

A NUTRITION EDUCATION INTERVENTION ON ACHIEVING HEALTHY  
WEIGHTS AMONG ADOLESCENTS FOR NUTRITION EDUCATORS  
FOR LOW-INCOME FAMILIES

by

MELISSA KRISTINE KAUS

(Under the Direction of Jung Sun Lee)

ABSTRACT

With the high prevalence of obesity in low-income Georgian adolescents, a nutrition education intervention addressing this issue is needed; however, such an intervention is not currently available in nutrition education programs targeted to low-income families in Georgia, such as University of Georgia (UGA) Cooperative Extension programs. This study developed, implemented, and tested a nutrition education intervention related to adolescent obesity on knowledge and confidence of nutrition educators for low-income families. The curriculum incorporated a variety of interactive learning experiences. Ten UGA Cooperative Extension providers participated in the intervention (mean age:  $56.3 \pm 6.96$ , 100% female, 20% African American, 30% Hispanic). Post-intervention, participants reported significantly increased knowledge (mean  $\pm$  SD,  $8.00 \pm 2.12$  vs.  $9.00 \pm 2.31$ ,  $p = 0.016$ ) and confidence in 3 of 4 topics related to adolescent obesity topics ( $p < 0.05$ ). This pilot study may serve as a model for adolescent obesity interventions for nutrition educators for Georgian low-income families.

INDEX WORDS: Adolescent, Nutrition Education Intervention, low-income, obesity

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MELISSA KRISTINE KAUS

BSFCS, University of Georgia, 2012

A Thesis Submitted to the Graduate Faculty of the University of Georgia in Partial  
Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

ATHENS, GA

2014

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MELISSA KRISTINE KAUS

Major Professor: Jung Sun Lee

Committee: Richard D. Lewis  
Connie Crawley

Electronic Version Approved:

Julie Coffield  
Interim Dean of the Graduate School  
The University of Georgia  
August 2014

## **ACKNOWLEDGEMENTS**

First, I would like to thank all of my family and friends for supporting me and encouraging me to pursue my entire academic and career goals. Without you, I would not have discovered my passion for nutrition, and would not be where I am today.

Second, I would like to thank all of my committee members for their expert advice, guidance, and patience. I would like to thank my advisor, Dr. Jung Sun Lee, for giving me the opportunity to select a research project that I would be passionate about, and that would ultimately give me necessary experience in my field to help prepare me for my future career in the field of nutrition. I would also like to thank Connie Crawley for recruiting the UGA Cooperative Extension providers to establish this project, helping me create the educational materials, driving me to Savannah, GA, co-teaching the workshop with me, and ultimately serving as an amazing role model for me to emulate as a future Registered Dietitian. I would like to thank Dr. Richard Lewis for supporting me through this process, serving on my committee, and giving me excellent insights from his own career experience to improve my project as well.

Third of all, this project would not have been possible without the consent of Dr. Vanessa da- Silva for allowing us to implement this study in the Cooperative Extension providers, nor would it have been possible without the help of the providers in the Savannah area who helped set up the training, made breakfast and lunch arrangements, and reserved the beautiful facility for us to implement the training workshop.

Next, I can't thank the Cooperative Extension providers who participated in the two workshops. Your positive spirits, encouragement and passion for this topic gave me so much joy as I taught my portions of the workshop. Your participation is greatly appreciated, and I hope you continue to use the information you learned and spread your knowledge to others to help reduce the obesity crisis in Georgia.

Finally, thank-you to all of the students and faculty in the Department of Foods and Nutrition at the University of Georgia. I am truly grateful for being given the opportunity to conduct research as a graduate student here, and could not have asked for a more perfect setting in which to do so. Your smiling faces and daily encouragement have been so valuable to me.

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## **CHAPTER I**

### **INTRODUCTION**

With over a third of American children and adolescents who are now overweight or obese, the adolescent ‘obesity epidemic’ has grown to become a large concern in the United States (Ogden et al 2014). In 2011-2012, 16.9% of children and adolescents in the United States aged 2-19 were obese. Not only is adolescent obesity a concern for the entire United States, but in Georgia specifically as well. In 2011, Georgia was ranked 17<sup>th</sup> in the United States for obesity in 10-17 year-olds (F as in Fat 2013). Lewis et al (2006) measured the height and weight of 4<sup>th</sup>, 8<sup>th</sup>, and 11<sup>th</sup> grade students (N= 3114) in four regions of Georgia. They estimated that the prevalence of overweight/obesity in Georgian children and youths was 20.2%, and that it was higher in Georgian children and youths than nationally (Lewis et al 2006). In addition, not only are many Georgian adolescents overweight/obese, they also are not physically fit. According to a recent report from the Georgia State Department of Public Health, 20% of Georgia school children were not able to pass any of the five basic tests of physical fitness (Emerson 2013).

Obesity during adolescence is a problem for American adolescents in general, but may disproportionately affect those residing in low-income households (Ogden et al 2010). Ogden et al (2010) reported in their National Center for Health Statistics Data Brief, using National Health and Nutrition Examination Survey (NHANES) data, that the prevalence of obesity in boys and girls decreases with increasing socioeconomic status

(SES), however this is not consistent across race and ethnicity. They report that 11.9% of boys in households with incomes greater than 350% of the poverty level are obese, compared to 21.1% in households with income less than 130%. Following a similar trend, 12% of girls in households earning greater than 350% of the poverty level are obese compared to 19.3% in homes with incomes less than 130% of the poverty level. In addition, as reported by Singh et al (2010), in their study conducted between 2003-2007 using the National Survey of Children's Health, and involving over 40,000 U.S children aged 10-17 years, the adolescents residing in the low-income homes were over twice as likely to be obese than the children from the higher income homes. In fact, they reported that the prevalence of obesity from 2003-2007 in the low-income adolescents increased by 23%, and only 10% for all U.S adolescents. Not only has it been shown that obesity disproportionately affects low-income adolescents, but as reported by Skelton et al (2009) in their study involving 12,383 U.S children/adolescents aged 2-19 years using NHANES II and III data, there is a higher prevalence of severe obesity (BMI  $\geq 99^{\text{th}}$  percentile and  $\geq 40\text{kg/m}^2$ ) in this population as well.

Adolescent obesity is associated with a wide variety of health consequences, which can greatly impact quality of life both short- and long-term. Some of the more common physical consequences include: cardiovascular disease, type 2 diabetes, hypertension, dyslipidemia, and orthopedic problems (AAP 2013). In addition to the physical consequences of adolescent obesity, psychosocial consequences commonly arise, which can include teasing and bullying, low self-esteem and depression. Functional consequences of obesity consist of absenteeism from school, reduced productivity, reduced academic performance, and mobility limitations.

The literature stresses the importance of preventing adolescent obesity and provides solid support for an effective nutrition education intervention for nutrition educators for low-income families. Many programs targeting adolescent obesity have been implemented in recent years, however very few studies have been conducted in the low-income population. Programs such as the Expanded Food and Nutrition Education Program (EFNEP), which is provided through the Cooperative Extension and the Supplemental Nutrition Assistance Program- Education (SNAP-Ed), are two major programs that exist throughout the United States and in Georgia which both provide nutrition education to the low-income population. Currently, the programs operating out of the University of Georgia (UGA) Cooperative Extension for low-income populations do not address obesity, and with the high prevalence of obesity in low-income adolescents in Georgia, a nutrition education intervention which addressed these issues is needed. The goal of this study was to develop, implement, and test a nutrition education intervention for nutrition educators of low-income families which addresses the target behaviors for obesity prevention outlined by the American Academy of Pediatrics (AAP, Barlow 2007).

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **Adolescence**

Adolescence is a period of transition during which a child matures into an adult (APA 2002). This period marks the development of an individual's physical, mental, emotional and even moral characteristics. This transition period typically occurs from age 10 to 19 years. However, there is considerable individual variation as to when an individual begins and ends this period, as its onset and duration are heavily influenced by genetics. Because of this variation among individuals, body image issues often affect adolescents. Eating disorders can also emerge as a result of this.

Adolescence is also often accompanied by rebellion against parental influences (APA 2002). Because of this, health-risk behaviors such as smoking, drinking alcohol, taking drugs etc, may arise that the adolescent may then take with them into adulthood. Additionally, their diets tend to not be as nutritious, as 75% of current adolescents in the United States (U.S) eat less than the recommended servings of fruits and vegetables each day (CDC 2007). Not only do their diets tend to be poor in nutritional quality, they are also increasingly sedentary, as on average American adolescents spend six to eight hours a day exposed to media. Additionally 78% of today's U.S adolescents own a cell phone, 37% of which own a smart phone (Madden et al 2013, Smith 2013). Therefore, programs targeting health-risk behaviors in an adolescent population within the U.S. should consider these unique lifestyle characteristics.

## **Definition of Adolescent Overweight/Obesity**

The adolescent years are marked by intense physical and developmental changes. According to Biro et al (2010), height, weight, and BMI all increase during puberty regardless of gender. When compared to boys, girls typically gain more fat mass than fat-free mass (Biro et al 2010). Having a higher BMI during childhood is also associated with a higher BMI during adolescence, coupled with a disproportionate increase in fat mass. Resting metabolic rate is greater around the time of menarche for females, and this relationship is also consistent with the rate of increase in adiposity after peak height velocity is attained. Biro et al (2010) found that for the children participating in their longitudinal study, those who had been overweight or obese at age 9 were also overweight or obese at age 18. In their study, they also found that the proportion of body fat was greater in the black participants with middle and highest quintile BMIs, in addition to higher waist-to-height ratios. Therefore, there are many physiological changes that occur during adolescence which differ between gender and among races. Because of the many changes that are actively occurring throughout the adolescent years, while the use of BMI is a useful means for defining weight status in adults, it is not as valid of a measure in children and adolescents whose bodies are still developing and changing (Barlow 2007). Therefore, gender and age specific percentiles are used to compare children's BMI to others with similar defining characteristics, rather than using ranges. Adolescent overweight is defined as an individual having a BMI from the 85<sup>th</sup> to less than the 95<sup>th</sup> percentile, while adolescent obesity is defined as an individual having BMI greater than or equal to the 95<sup>th</sup> percentile compared to others of their age and gender (Ogden et al 2010). This differs from the use of BMI in adults where BMI is

defined in terms of ranges, with <18.5 as ‘underweight,’ 18.5-24.9 as ‘normal weight,’ 25-29.9 as ‘overweight,’ and  $\geq 30$  as ‘obese,’ (CDC 2011). It is important for adolescents to be seen by a primary care provider or clinician to determine whether their BMI percentile indicates a need for a lifestyle change to prevent further weight gain, as the percentile may be inaccurately representing their body composition (Barlow 2007).

