substantially lower their intake of added fats, refined grains, sodium, added sugars and sweeteners, and increase their consumption of fruits, vegetables, whole grains, low-fat milk, and milk products (Robert Wood Johnson Foundation, 2010). When it comes to maintaining a healthy weight for a lifetime, the bottom line is that calories count (CDC, 2011a). The obesity epidemic has prioritized consideration of the complex issue of matching appropriate energy intake to energy expenditure (Birch, Dennison, & Gidding, 2005). Long-term energy imbalance (calories consumed vs. calories expended) is widely accepted as the formula that leads to weight gain or weight loss (USDA/ARS Children's Nutrition Research Center, 2008). With this in mind, children need nutrient-dense foods based on these recommendations. The CDC indicates that school-age children need to consume a balance of different types of food to supply the necessary nutrients. The six major classes of nutrients are carbohydrates, fats,

proteins, vitamins, minerals, and water (iHealth, 2010). Nutrients are essential for growth, tissue repair, and regulation of body functions (CDC, 2003).

Some benefits of healthy eating include (CDC, 2011a):

- Promotion of the optimal growth and development of children.
- Prevention of high cholesterol and high blood pressure.
- Reduction of risk for developing chronic diseases such as cardiovascular disease, cancer, and diabetes.
- Reduction of risk for developing obesity, osteoporosis, iron deficiency, and dental caries (cavities).

Weight management is all about balance—balancing the number of calories one consumes with the number of calories the body uses or “burns off” (CDC, 2011b). The Dietary Guidelines for Americans 2010 were designed to help individuals age 2 and older make better choices about eating and increasing physical activity (ACES, 2012). The overall scope of the DGA reflects the association of poor diet and physical activity with major causes of morbidity and mortality, including, but not limited to obesity (Redican, & Sparking, 2011).

The Dietary Guidelines are increasingly important as federal departments search for ways to reduce rates of morbidity and mortality related to obesity, diabetes, cardiovascular disease, cancer, and other chronic illnesses (USDA, 2011b). The two major themes are balancing calories to manage body weight and focusing on nutrient-dense foods and beverages (Redican & Sparking, 2011). A summary of the recommendations outlined in the Guidelines are to: (1) Improve eating habits and increase physical activity to prevent or reduce the risk of being overweight or obese; (2) Reduce the intake of fat, sodium, and sugary foods; (3) Increase consumption of nutrients packed foods such as fruits and vegetables, whole grains, or calcium-rich dairy products and low-fat protein foods; and (4)

Adopt an eating pattern based on suggested calorie intake and safe food handling to prevent food borne illnesses (USDA, 2011b).

Many sources can assist with dietary planning. Most are available at no charge. ChooseMyPlate.gov offers dietary assessment tools, nutrition education resources, and clear actionable information about how to make better choices (USDA, 2011b). Last year, the USDA offered a substitution to the MyPyramid. To assist with the healthier food choices, the USDA has suggested that people use MyPlate.

MyPlate is the “new generation” food icon to encourage consumers to think about food choices (USDA, 2011). These recommendations are based on the 2010 Dietary Guidelines for Americans. A study done by the Colorado State University Cooperative Extension System looked at the effectiveness of a nutrition education program improving fruit and vegetables in youth. The statistical analysis comparing children pre- and post- 24-hour food recalls and adults/children pre- and post- questionnaires revealed that the number of servings of fruits and vegetables consumed per day increased from one half to three fourths, after the intervention (Anderson et. al, 1995). It is recommended that school-age children eat three well-balanced meals and moderately exercise for at least 60 minutes daily. Because the stomach gets empty overnight resulting from a long night without food, breakfast foods fill a child’s empty tank and therefore, should start the day (AHA, 2003). Some easy-to-prepare breakfasts include cold cereal, whole-wheat toast, or oatmeal. Calcium is an important ingredient for a healthy diet that helps to build strong healthy bones.

Parents must help other professionals in reducing the risks school-age children face with health problems due to unhealthy eating and physical inactivity. Dietary habits developed early in life, remain the major environmental factor influencing CV risk (Arbeit et

al., 1991). Parents should provide their children with the recommended amounts from following My Plate. The guide shown in Table 2.1 can provide both parents and children with the knowledge for making good food choices. It is very important to note that school-age children must follow the MyPlate recommendations.

Table 2.1. MyPlate food guide

Grains	Vegetables	Fruits	Dairy	Proteins
Girls ages 9-13: 5oz	Girls ages 9-13: 2 cu	Girls ages 9-18: 1½ cu	3 cups	Girls ages 9-18: 5oz
Boys ages 9-13: 6oz	Boys ages 9-13: 2½ cu	Boys ages 9-13 1½ cu	3 cups	Boys ages 9-13: 5oz

The exception is the fact that parents and other professionals must consider a child's age, height, and weight. Clearly, nutrition plays a huge part in children becoming bigger and stronger. Good nutrition is linked to learning readiness and academic achievement, decreased discipline problems, and decreased emotional problems (CDC, 2003).

Healthy eating is associated with reduced risk for many diseases, including several of the leading causes of death: heart disease, cancer, stroke, and diabetes (CDC, 2011c).

Therefore, the key is to make healthy eating and exercise part of our everyday activities.

Over the past years, the USDA has changed its Food Guides to include different themes:

A Brief History of the USDA Food Guides (USDA, 2011b):

- 1916 to 1930s: “Food for Young Children” and “How to Select Food”
- 1940s: A Guide to Good Eating (Basic Seven)
- 1956-1970s: Food for Fitness, A Daily Food Guide (Basic Four)
- 1979: Hassle-Free Daily Food Guide
- 1984: Food Wheel: A Pattern for Daily Food Choices
- 1984: Food Wheel: A Pattern for Dairy Food Choices
- 1993: Food Guide Pyramid

- 2005: MyPyramid Food Guidance System
- 2011: MyPlate

According to ACES, the USDA introduced MyPlate in June 2011, replacing MyPyramid (ACES, 2012; USDA, 2011a). MyPlate is a representation of information provided by the Dietary Guidelines for improving the eating habits of Americans (USDA, 2011b). One of the biggest problems people face when eating fast food is the out-of-control portions (Noelcke, 2011). MyPlate emphasizes making half your plate fruits and vegetables (focus on fruit and varying your veggies), making half your grains whole grains, increasing your calcium rich foods, and going lean with protein (USDA, 2011b). MyPlate was not only introduced but also updated along with the USDA food patterns for the 2010 Dietary Guidelines for Americans. MyPlate includes the following (USDA, 2011c, p. 2).

- Different shape to help grab consumers' attention with a new visual cue
- Icon that serves as a reminder for healthy eating, not intended to provide specific message
- Visual is linked to food and is a familiar mealtime symbol in consumers' minds, as identified through testing
- "My" continues the personalization approach from MyPyramid

The idea is to help not just the child but, the families and communities through encouraging healthy eating and physical activity as a way of life. MyPlate offers some key messages to get you started (USDA, 2011b, p. 3):

- Make half your plate fruits and vegetables.
- Enjoy your food, but eat less.
- Avoid oversized portions.
- Make at least half your grains whole.
- Drink water instead of sugary drinks.
- Compare the sodium in your foods.
- Switch to fat-free or low-fat (1%) milk.

Tips to keep you going:

- Use a smaller plate.

- Eat some foods less often.
- Eat the right amount of food for you.
- Use the nutrition facts label.
- Drink water.
- Don't forget the dairy.

MyPlate is an icon that is supported by simple nutrition messages, and it can be used by any family or food culture to remind us of how to build a healthy plate (USDA, 2011a). Studies have consistently shown that the diets of US children and adolescents do not meet current national dietary recommendations for good health (Story, 2009). Current eating patterns do not at all resemble the “norm” of providing at least breakfast, dinner, and a single snack at home with lunch carried to school or purchased from a health-conscious cafeteria (Birch et al., 2005). There is a growing body of evidence that demonstrate that following a diet that complies with the Dietary Guidelines may reduce the risk of chronic disease (Dietary Guidelines for Americans, 2010). Therefore, the current study took an in-depth look at the Child Nutrition FAQs listed by the Alabama State Department of Education (ALSDE).

The State of Alabama has developed a mission/vision in relation to providing quality child nutrition programs that state the following (ALSDE, 2009, p. 1)

- To provide a framework for state assistance in the thorough integration of nutrition education, maximizing resources and delivering accurate, positive, consistent, nutrition information.
- To provide an integrated nutrition education program contributing to a nutritionally knowledgeable public motivated to making behavioral changes to promote optimal health and nutritional status.

Each school system utilizes a different procedure/method of menu planning (ALSDE, 2009).

Physical Activity for School-age Children

In addition to proper nutrition, the adoption and maintenance of a physically active lifestyle is an essential part of a healthy life. Physical activity is defined as the state of being active or energetic action (Redican & Sparking, 2011). Physical activity can also be defined as simply moving one's body to use the energy from food. Physical activity is a key component of energy balance and is promoted in children and adolescents as a lifelong positive health behavior (Hobbs & Kohl, 1998). Engaging in regular physical activity is widely accepted as an effective preventative measure for a variety of health risk factors across all age, gender, ethnic and socioeconomic subgroups (Colley et al., 2011). Physical activity guidelines for young people were initially formulated in 1988 by the American College of Sports Medicine, which produced an opinion statement on the amount of physical activity needed for optimum functional capacity and health (Andersen et al., 2006). To maximize the health benefits of physical activity, choose activities that you enjoy and are appropriate for your fitness level (USDA, 2011b). On an average, physically active people outlive those who are inactive.

Being physically active can help a person:

- Increase your chances of living longer.
- Feel better about yourself.
- Sleep well at night.
- Maintain or reach a healthy weight.

The Robert Wood Johnson Foundation made the following alarming statements as it relates to physical activity and school-age children (Robert Wood Johnson Foundation, 2010, pp. 16-18):

- Current studies show that most youth do not meet physical activity guidelines for children and adolescents that recommend engaging in 60 minutes or more of moderate-to-vigorous physical activity per day.

- Nationwide, less than one third of all children ages 6-17 engage in vigorous activity, defined as at least 20 minutes of physical activity that makes the child sweat and breathe hard. The percentage of children engaging in daily, vigorous activity ranged from a low of 17.6 percent in Utah to a high of 38.5 percent in North Carolina.
- Only 42 percent of children ages 6-11 engage in 60 minutes or more of moderate-to-vigorous physical activity on five or more days per week.
- Analysis of accelerometer data for children and adults shows that the amount of time spent in moderate-to-vigorous physical activity plummets as children reach adolescence.

Unfortunately, sustaining a physically active life is not easy (Eccles et al., 2011).

Most communities in Alabama do not provide enough optimal outdoor area for children.

Researchers have found that children play indoors more than before because of lifestyle changes (Lorenzo, 2003). Considering the knowledge and behaviors of most school-age children in Alabama as it relates to physical activity, children are more likely than parents to report that television viewing or playing video games are an important recreational activity for them. Understanding how individuals have been socialized to exercise is important because socialization is the process by which individuals learn what to value and pursue, thus influencing their daily priorities and decision-making (Winter, 1996). The media is an important source of socialization (McQuail, 2005). Several research studies have indicated that there are many complex and interwoven factors that contribute to this predicament of physical inactivity in school-age children. However, children typically perceive they are physically active. Some factors leading to a decrease in physical activity include loss of play space, a decline in physical education requirements within the school setting; the prevalence of sedentary activities such as television and video games, and omnipresent calorie-dense and nutrient-deficient fast food (Akey et al., 2009).

In general, states with the highest levels of bicycling and walking have the lowest levels of obesity, high blood pressure and diabetes, and have the greatest percentage of adults who meet the recommended 30-plus minutes a day of physical activity. It is important to encourage young people to participate in physical activities that offer a variety of enjoyable and are age-appropriate (Robert Wood Johnson Foundation, 2010). Most children know that physical activity keeps their muscles and bones strong, but have trouble seeing the big picture. This big picture is the importance of physical activity.

Balancing what one eats with physical activity is key to weight management (USDA, 2011b). The Robert Wood Johnson Foundation (2010) offered the following suggestions:

- Children and adolescents should do 60 minutes or more of physical activity daily.
- Aerobics: Most of the 60 minutes or more should include either moderate- or vigorous-intensity aerobics physical activity, and should include vigorous-intensity physical activity at least three days a week. Examples of moderate-intensity aerobic activities include hiking, skateboarding, rollerblading, bicycle riding, and brisk walking. Vigorous-intensity aerobic activities include bicycle riding, jumping rope, running and sports such as soccer, basketball and ice or field hockey.
- Muscle strengthening: The 60 or more minutes of daily physical activity should include muscle-strengthening activities at least three days a week. Examples of muscle-strengthening activities for younger children include gymnastics, playing on a jungle gym and climbing a tree. Examples of muscle strengthening activities for adolescents include; push-ups, pull-ups and weightlifting exercises.
- Bone-strengthening: The 60 or more minutes of daily physical activity should include bone-strengthening activities at least three days a week. Examples include jumping rope, running, and skipping. A kid's physical activity pyramid can also be used.

The U.S. Department of Health and Human Services and Department of Education identified promoting participation in physical activity and sports as a “critical national priority” and one of the “nation’s leading health indicators” for the next decade (U.S. Department of Health and Human Services, 2002). When reviewing the current messaging

about exercise by leading health organizations as well as the media, in general, it has become evident that exercise is mainly promoted in society as being important for living a healthy life, preventing disease, controlling weight, and getting fit (Wray, 2007). Specific socialization to exercise that individuals have accessed through the media, health care, and society, in general, has explicitly branded exercise primarily as a vehicle that promotes weight loss, health benefits, and disease prevention (Eccles et al., 2011).

In practical terms, this means that halting the increase in childhood obesity will require a sizable decrease in energy intake and/or a measurable increase in physical activity (USDA/ARS Children's Nutrition Research Center, 2008). Regular physical activity can produce long-term health benefits (USDA, 2011a). Promoting exercise primarily within health care and society as a method to "improve health" or to "be thinner" might inherently foster a feeling of compliance instead of autonomy toward exercising because cultural expectations and pressures under gird these specific goals (Eccles, 2005). However, if the societal branding of exercise results in individuals feeling a controlled or extrinsic regulation toward exercising (instead of autonomy) then one might consider this to be non-optimal for improving population-level physical activity participation (Eccles et al., 2008). People of all ages, shapes, sizes, and abilities can see results, and the more one is, the greater the health benefits (USDA, 2011b). For this reason, it is as equally important that Alabama increase intervention programs that focus on nutrition and physical activity.

Physical activity recommendations are different as one age; nevertheless, physical activity is important for everyone (USDA, 2011b). On Feb. 9, 2010, First Lady, Michelle Obama, unveiled her domestic policy initiative, Let's Move (Robert Wood Johnson Foundation, 2010). The goal of this campaign is to solve the problem of childhood obesity

with the assistance of a diverse group of people. The Task Force recommendations focus on the five pillars of the First Lady's *Let's Move!* Initiative (Let's Move, 2011):

1. Creating a healthy start for children
2. Empowering parents and caregivers
3. Providing healthy food in schools
4. Improving access to healthy, affordable foods
5. Increasing physical activity

Through physical activity, school-age children can help prevent weight gain or promote weight loss. Physical activity also helps in the mental and emotional development of youth, which can help increase students capacity for learning (Finnk et al., 2003). It has also been found that participation in activities that enable youth to establish healthy relationships with both adults and peers has been shown to have a significant effect on youth's likelihood of achieving good developmental and young adult outcomes (Connell, et al., 2002).

Attitudes and knowledge are two additional constructs that have been investigated as potential determinants of physical activity (Hobbs & Kohl, 1998). The inactivity crisis is especially important in the pediatric population as recent data from the Canadian Health Measures Survey suggested that only 7% of children and youth aged 6-19 years participate in at least 60 minutes of moderate- to vigorous-intensity physical activity per day, thus meeting the current physical activity guidelines from Canada, the U.S., the U.K, Australia, and the World Health Organization (WHO), (Colley et al., 2011).

Low physical activity and poor cardiovascular fitness are independent predictors of mortality related to type 2 diabetes and chronic disease in general (Amy & O'Dea, 2011). Accumulating evidence has suggested that, independent of physical activity levels, sedentary behaviors are associated with increased risk of cardio-metabolic disease, and all cause mortality and a variety of physiological and psychological problems:

A systematic review was performed to determine the relationship between sedentary behavior and health indicators in school-aged children and youth aged 5-17 years. Online databases (MEDLINE, EMBASE, and PsycINFO), personal libraries and government documents were searched for relevant studies examining time spent engaging in sedentary behaviors and six specific health indicators (body composition, fitness, metabolic syndrome and cardiovascular disease, self-esteem, pro-social behavior and academic achievement). 232 studies including 983,840 participants met inclusion criteria and were included in the review. Quality analysis of all of all studies revealed a dose-response relationship between increased sedentary behavior and unfavorable health outcomes. There is a large body of evidence from all study designs, which suggest that decreasing any type of sedentary time is associated with lower health risk in youth aged 5-17 years. (Colley et al., 2011, p. 48)

Sedentary behavior is not merely the absence of physical activity; rather, it involves purposeful engagement in a large variety of behaviors associated with low energy expenditure (Foley et al, 2011). Decreasing sedentary time has emerged as an important target for health promotion in conjunction with efforts to promote increased participation in physical activity (Foley et al.). School-age children are more willing to participate in physical activities that they find fun. Eccles et al. (2011) proposed that it would be strategic to rebrand exercise as a primary method to enhance aspects of daily quality of life through social marketing, advertising, programming, and prescribing practices. Rebranding seems to be a different approach that may work. According to Harter and Rath (2010), "...rewarding substitutions", is a strategy from the field of behavioral economics to improve adherence by switching the motive for a behavior away from distant rewards like disease prevention to immediately experienced incentives like increased energy.

Intervention Programs

An intervention program is designed for intervening, interfering, or interceding with the intent of modifying the outcome (LSI Center for Health Promotion, 2004). According to

the Dietary Intervention Study in Children (DISC), nutrition education programs for children can enhance health outcomes (ADA, 2006). By altering dietary behaviors, nutrition interventions during adolescence have the potential of affecting children at that time and later in life (Evans, Hoelscher, Kelder, & Parcel, 2002).

The National Alliance for Nutrition and Physical Activity (NANA) advocates national policies and programs to promote healthy eating and physical activity that help reduce illnesses, disabilities, premature deaths, and costs resulting from diet- and inactivity-related diseases (National Alliance for Nutrition and Physical Activity, 2008). The use of intervention planning techniques, coordination of nutrition and physical education interventions, and use of technological advances such as CD-ROMSs, incorporation of policy changes into intervention efforts, and dissemination of effective programs are all trends that will influence the future development of effective nutrition program for adolescents (Evans et al., 2002). Alabama's children are becoming overweight, and developing type II diabetes and high blood pressure at alarming rates. Obesity has been classified as the heart of these health problems. Obesity is a complex health issue that needs to address a variety of factors that play a role in obesity (CDC, 2011a). For many children, these health problems can be prevented through both nutrition and physical activity education. In response to the epidemic of many related diseases, the CDC is building statewide networks of nutrition and physical activity programs to prevent chronic diseases and obesity through interventions that focus on population-based strategies, including environmental and policy-level change (CDC, 2002). Health and wellness programs that promote positive social experiences and encourage physical activity should be implemented to include children of all sizes (Amy & O'Dea, 2011). As researchers in health and family consumer sciences, we appreciate the importance

of preventing childhood obesity and of teaching children to make healthful choices about diet and physical activity (Baker et al., 2007).

Results, impacts, and benefits to direct clientele and public of CHAMPION indicated the following (Alabama Cooperative Extension System, 2009, pp. 1-2):

Six REAs who conducted the CHAMPION Weight management program youth (children and teens) and 7348 adults indicated that 1371 youth (children and teens) and 7348 adults were involved in the some aspect of the program. However, 1115 youth were taught the program during a one week time period and 163 adults participated in the classes conducted on nutrition, physical activity, and chronic diseases intervention/maintenance. Two hundred and sixty-eight (268) participants (children and adults) were the determining factors for knowledge gained and behavioral changes (One hundred and five (105) girls ages 10-12 attended the BETF Summer Camp for girls. 83% of the girls showed a knowledge gain from the pretests and post-test and a total weight loss of 420.3 pounds. In addition, 74% percent indicated they will make healthier choices when eating out.

Nutrition education is a critical component of most major health promotion and disease prevention programs (CDC, 2003). Physical activity is one of the most important contributions to long-term weight loss and weight management (Castle et al., 2008). Being physically active early in life has many physical, social, and emotional benefits and can lead to a reduced incidence of chronic diseases in adulthood (Lorenzo, 2003). It is the position of the American Dietetic Association (ADA), the Society for Nutrition Education (SNE), and the American School Food Service (ASFSA) that comprehensive nutrition services must be provided to all of the nation's students in preschool through grade 12 (ADA, 2003).

One of the strongest risk factors for childhood obesity is parental overweight and obesity (Cao et al., 2011). Parents of Alabama school-age children must start taking a more proactive approach to the matter at hand. Since statistics have revealed that Alabama is the second most obese state in the United States, it may be reasonable to state that neither parent

nor the child may be knowledgeable about the importance of both good nutrition and physical activity. For this reason, an effective intervention program might provide a solution for the school-age children in Alabama. The answer is clear and the time is now!

To prevent a further increase of obesity in children, there is an urgent need for evidence-based intervention, targeting families in different risk groups (Cao et al., 2011). Intervention programs should be centered on a healthier lifestyle. The American Heart Association (2003) has developed the following steps to combat obesity:

- 1) Be a positive role model.
- 2) Get the whole family active.
- 3) Limit TV, video game and computer time.
- 4) Customize physical activity.
- 5) Be supportive.

Federal regulations exist for the National School Lunch Program (NSLP); however, there are few regulations for food that is sold in snack or vending machines. Federal obesity programs are too limited and soiled to have a significant impact on reducing or controlling obesity (TFAH, 2008). Nevertheless, school-based interventions have been implemented in many states that have experienced success. These interventions mainly focused on increasing vegetable and fruit consumptions. Dr. Craig Johnson and his colleagues at the USDA/ARS Children's Nutrition Research Center developed and implemented an intensive 6-month, school-based intervention that has been successful in decreasing obesity among 10-to 14 year-old Mexican American children (USDA/ARS Children's Nutrition Research Center, 2008). Schools have become a battleground for fighting the obesity epidemic (Birch et al., 2005). The environments in which children are exposed in their daily lives (i.e., schools, childcare facilities, and their communities) can influence the healthfulness of their lives (CDC, 2011c).

Nutrition education in schools is considered useful in improving knowledge about nutrition, but few studies have suggested that it is effective in altering eating behaviors in the absence of a change in one's environment (Birch et al., 2005). Recent public health efforts to curb the rising rates of childhood obesity have focused on public schools. Such efforts have been said to create a huge challenges for some school systems. Although the need for interventions is obvious, most school systems in Alabama do not want the responsibility of overseeing intervention programs. This may be noted by the fact that elementary school physical education has been reduced from 60 minutes to 30 minutes. At the high school level, physical education is not a requirement. Students are allowed to substitute physical education for band, ROTC, or another elective class. The CDC (2007) has stated that better health education, more physical education, and physical activity, and healthier school environments are needed to combat the serious health problems that school-age children in Alabama are facing. It should also be noted that:

The Child and Adolescent Trial for Cardiovascular Health (CATCH) was the largest school-based field trial ever sponsored by the National Institutes of Health. The trial demonstrated positive changes in the school food service and physical education program, as well as in students' cardiovascular health behaviors. Because the CATCH intervention programs were implemented in 56 schools (in four states) that were typical of schools throughout the United States, their reception by schools and degree of implementation provide evidence about their feasibility for schools nationally. Extensive process evaluation data were collected from students, teachers, school food service personnel, and physical education specialists throughout the three school years of the CATCH intervention. Four of the CATCH programs—school food service, physical education, classroom curricula, and home programs—were assessed over the three school years. The process data provide information on participation, dose, fidelity, and compatibility of the CATCH programs in the intervention schools for these programs. High levels of participation, dose, fidelity, and compatibility were observed for the four programs during the 3 school years. CATCH emerges as a model of a feasible multilevel health promotion program to improve eating and exercise behaviors for elementary schools in the United States. (Bachman et al., 1997, pp. 716-717)

It is important to identify early the behavioral eating traits that promote overeating and obesity in order to address this in multifaceted interventions directed to parents (Cao et al., 2011). Results have indicated that, through prevention programs, school-age children know and perceive changes about nutrition and physical activity for the better (Aldridge et al., 2002). Barroso (2000) conducted a study with a sample size of 258 children (49% male and 50.8% female) to ascertain the relationship between physical activity and a nutrition program, which revealed the following:

After attending the program, a small number of students knew the daily-recommended servings based on the food pyramid: 26% knew that the bread, cereal, rice, and pasta group should have the most servings; 57% knew that the fats, oils, and sweets group should have the least servings; and 30% knew the correct servings for the fruit and vegetable groups. Very few children (27%) had high-levels of nutrition knowledge and very few (17%) practiced healthy food choices. (p. 1)

Programs that use nutrition and cooking classes should focus on menu planning, making wise food choices, cooking healthy meals, reading food labels, appropriate ways to lose/maintain body weight, and planning healthy snack alternatives (Sanders, 2002). To prevent certain diseases and to promote good health, Alabama's school-age children should follow the recommendations of the Dietary Guidelines and Physical Activity Pyramid. Research has validated that behavioral change correlates positively with the amount of nutrition instruction received (CDC, 2003). Alabama's children deserve better nutrition and physical activity programs. On average, children who eat properly and are physically active at an early age will continue these good habits throughout life (LSI, 2004). The underlying assumption is that if there is a positive experience in childhood or adolescence, then the

behavior will track into adulthood, when it is more likely to provide physiological benefits (Hobbs & Kohl, 1998).

Participating in nutrition and physical activity programs may lead children to become healthy adults. Physical activity is to be encouraged among children and adolescents based largely on the assumption that the behavior will become part of the person's life and carry over to adulthood, where it will help lower the risk of several chronic diseases as well as premature mortality. All children develop certain behaviors toward nutrition and physical activity based on the knowledge they have gained. Findings from research has shown that when children hear messages repeatedly through a variety of sources, they are more likely to accept them and act accordingly (Hellison, 2003). Therefore, there is a high likelihood that intervention programs may be "the way to go." According to the Archives of Internal Medicine, intensive medical intervention yields positive results.

Modern life extends the umbrella of social responsibility for provision of appropriate nutrition and nutrition knowledge beyond the home to government, the health professions, schools, the food industry, and the media (Birch et al., 2005). According to the Dietary Intervention Study in Children (DISC), nutrition education programs for children can enhance health outcomes (ADA, 2006). Alabama's children are suffering when it comes to being knowledgeable about the importance of the relationship between good nutrition and physical activity. The environment in which these school-age children live, go to school, and play currently does not foster effective nutrition and physical activity. Thus, nutrition and physical activity intervention programs are needed for school-age children in Alabama to inculcate healthy lifestyles that foster and maintain good health throughout life.

CHAPTER 3. METHODOLOGY

The purpose of this study was to assess the impact of an intervention program on the knowledge and behaviors of school-aged children participating in two North Alabama Boys and Girls Clubs, ages 10, 11, and 12. Specifically, the study examined the degree to which CHAMPION (Community Health Aerobic Motivational Program Initiating Optimal Nutrition) increases positive nutrition knowledge and healthy physical activity behaviors. The intervention program implemented for this study was a part of the existing program, CHAMPION. CHAMPION was developed as a weight management program to be implemented throughout Alabama. Quantitative research was the design used for the study. Quantitative analysis is used to describe trends and explain the relationship among variables (Creswell, 2005). The intervention program applied in this study was comprised of nutrition and physical activity lessons implemented during regular Boys and Girls Club hours. Participants' knowledge and behaviors were recorded by pre-, post, and delayed tests. This chapter describes the methodology applied to conduct the study.

Population and Sample

The Boys and Girls Clubs of America currently have approximately 3,985 facilities. These facilities include 1,314 schools, 392 BGCA-affiliated Youth Centers on U.S. military installations worldwide, 360 in public housing, and 199 Native American lands (Boys and Girls Clubs of America, 2011). Based on overall age and gender, the population distribution of the Clubs is as follows: 5% are 5 years old, 46% are 6-10 years old, 20% are 11-12 years old, 19% are 13-15 years old, and 10% are 16 years or older; and 56% are male, and 44% are female. Based on the ethnicity of the youth served, the percentages are: Caucasian=33%,

African-American =30%, Hispanic/Latino =23%, Multi-racial=8%, Asian-American=3%, and Native American=3% (Boys and Girls Clubs of America, 2011). The population demographics of the 10 North Alabama Boys and Girls located in Limestone and Madison counties, Alabama, are similar to the national demographics. Based on the overall age and gender, the population distribution of the North Alabama Clubs is: 7% are 5 years old, 42% are 6-10 years old, 15% are 11-12 years old, 18% are 13-15 years old, and 15% are 16 and older, 51.70% are male, and 48.30% are female. Based on the ethnicity of the youth served, the percentages are: Caucasian=9.2%, African-American=85%, Hispanic/Latino=1.91%, Multi-racial=3.47%, Asian-American=0.06%, and Native American=0.05% (H. Weatherly, personal communication, August 20, 2012).

Among the 10 clubs, two were selected for this study. The sample included children ages 10, 11, and 12 from two locations within the Boys and Girls Clubs of North Alabama. One school and one public housing club were utilized. These school-age children were in grades 4-7. Club 1 (Experimental) was comprised of 43% ($N=19$) males and 57% ($N=24$) females. Blacks made up 46% ($N=20$) of the sample, Hispanics/Latino made up 19% ($N=8$) of the sample, White/Caucasian made up 21% ($N=9$) of the sample, Asian/Pacific Islander made up 2% ($N=1$) of the sample, and Native/American/American Indian made up 12% ($N=5$). Club 2 (Control) was comprised of 58% ($N=23$) males and 42% ($N=16$) females. Blacks made up 80% ($N=31$) of the sample, Hispanic/Latino made up 15% ($N=6$) of the sample, and White/Caucasian made up 5% ($N=2$). This resulted in a total number of 82 participants between both Clubs.

Research Protocol

Table 2.2 indicates how the intervention program was administered and data were collected. The program was comprised of 12 sessions. The sessions included both nutrition and physical activity lessons focused around knowledge and behavior. Some topics discussed where: serving sizes, MyPlate, Kids Activity Guide, food preparation, fat, muscle, healthy eating, staying active and fit, and eating on the go.

Table 2.2. Research protocol

ACTIVITY	LESSON DATES	CLUB 1	CLUB 2
Mon., Day 1	Subject(s): Get Acquainted/ Pretest/MyPlate with Suggested Serving Sizes/Kids Activity Pyramid	X	
Mon., Day 1	Subject(s): Pretest		X
Tues., Day 2	Subject(s): MyPlate/Kids Activity Guide	X	
Wed., Day 3	Subject(s): MyPlate/Preparing Healthy Meals/Fat/Muscle	X	
Thurs., Day 4	Subject (s): MyPlate/USDA 2010 Dietary Guidelines	X	
Fri., Day 5	Subject(s) (Fat Tracks) Nutrition/Physical Activity/Eating Healthy to Stay Fit	X	
Mon., Day 6	Subject(s): (Six Corners) Healthy Snacking/Nutrition/Physical Activity	X	
Tues., Day 7	Subject(s): (Becoming & Staying Healthy/Eating Healthy/Physical Activity)	X	
Wed., Day 8	Subject(s): (Where Does It Come From?) Nutrition and Physical Activity	X	
Thurs., Day 9	Subject(s): At the Drive Thru Nutrition and Physical Activity	X	
Fri., Day 10	Subject(s): Healthy Eating: Nutrition and Physical Activity	X	
Mon., Day 11	Subject(s): Post Survey	X	X
Mon., Day 60	Subject(s): 2 nd Post Survey (Delayed)	X	

The following procedures were followed to conduct this research:

1. Iowa State University's Institutional Review Board approved and declared this research exempt from the requirements of human subject's protections regulations (Appendix B).
2. Permission letters were sent to the Boys and Girls Clubs of North Alabama Club Directors requesting participation. The population was selected based on the Boys and Girls Clubs of North Alabama that responded to a written request. Two clubs agreed to participate. These clubs were designated throughout this research as Club 1 (Experimental) and Club 2 (Control) (Appendix C).
3. To encourage participation from the children, recruitment flyers and permission letters were posted throughout the clubs and given to parents (Appendix C).
4. Consent was then given to proceed during the clubs' regular hours of operation. (Appendix C).
5. Permission was requested and granted from Dr. Warren to use lessons from CHAMPION (Community Health Aerobic Motivational Program Initiating Optimal Nutrition) to conduct surveys and implement curriculum (Appendix C). The survey consisted of 19 questions (Appendix D). Questions 1-10 tested the participant's behavior. Questions 11-19 tested the participant's knowledge.
6. Club 2 (Control) received the pre-test first due to time allotted by the director.
7. Club 1 (Experimental) received the pre-test that following Monday. The program was implemented. On this first visit, each student received a folder in which to keep all provided information [at the club]. These folders were given at the start of each session and taken back up at the conclusion of each lesson. They were stored in the

- club's education room. The participants were introduced to ten intervention lessons that included a video, group discussions, handouts, activity sheets, and interactive activities. Parent informational flyers were sent home on some days (Appendix C). Club 2 did not receive the intervention program.
8. Club 1 (Experimental) received the 1st post-test on the last day of the program and their folders to take home.
 9. Club 2 (Control) received their post-test on the same day as Club 1.
 10. The intervention period lasted for two months. At the conclusion of the two-month intervention period, Club 1 received the 2nd post-test (Delayed).
 11. When complete, a comparison study was done of all pre-tests, post-tests, and delayed tests given at both clubs.