### **Prevalence of Adolescent Overweight/Obesity**

The prevalence of obesity among adolescents in the U.S. is at its highest level in history, more than tripling since the 1960’s when it was only 5% (May et al 2013). Over a third of American children and adolescents are overweight or obese (Ogden et al 2014). In Georgia specifically, 15% of adolescents in grades 9-12 were overweight in 2011, and 15.8% were obese (Centers for Disease Control and Prevention 2012). In 2011, Georgia was ranked 17<sup>th</sup> in the U.S. for obesity in 10-17 year-olds (F as in Fat 2013). Lewis et al (2006) measured the height and weight of 4<sup>th</sup>, 8<sup>th</sup>, and 11<sup>th</sup> grade students (N= 3114) in four regions of Georgia. They estimated that the prevalence of overweight/obesity in Georgian children and youths was 20.2%, and that it was higher in Georgian children and youths than nationally (Lewis et al 2006). They also found that the extent of overweight was highest in the rural growth region of Georgia when compared to the urban, suburban, and rural decline regions. A rural growth region is one in which has experienced population growth within the past 2 decades, has touristic areas, and is either near a military base or regional growth center. Therefore, not only is the prevalence of adolescent overweight and obesity a concern throughout the U. S., but it is also a major concern in Georgia.

## Prevalence of Overweight/Obesity in Low-Income Adolescents

Overweight/obesity is a problem for adolescents in general, but may disproportionately affect adolescents in certain socioeconomic groups. According to Wang and Zhang (2006), common variables used to define socioeconomic status (SES) include information regarding an individual's education, income, and occupational status. As reported in their National Center for Health Statistics Data Brief, using data from the National Health and Nutrition Examination Survey (NHANES), Ogden et al (2010) found that the prevalence of obesity in boys and girls decreases with increasing SES. They report that 11.9% of boys in households with incomes greater than 350% of the poverty level are obese, compared to 21.1% in households with income less than 130%.

Following a similar trend, 12% of girls in households earning greater than 350% of the poverty level are obese, compared to 19.3% in homes with incomes less than 130% of the poverty level. However, even though proportionally more children are obese at lower income levels, Ogden et al (2010) acknowledges that the majority of obese children live in homes with incomes greater than 130% of the poverty level, at 62% of the population.

While Ogden et al (2010) found that the prevalence of obesity in boys and girls decreases with increasing SES, this is not consistent across race and ethnicity. Utilizing NHANES data, Wang and Zhang (2006) found significant differences in the relationship between SES and overweight across racial and ethnic groups, and therefore not all low-SES groups were at an increased risk for overweight, which contradicts the common perception that high-SES directly correlates to a lower risk for obesity. These researchers did find that for black females, there was a strong positive association with low-SES and overweight, however (Wang and Zhang 2006). Barlow (2007) also notes that while high



SES is associated with a lower prevalence of obesity in white girls, it is not associated with lower prevalence in black girls.

Using data from the National Longitudinal Study of Adolescent Health (Add Health), an ongoing nationally-representative, school-based study of adolescents in grades 7 to 12, Lee and Hicken (2013) found significant disparities in SES and obesity from adolescence to adulthood for females, and that such disparities were greater between Blacks and Whites compared to Hispanics and Whites. Blacks also had the highest rates for persistent obesity from adolescence to adulthood.

Singh et al (2010), in their study conducted between 2003-2007 using the National Survey of Children's Health, and involving over 40,000 U.S children aged 10-17 years, found that the adolescents residing in the low-income homes were over twice as likely to be at risk for obesity as children from the higher income homes. In fact, they reported that the prevalence of obesity in the low-income adolescents increased by 23%, while it only increased 10% for all U.S. adolescents. Not only has it been shown that obesity disproportionately affects low-income adolescents, but as reported by Skelton et al (2009) in their study involving 12,383 U.S. children/adolescents aged 2-19 years using NHANES II and III data, there is a higher prevalence of severe obesity (BMI  $\geq 99^{\text{th}}$  percentile and  $\geq 40\text{kg/m}^2$ ) in this population as well.

These studies show that although overweight/obesity affects adolescents of all socioeconomic statuses, genders, races and ethnicities, there are significant disparities in SES and severity of obesity among different groups (Lee and Hicken 2013, Wang and Zhang 2006, Skelton et al 2009).

## **Consequences of Adolescent Overweight/Obesity**

Excess adipose tissue, which is correlated with a higher BMI, is associated with many serious health risks that can severely impact an adolescent's life, both short-term, and long-term (Barlow 2007). It is estimated that 80% of obese adolescents aged 10-13 will be obese as adults (ACCP 2013). The 2012 Institute of Medicine (IOM) report on "Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation" outlines the numerous health consequences associated with obesity over the lifespan. Not only are these physical consequences linked to excess body weight, but so are many psychosocial and functional consequences as well. Some of the more common physical consequences include: cardiovascular disease; type 2 diabetes; hypertension; dyslipidemia; and orthopedic problems. It is estimated that children and adolescents who are overweight/obese have a 52% greater risk of a new diagnosis of asthma (F as in Fat 2011). Also, approximately 43% of obese teenagers in the United States have abnormal cholesterol levels. The American Diabetes Association reported that in 2011, about 1 in 400 American children and adolescents have diabetes. May et al (2012) evaluated NHANES data from 1999-2008 from 3,400 U.S. adolescents aged 12-19, and found that in addition to their excess weight, 50% of the overweight and 60% of the obese adolescents in their study had one or more risk factors for cardiovascular disease, including Type 2 diabetes. The IOM report also states that these conditions may eventually contribute to shorter lifespans for obese adolescents. Psychosocial consequences can include teasing and bullying, low self-esteem, and depression. Functional consequences of obesity consist of absenteeism from school, reduced productivity, reduced academic performance, and mobility limitations.

Not only does obesity have significant effects on the individual, but it takes a serious economic toll as well. According to the Medical Expenditure Panel Survey from 2000-2005, \$190 billion was spent on obesity-related illnesses, of which \$14.1 billion was from childhood obesity alone (IOM 2012). Therefore, obesity comes with a high economic cost as well, beyond its physical and psychological impacts.

### **Prevention of Adolescent Overweight/Obesity**

Because obesity is associated with so many negative physical, emotional and mental consequences, and because such a high percentage of obese adolescents go on to be obese adults, its prevention is key in reversing these life-threatening comorbidities (AAP 2013). Because obesity can result from a wide variety of both external and internal influences, its prevention is difficult. According to Barlow (2007), both genetics and the environment contribute to risk for obesity development. Although genetics can increase obesity risk, behavioral and environmental modifications, such as diet and exercise, can greatly affect this predisposition. Doak et al (2006) emphasizes that the first step in preventing overweight and obesity in children is to understand the factors contributing to the obesogenic environment in which they live. According to the American Academy of Pediatrics (AAP), there are seven evidence-based behaviors that can be adopted by families and adolescents to prevent excess weight gain (Barlow 2007). These include: limiting consumption of sugar sweetened beverages; encouraging consumption of diets high in fruits and vegetables; limiting screen time; eating breakfast daily; limiting dining out; encouraging families to eat meals together; and limiting portion sizes.

Parents have an important role in adolescent obesity prevention, because they serve as role models for health behaviors, and an estimated 66% of a child/adolescent’s food intake occurs in the home (Poti and Popkin, 2011). Therefore parents/caregivers must be included in any prevention strategy for addressing adolescent obesity.

In the IOM report on “Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation,” the authors stress that the changes required to prevent obesity will only occur if all levels of the population are engaged, including the society, the community, the family/households, and the individual. Figure 1 outlines the multifactorial approach necessary to address obesity prevention, and the many ‘environments’ which play a role in an individual’s risk for developing obesity. All of these components must be addressed in order for obesity prevention to be successful.

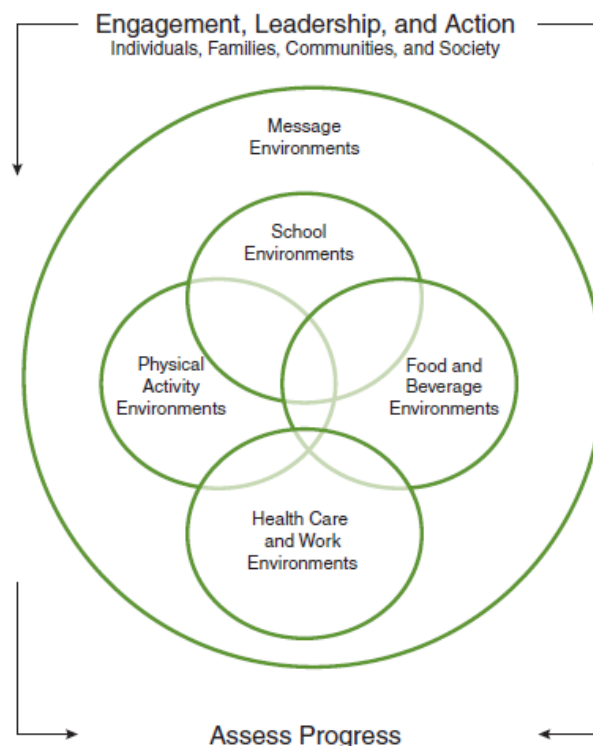


Figure 2.1. The multifactorial approach to addressing obesity prevention (IOM, 2012)

## **Adolescent Obesity Interventions**

Because adolescent obesity has become such a large concern in the U.S., many obesity prevention programs (or interventions) have been developed and examined in recent years. The hallmark program for adolescent obesity intervention is ‘The Child and Adolescent Trial for Cardiovascular Health (CATCH),’ which is a successful school- and family- based research study to promote healthy behaviors. The CATCH study integrated their intervention materials related to food consumption, physical activity, and tobacco use into a school curriculum for third- to fifth-grade elementary students, and a home-based program for the family. They also modified the school environment in order to reduce cardiovascular risk factors in elementary students (Kelder et al 2002). The researchers reported that the positive effects of their intervention continued at least until the students were in eighth grade, even though there were no additional interventions after the fifth grade. The CATCH Physical Education involved three, 30-40 minute classes per week in which students partook in activities such as running, walking, and other aerobic games. The CATCH study also identified barriers the teachers or students had during the trial in order to help alleviate them in future programs.

To compare the many prevention interventions already implemented, Doak et al (2006) conducted a review of school-based obesity interventions that modified diet- or activity-related behaviors. Based on their review, they proposed that future obesity interventions in school children should consider implementing the following nine recommendations to be more successful: 1) take body composition measures regularly; 2) give more attention to improving the rate of participation; 3) target the intervention to a heterogeneous group; 4) tailor the health promotion messages to appropriate groups

based on age, ethnicity, gender, etc; 5) alter the physical/social environment of participants directly; 6) give greater attention to making the intervention sustainable long-term; 7) report frequency and distribution of BMI and adiposity measures; 8) assess adverse affects, such as stigmatization; and finally, 9) evaluate and publish the results so more successful interventions can be created. Van Ryzin and Nowicka (2013) conducted a randomized trial of family-based obesity interventions in adolescents, and recommended that obesity interventions should also address the effects on family functioning.

In order to develop more effective interventions targeting adolescent obesity, it is important to first evaluate existing programs and to look at how these existing programs measure their own success. Contento et al (2002) reviewed evaluation measures used in nutrition education interventions. In interventions with school-aged children, the most commonly evaluated measure is attitudes of the adolescent participants. In addition to attitudes, other common measures include evaluation of self-efficacy, social norms and social support, and intentions to change behavior. In the IOM report on evaluating obesity prevention efforts, an evaluation framework is discussed which highlights that the ‘needs, inputs, resources, activities, outputs, outcomes, and impacts should all be considered when evaluating obesity prevention efforts’ (IOM 2013).

#### Adolescent obesity interventions in Georgia

Many obesity interventions have been conducted throughout the U.S. in recent years. Only a few have been conducted in Georgia. One of these Georgia-based programs entitled ‘Healthy 4 Life’ was a research project conducted through the University of Georgia. The pilot program included a 6-week theater-based nutrition and

physical activity intervention, which was developed for low-income, urban, African American adolescents (Jackson et al 2010). Throughout the intervention, the participants received six health lessons through a unique theatrical delivery. All the participants were required to contribute to and participate in the final performance, which led to high participant satisfaction. Participants completed pre-and post-surveys of their knowledge, choices, and behaviors related to food and physical activity. After the intervention, more participants knew the daily recommended number of servings of fruits and vegetables, and how much time they should engage in physical activity each day.

A Georgia-based grass-roots organization entitled, the “Center Helping Obesity in Children End Successfully,” (C.H.O.I.C.E.S), was initially formed as a resource for families with clinically diagnosed and at-risk obese children in Georgia (C.H.O.I.C.E.S 2013). Since 2002, C.H.O.I.C.E.S has reached over 70,000 obese children and families in and around the Atlanta, Georgia area. Their strategy for combating childhood obesity consists of physical fitness, dietary/nutritional education, peer socialization, an interactive website, counseling, and collaboration with the community. The C.H.O.I.C.E.S professional staff includes an executive chef and a Registered Dietitian. C.H.O.I.C.E.S manages many different programs which help fulfill the goals of their strategy. Some examples of these programs include ‘Camp Divas,’ and ‘Sisters in the LITE.’ Camp Divas is a week long program for overweight adolescent females that teaches nutrition, physical fitness, and also provides cooking demos. Sisters in the LITE (Lifestyle Intervention Teaching Exercise) is specifically for girls aged 10-17, and is a program that provides nutrition education and fitness classes, as well as sessions on building self-esteem. C.H.O.I. C.E.S stresses that their goal is to teach adolescents how to make long-

term lifestyle changes in order to sustain a healthy weight, not just a short-term diet program.

Researchers from Georgia Regents University evaluated the effect of their three-year after-school physical activity program entitled 'Fitkid' in 206 Georgian adolescents (Gutin et al 2008). Their overall hypothesis was that their program would produce less fat tissue and more lean tissue, and improve cardiovascular health in their participants. The two-hour after-school program which was provided every school day consisted of three parts: delivery of a healthy snack; assistance with homework; and exercise. Certified physical education teachers, classroom teachers, teacher aids, and paraprofessionals already employed by the intervention schools worked with the participants. Body composition of the participants using dual x-ray absorptiometry, BMI and waist circumference was used to measure the effects of the program. During the intervention (the school-year), participants improved in both their fitness level and percent body fat. However, during the summers when the intervention was not occurring, these participants returned to their pre-intervention levels. The researchers concluded that interventions of this nature should be year-round to promote the healthy growth of adolescents.

### **Nutrition Education Interventions for Low-Income Populations**

Although several adolescent obesity interventions have been implemented in recent years, very few have been specifically targeted towards the low-income population. Cooperative Extension provides several large nutrition education programs such as Expanded Food and Nutrition Education Program (EFNEP), which do target the



low-income population, although these programs do not currently focus on adolescent obesity specifically.

The seeds of the Cooperative Extension system first began in 1862 with the passage of the Morrill Act, requiring that one university in each state, now called ‘Land-Grant Universities’ educate citizens in the fields of agriculture and mechanics. The University of Georgia (UGA) serves as the Land-Grant University for the state of Georgia (Family and Consumer Science 2014). The main goal of UGA Cooperative Extension is to translate the research done at UGA and other educational institutions throughout the world and deliver this knowledge to the public. It is supported by specialists in the College of Agricultural and Environmental Sciences, and the College of Family and Consumer Sciences. UGA Cooperative Extension offers programs to Georgia citizens related to food preservation, food safety, parenting, healthy relationships, child care, housing, financial management, and healthy eating habits.

One important program provided through Cooperative Extension, is EFNEP funded by the United States Department of Agriculture (USDA). The overall goal of EFNEP is to teach low-income families with children the knowledge, attitudes, and skills necessary for preparing nutritious meals (Wakou et al 2003). EFNEP is unique, in that it employs and trains individuals called ‘paraprofessionals’ from the communities in which they will teach. EFNEP paraprofessionals are trained by university and county-based faculty and use hands-on and interactive teaching methods such as cooking demos to enhance the overall learning experience of EFNEP participants (USDA 2012). Because these individuals are residents of their specific instructional territories, they can more

effectively communicate the EFNEP messages to the participants. EFNEP participants gain knowledge in diet quality, nutrition, food budgeting, food preparation, and food safety.

EFNEP operates in over 800 counties in the U.S., six U.S territories, and the District of Columbia (USDA 2012). In 2012 alone, EFNEP directly impacted 130,485 adults and 479,398 youths with its nutrition education programs. More than 500,000 new participants complete the program every year. About 85% of EFNEP participants are either at or below 100% of the U.S. poverty rate and 73% of these participants are minorities.

SNAP-Ed, is another program that provides nutrition education to low-income individuals. SNAP-Ed was first implemented in 1988, and is both a federal and state funded program that provides nutrition education for individuals who are eligible to receive benefits through the Supplemental Nutrition Assistance Program (SNAP) (USDA 2009). The goal of SNAP-Ed is to educate SNAP recipients on how to make healthier choices when purchasing food within their limited budgets, and how to become more physically active in accordance with the recommendations provided by the Dietary Guidelines for Americans. States are encouraged by USDA's Food and Nutrition Service (FNS) to focus their SNAP-Ed programs on the key messages of the Dietary Guidelines for Americans, such as making half of the plate fruits and vegetables, increasing physical activity, and maintaining an appropriate calorie balance (USDA SNAP 2012). SNAP-Ed program activities are evidence-based, and can be delivered through a variety of approaches, such as individual or group-based education sessions or comprehensive multi-level interventions.

In 2011, almost 45 million low-income individuals in the U.S. received SNAP benefits, with half of these under 18 years of age (USDA SNAP 2012). The Healthy, Hunger-Free Kids Act of 2010 established SNAP-Ed as the Nutrition Education and Obesity Prevention Grant Program because SNAP affects such a large number of children.

Recently three SNAP-Ed demonstration projects were evaluated, two of which are child-focused, while the third is focused on seniors (USDA 2013). The findings from this report from the USDA FNS SNAP Education and Evaluation Study, Wave II, show several key successes in the child-focused projects: BASICS and LEAP2. Both projects focus on increasing fruit and vegetable consumption of low-income school children. One positive outcome was that the design, content and messages from the SNAP-Ed programs were well-received by school staff at intervention sites. Another success was that the majority of school faculty supported the implementation of the program, found the curriculum easy to implement and reinforced the messages with their students. During the process evaluation, many challenges were identified that should be focused on in the future. One challenge was that parents and caregivers need to be more engaged in the implementation of the program, since they play a critical role in reinforcing nutrition messages. Another is that while many of the school staff members were engaged, several still were unwilling to participate, which greatly hindered the impact SNAP-Ed had in their classrooms. Also, because SNAP-Ed targets a low-income audience, the parents/caregivers of the students were still worried about the costs of purchasing fruits and vegetables. Because of this concern, the evaluation showed no increase in the children's at-home fruit and vegetable consumption. However, the evaluation did show

that the SNAP-Ed materials were very effective, and can have a broad reach/scope. Therefore, if these challenges can be overcome, SNAP-Ed could have a significant impact on the health of low-income school children, especially in regards to their weight status.