Data Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS Version 17.0). Testing of the hypotheses required a comparison of pretests and post-tests for both clubs. Simple non-parametric frequencies, means, and *t*-tests were used for descriptive purposes. The mean test score was calculated based on both the pretests and post-tests. To analyze the pretest, post-test, and delayed tests data, analysis of variance (ANOVA) was used to determine the differences between clubs.

CHAPTER 4. RESULTS

Descriptive Statistics of the Samples

Descriptive statistics are presented based on club participants (Table 4.1). Complete data from the tests scores (pretest, post-test, and delayed test) were obtained from 43 school-age children (experimental group). Complete data from test scores (pretest and post-test) were obtained from 39 school-age children (control group). There were 82 participants combined.

Table 4.1. Descriptive statistics of club participation in pre-, post-, and delayed tests for club 1 and 2

Test	<i>N</i>		<i>Total</i>
	Club 1	Club 2	
Pretest	43	39	82
Post-test	43	39	82
Delayed test	43	0	43

Table 4.2 provides demographic data of the participants for club 1 and 2 based on grade, gender, and ethnicity. Club 1 (Experimental) was comprised of 43% ($N=19$) males and 57% ($N=24$) females. The participants in club 1 by ethnicity were: (a) Blacks, 46% ($N=20$); Hispanics/Latino, 19% ($N=8$); White/Caucasian, 21% ($N=9$); Asian/Pacific Islander, 2% ($N=1$); and Native/American/American Indian, 12% ($N=5$). Club 2 (Control) was comprised of 58% ($N=23$) males and 42% ($N=16$) females. The participants in club 2 by ethnicity were: Blacks, 80% ($N=31$); Hispanic/Latino, 15% ($N=6$); and White/Caucasian, 5% ($N=2$).

Table 4.3 shows the knowledge pre-test results of club 1 and 2. These results show the knowledge level of the participants in both clubs before the intervention method was

Table 4.2. Demographic data of participation for club 1 and 2

Variable (<i>N</i> =82)	Frequency (%)	
	Club 1	Club 2
Age		
10	17 (39.5)	13 (33.3)
11	14 (32.6)	10 (25.6)
12	12 (27.0)	16 (41.0)
Grade		
4	6 (14.0)	9 (23.1)
5	11 (25.6)	12 (30.8)
6	14 (32.6)	18 (46.2)
7	12 (27.0)	0 (00.0)
Gender		
Male	19 (43.0)	23 (57.0)
Female	24 (57.0)	16 (43.0)
Race		
Black	20 (46.5)	31 (79.5)
Hispanic/Latino	8 (18.6)	6 (15.4)
White/Caucasian	9 (20.9)	2 (5.1)
Asian/Pacific	1 (2.3)	
Islander		
Native American/ American Indian	5 (11.6)	

implemented. An independent-samples *t*-test was conducted to compare the differences between the pre-test scores for club 1 and 2 based on their knowledge (Table 4.3). Questions 11, 12, 13, 14, 16, 17, 18, and 19 revealed no significant difference. These questions related to servings, daily exercise, and making better choices. Question 15 did reveal a significant difference. This question related to the new food guide. There was also a significant difference in question 15 pre-test ($M=2.1$, $SD=.64$) and post-test scores ($M=1.7$, $SD=.89$) conditions; $t(80) = 3.3$, $p < .001$.

Table 4.3. Differences in knowledge questions for pre-test comparisons between club 1 and 2

Knowledge question...	Club 1		Club 2		<i>t</i> -test
	Mean	SD	Mean	SD	
Q11. Vegetable Servings	1.91	0.78	1.85	0.78	0.35
Q12. Grain Servings	2.05	0.75	2.21	0.66	1.01
Q13. Fruit Servings	1.84	0.84	1.97	0.74	0.78
Q14. Dairy Servings	1.93	0.77	1.64	0.74	1.73
Q15. New Food Guide	2.14	0.64	1.69	0.61	3.22*
Q16. Daily Exercise	2.12	0.85	2.28	0.89	0.86
Q17. Whole Bread	1.40	0.49	1.41	0.50	0.14
Q18. Milk	1.63	0.49	1.46	0.51	1.51
Q19. Juice	1.33	0.47	1.49	0.51	1.49

*Significant at $p < .005$.

Table 4.4 reveals the behavior pre-test results for club 1 and 2. These results show the level of behavior the participants in both clubs had before the intervention method was implemented. These questions related to eating vegetables, fruits, grains, dairy, and protein. They also related to MyPlate, exercise/sports, enjoying exercising, fast food, and family exercise. An independent-samples *t*-test was conducted to compare the differences between the pre-test scores for club 1 and 2 based on their behaviors. Results showed a significant difference on questions 7 and 8. These questions related to exercises/sports and enjoyment of exercising. There was a significant difference in question 7 pre-test ($M=2.1$, $SD=.83$) and post-test scores ($M=2.7$, $SD=.70$) conditions; $t(80) = 3.08$, $p = .005$. There was also a significant difference in question 8 pre-test ($M=2.1$, $SD=.59$) and post-test scores ($M=2.6$, $SD=.58$) conditions; $t(80) = 4.39$, $p < .005$.

Table 4.4. Differences in behavior questions in the pre-test for comparison between club 1 and 2

Behavior question...	Club 1		Club 2		<i>t</i> -test
	Mean	SD	Mean	SD	
Q1. Eat Vegetables	2.30	0.64	2.15	0.63	1.06
Q2. Eat Fruits	2.56	0.55	2.67	0.66	0.81
Q3. Eat Grain	1.93	0.80	1.62	0.75	1.84
Q4. Eat Dairy	1.95	0.65	1.79	0.86	0.94
Q5. Eat Protein	1.67	0.78	1.69	0.83	0.10
Q6. My Plate	1.35	0.61	1.51	0.76	1.08
Q7. Exercise/Sports	2.14	0.83	2.67	0.70	3.08*
Q8. Enjoy Exercising	2.07	0.59	2.64	0.58	4.39*
Q9. Fast Food	2.19	0.63	2.31	0.61	0.89
Q10. Family Exercise	1.53	0.63	01.95	0.79	2.63

*Significant at $p < .005$.

Table 4.5 shows the knowledge post-test results of club 1 and 2. These results show the level of knowledge the participants in both clubs had after the intervention method was implemented. An independent-samples *t*-test was conducted to compare the differences between the post-test scores for club 1 and 2 based on their knowledge (Table 4.5). Results showed a significant difference on questions 12, 13, 15, 16, 17, 18, and 19. These questions related to servings, new food guide, daily exercise, and making better choices. However, questions 11 and 14 showed no significant difference. These questions related to vegetable and dairy servings. There were no significant difference in the scores for question 11 pre-test ($M=1.9$, $SD=.54$) and post-test scores ($M=1.7$, $SD=.85$) conditions; $t(64) = .88$, $p = .38$. There was also no significant difference in the scores for question 14 pre-test ($M=1.9$, $SD=.37$) and post-test scores ($M=1.8$, $SD=.81$) conditions; $t(52) = .98$, $p = .33$.

Table 4.5. Differences in knowledge questions for post-test comparisons between club 1 and 2

Knowledge of	Club 1		Club 2		<i>t</i> -test
	Mean	SD	Mean	SD	
Q11. Vegetable Servings	1.88	0.54	1.74	0.85	0.88
Q12. Grain Servings	1.30	0.64	2.18	0.64	6.19*
Q13. Fruit Servings	1.19	0.39	2.18	0.72	7.64*
Q14. Dairy Servings	1.91	0.37	1.77	0.81	0.98
Q15. New Food Guide	1.00	0.00	1.82	0.64	7.96*
Q16. Daily Exercise	1.00	0.00	2.28	0.86	9.34*
Q17. Whole Bread	1.05	0.21	1.59	0.55	5.80*
Q18. Milk	1.93	0.26	1.44	0.50	5.52*
Q19. Juice	1.00	0.00	1.41	0.50	5.14*

*Significant at $p < .005$.

Table 4.6 reveals the behavior post-test results of club 1 and 2. These results show the level of knowledge the participants in both clubs had after the intervention method was implemented. An independent-sample *t*-test was conducted to compare the difference in participant eating for the post-test scores for activity behavior questions between club 1 and 2 (Table 4.6). Questions 2, 3, 4, 5, 6, 8, and 10 showed a significant difference in results. These questions related to eating vegetables, fruits, grains, dairy, and protein. They also related to MyPlate, enjoying exercises, and family exercise. Questions 1, 7, and 9 showed no significant differences in the results. These questions related to eating vegetables, exercise/sports, and fast food. There was no significant difference in scores for question 1 pre-test ($M=2.4$, $SD=.54$) and post-test scores ($M=2.2$, $SD=.67$) conditions; $t(80) = 1.57$, $p = .12$. There was no significant difference in the scores for question 7 pre-test ($M=2.6$, $SD=.54$) and post-test scores ($M=2.4$, $SD=.67$) conditions; $t(73) = 1.84$, $p = .03$. There was also no significant difference in scores for question 9 pre-test ($M=2.2$, $SD=.48$) and post-test scores ($M=2.3$, $SD=.58$) conditions; $t(75) = 1.45$, $p = .15$.

Table 4.6. Differences in behavior questions for post-test comparisons between club 1 and 2

Behavior question...	Club 1		Club 2		<i>t</i> -test
	Mean	SD	Mean	SD	
Q1. Eat Vegetables	2.44	0.55	2.23	0.67	1.57
Q2. Eat Fruits	2.93	0.26	2.64	0.54	4.15*
Q3. Eat Grain	2.51	0.55	1.74	0.72	5.48*
Q4. Eat Dairy	2.49	0.55	1.85	0.67	4.76*
Q5. Eat Protein	2.33	0.57	1.44	0.68	6.46*
Q6. My Plate	2.81	0.45	1.33	0.66	11.94*
Q7. Exercise/Sports	2.60	0.54	2.36	0.67	1.84
Q8. Enjoy Exercising	2.56	0.55	2.18	0.64	2.88*
Q9. Fast Food	2.16	0.48	2.33	0.58	1.45
Q10. Family Exercise	2.12	0.63	1.56	0.79	3.53*

*Significant at $p < .005$.

Results based on the Research Questions

The following research questions framed the study to identify the impact the intervention program had on school-age children in North Alabama's knowledge and behavior:

1. Does an intervention program impact the knowledge of school-age children regarding nutrition and physical activity?
2. Does an intervention program impact the behaviors of school-age children regarding nutrition and physical activity?
3. Does an intervention program have a long-term effect on school-age children?

Research Question 1: Does an intervention program impact the knowledge of school-age children regarding nutrition and physical activity?

An independent samples *t*-test was conducted to identify differences between the pre-test and post-test scores for club 1 based on the students' knowledge of nutrition and physical

activity (Table 4.7). Tests were conducted on differences for nine dependent variables simultaneously (Questions 11-19). Because multiple *t*-tests were performed, Bonferroni corrections were applied to derive a protected *p*-value. The protected *p*-value is .05/9, equaling .0055. Questions 12, 13, 15, 16, 17, 18, and 19 revealed significant differences in scores ($p < .05$). These questions related to the knowledge of grain servings, fruit servings, new food guide, daily exercise, and making better choices.

However, questions 11 and 14 did not. These questions related to knowledge of vegetables and dairy servings. There were no significant difference in the scores for vegetable servings pre-test ($M=1.9$, $SD=.78$) and post-test scores ($M=1.8$, $SD=.54$) conditions; $t(75) = .2$, $p = .89$. There was also no significant difference on question 14 for the dairy servings pre-test ($M=1.9$, $SD=.77$) and post-test scores ($M=1.9$, $SD=.37$) conditions; $t(60) = .2$, $p = .858$. One related factor may be that many of the children indicated being lactose intolerant.

Table 4.7. Pre- and post-test results for nutrition and physical activity knowledge questions for club 1

Knowledge question	Pre-test		Post-test		<i>t</i> -test
	Mean	SD	Mean	SD	
Q11. Vegetable Servings	1.91	0.78	1.88	0.54	0.2
Q12. Grain Servings	2.05	0.75	1.30	0.64	4.9*
Q13. Fruit Servings	1.84	0.84	1.19	0.39	4.6*
Q14. Dairy Servings	1.93	0.77	1.91	0.37	0.2
Q15. New Food Guide	2.14	0.64	1.00	0.00	11.7*
Q16. Daily Exercise	2.12	0.85	1.00	0.00	8.6*
Q17. Bread	1.40	0.49	1.05	0.21	4.2*
Q18. Milk	1.63	0.49	1.93	0.26	3.6*
Q19. Juice	1.33	0.47	1.00	0.00	4.5*

*Significant at $p < .005$.

An independent samples *t*-test was conducted to identify differences between the pre-test and post-test scores for club 2 based on the students' knowledge of nutrition and physical activity (Table 4.8). Tests were conducted on differences for nine dependent variables simultaneously (Questions 11-19). Because multiple *t*-tests were performed, Bonferroni corrections were applied to derive a protected *p*-value. Results showed no significant differences among any of the scores.

Table 4.8. Pretest and post-test results for nutrition and physical activity knowledge questions for club 2

	Pre-test		Post-test		<i>t</i> -test
	Mean	SD	Mean	SD	
Q11. Vegetable Servings	1.85	0.78	1.74	0.85	0.56
Q12. Grain Servings	2.21	0.66	2.18	0.64	0.17
Q13. Fruit Servings	1.97	0.74	2.18	0.72	1.24
Q14. Dairy Servings	1.64	0.74	1.77	0.81	0.73
Q15. New Food Guide	1.69	0.61	1.82	0.64	0.90
Q16. Daily Exercise	2.28	0.89	2.28	0.86	0.00
Q17. Whole Bread	1.41	0.50	1.59	0.55	1.51
Q18. Milk	1.46	0.51	1.44	0.50	0.22
Q19. Juice	1.49	0.51	1.41	0.50	0.68

Research Question 2: Does an intervention program impact the behaviors of school-age children regarding nutrition and physical activity?

An independent samples *t*-test was conducted to identify differences between the pre-test and post-test scores for club 1 based on the students' behavior on nutrition and physical activity (Table 4.9). Tests were conducted on differences for 10 dependent variables simultaneously (Questions 1-10). Because multiple *t*-tests were performed, Bonferroni corrections were applied to derive a protected *p*-value. The protected *p*-value is .05/10 equaling .005. Questions 2, 3, 4, 5, 6, 7, 8, and 10 revealed a significant difference in scores.

Table 4.9. Pretest and post-test results for nutrition and physical activity behavior questions for club 1

	Pre-test		Post-test		<i>t</i> -test
	Mean	SD	Mean	SD	
Q1. Eat Vegetables	2.30	0.64	2.44	0.55	1.1
Q2. Eat Fruits	2.56	0.55	2.93	0.26	4.0*
Q3. Eat Grain	1.93	0.80	2.51	0.55	3.9*
Q4. Eat Dairy	1.95	0.65	2.49	0.55	4.1*
Q5. Eat Protein	1.67	0.78	2.33	0.57	4.4*
Q6. My Plate	1.35	0.61	2.81	0.45	12.6*
Q7. Exercise/Sports	2.14	0.83	2.60	0.54	3.1*
Q8. Enjoy Exercising	2.07	0.59	2.56	0.55	3.9*
Q9. Fast Food	2.19	0.63	2.16	0.48	0.2
Q10. Family Exercise	1.53	0.63	2.12	0.63	4.3*

*Significant at $p < .005$.

These questions related to eating vegetables, grains, dairy, and protein. They also included exercise, sports, enjoying activities, and family exercising. However, questions 1 and 9 showed no significant difference. These questions related to eating vegetables and fast food. There was no significant difference in the scores for eating vegetables.

An independent sample *t*-test was conducted to identify differences between the pre-test and post-test scores of club 2 based on the students' behaviors on nutrition and physical activity (Table 4.10). Test were conducted on differences for dependent variables simultaneously (Questions 1-10). Because multiple *t*-tests were performed, Bonferroni corrections were applied to derive a protected *p*-value. Results showed no significant differences in questions 1, 2, 3, 4, 5, 6, 7, and 9. These questions related to eating vegetables, fruits, grains, dairy, and protein. They also related to MyPlate, exercise/sports, and fast food. However, question 8 and 10 had a significance difference. These questions related to enjoying exercise and family exercise. There was a significant difference in the scores for enjoying exercise pre-test ($M=2.6$, $SD=.59$) and post-test scores ($M=2.2$, $SD=.64$) conditions;

Table 4.10. Pretest and post-test results for nutrition and physical activity behavior questions for club 2

	Pre-test		Post-test		<i>t</i> -test
	Mean	SD	Mean	SD	
Q1. Eat Vegetables	2.15	0.63	2.23	0.67	0.52
Q2. Eat Fruits	2.67	0.66	2.64	0.54	0.19
Q3. Eat Grain	1.62	0.75	1.74	0.72	0.77
Q4. Eat Dairy	1.79	0.86	1.85	0.67	0.29
Q5. Eat Protein	1.69	0.83	1.44	0.68	1.49
Q6. My Plate	1.51	0.76	1.33	0.66	1.11
Q7. Exercise/Sports	2.67	0.70	2.36	0.67	1.98
Q8. Enjoy Exercising	2.64	0.58	2.18	0.64	3.32*
Q9. Fast Food	2.31	0.61	2.33	0.58	0.19
Q10. Family Exercise	1.95	0.79	1.56	0.79	2.15*

Significant at $p < .005$.

$t(76) = 3.32, p < .005$. There was also a significant difference in the scores for family exercise pre-test ($M=1.9, SD=.79$) and post-test scores ($M=1.6, SD=.79$) conditions; $t(76) = 2.15, p < .005$.

Research Question 3: Does an intervention program have a long-term effect on school-age children?

To analyze the effects of the intervention fully for club 1, an independent samples *t*-test was conducted first to compare their pretest and post-test scores Then a one-way ANOVA with post-hoc comparisons was estimated to see if the effects of the intervention (CHAMPION) were still present two months after the experiment had ended. Both knowledge and behavior questions were analyzed (Tables 4.11 – 4.14). There were significant effects on several knowledge questions: grain servings, fruit servings, new food guide, daily exercise, whole bread, milk, and juice (Table 4.11 and 4.12). There also were significant effects on several behavior questions: eating fruits, eating grains, eating dairy, eating protein, MyPlate, exercise/sports, enjoy exercising, and family exercise (Table 4.13 and 4.14).

Table 4.11. Summary ANOVA for intervention and knowledge between groups

		Sum of Squares	<i>df</i>	Mean Square	<i>F</i>
Q11. Vegetable Servings	Between Groups	0.20	2	0.10	0.27
	Within Groups	46.56	126	0.37	
	Total	46.76	128	0.00	
Q12. Grain Servings	Between Groups	16.39	2	8.19	17.92*
	Within Groups	57.63	126	0.46	
	Total	74.02	128	0.00	
Q13. Fruit Servings	Between Groups	10.67	2	5.33	14.29*
	Within Groups	47.02	126	0.37	
	Total	57.69	128	0.00	
Q14. Dairy Servings	Between Groups	0.05	2	0.02	0.09
	Within Groups	32.33	126	0.26	
	Total	32.37	128	0.00	
Q15. New Food Guide	Between Groups	37.22	2	18.61	136.64*
	Within Groups	17.16	126	0.14	
	Total	54.39	128	0.00	
Q16. Daily Exercise	Between Groups	35.72	2	17.86	73.98*
	Within Groups	30.42	126	0.24	
	Total	66.14	128	0.00	
Q17. Whole Bread	Between Groups	3.49	2	1.74	15.59*
	Within Groups	14.09	126	0.11	
	Total	17.58	128	0.00	
Q18. Milk	Between Groups	3.09	2	1.54	14.07*
	Within Groups	13.81	126	0.11	
	Total	16.90	128	0.00	
Q19. Juice	Between Groups	2.84	2	1.42	17.16*
	Within Groups	10.42	126	0.08	
	Total	13.26	128	0.00	

*Significant at $p < .001$.

Table 4.12. Post-hoc comparisons for knowledge differences

	(I) Test	(J)Test	Mean Test Diff (I-J)	SE	95% Confidence Interval	
					Lower Bound	Upper Bound
Q 11. Vegetable Servings	Pre-test	Post-test	0.02	0.15	-0.33	0.38
		Delayed	0.09	0.14	-0.24	0.43
Q12. Grain Servings	Pre-test	Post-test	0.74	* 0.15	0.39	1.10
		Delayed	0.77	* 0.15	0.41	1.12
Q13. Fruit Servings	Pre-test	Post-test	0.65	* 0.14	0.30	1.00
		Delayed	0.56	* 0.15	0.19	0.92
Q14. Dairy Servings	Pre-test	Post-test	0.02	0.13	-0.30	0.34
		Delayed	-0.02	0.12	-0.32	0.28
Q15. New Food Guide	Pre-test	Post-test	1.14	* 0.10	0.90	1.38
		Delayed	1.14	* 0.10	0.90	1.38
Q16. Daily Exercise	Pre-test	Post-test	1.12	* 0.13	0.79	1.44
		Delayed	1.12	* 0.13	0.79	1.44
Q17. Whole Bread	Pre-test	Post-test	0.35	* 0.08	0.15	0.55
		Delayed	0.35	* 0.08	0.15	0.55
Q18. Milk	Pre-test	Post-test	-0.30	* 0.08	-0.51	-0.10
		Delayed	-0.35	* 0.08	-0.54	-0.16
Q19. Juice	Pre-test	Post-test	0.33	* 0.07	0.15	0.51
		Delayed	0.30	* 0.08	0.11	0.49

*Significant at $p < .001$.

Table 4.13. Summary ANOVA for intervention and behavior between groups

		Sum of Squares	<i>df</i>	Mean Square	<i>F</i>
Q1. Eat Vegetables	Between Groups	1.67	2	0.84	2.39
	Within Groups	44.14	126	0.35	
	Total	45.81	128	0.00	
Q2. Eat Fruits	Between Groups	2.99	2	1.50	7.84*
	Within Groups	24.05	126	0.19	
	Total	27.04	128	0.00	
Q3. Eat Grain	Between Groups	7.74	2	3.87	9.14*
	Within Groups	53.30	126	0.42	
	Total	61.04	128	0.00	
Q4. Eat Dairy	Between Groups	6.16	2	3.08	8.86*
	Within Groups	43.77	126	0.35	
	Total	49.92	128	0.00	
Q5. Eat Protein	Between Groups	11.35	2	5.67	12.87*
	Within Groups	55.53	126	0.44	
	Total	66.88	128	0.00	
Q6. My Plate	Between Groups	57.88	2	28.94	104.38*
	Within Groups	34.93	126	0.28	
	Total	92.81	128	0.00	
Q7. Exercise/ Sports	Between Groups	6.53	2	3.26	7.998
	Within Groups	51.49	126	0.41	
	Total	58.02	128	0.00	
Q8. Enjoy Exercising	Between Groups	11.02	2	5.51	19.808
	Within Groups	35.07	126	0.28	
	Total	46.09	128	0.00	
Q9. Fast Food	Between Groups	1.41	2	0.71	2.75
	Within Groups	32.28	126	0.26	
	Total	33.69	128	0.00	
Q10. Family Exercise	Between Groups	12.02	2	6.01	14.908
	Within Groups	50.79	126	0.40	
	Total	62.81	128	0.00	

*Significant at $p < .001$.

Table 4.14. Post-hoc comparisons for behavior differences

	(I) Test	(J)Test	Mean Test Diff (I-J)		SE	95% Confidence Interval	
						Lower Bound	Upper Bound
Q1. Eat Vegetables	Pre-test	Post-test	-0.14		0.13	-0.45	0.17
		Delayed	-0.28		0.13	-0.59	0.03
Q2. Eat Fruits	Pre-test	Post-test	-0.37	*	0.09	-0.60	-0.15
		Delayed	-0.16		0.11	-0.43	0.10
Q3. Eat Grain	Pre-test	Post-test	-0.58	*	0.14	-0.92	-0.24
		Delayed	-0.42	*	0.14	-0.76	-0.08
Q4. Eat Dairy	Pre-test	Post-test	-0.53	*	0.13	-0.84	-0.23
		Delayed	-0.26		0.13	-0.56	0.05
Q5. Eat Protein	Pre-test	Post-test	-0.65	*	0.15	-1.01	-0.29
		Delayed	-0.60	*	0.15	-0.98	-0.23
Q6. My Plate	Pre-test	Post-test	-1.47	*	0.12	-1.75	-1.18
		Delayed	-1.37	*	0.12	-1.67	-1.08
Q7. Exercise/ Sports	Pre-test	Post-test	-0.47	*	0.15	-0.84	-0.09
		Delayed	-0.49	*	0.15	-0.85	-0.13
Q8. Enjoy Exercising	Pre-test	Post-test	-0.49	*	0.12	-0.79	-0.19
		Delayed	-0.70	*	0.11	-0.97	-0.43
Q9. Fast Food	Pre-test	Post-test	0.02		0.12	-0.27	0.32
		Delayed	0.23		0.11	-0.04	0.51
Q10. Family Exercise	Pre-test	Post-test	-0.58	*	0.14	-0.91	-0.25
		Delayed	-0.70	*	0.14	-1.03	-0.37

*Significant at $p < .001$.

CHAPTER 5. DISCUSSION

Summary

The purpose of this study was to assess the impact of an intervention program on the knowledge and behaviors of school-aged children participating in two North Alabama Boys and Girls Clubs, ages 10, 11, and 12. Specifically, the study examined the degree to which CHAMPION (Community Health Aerobic Motivational Program Initiating Optimal Nutrition) increases positive nutrition knowledge and healthy physical activity behaviors. The intervention program implemented for this study was a part of the existing program, CHAMPION. CHAMPION was developed as a weight management program to be implemented throughout Alabama. For this purpose, an intervention program was administered at two Boys and Girls Clubs of North Alabama school-age children. These participants were ages 10, 11, and 12 year old.

Throughout this research, the three rapidly increasing diseases among this age group were discussed—obesity, type II diabetes, and high blood pressure, which are major health concerns. The intervention program did not focus only on those school-age children identified as having any of the three health problems discussed. Rather, it took a holistic approach in incorporating the importance of nutrition and physical activity as it relates to knowledge and behavior.

Limitations

The findings and recommendations of this study should be viewed in light of the limitations under which the study was conducted. There was no opportunity to collect baseline data. The study was limited to school-age children ages 10, 11, and 12. Participation

was voluntary. The participants were all members of two Boys and Girls Clubs of North Alabama who were willing to participate and only during certain times. The local school system did not respond. Therefore, these findings may not apply to other school-age children throughout Alabama. In addition, the findings may not apply to non-school-age children. The intervention program was implemented during regular club hours with consideration to existing Boys and Girls Club educational programs. The intervention program was scheduled for one hour each day over a two-week period. Some club members were hesitant to participate in both the classroom and/or activity components. Being an after school care program, some participants seemed tired and showed some lack of interest due to the time of day.

There was also a lack of control over extraneous variables, such as parents who often arrived after the start of the intervention program. Therefore, some participants left early on some days. Another limitation for the study was that some participants were not assigned numbers for survey purposes. A limitation of personnel to assist with the classroom and physical activity components may also influence the findings.

Findings and Discussion

This research study focused on assessing the impact of an intervention program that was designed to test the knowledge and behaviors of school-age children in North Alabama ages 10, 11, and 12 as related to good health. Specifically, the study examined the degree to which CHAMPION (Community Health Aerobic Motivational Program Initiating Optimal Nutrition) increased positive nutrition knowledge and healthy physical activity behaviors.

The ADA has recognized and promoted the importance of nutrition and physical activity programs for promoting health.

There were 82 participants combined who participated in the study. The results of this research showed positive increases in the knowledge and behaviors of the sample of participants in the study. The research showed significant impacts related to all three assumptions made prior to the intervention program. The school-age children who participated in this study revealed positive gains in their knowledge of good nutritional benefits and physical activity measured on their pre- to post test for the Club 1. Tests were conducted on nine dependent variables simultaneously (Questions 11-19). These questions related to the knowledge of grain servings, fruit servings, new food guide, daily exercise, and making better choices. Questions 12, 13, 15, 16, 17, 18, and 19 revealed significant differences in scores ($p < .05$). However, questions 11 and 14 did not. These questions related to knowledge of vegetables and dairy servings. There were no significant difference in the scores for vegetable servings pre-test ($M=1.9$, $SD=.78$) and post-test scores ($M=1.8$, $SD=.54$) conditions; $t(75)=.2$, $p = .89$. In addition, there were no significant difference on question 14 for the dairy servings pre-test ($M=1.9$, $SD=.77$) and post-test scores ($M=1.9$, $SD=.37$) conditions; $t(60)=.2$, $p = .858$. One related factor may be that many of the children indicated being lactose intolerant. The school-age children who participated in this study did show positive gains in the behaviors in regards to making healthier food choices and being active on their pre- to post test for Club 1. Tests were conducted on 10 dependent variables simultaneously (Questions 1-10). These questions related to eating vegetables, grains, dairy, protein, exercise, sports, enjoying activities, and family exercising. Questions 2, 3, 4, 5, 6, 7, 8, and 10 revealed a significant difference in scores. However, questions 1 and 9 showed no

significant difference. These questions related to eating vegetables and fast food. There was no significant difference in the scores for eating vegetables.

The intervention program did have a long-term effect on the school-age children who participated in this study as shown in the delayed test. To analyze the effects of the intervention fully for Club 1, an independent samples *t*-test was conducted to compare their pretest and post-test scores, in addition to a one-way ANOVA with post-hoc comparisons to determine if the effects of the intervention (CHAMPION) were still present two months after the experiment had ended. There were significant effects on several knowledge questions: grain servings, fruit servings, new food guide, daily exercise, whole bread, milk, and juice (Table 4.11 and 4.12). There were also significant effects on several behavior questions: eating fruits, eating grains, eating dairy, eating protein, MyPlate, exercise/sports, enjoy exercising, and family exercise (Table 4.13 and 4.14). The CDC has taken a strong stand on their position when it comes to encouraging better health education, more physical education, and physical activity, and healthier school environments are needed to combat the serious health problems that school-age children in Alabama are facing (CDC, 2007). These findings revealed that an intervention program could have positive impacts on the knowledge and behaviors of school-aged children. In specific, results have also shown that CHAMPION does increase positive nutrition knowledge and healthy physical activity behaviors.

The findings of the modified CHAMPION intervention program and this study is supported by the results of the original CHAMPION program that was implemented in 2009. During a period of 1 week, 1,115 youth participated in classes related to nutrition, physical activity, and chronic diseases. Overall, 83% of the children showed knowledge gained and behavior changes as well as increased physical activity. These three elements are

perceived to be key to the overall success impacting the nutrition and health status of children. The environments to which children are exposed in their daily lives--schools, childcare facilities, and their communities--can influence the healthfulness of their lives (CDC, 2011b). Therefore, there is recognition of the need for intervention programs that focus comprehensively on nutrition and health behaviors.

The long-term impact of the CHAMPION intervention program was assessed by delayed testing using a post-test administered after 60 days. The results showed a positive retention of knowledge, behavior, nutrition, and physical activity. A review of the literature suggests that intervention programs range from 1 week to 3 years in length. Many are one-dimensional assessing only one aspect of nutrition, physical activity, or health. It is important to note that prevention programs are needed as well. Prevention programs that are integrated with schools programs and extracurricular activities as a permanent part of the education and group activities for children. The National Prevention and Public, Health Promotion and Public Health Council supports prevention programs that are community-based which promote disease prevention and control at the local level, such as the National Diabetes Prevention Program (Brown, Hausner, & Seffrin, 2010). Although successful treatment regimens exist, prevention should be the primary objective (Skelton, 2004).

Implications for Action

This research study demonstrated the ability of an intervention strategy to cause a potential reduction in the three major health problems discussed: obesity, type II diabetes, and high blood pressure. The need for intervention programs was assessed through surveys and a comparative follow up study. The impact of the intervention program was assessed

through a pre-test, post-test, and delayed data. Based on the results of this research study, parents and other age groups in Alabama could also benefit from this type intervention program. Programs that combine nutrition and physical activity in a fun educational way is what Alabama needs. Although most students looked forward to the lessons, participation may have been enhanced through parent involvement. Because of the benefits, parents also need to participate in intervention programs.

Surprisingly, most participants shared their home activities and nutritional behaviors with the researcher throughout the program. Participants expressed how they shared what they were learning with family and friends. They even expressed their attempt to encourage others to become more active and eat healthier. Encouraging school-age children in Alabama to eat healthy and become physically active needs to be capitalized. School care programs as well as schools and community centers should encourage intervention programs.