Because both EFNEP and SNAP-Ed reach thousands of Americans each year and research shows they are both effective programs, a study by Koszewski et al (2011) looked at the impact of these programs on participants six months after their respective graduations and whether they maintained their behavior changes. Participants were asked to complete fifteen behavior questions, such as “How often do you plan meals ahead of time,” or “How often do you prepare foods without adding salt.” Of these fifteen questions, thirteen of these behaviors were improved during the course of the programs and were subsequently maintained six months later by the program graduates. Therefore, this study shows that both EFNEP and SNAP-Ed can have lasting impacts on low-income clients to both change and maintain their behaviors with regards to nutrition practices. Also, because of their extensive reach, these programs may be able to impact adolescent obesity if proper nutrition education materials are developed.

### **Nutrition Education Interventions for Educators**

Although nutrition educators such as Registered Dietitians are arguably the most qualified individuals to deliver nutrition education interventions, many times other intermediaries such as paraprofessionals, school teachers, and food service workers are used to deliver the intervention materials (Contento et al 2002). Studies evaluating in-service trainings for these intermediaries commonly assess the knowledge and skills gained from the training with outcome measures being that the intermediaries can relate

this knowledge to their professional activities. No studies have been done involving nutrition education interventions focusing on adolescent obesity for paraprofessionals who work with low-income adolescents.

### **Rationale, Specific Aims, and Hypothesis**

In 2009-2010, 16.9% of children and adolescents in the U.S. aged 2-19 were obese (Ogden et al 2012). In addition, in Georgia specifically, over 30% of high school students were overweight and obese (Centers for Disease Control and Prevention 2012). The Georgia State Department of Health recently reported that 20% of Georgia school children were not able to pass any of the five basic tests of physical fitness (Emerson 2013). Adolescents residing in poorer counties of Georgia are nearly twice as likely to become obese. The University of Georgia (UGA) Cooperative Extension and SNAP-Ed have not developed nutrition education interventions related to adolescent obesity in Georgia, so such a program was needed.

The purpose of this present study was to develop, implement, and test a nutrition education intervention for low-income families related to adolescent obesity. The first specific aim was to develop the ‘Achieving Healthy Weights for Children and Teens’ nutrition education intervention training. This was accomplished by addressing the target behaviors for obesity prevention in adolescents by the AAP (Barlow 2007). The second specific aim was to have workshop attendees complete a pre-test evaluating their knowledge and confidence related to adolescent obesity. The pre-test consisted of twelve true/false questions asking about the facts related to adolescent obesity that were covered during the intervention training, two short-answer questions, and four Likert scale questions assessing their perceived confidence about adolescent obesity risk factors. The

third specific aim was to conduct the ten-hour, two-day adolescent obesity intervention training, which was held in September and October, 2013. The fourth specific aim was to follow up with a post-test to assess the changes in knowledge and confidence related to adolescent obesity after attending the seminar, and the intervention attendees' perceptions of the activities presented during the intervention training.

## **CHAPTER III**

### **METHODS**

The present study involves the development, pilot-testing, and evaluation of a nutrition education intervention for UGA Cooperative Extension educators of low-income families in the Savannah, GA area. All methods and procedures were approved by the University of Georgia Institutional Review Board before any procedures with human subjects were initiated (IRB# 2013-10856-0). A timeline is included in Appendix A as an overview of key project activities. The IRB consent form for participation in this study can be found in Appendix B.

#### **Development of “Achieving Healthy Weights for Children and Teens” intervention**

The intervention was developed while working with Connie Crawley, MS, RD, LD who works for UGA Cooperative Extension. Beginning in August 2012, monthly meetings with Connie Crawley occurred to brainstorm ideas for each section to be included in the intervention. The intervention was designed to address target behaviors for obesity prevention in adolescents outlined by the American Academy of Pediatrics (AAP) (AAP, Barlow 2007). It was during the monthly meetings with Connie Crawley that the various sections to be covered during the intervention were established. Table 1 shows the list of the developed sections in the intervention manual along with the desired outcomes for each for whether knowledge and/or confidence were to be obtained.

Table 1. List of the intervention topics

<b>Topics</b>	<b>Outcome Purpose</b>
1. Childhood and Adolescent Obesity Overview	Knowledge
2. Physical Activity	Knowledge
3. Limiting Screen Time	Knowledge
4. Sugar and Fat	Knowledge; confidence
5. Portion Distortion	Knowledge; confidence
6. Eating Disorder Overview	Knowledge; confidence
7. Calorie and Physical Fitness Apps for Smart Phones and Tablets	Knowledge
8. Label Reading	Knowledge; confidence
9. Healthy Snacking/Healthy Lunchbox	Knowledge

The “Achieving Healthy Weights in Children and Teens” nutrition education intervention included an overview of childhood and adolescent obesity, physical activity recommendations, limiting screen time, information about sugar and fat, portion distortion, eating disorders, calorie and physical fitness apps for smart phones, label reading, and information on healthy snacking/healthy lunchbox. The name of the intervention was decided as “Achieving Healthy Weights for Children and Teens,” as this title effectively emphasizes that this material is meant to target the prevention strategies for adolescent obesity outlined by the AAP. The key topics covered in the intervention compared with the AAP target behaviors are shown in Table 2. Seven of the target behaviors listed are supported by evidence, while the last two are recommended by the AAP prevention writing group based on their evaluation of current data and expertise.



Table 2. Comparison of American Academy of Pediatrics target behaviors for obesity prevention and key intervention topics

<b>American Academy of Pediatrics target behaviors for obesity prevention</b>	<b>Key intervention topics covered in “Achieving Healthy Weights for Children and Teens” training</b>
Limit consumption of sugar-sweetened beverages	Sugar and Fat
Encourage consumption of diets with recommended quantities of fruits and vegetables; the current recommendations from the USDA are for 9 servings/day, with serving sizes varying with age.	Healthy snacking/healthy lunchbox
Limit television and other screen time (no television viewing before 2 years of age, and no more than 2 hrs of television viewing/day)	Limiting screen time
Eat breakfast daily	Healthy snacking/healthy lunchbox
Limit eating out at restaurants, particularly fast food restaurants	Sugar and Fat
Encourage family meals in which parents and children eat together	Eating disorders, childhood and adolescent obesity overview
Limit portion size	Portion distortion, label reading
Promoting moderate to vigorous physical activity for at least 60 mins/day	Physical activity recommendations
Limit consumption of energy-dense foods	Sugar and fat section, calorie and physical fitness apps for smart phones

As the materials were drafted, they were reviewed by Connie Crawley and Dr. Lee to ensure they were understandable, creative, and accurate. Any necessary revisions were made before copies were made for the participants’ folders. Connie Crawley is an expert in designing and implementing interactive interventions of this nature. The curriculum incorporated a variety of interactive learning experiences including hands-on activities, short exercise breaks, group work, videos, a food demonstration, and PowerPoint presentations. In addition, several sections of the video “The Weight of the Nation-Children in Crisis” were shown (The Weight of the Nation 2012). All handouts used

throughout the workshop were organized into a folder for the participants. A CD with some of the games used in the workshop was also included in the folder. Table 3 outlines the sections, the activities and contents incorporated within each section, in addition to all materials used in each section. The intervention was unique because it is the first workshop targeting adolescent obesity ever implemented in a training session for UGA Cooperative Extension educators of low-income families

Table 3. “Achieving Healthy Weights in Children and Teens” sections, contents and materials

<b>Intervention Training Sections</b>	<b>Intervention Training Section Contents</b>	<b>Intervention Training Section Materials Used</b>
1. Childhood and Adolescent Obesity Overview	<ul style="list-style-type: none"> <li>• Brainstorming on factors associated with adolescent obesity</li> <li>• PowerPoint presentation</li> <li>• “The Weight of the Nation- Children in Crisis” Video</li> </ul>	<ul style="list-style-type: none"> <li>• Flipchart</li> <li>• Markers</li> <li>• Computer and projector with screen</li> </ul>
2. Exercise activity	<ul style="list-style-type: none"> <li>• Physical activity #1: Hot Tamale</li> <li>• Demonstration of “Take Ten” kit</li> <li>• Handout on CDC physical activity recommendations for adolescents</li> <li>• Description of “Walk Georgia”</li> <li>• CATCH video demonstration</li> <li>• Brainstorming on physical activities for adolescents</li> </ul>	<ul style="list-style-type: none"> <li>• Tamale/taco food model</li> <li>• “Take Ten” kit</li> <li>• Computer and projector with screen</li> <li>• Flipchart</li> <li>• Markers</li> </ul>
3. Limiting screen time	<ul style="list-style-type: none"> <li>• “The Weight of the Nation” Ch. 2- Food Marketing to Children</li> <li>• Limiting screen time homework assignment</li> </ul>	<ul style="list-style-type: none"> <li>• Screen time log</li> <li>• Pen/pencil</li> <li>• Computer and projector with screen</li> </ul>