Recommendations for Future Research

One should not underestimate the need or benefits of intervention programs in Alabama. Future research studies should replicate these findings across a wider range of school-age children. There is an ongoing need to develop and test intervention programs constructed based on the significant knowledge and behavioral findings observed in this study. Future intervention programs are also needed to disseminate the findings of this study across Alabama. Future research should include parents within the household and, perhaps, entire families. The results of this study emphasized the importance of a continued focus on improving nutrition and physical activity to reduce the risk of developing health problems.

APPENDIX A. BLOOD PRESSURE TABLES

Table E-1. Blood Pressure by Age for Children and Adults

Description	Age	Systolic Blood Pressure	Diastolic Blood Pressure
Kids	3-6 years	116	76
Kids	7-10 years	122	78
Children	11-13 years	126	82
Teenagers	14-16 years	136	86
Optimal Level for Young Adults	17-19 years	less than equal to 120	less than equal to 85
Adults	20-24 years	120	79
Adults	25-29 years	121	80
Adults	30-34 years	122	81
Adults	35-39 years	123	82
Adults	40-44 years	125	83
Adults	45-49 years	127	84
Adults	50-54 years	129	85
Adults	55-59 years	131	86
Adults	60-64 years	134	87

Table E-2. Blood Pressure by Gender for Children

Age	Male (mmHg)	Female (mmHg)
1 to 3	80/34 to 120/75	83/38 to 117/76
4 to 6	88/47 to 128/84	88/50 to 122/83
7 to 10	92/53 to 130/90	93/55 to 129/88

Table E-3. Normal, High and Low Blood Pressure

Pressure Level	Systolic (mmHg)	Diastolic (mmHg)
Low Blood Pressure (Hypotension)	50 – 90	35 – 60
Mild Low Blood Pressure	90 – 100	60 – 70
Normal Blood Pressure	100 – 130	70 – 85
Mild High Blood Pressure	130 – 140	85 – 90
Moderately High Blood Pressure	140 – 160	90 – 110
Severely High Blood Pressure (Hypertension)	160 – 230	110 – 135

Palande, L. (2011).

APPENDIX B. HUMAN SUBJECTS APPROVAL

IOWA STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Assurances
Vice Provost for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4267
FAX 515 294-4566

Date: 7/13/2011

To: Angel N Dunlap
PO Box 5553
Huntsville, AL 35814

CC: Dr. Daniel Robinson
N247 Lagomarcino
Dr. Virginia Caples
Alabama A&M University, James A Dawson
Bldg, 4900 Meridian St

From: Office for Responsible Research

TITLE: The Impact of an Intervention Program on the Knowledge and Behaviors of School-Age Children in Alabama Regarding Nutrition and Physical Activity

IRB Num: 11-590

Study Review Date: 1/24/2012

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46,101(b). The IRB determination of exemption means that:

- (1) Research conducted in established or commonly accepted education setting involving normal education practices, such as:
 - Research on regular and special education instructional strategies; or
 - Research on the effectiveness of, or the comparison among, instruction techniques, curricula, or classroom management methods.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as proposed in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

Detailed Information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

APPENDIX C. PERMISSION LETTERS AND CONSENT FORM

Club Director
Boys and Girls Clubs of North Alabama
Huntsville, Alabama

To Whom It May Concern:

My name is Angel Dunlap and I am a graduate student at Iowa State University majoring in Family and Consumer Sciences Education and Studies at Iowa State University. The title of my Dissertation is "The impact of a intervention program on the knowledge and behaviors of school-age children in Alabama regarding nutrition and physical activity." I am requesting permission that all 10, 11, and 12-year-old members participate in this intervention program. Your club and members **WILL NOT BE IDENTIFIED** in anyway and is free of charge.

The purpose of the program is to educate school-age children ages 10-12 on the importance of nutrition and physical activity. It is my goal to improve both knowledge and behavior changes as it relates to nutrition and physical activity.

The program will consist of eight educational sessions. During the program, the students will learn lifelong nutrition and physical activity information. The sessions will last 1-2 hours. I have enclosed a copy of the consent form for each child to be taken home and returned. Flyers will also be placed throughout the center for advertisement purposes. Participation in this program is strictly voluntary.

I have also enclosed a copy of the exact questionnaire that will be used. If you have any questions regarding the questionnaire, you may contact me at (256) 372-8263 between the hours of 8 a.m. to 12 noon, Monday thru Friday. Your permission would be greatly appreciated.

Thank you in advance for allowing the Boys and Girls Club to participate in this beneficial project.

Sincerely,

Angel Dunlap

Enc: Questionnaire

Consent Form

Title of Study: The Impact of an Intervention Program On The Knowledge and Behaviors Of School-Age Children In Alabama Regarding Nutrition and Physical Activity.

Investigators: Angel Dunlap, MS

This is a research study. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time.

INTRODUCTION

The purpose of this study is to understand the impact a nutrition and physical activity intervention program would have on school-age children. Moreover, this study seeks to understand the impact this intervention program would have on their knowledge and behaviors as related to good health. You are being invited to participate in this study because you are between the ages of 10-12 and live within the state of Alabama.

DESCRIPTION OF PROCEDURES

If you agree to participate, you will be asked to complete a survey about your knowledge and behaviors concerning nutrition and physical activity as it relates to good health. The first survey will be given before you start the program. The second survey will be given after the program has ended. The last survey will be given two months later. During the program, you will be asked to participate in at least thirty minutes of lecture and at least thirty minutes of physical activity on some days. The lectures will consist of me providing basic nutrition and physical activity information based on the lesson plans. These times will vary according to the lesson plans. Some lesson plans include equipment like balls, jump ropes, and hula-hoops.

If you agree to participate in this study, your participation will last for approximately three months. You will meet with me in your gym and classroom facility for approximately fourteen visits over a two-month period. Each visit will take no more than one hour each time.

RISKS

While participating in this study, you may experience some emotional risk if you or any of your family members are currently experiencing any of the health problems that will be discussed during the lessons. You may also experience some emotional discomfort if you or any of your family members are overweight, obese, or morbidly obese. There are no other foreseeable risks at this time from participating in this study.

BENEFITS

If you decide to participate in this study there may be positive lifestyle changes that you will make as a direct benefit to you. Through your participation, you will better understand the importance of including both good nutrition and physical activities into your daily routine. You will show positive gains in your knowledge of good nutritional information and physical activity. In addition, you will also show positive gains in the behaviors as it relates to making healthier food choices and being active. Most importantly, it is hoped that the information gained in this study will benefit the state of Alabama by providing insight on the types of intervention programs needed to reduce the health problems of school-age children.

COSTS AND COMPENSATION

You will not have any costs from participating in this study. You will not be compensated for participating in this study.

PARTICIPANT RIGHTS

Your participation in this study is voluntary and you may refuse to participate or leave the study at any time. If you decide to not participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled. You can skip any questions that you do not wish to answer.

CONFIDENTIALITY

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies NIH, auditing departments of Iowa State University, and the Institutional Review Board (a committee that reviews and approves human subject

research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken:

- Your name will not be recorded onto the questionnaires but instead numbers.
- Access to all research information is limited to both me and my POS Committee.
- Data will be collected and will remain confidential (will not be shared with anyone in a way that can be linked to your name).
- Both a locked filing cabinet and a password protected computer will be used.
- Erasure and destruction of data will take place no later than August 1, 2015. If the results are published, your identity will remain confidential.

QUESTIONS OR PROBLEMS

You are encouraged to ask questions at any time during this study.

- For further information about the study contact Virginia Caples , (256) 372-5943, virginia.caples@aamu.edu, James A. Dawson Building, Alabama A&M University, 4900 Meridian Street, Normal, AL. 35762
- If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

PARTICIPANT SIGNATURE

Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document, and that your questions have been satisfactorily answered. You will receive a copy of the written informed consent prior to your participation in the study.

Participant's Name (printed) _____

(Participant's Signature) (Date)

(Signature of Parent/Guardian or Legally Authorized Representative) (Date)

Angel Dunlap
P.O. Box 5553
Huntsville, AL 35814
(256) 372-8263

August 1, 2012

Tamara Warren, Extension Specialist
Alabama Cooperative Extension System
Alabama A&M University
P.O. Box 967
Normal, AL 35762

Dear Tamara Warren:

My name is Angel Dunlap and I am a graduate student at Iowa State University majoring in Family and Consumer Sciences Education and Studies. The title of my Dissertation is “The impact of a intervention program on the knowledge and behaviors of school-age children in Alabama regarding nutrition and physical activity.” This research is focused on 10, 11, and 12-year-old. I am requesting permission to use lesson plans from CHAMPION: Community Health Aerobic Motivational Program Initiating Optimal Nutrition.

The purpose of my study is to assess the impact of an intervention program has on the knowledge and behaviors of school-aged children at two North Alabama Boys and Girls Clubs. Specifically, the study will examine the degree to which CHAMPION (Community Health Aerobic Motivational Program Initiating Optimal Nutrition) increases positive nutrition knowledge and healthy physical activity behaviors.

If you have any questions regarding the questionnaire, you may contact me at (256) 372-8263 between the hours of 8 a.m. to 12 noon, Monday thru Friday. Your permission would be greatly appreciated.

Thank you in advance for allowing the use of the CHAMPION lesson plans.

Sincerely,

Angel Dunlap
Graduate Student

APPENDIX D. SURVEY INSTRUMENT



Community Health Aerobic Motivational Program Initiating Optimal Nutrition




NUTRITION AND PHYSICAL ACTIVITY QUESTIONNAIRE
 (Ages 10-12 years old)

Please complete answer all parts of the questionnaire. All information will be kept **COMPLETELY CONFIDENTIAL**.

Age _____ Grade _____ Gender _____ Male _____ Female

Racial/Ethnic Background (Please check only one)

☐ Black/African American
 ☐ Hispanic/Latino
 ☐ White/Caucasian
☐ Asian/Pacific Islander
 ☐ Native American/American Indian
☐ Other

Directions: Place an “X” under only one face for each question.	 Never	 Sometimes	 All the Time
1. Do you eat vegetables?			
2. Do you eat fruits?			
3. Do you eat grains?			
4. Do you eat dairy?			
5. Do you eat protein?			
6. Do you hear about MyPlate Food Guide?			
7. Do you participate in exercise or sports?			
8. Do you enjoy exercising?			
9. Do you and your family eat out at restaurants/fast food?			
10. Do you exercise with your family?			

DIRECTIONS: Circle only one answer for each question.

11. How many servings of vegetables should you eat each day?
 a. 3 ½ cups b. 2-2 ½ cups c. 1-1 ½ cups
12. How many servings of grains should you eat a day?
 a. 5-6 ounces b. 2-3 ounce c. 1-2 ounces
13. How many servings of fruits should you eat a day?
 a. 1 ½ cups b. 3 cups c. 4 ½ cups
14. How many servings of dairy should you eat?
 a. 1 cup b. 3 cups c. 4 cups
15. What is the name of the new food guide?
 a. MyPlate b. Food Guide Pyramid c. MyPyramid
16. How long should you exercise each day?
 a. 60 minutes b. 90 minutes c. 30 minutes

DIRECTIONS: Circle only one of the two foods you think is the HEALTHIEST.

17.



Whole Wheat Bread



White Bread

18.



Regular Milk



Low fat

19.



100% Juice



Flavored Fruit Punch



Developed by Tamara C. Warren, PhD
 Urban Health and Nutrition Specialist
 Phone: (256) 372-4981 or Email: tcw0004@auburn.edu

&
 Angel Dunlap, MS
 Instructor, Department of Education, Humanities & Behavioral Science
 Phone (256) 372-8263 or Email angel.dunlap@amu.edu

APPENDIX E. LESSON PLANS AND RELATED MATERIALS**The Importance of Nutrition and Physical activity for Children Ages 10-12
Lesson Plan (Mon., Day 1)**

Submitted By: Angel Dunlap
Iowa State University
Date: February 2012
Grade Level (s): 4, 5, 6, 7

Subject(s): Get Acquainted/ Pretest/MyPlate with Suggested Serving Sizes/Kids Activity Pyramid

Duration: 60 Minutes

Objectives:

1. To test the knowledge and behaviors that children ages 10-12 have concerning nutrition and physical activity.
2. Discuss/Explain MyPlate and Kids Activity Guide.

Materials:

- In Class Folders (To be kept at the center)
- Handouts (MyPlate/Kids Activity Pyramid-Participant Copy)
- Handouts (MyPlate/Kids Activity Pyramid-Parent Copy)

Procedure:

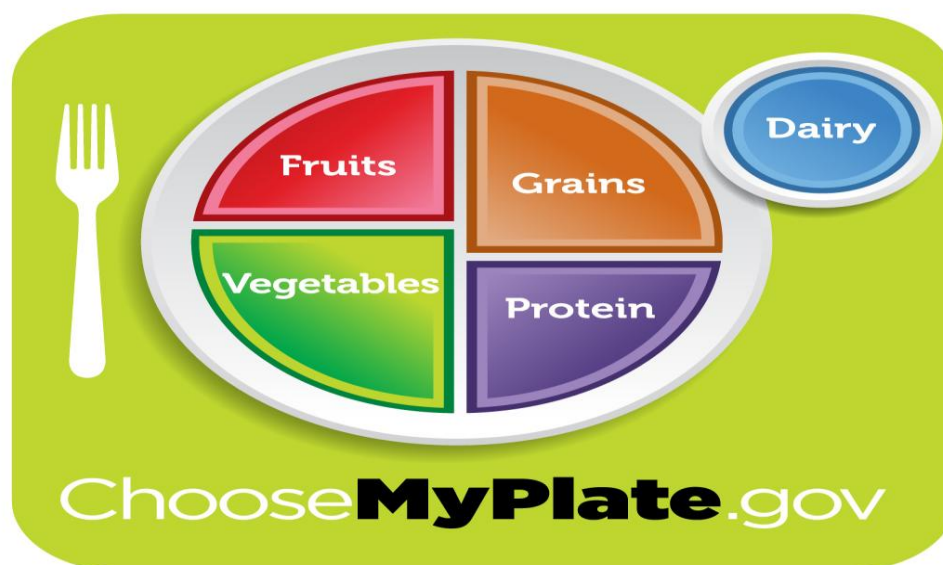
- Teacher will introduce herself and ask each student to do the same.
- Administer the pretest to each student.
- Explain the purpose of my future sessions.
- Give each participant a personal folder and handouts.
- Read and explain the MyPlate and Kids Activity Guide.
- Ask all students to stand, stretch, and jog in place for count of twenty.
- Participants given a take home handout for parent(s) (be a healthy role model for children: 10 tips for setting good examples).

Assessment: Students will be asked to respond aloud to all questions:

- What will be the purpose of the future sessions?
- What is the new food guide called?
- What is the suggested exercise time for school-age children?
- What are the suggested serving sizes for fruits, vegetables, proteins, grains, and dairy?