4. Sugar and fat section	<ul style="list-style-type: none"> <li>• Fat vest demonstration</li> <li>• What’s the difference between solid and liquid fat</li> <li>• “High on Fat” activity</li> <li>• “I Spy Sat Fat and Added Sugar” activity</li> </ul>	<ul style="list-style-type: none"> <li>• 3 tubs of Crisco/lard</li> <li>• Paper towels</li> <li>• Tablecloths</li> <li>• Table tent labels</li> <li>• 1 bag of regular white sugar</li> <li>• Fat vest</li> <li>• Measuring cups and spoons</li> <li>• Disposable clear plastic bowls</li> <li>• Plastic spoons and knives</li> <li>• Small paper plates</li> </ul>
5. Portion distortion	<ul style="list-style-type: none"> <li>• Portion Distortion PowerPoint from NHLBI</li> <li>• Price is Right games (Liquid Calories)</li> <li>• “The Weight of the Nation Sugar-Sweetened Beverage”</li> </ul>	<ul style="list-style-type: none"> <li>• Computer and projector with screen</li> <li>• “Price is Right” printouts and board</li> </ul>
6. Eating disorder overview	<ul style="list-style-type: none"> <li>• Eating disorder PowerPoint</li> <li>• Handout on binge-eating</li> <li>• Body satisfaction assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Computer and projector with screen</li> <li>• Paper and ink</li> </ul>
7. Calorie and physical fitness applications	<ul style="list-style-type: none"> <li>• Case studies using “My Fitness Pal” and “Eat and Move O’Matic”</li> <li>• Fact sheet handout on other applications</li> </ul>	<ul style="list-style-type: none"> <li>• Paper and ink</li> <li>• Smart phones and tablets</li> </ul>
8. Label reading	<ul style="list-style-type: none"> <li>• USDA label reading tutorial</li> <li>• “Shop Well” Application label reading activity (Consumer judging)</li> </ul>	<ul style="list-style-type: none"> <li>• Computer and projector with screen</li> <li>• Smart phones and tablets</li> <li>• Nutrition labels for the following food items: <ul style="list-style-type: none"> <li>• Pretzel Goldfish</li> <li>• Cheddar Goldfish</li> <li>• Spaghetti and Meatballs Healthy Choice</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>• Chicken Breast Nuggets Kid Cuisine</li> <li>• 1% Nurture Lowfat Milk by Mayfield</li> <li>• TruMoo Chocolate Whole Milk</li> <li>• Odwalla Berries GoMega Juice Smoothie Blend</li> <li>• Pizza with Pepperoni Lunchables</li> <li>• Beef Ravioli Chef Boyardee</li> <li>• Cheese and Pepperoni Bagel Bites</li> <li>• Pepperoni Pizza Rolls</li> <li>• Kroger Chocolate Fudge Pudding Snacks</li> <li>• Kroger Classic Applesauce Sauce Cups</li> <li>• Kroger Yellow Cling Diced Peaches Snack Bowls, in naturally peach flavored light syrup</li> <li>• No Sugar Added Diced Peaches Del Monte, packed in water and artificially sweetened</li> <li>• Monster energy drink</li> <li>• Coca-Cola</li> <li>• Revive Vitamin Water</li> <li>• Lucky Charms</li> <li>• Raisin Bran</li> <li>• Nacho Cheese Doritos</li> <li>• Terra Original Exotic Vegetable Chips</li> <li>• Kroger Vividly Vanilla Deluxe Ice Cream</li> <li>• Kroger Fat Free</li> </ul>
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		<ul style="list-style-type: none"> <li>Rainbow Sherbet</li> <li>Private Selection</li> <li>Summer Raspberry Sorbet</li> </ul>
9. Healthy snacking, healthy lunchbox	<ul style="list-style-type: none"> <li>Apple oat balls cooking demo</li> <li>Price is Right-Sneaky Sugar and Fast Food Frenzy</li> <li>Social Cues Activity</li> <li>Handout with tips for healthy eating and quick breakfast ideas</li> </ul>	<ul style="list-style-type: none"> <li>Ingredients for apple oat balls and cooking utensils</li> <li>“Price is Right” printouts and board</li> <li>Paper and ink</li> </ul>

### **Development of pre- and post-questionnaires**

In order to evaluate the change in knowledge and confidence of the UGA Cooperative Extension providers participating in our intervention, pre-and post-test study design was used. The questionnaires were developed by adapting the approach used by Kleemeier et al (1988) which evaluated a 6-hour teacher training about the prevention of child sexual abuse. They used several pre-and post-tests which contained a 30-question true-false questionnaire to evaluate the impact of the intervention on the knowledge of the teachers related to child sexual abuse. They also used a 25-item Likert scale to assess the teachers’ attitudes about child sexual abuse. Another similar approach to our pre-and post-test study design was used by Rustad and Smith (2013), who also used pre-and post intervention surveys in their study “Nutrition Knowledge and Associated Behavior Changes in a Holistic, Short-term Nutrition Education Intervention with Low-Income Women.” Their surveys included 11 Likert scale questions assessing knowledge change and 11 questions assessing behaviors. Their surveys did not contain free-response questions however.

The 10-hour intervention was evaluated with true/false and Likert scales and several open-ended questions to detect changes in the knowledge and confidence of the UGA Cooperative Extension providers related to adolescent obesity in Georgia. The pre- and post-test questionnaires can be found in Appendix C-1 and C-2 respectively. The questionnaires asked providers to answer twelve basic knowledge questions in true/false form about factors related to adolescent obesity as defined by the AAP, such as screen time, portion control, label reading, and physical activity (Barlow 2007). There were four Likert scale questions which assessed confidence of the participants in several areas relating to adolescent obesity, such as “How do you feel about your ability to read a nutrition label?” These questions were rated on a scale of 1-5, with 1 being not at all comfortable, and 5 being extremely comfortable.

Two open-ended questions were included on the pre-questionnaire. The first question asked “What factors do you think contribute to an adolescent becoming obese?” The second question asked “Do you currently use any phone apps to monitor your nutrition or physical activity? If so, which ones?” This second question was included because the curriculum contained a section on health-related phone apps that supported some of the target behaviors promoted by the AAP. (Barlow 2007). The post-questionnaire, contained the same questions as the first, but some extra questions were added to collect key demographic information, such as gender, race/ethnicity, and highest level of education, age, height and weight. The UGA Cooperative Extension providers were also asked to provide years of employment in their current positions and documentation of previous experience with nutrition education for adolescents or obese individuals. Additionally they were asked to indicate how likely they were to incorporate

any of the activities demonstrated during the intervention into their own nutrition classes, and whether they planned to use any phone apps to monitor their own nutrition or physical activity. Finally, a question related to the participants' overall satisfaction with the intervention was asked, utilizing a scale of 0-4 with 0 being 'poor' and 4 as 'excellent.' These responses were tallied to assess the overall satisfaction with the intervention, and additional comments were analyzed to provide insight into future improvements needed for the intervention.

### **Validation of pre- and post-questionnaires**

Once the materials for the intervention and the pre- and post-questionnaires were developed, the pre-questionnaire was validated in a convenience sample of six UGA EFNEP providers in the Athens area in July, 2013, to clarify the questions and to gauge the baseline knowledge and confidence of our target population about adolescent obesity. The participants involved in the validation did not receive the nutrition education intervention, but were solely given the pre-test to assess how well they understood and completed the questions and to gather any comments about how the questions could be made more clear.

The only recommendation for improvement was to enlarge the nutrition label, and this was done in the final version of the questionnaires. This EFNEP group also expressed interest in receiving the intervention in the future.

### **Recruitment of UGA Cooperative Extension providers**

Once the intervention materials were developed and validated, ten UGA Cooperative Extension providers were recruited from the Southeast District of UGA Cooperative Extension. One of the Extension EFNEP agents in this area was contacted

via e-mail, and she agreed to allow the intervention to take the place of their normal monthly training sessions for two months. Sole inclusion criterion for participation was that the individual was either an EFNEP agent or program assistant in Georgia. All other participants were contacted via e-mail through the initial agent contacted.

### **Implementation of the intervention**

#### “Achieving Healthy Weights for Children and Teens” Training Day 1

Once the participants were recruited, the intervention was divided into two separate days, and was held for a total of 10 hours in September and October, 2013 at the Historic Bamboo Farm in the Coastal Georgia Botanical Gardens in Savannah, GA. The intervention took place during the required monthly in-service trainings for the EFNEP personnel. Before any data was collected, consent was sought from participants. The informed consent form can be found in Appendix B. Before the first training session began, the pre-test questionnaire was administered and collected. The first topic of the day was an overview of childhood and adolescent obesity. Participants were asked to brainstorm on factors that lead to adolescent obesity. They wrote their thoughts down on note cards, which were read aloud and discussed amongst the group. Afterwards, a PowerPoint presentation was given which can be found in Appendix D. “The Weight of the Nation-Children in Crisis-Ch.1,” was then shown (The Weight of the Nation 2012).

The second topic of the day was physical activity. The first activity in this section included actually participating in a physical activity that the participants could potentially use during their own nutrition education classes. After this, a demonstration of the “Take Ten” kit was given and a video of a CATCH physical activity class was shown. A



handout of the CDC physical activity recommendations was discussed and participants brainstormed about how exercise activities could be done in groups.

The third section during the first training day was on limiting screen time. “The Weight of the Nation-Food Marketing to Children- ch.2” was shown, (The Weight of the Nation 2012). Participants were then given copies of the homework assignment which can be found in Appendix D. For this, participants were asked to write down the amount of time they spent on their computer or watching TV during one 24 hour period between the two trainings.

Next the sugar and fat section was presented. For this section, participants were asked to put on a 20-pound fat vest while completing a series of daily activities, such as touching their toes. Then, the participants participated in the “High on Fat” activity. A copy of this can be found in Appendix D. For this activity participants were each given a common menu item from a restaurant along with its nutrition facts. The participants were then asked to measure out the corresponding fat content of each item using Crisco as the fat source. When each participant finished, the entire group looked at the amounts of fat contained in each item. Finally, the last activity in the ‘sugar and fat’ section was the “I Spy Sat Fat and Added Sugar.” This can be found in Appendix D as well. For this activity, participants were given ingredient lists of several common store-bought items, and asked to find ingredients which contributed saturated fat or added sugar. The ten subjects then participated in a second physical activity which concluded the first half of Day 1.