STUDENT HANDOUT

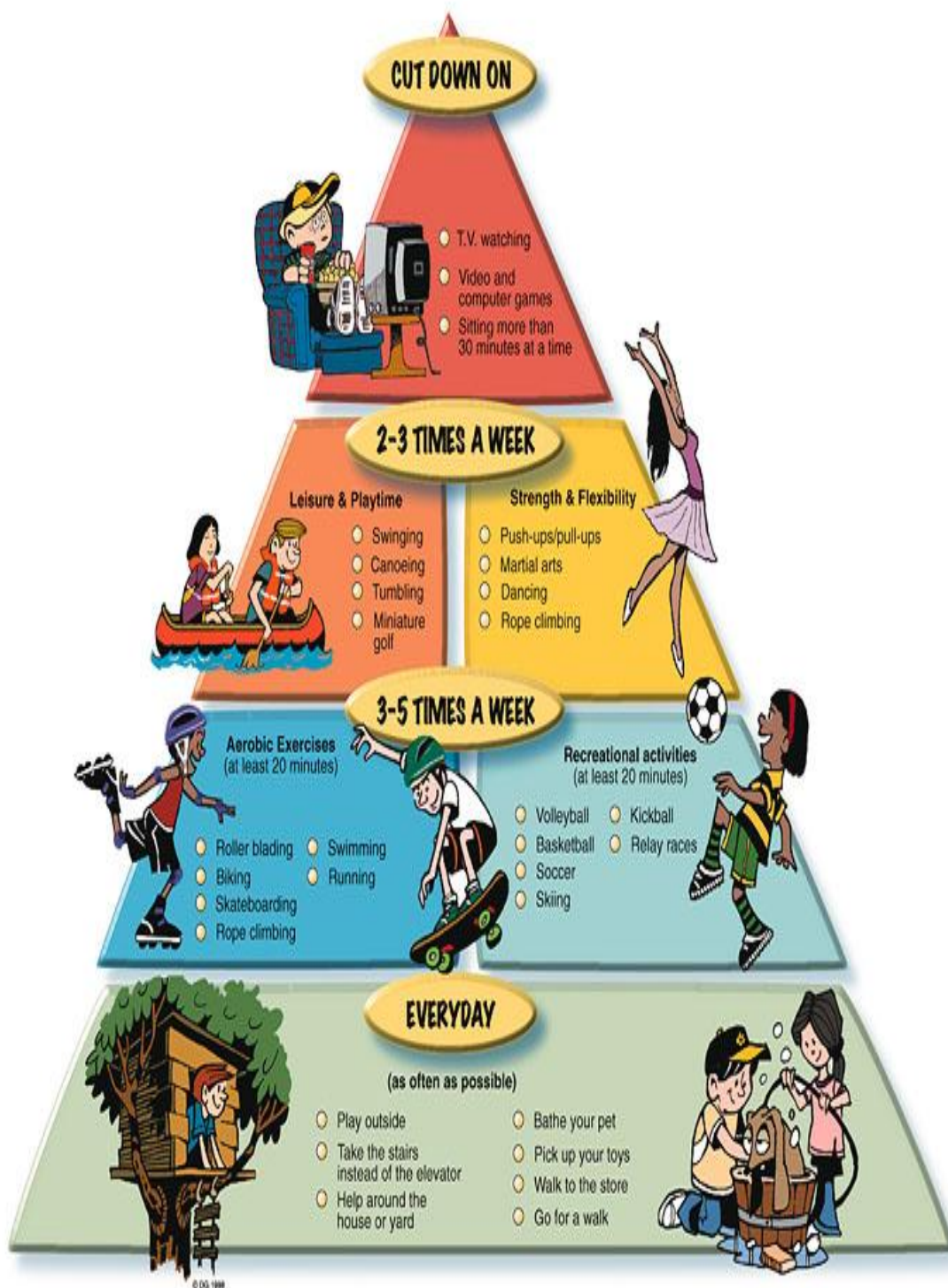
MYPLATE/SERVING SIZES



Grains	Vegetables	Fruits	Dairy	Protein
Start smart with breakfast. Look for whole grain cereals. Make sure the first word is “whole” (like “whole wheat”).	Color your plate with all kinds of great-tasting veggies: try broccoli, spinach, carrots and sweet potatoes.	Fruits are nature’s treats – sweet and delicious. Go easy on juice and make sure it is 100%.	Move to the dairy group to get your calcium. Calcium builds strong bones.	Eat lean or low-fat meat, chicken, turkey and fish. Remember nuts, seeds, peas and beans, too.
The amount of grains you need depends on your age and level of activity.	The amount of vegetables you need depends on your age and level of activity.	The amount of fruit you need depends on your age and level of activity.	The amount of dairy you need depends on your age and level of activity.	The amount of protein you need depends on your age and level of activity.
At least half should be whole. Ounces: Kids ages 2-3: 3 oz. Kids ages 4-8: 5 oz. Girls ages 9-13: 5 oz. Girls ages 14-18: 6 oz. Boys ages 9-13: 6 oz. Boys ages 14-18: 8 oz.	Kids ages 2-3: 1 cup Kids ages 4-8: 1 ½ cups Girls ages 9-13: 2 cups Girls ages 14-18 ½ cups Boys ages 9-13: 2 ½ cups Boys ages 14-18: 3 cups	Kids ages 2-3: 1 cup Kids ages 4-8: 1-1 ½ cups Girls ages 9-18: 1 ½ cups Boys ages 9-13: 1 ½ cups Boys ages 14-18: 2 cups	Most kids and adults should have 3 cups from the dairy group each day. Other ages: Kids 2 to 3: 2 cups Kids 4-8: 2 ½ cups	Kids ages 2-3: 2 oz. Kids ages 4-8: 4 oz. Girls ages 9-18: 5 oz. Boys ages 9-13: 5 oz. Boys 14-18: 6 1/2 oz.

STUDENT HANDOUT

KIDS ACTIVITY GUIDE



The Importance of Nutrition and Physical activity for Children Ages 10-12
Lesson Plan (Tues., Day 2)

Submitted By: Angel Dunlap

Iowa State University

Date: February 2012

Grade Level (s): 4, 5, 6, 7

Subject(s): MyPlate/Kids Activity Guide

Duration: 60 Minutes

Objective:

1. Identify and learn the different components in MyPlate and Kids Activity Guide.

Materials:

- Folders
- Handouts (Definition of nutrition and physical activity/Great Body Shape-Fitness & Nutrition-Participant)
- Handout (be a healthy role model for children:10 tips for setting good examples-Parent)

Procedure:

- Hand out each folder.
- Reinforce Monday's lesson. What did we learn on yesterday? Should this information be important to use?
- Give/discuss handouts.
- Participants will complete Great Shape-Fitness & Nutrition handout.
- Participants will be asked to stand, stretch, and jog in place for count of twenty.

Assessment: Students will be asked to respond aloud to all questions:

1. What is nutrition?
2. What is physical activity?
3. What are some important things about nutrition and physical activity?
4. Review MyPlate & Serving Sizes.

STUDENT HANDOUT

Behavior- the response of an individual, group, or species to its environment (Merriam-Webster, 2002).

High Blood Pressure or Hypertension- A chronic disease that has a higher than normal pressure inside the arteries either during systolic (when the heart contracts and pumps blood through the body), or during diastolic (when the heart is at rest and is filling with blood) (American Heart Association, 2003).

Nutrition- The study of nutrients in food and how the body uses them (Duyff, 2003).

Obesity- A condition characterized by excess body fat, typically defined in clinical settings as body mass index (BMI) \geq 30 (Duyff, 2003).

Physical Activity- A muscular movement of the body that results in significant energy expenditure above the resting metabolism (Redican, K. & Sparking, P. (2011).

Physical Inactivity- A sedentary state (Hellison, 2003).

Type II Diabetes- A condition in which the body cannot control levels of sugar in the blood properly. Insulin therapy can be used but often is not required; often associated with obesity (Duyff, 2003).

PARENT HANDOUT

**10
tips**
Nutrition
Education Series

be a healthy
role model for children
10 tips for setting good examples



You are the most important influence on your child. You can do many things to help your children develop healthy eating habits for life. Offering a variety of foods helps children get the nutrients they need from every food group. They will also be more likely to try new foods and to like more foods. When children develop a taste for many types of foods, it's easier to plan family meals. Cook together, eat together, talk together, and make mealtime a family time!

1 show by example

Eat vegetables, fruits, and whole grains with meals or as snacks. Let your child see that you like to munch on raw vegetables.

2 go food shopping together



Grocery shopping can teach your child about food and nutrition. Discuss where vegetables, fruits, grains, dairy, and protein foods come from. Let your children make healthy choices.

3 get creative in the kitchen

Cut food into fun and easy shapes with cookie cutters. Name a food your child helps make. Serve "Janie's Salad" or "Jackie's Sweet Potatoes" for dinner. Encourage your child to invent new snacks. Make your own trail mixes from dry whole-grain, low-sugar cereal and dried fruit.

4 offer the same foods for everyone

Stop being a "short-order cook" by making different dishes to please children. It's easier to plan family meals when everyone eats the same foods.



5 reward with attention, not food

Show your love with hugs and kisses. Comfort with hugs and talks. Choose not to offer sweets as rewards. It lets your child think sweets or dessert foods are better than other foods. When meals are not eaten, kids do not need "extras"—such as candy or cookies—as replacement foods.

6 focus on each other at the table

Talk about fun and happy things at mealtime. Turn off the television. Take phone calls later. Try to make eating meals a stress-free time.



7 listen to your child

If your child says he or she is hungry, offer a small, healthy snack—even if it is not a scheduled time to eat. Offer choices. Ask "Which would you like for dinner: broccoli or cauliflower?" instead of "Do you want broccoli for dinner?"

8 limit screen time

Allow no more than 2 hours a day of screen time like TV and computer games. Get up and move during commercials to get some physical activity.

9 encourage physical activity

Make physical activity fun for the whole family. Involve your children in the planning. Walk, run, and play with your child—instead of sitting on the sidelines. Set an example by being physically active and using safety gear, like bike helmets.



10 be a good food role model

Try new foods yourself. Describe its taste, texture, and smell. Offer one new food at a time. Serve something your child likes along with the new food. Offer new foods at the beginning of a meal, when your child is very hungry. Avoid lecturing or forcing your child to eat.

The Importance of Nutrition and Physical activity for Children Ages 10-12
Lesson Plan (Wed., Day 3)

Submitted By: Angel Dunlap

Iowa State University

Date: February 2012

Grade Level (s): 4, 5, 6, 7

Subject(s): MyPlate/Preparing Healthy Meals/Fat/Muscle

Duration: 60 Minutes

Objectives:

1. Identify/prepare healthy food models based on MyPlate.
2. Identify and view fat and muscle models.

Materials:

- Folders
- Food Models
- Plate Models
- Fat/Muscle Models
- Handouts (Can You Name These Foods & Step Up To Health & Nutrition-Participants)
- Handout (Eat Right: Get Your Plate in Shape-Parent)

Procedure:

- Hand out each folder.
- Reinforce previous lessons.
- Give/discuss handouts.
- Explain and allow participants to touch fat/muscle models (10 Pounds Each)
- Allow participants to demonstrate making healthy meal plates using food/plate models (Breakfast, Lunch, Dinner, & Snack).
- Have participants complete Can You Name These Foods & Healthy Me: Cross Word Puzzle handouts.
- Ask all students to stand, stretch, and jog in place for count of twenty.

Assessment: Participants will be asked to respond aloud to all questions:

- What are some important things about nutrition and physical activity?
- Review MyPlate & Serving Sizes.

STUDENT ACTIVITY

Can You Name These Foods?

List the foods pictured in each of the food groups to the right.

Hint: There may be extra lines in the groups below.



Fruits	Vegetables	Grains	Protein	Dairy
_____	_____	_____	_____	_____
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	

ANSWERS:

Fruits	Vegetables	Grains	Protein	Dairy
apple	asparagus	beans	broccoli	cheese
banana	broccoli	brown rice	carrots	eggs
cherries	corn	whole grain bread	chicken	milk
strawberry	mushrooms	pasta	shrimp	
kiwi	peas	tortilla	beef	
orange	peppers	cereal	salmon	
	tomato			
	spinach			

PARENT HANDOUT

eat right. Academy of Nutrition and Dietetics

Eat Right

Food, Nutrition and Health Tips from the Academy of Nutrition and Dietetics

Get Your Plate in Shape

Before you eat, think about what goes on your plate or in your bowl. Foods like vegetables, fruits, whole grains, low-fat dairy products and lean protein foods contain the nutrients you need without too many calories. Over the day, include foods from all the food groups. Try the following tips to “Get Your Plate in Shape.”

Make half your plate fruits and vegetables.

Eat a variety of vegetables, especially dark-green, red and orange vegetables plus beans and peas. Fresh, frozen and canned vegetables all count. Choose “reduced sodium” or “no-salt-added” canned vegetables.

Add fruit to meals and snacks. Buy fruits that are dried, frozen or canned in water or 100% juice, as well as fresh fruits.

Make at least half your grains whole.

Choose 100% whole-grain breads, cereals, crackers, pasta and brown rice.

Check the ingredients list on food packages to find whole-grain foods.

Switch to fat-free or low-fat milk.

Fat-free and low-fat milk have the same amount of calcium and other essential nutrients as whole milk, but less fat and calories.

If you are lactose intolerant, try lactose-free milk or a calcium-fortified soy beverage.

Vary your protein choices.

Eat a variety of foods from the protein food group each week, such as seafood, nuts and beans, as well as lean meat, poultry and eggs.



PARENT HANDOUT



Eat Right

Food, Nutrition and Health Tips from the American Dietetic Association

Step Up to Nutrition and Health

The food and physical activity choices made today—and everyday—affect your health and how you feel today and in the future. Eating right and being physically active are keys to a healthy lifestyle. The Dietary Guidelines for Americans, 2005, can lead the way to a healthier you.

Make smart choices from every food group

Give your body the balanced nutrition it needs by eating a variety of nutrient-packed foods every day. Just be sure to stay within your daily calorie needs.

A healthy eating plan:

- Emphasizes fruits, vegetables, whole grains and fat-free or low-fat milk and milk products.
- Includes lean meats, poultry, fish, beans, eggs and nuts.
- Is low in saturated fats, trans fats, cholesterol, salt (sodium) and added sugars.

Get the most nutrition out of your calories

Choose the most nutritionally rich foods you can from each food group each day—those packed with vitamins, minerals, fiber and other nutrients but lower in calories.

- Focus on fruits. Eat a variety of fruits—fresh, frozen, canned or dried. For a 2,000 calorie diet, you need 2 cups of fruit each day.
- Vary your veggies. Eat more orange and dark green vegetables such as carrots, sweet potatoes, broccoli and dark leafy greens. Include beans and peas such as pinto beans, kidney beans, split peas and lentils more often.
- Get your calcium-rich foods. Have 3 cups of low-fat or fat-free milk—or an equivalent amount of low-fat yogurt and/or low-fat cheese every day (1½ ounces of cheese equals 1 cup of milk). If you don't or can't consume milk, choose lactose-free milk products and/or calcium-fortified foods and beverages.
- Make half your grains whole. Eat at least 3 ounces of whole-grain cereals, breads, crackers, rice or pasta every day. Look to see that grains such as wheat, rice, oats,



The Importance of Nutrition and Physical Activity For Children Ages 10-12
Lesson Plan (Thurs., Day 4)

Submitted by: Angel Dunlap

Iowa State University

Date: February 2012

Grade Level (s): 4, 5, 6, 7

Subject (s): MyPlate/USDA 2010 Dietary Guidelines

Duration: 60 Minutes

Objectives: The students will be able to:

1. Explain orally the five food groups.
2. Identify and categorize different types of foods into their food groups.
3. Identify with the 2010 Dietary Guidelines.

Materials:

- Folders
- Tape
- Envelopes
- 2 Paper Bags
- 2 Sets of index Cards (Each Set a Different Color)
- Markers or Chalk
- Handout (USDA 2010 Dietary Guidelines/Press Release-Parent)
- Handout (USDA 2010 Dietary Guidelines/Healthy Me-Participants)

Procedures:

- Hand out each folder.
- Reinforce previous lessons.
- Give/discuss handouts.
- Discuss MyPlate/Kids Activity Pyramid.
- Have participants complete the Healthy Me activity sheet.
- Inform the class of the game and instructions before playing.
- MyPlate posters placed on the wall of opposite side of the gym floor each.
- An envelope will be taped inside each area of the pyramid.
- Names of different types of foods written on the index (twice-one on each set of colored index cards).
- Each set of index cards will be placed into 2 paper bags across gym floor.
- Divide the class into 2 teams. Each team will line up in single file. When the teacher says, go the first person in each line runs to the paper bag and draw an index card with the name of a food. He/She then goes to the chalkboard and puts the card into the corresponding envelopes in one of the food groups. Once the first person was done, the second person in the line would do the same thing. This will continue until one team

used all their index cards. This team would earn 15 points. The other team would earn 10 points.

- The envelopes are now checked to be sure that the foods were placed in the correct food group. Each team will get 2 points for each properly placed in the correct food card (the team is determined by the color of the index card (the team is determined by the color of the index card). However, on the other hand, incorrectly placed cards will result in the team losing 2 points. While doing this, the teacher should be reviewing the information with the students.
- Participants given a take home handout for parent (USDA 2010 Dietary Guidelines-Press Release)

Assessment: Students will be asked to respond to the following questions:

1. How does this lesson relate to nutrition and physical activity.
2. What did we learn from the USDA 2010 Dietary Guidelines, MyPlate, & Kids Activity Pyramid activity?
3. How many minutes are recommended for exercise?
4. Why is nutrition and physical activity important?

STUDENT ACTIVITY

HEALTHY ME!

S S I U A S E S E F T E
 K G E A X D C L G F B T
 C A E G X O T F T E U N
 A E L S E O R A K R E V
 N X S M F F U S I A H S
 S E L B A T E G E V F L
 Y R O S M S R B A R L A
 H C L O H A L I U C K S
 T I X L I F K I R K S I
 L S M N M S T S L L H E
 A E S S U S E I I S B A
 E S S L A E M E E R H T
 H F S A T L L I M E R A

FRUITS

VEGETABLES

LESSFASTFOODS

THREEMEALS

MILK

GRAINS

HEALTHYSNACKS

EXERCISE

STUDENT HANDOUT

USDA 2010 Dietary Guidelines Communications Message Calendar September 2011 – December 2013

The 2010 *Dietary Guidelines for Americans* (DGA) are the foundation for Federal dietary guidance promotion and education efforts aimed at improving America's health and reversing obesity and chronic diet-related diseases. Communicating the DGA to not only inform consumers but to change behaviors has never been more critical. The DGA consumer communications initiative is a multi-modal approach in order to sustain momentum and ultimately change behavior. One key element of this initiative is a multi-year strategy to coordinate and streamline nutrition messages delivered by the public and private sectors for the public. When the 2010 DGA were released, they were accompanied by selected messages for consumers (outlined on the other side) related to several major themes. These key Dietary Guidelines themes, and background information for each, are:

Balancing Calories

- o Calorie balance refers to the relationship between calories consumed from foods and beverages and calories expended in normal body function and through physical activity.
- o Achieve and sustain appropriate body weight across the lifespan to maintain good health and quality of life.
- o To address current calorie imbalance in the United States, individuals are encouraged to become more conscious of what, when, why and how much they eat.

Foods to Reduce

- o Certain foods and food components are consumed in excessive amounts and may increase the risk of certain chronic diseases. These include sodium, saturated fat, trans fatty acids, added sugars, and refined grains.
- o Eating less of these foods and food components can help Americans meet their nutritional needs within appropriate calorie levels and help to reduce risk of chronic diseases such as cardiovascular disease, diabetes and certain types of cancer.

Foods to Increase

- o Many Americans do not eat the variety of foods that will provide all needed nutrients while staying within calorie needs.
- o Intakes of vegetables, fruits, whole grains, milk and milk products and oils are lower than recommended. As a result, several key nutrients – potassium, dietary fiber, calcium and vitamin D – are of public health concern for both adults and children.
- o More emphasis is placed on foods choices that are nutrient dense and from the fruits, vegetables, whole grains, low-fat and fat-free milk and milk products food groups. These foods can help Americans close nutrient gaps and move toward healthful eating patterns.

Be Active Your Way

- o This message was developed to support the 2008 *Physical Activity Guidelines* developed by the Department of Health and Human Services.



PARENT HANDOUT



FOR IMMEDIATE RELEASE

CONTACT:
 USDA Office of Communications
 (202) 720-4623
 HHS Press Office
 (202) 690-6343

USDA and HHS Announce New Dietary Guidelines to Help Americans Make Healthier Food Choices and Confront Obesity Epidemic

WASHINGTON, Jan. 31, 2011 — Agriculture Secretary Tom Vilsack and Secretary of the Department of Health and Human Services (HHS) Kathleen Sebelius today announced the release of the *2010 Dietary Guidelines for Americans*, the federal government's evidence-based nutritional guidance to promote health, reduce the risk of chronic diseases, and reduce the prevalence of overweight and obesity through improved nutrition and physical activity.

Because more than one-third of children and more than two-thirds of adults in the United States are overweight or obese, the 7th edition of *Dietary Guidelines for Americans* places stronger emphasis on reducing calorie consumption and increasing physical activity.

"The *2010 Dietary Guidelines* are being released at a time when the majority of adults and one in three children is overweight or obese and this is a crisis that we can no longer ignore," said Secretary Vilsack. "These new and improved dietary recommendations give individuals the information to make thoughtful choices of healthier foods in the right portions and to complement those choices with physical activity. The bottom line is that most Americans need to trim our waistlines to reduce the risk of developing diet-related chronic disease. Improving our eating habits is not only good for every individual and family, but also for our country."

The new *2010 Dietary Guidelines for Americans* focus on balancing calories with physical activity, and encourage Americans to consume more healthy foods like vegetables, fruits, whole grains, fat-free and low-fat dairy products, and seafood, and to consume less sodium, saturated and *trans* fats, added sugars, and refined grains.

"Helping Americans incorporate these guidelines into their everyday lives is important to improving the overall health of the American people," said HHS Secretary Sebelius. "The new *Dietary Guidelines* provide concrete action steps to help people live healthier, more physically active and longer lives."

The *2010 Dietary Guidelines for Americans* include 23 Key Recommendations for the general population and six additional Key Recommendations for specific population groups, such as women who are pregnant. Key Recommendations are the most important messages within the *Guidelines* in terms of their implications for improving public health. The recommendations are

The Importance of Nutrition and Physical Activity for Children Ages 10-12
Lesson Plan (Fri., Day 5)

Submitted by: Angel Dunlap

Iowa State University

Date: February 2012

Grade Level(s): 4, 5, 6, 7

Subject(s) (Fat Tracks) Nutrition/Physical Activity/Eating Healthy to Stay Fit

Duration: 60 minutes

Objectives: The student will be able to:

1. Explain orally the Kids Activity Pyramid.
2. Know the importance of staying active.
3. Label certain foods in their correct food group.
4. Identify the importance of certain foods and physical activities.

Materials:

- Folders
- Note Cards
- Paper
- Pencil
- Handout (Let's eat for the health of it & Food Fun Messages-Participants)
- Handout (Shop Smart-Get The Facts On Food Labels)

Procedures:

- Handout folders.
- Reinforce previous lessons.
- Give/discuss handouts.
- Have participants complete the Food Fun Messages Activity
- Inform the class of the game and instructions to be played before starting.
- On Go! The first player in each line moves forward either using a physical activity movement of their choice.
- The student will collect one food card and return it to their group.
- After each player in each group has had a turn, teams add the total fat grams from the food cards that they collect, and the group with the lowest total fat grams is declared the winner.
- The cards will be replaced and the students will play again.

Assessment: Informal. Ask question.

1. What did we learn today?

PARTICIPANT HANDOUT



Let's eat for the health of it



Start by choosing one or more tips to help you...



**Build a
healthy plate**



**Cut back on
foods high in solid
fats, added sugars,
and salt**



**Eat the right
amount of
calories for you**



**Be physically
active your way**

STUDENT ACTIVITY

Food Fun Messages

NNM 2012



Each letter will fit into a space under its own column.

When you fill in the grid correctly, you will have a fun message with a food word.

Several letters are provided to start you off!

J	S	T	E	S	H	B	U	C	T	E	R	D	A	P	I	H	E	S	H	E	S	R	S	T	F	G	E
	A	O	O	T		E		T	W	A	L		U	R	W	A	Y	R		T	I	Y	I	B	N	K	
									T															E			

A	T	D	E	S	W	S	R	E	D	A	W	H	H	A	/	L	N	C	C	A	K	E	N	G	P	H	E
S	N	E	P		A	E	W	H	E	N	L	S	A	T	R	O	K	I	N	G	M	O	N	U	T		
								H											A								

B	U	A	E	N	D	I	S	H	R	I	O	U	F	S	N	T	O	F	D	A	L	I	K	A	G	E	R
		T			F	Y	S	T	H												R	D	I	E	T		
		W																									
								H															K				

Answers:

1. Janet was always trying to **buffer** up her sister so she could ride her bike.
2. We were all talking on the steps when Sharon came up and asked, "What's **cooking**?"
3. Wendy tried snowboarding, but she felt like a **fish** out of water.

PARENT HANDOUT



Eat Right

Food, Nutrition and Health Tips from the Academy of Nutrition and Dietetics

Shop Smart — Get the Facts on Food Labels

Become a smart shopper by reading food labels to find out more about the foods you eat. The Nutrition Facts panel found on most food labels will help you:

- Find out which foods are good sources of fiber, calcium, iron, and vitamin C
- Compare similar foods to find out which one is lower in fat and calories
- Search for low-sodium foods
- Look for foods that are low in saturated fat and trans fats

A Quick Guide to Reading the Nutrition Facts Label

Start with the Serving Size

- Look here for both the serving size (the amount for one serving), and the number of servings in the package.
- Remember to check your portion size to the serving size listed on the label. If the label serving size is one cup, and you eat two cups, you are getting twice the calories, fat and other nutrients listed on the label.

Check Out the Total Calories and Fat

Find out how many calories are in a single serving and the number of calories from fat. It's smart to cut back on calories and fat if you are watching your weight!

Let the Percent Daily Values Be Your Guide

Use percent Daily Values (DV) to help you evaluate how a particular food fits into your daily meal plan:

- Daily Values are average levels of nutrients for a person eating 2,000 calories a day. A food item with a 5% DV means 5% of the amount of fat that a person consuming 2,000 calories a day would eat.
- Remember: percent DV are for the entire day—not just for one meal or snack.
- You may need more or less than 2,000 calories per day. For some nutrients you may need more or less than 100% DV.

The High and Low of Daily Values

- 5 percent or less is low—try to aim low in total fat, saturated fat, cholesterol, and sodium
- 20 percent or more is high—try to aim high in vitamins, minerals and fiber

Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving	
Calories 250	Calories from Fat 110
% Daily Value*	
Total Fat 12g	18%
Saturated Fat 5g	15%
Trans Fat 1.5g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

*Percent Daily Values are based on a diet of other people's secrets. Your Daily Values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat. Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber	25g	30g	30g

For more food label information, visit the Food and Drug Administration at www.fda.gov/Food/ResourcesForYou/Consumers

The Importance of Nutrition and Physical Activity for Children Ages 10-12
Lesson Plan (Mon., Day 6)

Submitted by: Angel Dunlap

Iowa State University

Date: February 2012

Grade Level(s): 4, 5, 6, 7

Subject(s): (Six Corners)

Healthy Snacking/Nutrition/Physical Activity

Duration: 60 minutes

Goal: To learn healthy snack choices.

Objectives: The students will be able to:

1. Name healthy food choices and different types of exercises.
2. Explain the importance of healthy food choices and exercising.

Materials:

- Folders
- Foam Die (1)
- Music
- Note Cards, Tape
- Handouts (25 Healthy Snacks For Kids-Participants)
- Handouts (Smart Snacking For Adults & Teens-Parent)

Procedure:

- Handout folders.
- Reinforce previous lessons.
- Give/discuss handouts.
- Read and explain the instructions to the game.
- Number the corners and two sides of the room 1 through 6.
- Place three note cards with nutrition and physical activity.
- Instruct each student to read each aloud and do the exercises listed on the card as a group when their number is rolled.
- Starts the music and as participants travel around the room in the given way.
- Music stops as everyone has 5 seconds to get to a named corner.
- Die is rolled again once all the participants are in a corner (Activity Repeated).

Assessment: Informal. Ask question.

- 1) What did you learn today?

PARENT HANDOUT



Eat Right

Food, Nutrition and Health Tips from the American Dietetic Association

25 Healthy Snacks for Kids

When a snack attack strikes, refuel with these nutrition-packed snacks.

Easy, Tasty (and Healthy) Snacks

You may need an adult to help with some of these snacks.

1. Peel a banana and dip it in yogurt. Roll in crushed cereal and freeze.
2. Spread celery sticks with peanut butter or low-fat cream cheese. Top with raisins. Enjoy your "ants on a log."
3. Stuff a whole-grain pita pocket with ricotta cheese and Granny Smith apple slices. Add a dash of cinnamon.
4. Mix together ready-to-eat cereal, dried fruit and nuts in a sandwich bag for an on-the-go snack.
5. Smear a scoop of frozen yogurt on two graham crackers and add sliced banana to make a yummy sandwich.
6. Top low-fat vanilla yogurt with crunchy granola and sprinkle with blueberries.
7. Microwave a small baked potato. Top with reduced-fat cheddar cheese and salsa.
8. Make snack kabobs. Put cubes of low-fat cheese and grapes on pretzel sticks.
9. Toast a whole grain waffle and top with low-fat yogurt and sliced peaches.
10. Spread peanut butter on apple slices.
11. Blend low-fat milk, frozen strawberries and a banana for thirty seconds for a delicious smoothie.
12. Make a mini-sandwich with tuna or egg salad on a dinner roll.
13. Sprinkle grated Monterey Jack cheese over a corn tortilla; fold in half and microwave for twenty seconds. Top with salsa.
14. Toss dried cranberries and chopped walnuts in instant oatmeal.



PARENT HANDOUT

Eat Right

Food, Nutrition and Health Tips from the Academy of Nutrition and Dietetics

Smart Snacking for Adults and Teens

Make snacks work for you by choosing nutrient-rich foods from the grains, fruit, vegetable, dairy and protein food groups. Snacks can boost your energy between meals and supply essential vitamins and minerals. There is a place for snacks in a healthy eating plan. Just choose wisely:

- Think of snacks as mini-meals that contribute nutrient-rich foods. You can fit snack calories into your personal healthy eating plan without over-spending your day's calorie budget.
- Snack only when you're hungry. Skip the urge to nibble when you're bored, frustrated or stressed. Feed the urge to do something by walking the dog or working in the garden.
- Keep portion control in mind. Have a single-serve container of yogurt or put a small serving of nuts in a bowl. Eating directly from a multiple-serving package can lead to overeating.
- Plan snacks ahead of time. Keep a variety of nutritious ready-to-eat supplies on hand, such as whole-grain crackers and low-fat cheese.



Get creative with the following snack suggestions by swapping out different fruits, vegetables and grains to keep your snacking exciting!

Snacks with 200 calories or less:

- One tablespoon peanut butter spread on slices of a medium apple
- One cup tomato soup with five whole-grain crackers
- Three cups air-popped popcorn sprinkled with three tablespoons grated parmesan cheese

The Importance of Nutrition and Physical Activity for Children Ages 10-12
Lesson Plan (Tues., Day 7)

Submitted by: Angel Dunlap
Iowa State University
Date: February 2012
Grade Level (s): 4, 5, 6, 7

Subject(s): (Becoming & Staying Healthy/Eating Healthy/Physical Activity)

Duration: 60 minutes

Objectives: The students will be able to:

1. Explain the importance of proper diet, physical activity, and nutrition.
2. Give alternatives to certain foods (for example, students who do not eat meat because of personal reasons or religion).
3. Explain to their parents and friends the different types of activities to be physically active.

Materials:

- Handouts (Nutrition cross word puzzles & Everyday Eating For A Healthier You-Participants).
- Handout (enjoy your food, but eat less-Parent & Participant)

Procedures:

- Handout folders
- Reinforcement previous lessons.
- Give/discuss handouts.
- Ask introductory questions to stimulate class discussion:
 1. What do you consider a healthy meal?
 2. Write down five exercises you like to do?
 3. Write down what you consider a healthy meal?
 4. How could that meal be made healthier?
- Talk about the MyPlate and ways to eat healthy on the go (fast food), and ways to be active.
- Give out a crossword puzzle called Dietary Guidelines.

Assessment: Informal. Ask questions.

ds low in ___(3) and salt
(7) in any form.
of ___(10) and fruits
7) in moderation, if at all

7- Maintain a healthy ____ (6).

STUDENT HANDOUT



Eat Right

Food, Nutrition and Health Tips from the American Dietetic Association

Everyday Eating for a Healthier You

2010 Dietary Guidelines

The newly released 2010 *Dietary Guidelines for Americans* offer a practical roadmap to help you make changes in your eating plan to improve your health.

Balancing Calories to Manage Weight

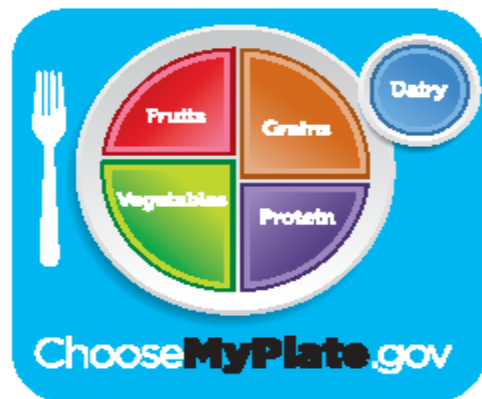
The first step is to focus on balancing calories with physical activity and consuming an overall healthy eating pattern. This will put you on the road to achieving or maintaining a healthy weight and reducing the risk of developing diet-related chronic diseases.

The *Dietary Guidelines* recommend shifting eating patterns to eat more of some foods and nutrients and less of others. A healthy eating pattern will allow you to meet the recommendations while staying within your calorie needs.

Foods and Nutrients to Increase

The *Dietary Guidelines* encourage Americans to eat more:

- **Whole grains:** Increase whole grains by choosing whole grain breads and cereals, brown rice and whole wheat pasta. Make at least half your grain servings whole grains.
- **Vegetables:** Eat a variety of vegetables, especially dark-green, red and orange vegetables plus beans and peas. Most adults need 2 ½ cups of vegetables per day.



- **Fruits:** Add fruit to meals and snacks—fresh, frozen or canned—to get about 2 cups each day.
- **Low-fat or fat free milk, yogurt and cheese or fortified soy beverages:** Include 3 cups per day for calcium, vitamin D, protein and potassium. Lactose-free milk is also an option.
- **Vegetable oils such as canola, corn, olive, peanut and soybean:** These are high in monounsaturated and polyunsaturated fats. Use in moderate amounts in place of solid fats.
- **Seafood:** Include a variety of seafood more often in place of some meat and poultry.

Foods and Food Components to Reduce

More than one-third of all calories consumed by Americans are solid fats and added sugars.