To begin the second half of Day 1, a presentation using the NHLBI PowerPoint on portion sizes was delivered. This can be found in Appendix D. The next activity in

the ‘portion distortion’ section of Day 1, was the “Liquid Calories-Price is Right” game. For this, a participant volunteered to put a series of sweetened beverages in order from least to highest in calories. Following this activity, “The Weight of the Nation-Sugar Sweetened Beverages” was shown.

To complete the first day of the “Achieving Healthy Weights for Children and Teens” intervention, a section on eating disorders was presented. Participants filled out eating behavior and body dissatisfaction assessments and a PowerPoint on the various eating disorders was presented. The importance of this section was primarily so that the educators could identify signs of these eating disorders in their clients. Before the participants were dismissed, several homework assignments were given to prepare the participants for the second day of training including instructions on how to download the phone applications that would be used during the second day of the training. .

#### “Achieving Healthy Weights for Children and Teens” Training Day 2

The second day of the intervention took place on October 11<sup>th</sup>, 2013 in the Coastal Georgia Botanical Gardens. The first section used the calorie and physical fitness applications for smart phones and tablets. This section was included because as described by Hebden et al (2012), smart phone applications can serve as an innovative way to deliver messages for health behavior change as long as they are appropriate for the target population (Smith 2013). In addition, due to the high prevalence of adolescents who own smart phones, activities utilizing these applications would be appropriate. The first activity utilized the “My Fitness Pal” application. This application was chosen due to its widespread popularity, reliability, and the type of information it delivers. Participants entered in a variety of foods to simulate an entire day of meals and snacks for

an individual. This activity can be found in Appendix D. Many of the participants stated that they would like to begin using this application in their own daily lives. Their comments can be found in Table 7. Next, participants compared various foods with the physical activities and times necessary to burn off the calories from these foods with the “Eat and Move O’Matic” application. This app was chosen for its ease-of-use, especially for young adolescents, and for the unique, helpful and often surprising information it delivers. The directions for this activity can be found in Appendix D. Participants were then given a handout on other applications that included descriptions of their functions and their prices (most were free). This handout can be found in Appendix D as well.

For the second section on Day 2, activities related to label reading were used. First, a video tutorial on how to properly read a nutrition label was shown which was created by the USDA. Then, using another application for smartphones and tablets called “Shopwell”, participants engaged in a consumer judging activity. This application allows consumers to scan food items and rates foods based on desired nutrition objectives, such as ‘low-fat’ or ‘low-sodium.’ Twenty-five food and drink items were set up on a table, and participants compared the various items in the categories based on a set list of criteria to determine the best item to purchase if they were grocery shopping.

The final section of the intervention included information on healthy eating. The first activity included a food demonstration of a ‘kid-friendly’ recipe from Michelle Obama’s “Let’s Move” campaign called “Apple Oat Balls” (Let’s Move 2012). Participants were able to taste the recipe following the demonstration. Two more “Price is Right” activities were then implemented entitled “Sneaky Sugar” and “Fast Food Frenzy.” For the “Sneaky Sugar” game, participants put in order pictures of commonly

consumed breakfast cereals, such as Raisin Bran from least to highest in sugar content . For “Fast Food Frenzy” the participants ranked fried chicken sandwiches and fries from a variety of fast food restaurants from least to most calories. This activity was included to stress to the participants that they should seek calorie information before ordering at restaurants and read nutrition labels, as calories can vary significantly among brands.

The next activity in this section was called “Social Cues.” For this activity, participants were given cards containing various situations adolescents might encounter regarding undesirable eating habits. Participants were asked to determine how the teen should handle the situations in order to make the healthiest decisions in each case. Participants then discussed their various solutions with the group. Finally, two handouts were discussed with the nutrition educators regarding healthy snacking and healthy lunchboxes which can be found in Appendix D.

To conclude the intervention, an ‘active’ review game was implemented before participants took the post-test questionnaire. The review game consisted of true and false statements to which participants had to either squat or do arm rolls based on whether they thought the statement was false or true respectively. Immediately following, participants filled out copies of the post-test questionnaire and instructor evaluations before being dismissed. Copies of both questionnaires can be found in Appendix C-1 and C-2 respectively.

### **Data analysis**

Descriptive statistics including mean and standard deviation of age, BMI, and history of years in their position with UGA Cooperative Extension were calculated. Gender, race/ethnicity, and level of education were used to describe the characteristics of

the sample. To examine differences in knowledge and confidence after completion of the intervention, paired t-tests were used. The level of statistical significance was defined at  $p < 0.05$ , and STATA, (Version 10, College Station, TX) was used to analyze the data.

## CHAPTER IV

### RESULTS

#### Characteristics of study sample

Ten UGA Cooperative Extension educators of low-income families were recruited to participate in the intervention. Table 4 shows the characteristics of the recruited participants. All ten participants were female. In addition, half of the participants were Non-Hispanic white, while the other 50% were divided between Black and Hispanic, with 20% of the participants Black, and 30% Hispanic. The education level of the study sample was also very diverse. The majority (50%) of the participants reported having completed ‘some technical school or college,’ but all education categories were represented, with one participant having earned a Master’s degree. In regards to age, the mean age of the participants was  $56.30 \pm 6.96$  years. The mean BMI of the participants was  $32.92 \pm 5.99 \text{ Kg/m}^2$ , indicating that the majority of the participants were obese. The mean years of experience as EFNEP employees were  $8.30 \pm 6.45$  years. Therefore, the majority of the participants were not new to their positions. No participants dropped out of the study.

Table 4. Characteristics of study sample: “Achieving Healthy Weights for Children and Teens” (n=10)

<b>Characteristic</b>	<b>Percent (%) or Mean<math>\pm</math>SD</b>
<b>Age (years)</b>	56.30 $\pm$ 6.96
<b>Gender</b> Female	10 (100%)

Male	0 (0%)
<b>Race/Ethnicity</b>	
Non Hispanic white	5 (50%)
Black	2 (20%)
Hispanic/Latino	3 (30%)
Asian	0 (0%)
Other	0 (0%)
<b>Level of Education</b>	
High school diploma or GED	2 (20%)
Some college or technical school	5 (50%)
Technical school associate degree	1 (10%)
College degree	1 (10%)
Graduate degree	1 (10%)
<b>BMI (kg/m<sup>2</sup>)</b>	32.92±5.99
<b>History of years at EFNEP</b>	8.30±6.45

Participants' nutrition education experience with obese individuals

At the end of the post-test questionnaire, participants were asked whether these nutrition educators had ever given nutrition education to obese individuals, and to explain their experience. Their responses can be found in Table 5. The majority of the participants reported that they have worked with obese individuals, with a mixture of positive and negative experiences amongst the participants, and a wide variety of venues in which they have delivered these educational messages.

Participants' nutrition education experience with adolescents

Participants were also asked whether they had ever given nutrition education to adolescents, and to again report their experiences. Almost all participants indicated they had some experience working with adolescents. The most common experiences listed were with the Head Start program or with 4H. These comments can also be found in Table 5. However, although most participants reported having experience working with adolescents, none have ever been educated on the factors leading to adolescent obesity for their positions as EFNEP paraprofessionals.

Table 5. Participant comments on their nutrition education experiences

<b>Have you ever given nutrition education to obese individuals? If so, please explain your experience.</b>	<b>Have you ever given nutrition education to adolescents? If so, please explain your experience.</b>
We discuss HBP and diabetes. And reducing salt in their diets.	We talk about portion control and how much sugar are in some drinks
I give the same information as I give the other clients and if they ask for information detailing their condition, I direct them to the resource available (Dr's or clinic).	Be aware of their age, the material must be age appropriate. Guide them to ask their parents for assistance in the materials I have asked them.
None	No
Health fairs. EFNEP classes have some people that are obese.	Healthy eating, wellness in Rockies, 4-H food-General nutrition
Stand offish by some and interested by others. Don't take you seriously.	No
I do have some obese people in my classes. Most seem to appreciate the information.	Head Start
Yes-Walk a Weigh, etc for community classes	4th grade and Head Start Program and pregnant teens. They seem more interested than some adults.
Yes, general nutrition (more in group classes)	I have taught classes for youth and get some good responses from them such as questions



	about which milk is the 'lowest' fat milk.
N/A	Yes, when I was helping with girl scouts we had cooking classes on healthy eating.
No	Yes- 4H summer workshops

### Implementation of intervention materials

#### Changes in knowledge and confidence, and overall satisfaction, among participants

Results of the average changes in knowledge of participants from pre-to post-questionnaire are shown in Table 6. There were twelve true/false questions evaluated, and results are shown based on how many questions out of twelve the participants scored correctly. After attending the intervention, participants increased knowledge from  $8.00 \pm 2.12$  to  $9.00 \pm 2.31$  on a scale of 0-12 (T-score= 2.54, DF= 9,  $p=0.016$ ).

Table 6. Changes in knowledge before and after the intervention addressing adolescent obesity issues

	<i>Number of sample, n</i>	<b># of Correct Responses (0-12)</b>		
		<b>Mean±SD</b>	<b>Standard Error</b>	<b>Range</b>
<b>Pre-test</b>	10	8.00±2.11	0.667	(5,11)
<b>Post-test</b>	10	9.00±2.31	0.730	(4,12)
<b>Difference</b>	N/A	1.00±1.25	0.394	N/A

Results of the changes in confidence, from pre-to post-questionnaire are shown in Table 7. Participants' confidence significantly increased on questions 2-4 regarding their confidence in their ability to identify symptoms of eating disorders, sources of sugar, and proper portion sizes of food ( $p<0.05$ ), but not question 1. This may be because question 1 was related to participants' confidence in their ability to read a nutrition label, which is

a skill they are trained on for their jobs as nutrition educators, and therefore should already be fairly confident in this ability.

Table 7. Changes in confidence addressing factors associated with adolescent obesity discussed during the intervention

<b>Question</b>	<b>Pre-Test Mean±SD (1-5)</b>	<b>Post-Test Mean±SD (1-5)</b>	<b>Difference</b>	<b>T-score</b>	<b>p-value</b>
<b>How do you feel about your ability to read a nutrition label?</b>	4.1±0.88	4.3±0.66	+0.2	-0.688	0.2543
<b>How do you feel about your ability to recognize disordered eating signs/symptoms?</b>	2.5±0.85	3.8±0.92	+1.3	-3.881	0.002
<b>How do you feel about your ability to identify different sources of sugar?</b>	3.2±1.14	4.3±0.48	+1.1	-2.704	0.012
<b>How do you feel about your ability to identify proper portion sizes of foods?</b>	3.8±0.92	4.6±0.52	+0.8	-2.704	0.012

Participant feedback on intervention activities

Participants were asked about what factors they thought contributed to the development of adolescent obesity. Their comments did not change between the pre- and post-test questionnaires. All ten of the participants were correct in their perceptions of the causes, some of which they postulated were related to limited physical activity, excessive portion sizes, overabundance of fast foods, etc. Their comments from both the pre- and post-test questionnaires can be found in Table 8. Two additional open-ended questions that had been asked on the pre-test were asked again to determine if any change in participants' perceptions had occurred between the two training days. The first question addressed whether the participants plan to use any smart phone or tablet

applications to monitor their nutrition or physical activity, and specifically indicate which ones. Their comments can be found in Table 9. From their responses on the pre-test questionnaire on whether they currently use these applications on their smart phones or tablets, only two participants reported that they currently do. After the second workshop, 100% of the participants reported that they plan to begin using an application to monitor their calorie intake and physical fitness.

Table 8. Participant comments on factors that contribute to adolescent obesity

<b>Pre-test questionnaire: What factors do you think contribute to adolescent obesity?</b>	<b>Post-test questionnaire: What factors do you think contribute to adolescent obesity?</b>
fast food, no exercise, poor diet	Fast food and no physical activity)
lack of activity, not enough of the right food in the right portions.	Lack of activity/portion size/junk food
Fast food, no physical activity	Fast food, no exercise
Inactivity, food choices, soft drinks, videogames	Environment, PE out of schools, sodas and sugary drinks, TV/computers, Fast food.
Not doing exercise and eating not healthy food	Wrong eating, not exercise. Watching too much TV. Video games.
The way that they are eating. Not getting physical activity	Not enough physical activity. Food portions
Heredity, junk foods, mentors, what parents feed their children	Parents not setting a good example. Processed foods are too easy to come by.
Too little exercise, fast food, the wrong choices for snacks.	I think the schools should offer more PE classes as well as parents doing exercise time with their kids.
Diet, lack of physical activity, foods	Portion control/food choices/lack of physical activity
Too much screen time-tablets, TV's computers, games, not enough time spent doing outdoor activities; not enough PE in schools; high sugar soft drinks, snacks.	Too much screen time, consuming too much fast food and high sugar drinks, not enough time spent exercising or going outside, PE being cut in schools.

Table 9. Participant comments on using phone apps to monitor their nutrition or physical activity

<b>Do you currently use any phone apps to monitor your own nutrition or physical activity? If so, which ones?</b>	<b>Do you plan to use any phone apps to monitor your own nutrition or physical activity? If so, which ones?</b>
No	Yes, Myfitness Pal and Shopwell
No	Yes, label reading
No	I do have plans to use one but I might not want apple??
Fitbit	Become more familiar with apps- Smart Shop and Fitness pal- all were good! Will try to track my food.
No	I will when I buy an iPod and both activities.
No	Yes, all of them
No	My fitness pal, Shopwell.
No	I already have 'Myfitness pal' on my computer and enjoy using it. I don't have an "iphone" but would enjoy the scanner 'shopwell'
No	All of them
MyFitness Pal; Lose it!	Eat and Move-omatic; MyFitness Pal, Shopwell, Runkeeper

Another open-ended question inquired about whether the participants would want to include any of the activities demonstrated at the workshop in their future nutrition classes. All of the participants indicated they would like to include at least one of the activities in their future classes, with the majority of participants commenting that they would like to include all of the activities. The food demo especially resonated well with the participants, as performing food demos is part of their current jobs, and they felt they could easily incorporate this into their current classrooms. Their comments can be found in Table 10.

Table 10. Participant comments on the intervention

<b>Activities EFNEP Program Assistants/Agents would like to incorporate</b>	<b>Aspects to improve in the future</b>
All of the activities	Very good training. The best since I've been attending these trainings.
The price is right game/measuring the fat in the product.	Keep on doing what you are doing. Wide spread
Exhibit board activities- especially w/cereals. Label reading. Add exercise activities in each session- liked the short exercise activity for class review. Scenarios would be good to use. Recipe.	Very good- choosing healthy snacks would be great for EFNEP clients
Yes, all activities incorporate	Specially at the lunch schools they give junk food.
Yes, but have to ask our coordinator	Did a good job.
Yes, all of them	All of the information offered was exceptional.
Fat count, sugar demo, price is right, physical activities. I enjoyed it all.	Outstanding class and presentation.
Label scanning, Price is Right (whole CD), Eat and Move O'matic	I can't think of one thing I would change- great class!!!
Yes- I loved them all!! I think they would work great for all EFNEP programming.	N/A
I thought all of the exercise type activities were great.	N/A

Another interesting finding from this study is that the majority of the UGA Cooperative Extension educators of low-income families included in this study were obese themselves, and many of them did not know a large amount of the nutrition information presented. The participants expressed that they often felt that their students didn't take them as seriously because they didn't 'look the part.' They felt that their students wouldn't want to listen to their advice if they didn't look like they were following it themselves.

### Participant feedback on overall satisfaction with the intervention

Participants were also asked to rate their overall satisfaction with the intervention on a scale of 0-4, with 0 being 'poor' and 4 being 'excellent.' 80% of the participants rated the workshop as 'excellent.' The other two participants may not have read the question appropriately, and therefore the data may not be accurate. This misinterpretation may be due to the fact that these participants' first language was not English, and it may have been an issue related to comprehension. It could have also been due to the layout of the question, which some participants may have found confusing.

Participants were also asked to give comments on how to improve the nutrition education materials. None of the participants provided any comments on how to improve the intervention, but stated instead that they thoroughly enjoyed this intervention, and would like more of their monthly trainings to be as interactive as this one. Their comments can also be found in Table 10.

## **CHAPTER V**

### **DISCUSSION/CONCLUSIONS**

The purpose of the present study was to develop, implement, and evaluate a nutrition education intervention on achieving healthy weights in children and teens for UGA Cooperative Extension educators of low-income families. The findings and lessons learned from this study show that the intervention significantly increased the knowledge and confidence of the UGA Cooperative Extension educators, and the participants also reported high satisfaction with the nutrition education intervention. This pilot study may serve as a model for adolescent obesity interventions for nutrition educators for low-income families in Georgia.

#### **Uniqueness of the “Achieving Healthy Weights for Children and Teens”**

##### **Intervention**

The “Achieving Healthy Weights for Children and Teens” intervention is unique in many aspects. First of all, this intervention was targeted to UGA Cooperative Extension educators who are members of the community in which they work. This allows them to communicate nutrition education messages to their students in a friendly, understandable way. Therefore, because adolescent obesity may disproportionately affects children and teens from low-income families, these educators may be able to make a greater impact on this ‘obesity epidemic’ in Georgia than educators not indigenous to those communities.

Second, UGA Cooperative Extension educators for low-income families have never been educated on the tools needed to educate their clients on the factors contributing towards the development of adolescent obesity. These educators typically focus their nutrition education classes on the parents of adolescents, but not on the adolescents themselves. These education classes are also only geared towards very basic nutritional messages, and therefore do not target obesity-related issues. Because parents have such a strong influence on the health of their children, it is important for these educators to understand the importance of communicating these strategies for reducing childhood obesity to the parents with whom they work (Poti and Popkin 2011).

Third, the “Achieving Healthy Weights for Children and Teens” intervention focused on improving the knowledge and confidence levels of the UGA Cooperative Extension educators about adolescent obesity issues. This focus was intended to help the educators stress the importance of adolescent obesity prevention to the parents they work with, and possibly incorporate these strategies into their own families. After the intervention, most of the participants reported that they would like to incorporate this information into their classes and families.

The “Achieving Healthy Weights in Children and Teens” intervention is also unique in that it employed the use of many interactive learning experiences to deliver the content as opposed to simply using lectures and PowerPoint presentations. These learning experiences included games, videos, group work and discussions, a food demo and activities involving electronic smart phone and tablet applications. The incorporation of a wide variety of activities contributed to the high level of group satisfaction with the



intervention, in addition to reflecting current trends in increasing access to online and mobile apps.

### **Strengths**

This pilot-nutrition education intervention has many strengths. To our knowledge, this is the first and only intervention targeting adolescent obesity for UGA Cooperative Extension educators of low-income families in Georgia. The evaluation questionnaire used to measure the knowledge and confidence of the participants was validated in a comparable sample of six UGA Cooperative Extension educators from the Athens, GA area to ensure questions were readable and understandable to accommodate their unique education levels. Expert input from Registered Dietitians who had extensive working experiences with the Cooperative Extension educators was used to ensure the intervention materials would be understood and implemented as intended, and could be potentially translated for an adolescent audience in the future. Another major strength was the use of creative, interactive methods for delivery of the intervention topics, including hands-on activities, group work, videos, and even activities incorporating the use of applications for smart phones and tablets- which are quickly becoming the way of the future for nutrition and health education (Boulos et al 2011). Therefore, these strengths show that this nutrition education intervention can contribute to the development of materials for quality nutrition education for educators for low-income families in Georgia.