PARTICIPANT/PARENT HANDOUT

**10
tips**
Nutrition
Education Series

enjoy your food, but eat less



10 tips to enjoying your meal

You can enjoy your meals while making small adjustments to the amounts of food on your plate. Healthy meals start with more vegetables and fruits and smaller portions of protein and grains. And don't forget dairy—include fat-free or low-fat dairy products on your plate, or drink milk with your meal.

1 get to know the foods you eat

Use the **SuperTracker** to find out what kinds of foods and how much to eat and to get tips and support for making better food choices.

SuperTracker

6 choose to eat some foods more or less often

Choose more vegetables, fruits, whole grains, and fat-free or 1% milk and dairy products. Cut back on foods high in solid fats, added sugars, and salt.

2 take your time

Be mindful to eat slowly, enjoy the taste and textures, and pay attention to how you feel. Use hunger and fullness cues to recognize when to eat and when you've had enough.

7 find out what you need

Get your personalized plan by using the **SuperTracker** to identify your food group targets. Compare the foods you eat to the foods you need to eat.

3 use a smaller plate

Use a smaller plate at meals to help with portion control. That way you can finish your entire plate and feel satisfied without overeating.

8 sip smarter

Drink water or other calorie-free beverages, 100% juice, or fat-free milk when you are thirsty. Soda and other sweet drinks contain a lot of sugar and are high in calories.



4 if you eat out, choose healthier options

Check and compare nutrition information about the foods you are eating. Preparing food at home makes it easier to control what is in your meals.

9 compare foods

Check out the **Food-A-Pedia** to look up and compare nutrition information for more than 8,000 foods.

5 satisfy your sweet tooth in a healthy way

Indulge in a naturally sweet dessert dish—fruit! Serve a fresh fruit cocktail or a fruit parfait made with yogurt. For a hot dessert, bake apples and top with cinnamon.



10 make treats "treats," not everyday foods

Treats are great once in a while. Just don't make treat foods an everyday choice. Limit sweet treats to special occasions.

USDA United States
Department of Agriculture
Center for Nutrition
Policy and Promotion

Go to www.ChooseMyPlate.gov for more information.

DG TipSheet No. 18
December 2011
USDA is an equal opportunity
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The Importance of Nutrition and Physical Activity for Children Ages 10-12
Lesson Plan (Wed., Day 8)

Submitted by: Angel Dunlap

Iowa State University

Date: February 2012

Grade Level: 4, 5, 6, 7

Subject(s): (Where Does It Come From?)

Nutrition and Physical Activity

Duration: 60 minutes

Objectives: The students will be able to:

1. Identify where certain types of foods come from.
2. Explain orally how this lesson relates to all other lessons.

Materials:

- Folders
- Pencil
- Crayons
- Handout (Where Does It Come From? & Choose MyPlate.gov Coloring Sheet-Participant)
- Handout (cut back on your kids sweet treats-Parent)

Procedure:

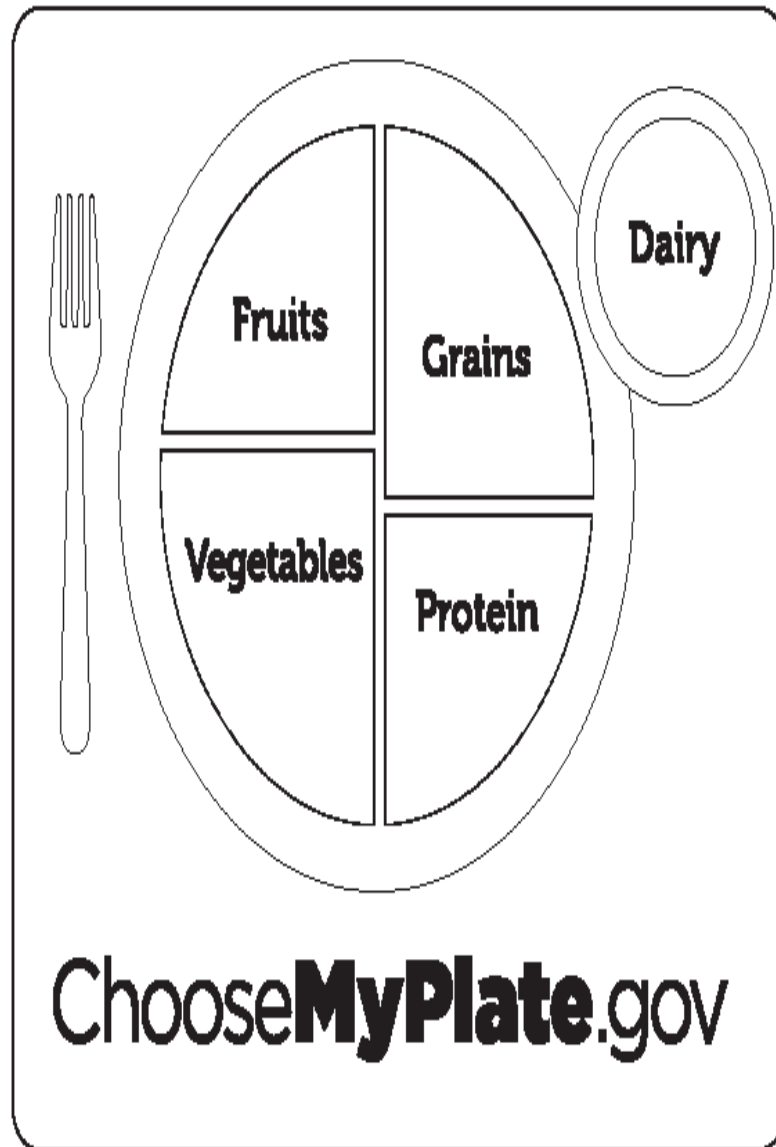
- Handout folders.
- Reinforce the previous lessons.
- Give/discuss handouts.
- Teacher will hold up one food item, tell the student what it is, and ask each student to write that food item down and where he or she think it comes from.
- Teacher will take up all handouts and check them with answer key.
- Participants will complete the Choose MyPlate.gov Coloring Sheet

Assessment: Informal. Ask questions.

Write the name of the food in the left column and where it Comes from in the right column.

COMES FROM

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

PARTICIPANT ACTIVITY

PARENT HANDOUT

10 tips
Nutrition
Education Series

cut back on your kid's sweet treats

10 tips to decrease added sugars



Limit the amount of foods and beverages with added sugars your kids eat and drink. If you don't buy them, your kids won't get them very often. Sweet treats and sugary drinks have a lot of calories but few nutrients. Most added sugars come from sodas, sports drinks, energy drinks, juice drinks, cakes, cookies, ice cream, candy, and other desserts.

1 serve small portions
It's not necessary to get rid of all sweets and desserts. Show kids that a small amount of treats can go a long way. Use smaller bowls and plates for these foods. Have them share a candy bar or split a large cupcake.

2 sip smarter
Soda and other sweet drinks contain a lot of sugar and are high in calories. Offer water, 100% juice, or fat-free milk when kids are thirsty.



3 use the check-out lane that does not display candy
Most grocery stores will have a candy-free check-out lane to help moms out. Waiting in a store line makes it easy for children to ask for the candy that is right in front of their faces to tempt them.

4 choose not to offer sweets as rewards
By offering food as a reward for good behavior, children learn to think that some foods are better than other foods. Reward your child with kind words and comforting hugs, or give them non-food items, like stickers, to make them feel special.

5 make fruit the everyday dessert
Serve baked apples, pears, or enjoy a fruit salad. Or, serve yummy frozen juice bars (100% juice) instead of high-calorie desserts.



6 make food fun
Sugary foods that are marketed to kids are advertised as "fun foods." Make nutritious foods fun by preparing them with your child's help and being creative together. Create a smiley face with sliced bananas and raisins. Cut fruit into fun and easy shapes with cookie cutters.

7 encourage kids to invent new snacks
Make your own snack mixes from dry whole-grain cereal, dried fruit, and unsalted nuts or seeds. Provide the ingredients and allow kids to choose what they want in their "new" snack.



8 play detective in the cereal aisle
Show kids how to find the amount of total sugars in various cereals. Challenge them to compare cereals they like and select the one with the lowest amount of sugar.

9 make treats "treats," not everyday foods
Treats are great once in a while. Just don't make treat foods an everyday thing. Limit sweet treats to special occasions.

10 if kids don't eat their meal, they don't need sweet "extras"
Keep in mind that candy or cookies should not replace foods that are not eaten at meal time.

The Importance of Nutrition and Physical Activity for Children Ages 10-12
Lesson Plan (Thurs., Day 9)

Submitted by: Angel Dunlap
Iowa State University
Date: February 2012
Grade Level: 4, 5, 6, 7

Subject(s): At the Drive Thru
Nutrition and Physical Activity

Duration: 60 minutes

Objectives: the students will be able to:

1. Plan, select, and prepare heedful meals that emphasize the principles of the Dietary Guidelines for Americans.
2. Analyze barriers to own healthful eating patterns and describe strategies for overcoming these barriers.

Materials:

- Folders
- Pencil
- Board
- Chalk or Dry Erase Markers
- Handout (Healthy Eating On The Run: A Month of Tips-Parent)
- Handout (Decode the Secret Message-Participant)

Procedure:

- Handout Folders
- Reinforce the previous lessons.
- Give/discuss handouts.
- The class will be divided into 5 groups. Each group selects a spokesperson.
- Each group is assigned a restaurant.
- The name of each fast-food restaurant is written on the board as the group must perform the activity while deciding which items at the restaurant would be healthiest. Activities could include jumping, jogging in place, stanky leg, crisscross or jumping jacks.
- One at a time, they run to the board and write down the item. The group continues this activity until time is called by the teacher.
- One at a time the spokesperson from each group will take the pencil and use it as microphone to place the groups order.
- Teacher provides feedback on their choices once all participants have had a turn.
- Teacher will continue the lesson by asking the following question:
 1. Which restaurants provided the healthiest meal?
- Participants will complete the Decode The Secret Message activity.











Assessment: Informal. Ask questions.











PARTICIPANT ACTIVITY







Decode the SECRET MESSAGE

GET YOUR PLATE IN SHAPE

National Nutrition Month®
Academy of Nutrition and Dietetics

CODE	A	C	E	H	K
					
					

PARENT HANDOUT

Eat Right

Food, Nutrition and Health Tips from the Academy of Nutrition and Dietetics

Healthy Eating on the Run: A Month of Tips

You probably eat out a lot—most Americans do. People are looking for fast, easy and good-tasting foods to fit a busy lifestyle. Whether it's carry-out, food court, office cafeteria or sit-down restaurant, there are smart choices everywhere. Here are 30 tips to help you eat healthy when eating out.

1. Think ahead and plan where you will eat. Consider what meal options are available. Look for restaurants or carry-out with a wide range of menu items.
2. Take time to look over the menu and make careful selections. Some restaurant menus may have a special section for “healthier” choices.
3. Read restaurant menus carefully for clues to fat and calorie content. Menu terms that can mean less fat and calories: baked, braised, broiled, grilled, poached, roasted, steamed.
4. Menu terms that can mean more fat and calories: batter-fried, pan-fried, buttered, creamed, crispy, breaded. Choose these foods only occasionally and in small portions.
5. Order the regular or child-size portion. Mega-sized servings are probably more than you need. For a lighter meal, order an appetizer in place of a main course.
6. It's OK to make special requests, just keep them simple. For example, ask for a baked potato or side salad in place of French fries; no mayonnaise or bacon on your sandwich; sauces served on the side.
7. Hunger can drive you to eat too much bread before your meal arrives. Hold the bread or chips until your meal is served. Out of sight, out of mind.
8. Think about your food choices for the entire day. If you're planning a special restaurant meal in the evening, have a light breakfast and lunch.
9. Limit the amount of alcohol you drink. No more than one drink for women and two for men. Alcohol tends to increase your appetite and provides calories without any nutrients.
10. Tempted by sweet, creamy desserts? Order one dessert with enough forks for everyone at the table to have a bite.
11. Split your order. Share an extra large sandwich or main course with a friend or take half home for another meal.
12. Boost the nutrition in all types of sandwiches by adding tomato, lettuce, peppers or other vegetables.



The Importance of Nutrition and Physical Activity for Children Ages 10-12

Lesson Plan (Fri., Day 10)**Submitted by: Angel Dunlap****Iowa State University****Date: February 2012****Grade Level: 4, 5, 6, 7****Subject(s):** Healthy Eating: Nutrition and Physical Activity**Duration:** 40 minutes**Objective:**

1. Consume healthful breakfast.
2. Choose snacks rich in nutrients and low in sugar and carbohydrates.

Materials:

- Folders
 - Paper/Chalk board
 - Makers/chalk

Procedure:

- Handout Folders
- Reinforce the previous lessons.
- Give/discuss handouts
- Students will stand towards the back of the room divided into 6 groups.
- Teacher calls out a breakfast or snack item.
- If the food could be consumed anytime, hop for 15 seconds.
- If the food should be consumed in moderation, move forward 2 spots, move for 15 seconds.
- If the food should be consumed only occasionally, move forward 1 spot, slide left to right.
- As students reach the front of the room, have them write their favorite breakfast or snack items on the board, then move to the back of the room and continue the activity as time permits.
- Conclude by asking the following questions:
 1. How can you improve your physical activity?
 2. How can you improve your diet?
 3. How can you get more servings of fruits and vegetables?

Assessment: Informal. Ask questions.

- Discuss food choices written on the board.

PARTICIPANT/PARENT HANDOUT

Eat Right

Food, Nutrition and Health Tips from the American Dietetic Association

25 Healthy Snacks for Kids

When a snack attack strikes, refuel with these nutrition-packed snacks.

Easy, Tasty (and Healthy) Snacks

You may need an adult to help with some of these snacks.

1. Peel a banana and dip it in yogurt. Roll in crushed cereal and freeze.
2. Spread celery sticks with peanut butter or low-fat cream cheese. Top with raisins. Enjoy your “ants on a log.”
3. Stuff a whole-grain pita pocket with ricotta cheese and Granny Smith apple slices. Add a dash of cinnamon.
4. Mix together ready-to-eat cereal, dried fruit and nuts in a sandwich bag for an on-the-go snack.
5. Smear a scoop of frozen yogurt on two graham crackers and add sliced banana to make a yummy sandwich.
6. Top low-fat vanilla yogurt with crunchy granola and sprinkle with blueberries.
7. Microwave a small baked potato. Top with reduced-fat cheddar cheese and salsa.
8. Make snack kabobs. Put cubes of low-fat cheese and grapes on pretzel sticks.
9. Toast a whole grain waffle and top with low-fat yogurt and sliced peaches.
10. Spread peanut butter on apple slices.
11. Blend low-fat milk, frozen strawberries and a banana for thirty seconds for a delicious smoothie.
12. Make a mini-sandwich with tuna or egg salad on a dinner roll.
13. Sprinkle grated Monterey Jack cheese over a corn tortilla; fold in half and microwave for twenty seconds. Top with salsa.
14. Toss dried cranberries and chopped walnuts in instant oatmeal.



PARENT HANDOUT

Eat Right

Food, Nutrition and Health Tips from the Academy of Nutrition and Dietetics

Smart Snacking for Adults and Teens

Make snacks work for you by choosing nutrient-rich foods from the grains, fruit, vegetable, dairy and protein food groups. Snacks can boost your energy between meals and supply essential vitamins and minerals. There is a place for snacks in a healthy eating plan. Just choose wisely:

- Think of snacks as mini-meals that contribute nutrient-rich foods. You can fit snack calories into your personal healthy eating plan without over-spending your day's calorie budget.
- Snack only when you're hungry. Skip the urge to nibble when you're bored, frustrated or stressed. Feed the urge to do something by walking the dog or working in the garden.
- Keep portion control in mind. Have a single-serve container of yogurt or put a small serving of nuts in a bowl. Eating directly from a multiple-serving package can lead to overeating.
- Plan snacks ahead of time. Keep a variety of nutritious ready-to-eat supplies on hand, such as whole-grain crackers and low-fat cheese.



Get creative with the following snack suggestions by swapping out different fruits, vegetables and grains to keep your snacking exciting!

Snacks with 200 calories or less:

- One tablespoon peanut butter spread on slices of a medium apple
- One cup tomato soup with five whole-grain crackers
- Three cups air-popped popcorn sprinkled with three tablespoons grated parmesan cheese

**The Importance of Nutrition and Physical Activity for Children Ages 10-12
Lesson Plan (Mon., Day 11)**

Submitted by: Angel Dunlap
Iowa State University
Date: February 2012
Grade Level: 4, 5, 6, 7

Subject(s): Post Survey
Nutrition and Physical Activity

Duration: 40 minutes

Objective:

1. Administer the post-test (Club 1).

Materials:

- Folders
- Pencils
- Surveys

Procedure:

- Administer the post-test
- Handout Folders
- Reinforce the previous lessons.

Assessment: Informal. Ask questions.

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