### **Limitations**

Although this study has many unique strengths, it has several limitations that need to be considered. This pilot study was conducted in a small convenience sample, as only

ten participants were recruited, and therefore results may not be generalizable to a larger population. Further studies are warranted with a larger sample of diverse nutrition educators for low-income families with adolescents. In addition, this study used the self-reported pre- and post-test questionnaires which were also hand-written. Because of this, some of the free-response answers could not be read by the researchers. A comprehensive issue may have arisen due to the potential language barrier of some of the participants whose first language was not English. Because of this, these participants may not have understood some of the questions asked on the questionnaires, or may not have correctly understood some of the program material delivered. Another limitation is that the pre-test questionnaire was given at the beginning of the first portion of the training workshop, while the second was given two weeks later, at the end of the second workshop. While a short review game was provided before the post-test questionnaire, the participants may have forgotten a large portion of the information covered during the first session. This may have contributed to a smaller, but still statistically significant increase in knowledge.

In conclusion, this nutrition education intervention helped increase the knowledge and confidence of UGA Cooperative Extension nutrition educators for low-income families regarding factors associated with adolescent obesity, and may serve as a model for the implementation of such a program in future lesson plans for adolescent participants.

### **Implications**

This study has several implications for key research for future implementation. Our data show that the knowledge and confidence of the UGA Cooperative Extension

educators for low-income families significantly improved after using our intervention materials. Therefore, these materials may be useful in developing future nutrition education interventions for this population. However, as this intervention was delivered to nutrition educators of low-income families, this training also needs to be evaluated in regards to how it can be translated for use in an adolescent population directly, and its potential impacts on adolescent obesity.

Because this was a pilot-nutrition education intervention, part of its purpose was to test all of the materials developed, the delivery method, and even the wording and use of questions on the pre and post-test questionnaires. Therefore, with the responses from the study participants, in addition to evaluation of the data, there are several areas that can be improved upon for future use of these program materials, especially in the wording of questions on the questionnaires.

Since the majority of the participants were obese themselves, it may be beneficial for a nutrition education intervention to be implemented in this group of educators along with learning about obesity issues in another population. Many of the participants in this study might benefit from a weight loss intervention themselves, and even expressed interest in applying the information covered during the workshop to their own lives. The educators themselves acknowledged that they would be more effective if they could model the healthy lifestyles they are promoting. This would allow them to feel more confident in the material they are teaching because they would personally know it is effective, and their students would be more likely to trust and follow their advice. Therefore, everyone involved, including the instructors and even the parents, should be active participants in an intervention targeting adolescent obesity.

Future use of this program would involve getting approval from UGA Cooperative Extension to incorporate these materials into the standard education materials for the nutrition education program for low-income families already in existence: EFNEP. It would also involve translating the materials for future implementation of these materials for an adolescent population, rather than for the adult parents who currently attend these Extension programs. In addition, the training would need to be expanded to the rest of the UGA Cooperative Extension educators of low-income families throughout Georgia. Also, EFNEP has never incorporated physical activities into their lessons. The participants did all agree, however, that physical activity breaks would be an excellent addition to their lesson plans, since they felt they kept them mentally alert during the educational sessions, along with reducing sedentary behavior.

Obesity is a critical issue among adolescents in Georgia and the United States as a whole, and may disproportionately affect low-income adolescents. Proper training of individuals who educate this population could potentially reduce the risk for obesity in youth and adults and the health issues related to it.

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## APPENDICES

### APPENDIX A

#### TIMELINE

<b>Month(s)</b>	<b>Activities</b>
August-September 2012	<ul style="list-style-type: none"><li>• Brainstormed ideas for intervention development</li></ul>
Fall 2012- Spring 2013	<ul style="list-style-type: none"><li>• Developed intervention curriculum</li></ul>
Summer 2013	<ul style="list-style-type: none"><li>• Obtained UGA IRB</li></ul>
July 2013	<ul style="list-style-type: none"><li>• Validation of pre-post questionnaires</li><li>• Questionnaires edited based on validation comments</li><li>• UGA Cooperative Extension Agent contacted to begin recruitment of participants/establish intervention dates</li></ul>
August 2013	<ul style="list-style-type: none"><li>• Intervention materials photocopied and placed in binders</li><li>• Final run-through of intervention</li><li>• Final supplies purchased for intervention</li></ul>
September 2013	<ul style="list-style-type: none"><li>• First half of intervention implemented</li><li>• Informed consent forms and pre-test questionnaires collected</li></ul>
October 2013	<ul style="list-style-type: none"><li>• Second half of intervention implemented</li><li>• Post-test questionnaires collected</li></ul>

## **APPENDIX B**

### **INFORMED CONSENT FORM**

#### **THE IMPACT OF ADOLESCENT OBESITY NUTRITION EDUCATION INTERVENTION ON THE KNOWLEDGE AND CONFIDENCE OF EFNEP AGENTS AND PROGRAM ASSISTANTS IN GEORGIA**

I, \_\_\_\_\_, agree to take part in a research study titled “The Impact of a Seminar on Achieving Healthy Weights in Adolescents on the Knowledge and Confidence of EFNEP Agents and Program Assistants in Georgia,” which is being conducted by Melissa Kaus from the Department of Foods and Nutrition at the University of Georgia (678-215-2565), under the direction of Dr. Jung Sun Lee from the Department of Foods and Nutrition at the University of Georgia (706-542-6783). My participation is voluntary; I can refuse to participate or stop taking part at any time without giving any reason, and without penalty or loss of benefits to which I am otherwise entitled. If I decide to withdraw from the study, the information that can be identified as mine will be kept as part of the study and may continue to be analyzed, unless I make a written request to remove, return, or destroy the information.

The purpose of this study is to test adolescent obesity nutrition education materials among Georgia EFNEP Agents and Program Assistants.

The benefits that I may expect from this study include increased knowledge of the factors associated with adolescent obesity.

The researchers also hope to learn more about the effectiveness of the nutrition education materials in helping to train Georgia EFNEP Agents and Program Assistants on how to help achieve healthy weights in low-income children and teens in Georgia.

If I volunteer to take part in this study, I will be asked to do the following things:

- Fill out a pre-and post-test before and after the training seminar to determine my knowledge of and attitudes towards adolescent obesity. Each questionnaire will take about 10 minutes to complete.
- Undergo two nutrition education interventions to be held in Savannah, Georgia that will take up to a total of 10 hours to complete.

No risk is expected, but I may experience discomfort or stress when the researchers ask me questions about my knowledge of and attitudes towards adolescent obesity. I understand that participation is voluntary and that I may withdraw at any time without any penalty or loss of benefits to which I am otherwise entitled. I also do not have to answer questions that

make me feel uncomfortable. I will be encouraged to contact the researchers if I have any questions following the seminar.

The individually-identifiable information that I provide will be kept confidential. The only people who will know that I am a research subject are members of the research team. I will be assigned an identifying number and this number will be used on all of the pre- and post-tests I fill out. The code key to these identifying numbers will be destroyed after 2 years. No individually-identifiable information about me, or provided by me during the research, will be shared with others, unless required by law.

The researcher will answer any further questions about the research, now or during the course of the project, and can be reached by telephone at: 706-583-0116 (office) or 678-215-2565 (cell).

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

<u>Melissa Kaus</u>	_____	
Name of Researcher	Signature	Date
Telephone: <u>706-583-0116 (office) or 678-215-2565 (cell)</u>		
Email: <u>melissa.kaus@gmail.com</u>		
_____	_____	_____
Name of Participant	Signature	Date

**Please sign both copies, keep one and return one to the researcher.**

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 629 Boyd Graduate Studies Research Center, Athens, Georgia 30602; Telephone (706) 542-3199; E-Mail Address [IRB@uga.edu](mailto:IRB@uga.edu)

**APPENDIX C-1**

**PRE-QUESTIONNAIRE**

**THE IMPACT OF A NUTRITION EDUCATION INTERVENTION ON  
ACHIEVING HEALTHY WEIGHTS IN ADOLESCENTS ON THE  
KNOWLEDGE AND CONFIDENCE OF EFNEP AGENTS AND PROGRAM  
ASSISTANTS IN GEORGIA  
Pre-Questionnaire**

**Participant ID:** \_\_\_\_\_

**Date (M/D/Y):** \_\_\_\_\_

**This is not a test; please be honest with your answers. These answers will help us improve our training program.**

**1. How do you feel about your ability to read a nutrition label?**

- 1- Not at all comfortable
- 2- Slightly comfortable
- 3- Moderately comfortable
- 4- Very comfortable
- 5- Extremely comfortable

**2. How do you feel about your ability to recognize disordered eating signs/symptoms?**

- 1- Not at all comfortable
- 2- Slightly comfortable
- 3- Moderately comfortable
- 4- Very comfortable
- 5- Extremely comfortable

**3. How do you feel about your ability to identify different sources of sugar?**

- 1- Not at all comfortable
- 2- Slightly comfortable
- 3- Moderately comfortable
- 4- Very comfortable
- 5- Extremely comfortable

**4. How do you feel about your ability to identify proper portion sizes of foods?**

- 1- Not at all comfortable
- 2- Slightly comfortable

- 3- Moderately comfortable
- 4- Very comfortable
- 5- Extremely comfortable

**Circle whether these statements are True or False.**

- 5. **True or false.** Soybean, cottonseed, and safflower oils are lower in calories than butter and lard.
- 6. **True or false.** Lifting weights is considered aerobic physical activity.
- 7. **True or false.** People with bulimia nervosa are usually underweight.
- 8. **True or false.** When interpreting a child/teen’s BMI, it must first be converted into a percentile based on weight and age.
- 9. **True or false.** Obese children have many of same health concerns as that of an obese 25 year old.
- 10. **True or false.** Weight loss is unnecessary for obese children because they grow into their weight.
- 11. **True or false.** 1 gram of fat contains 4 calories.
- 12. **True or false.** According to the nutrition label below, if someone were to eat the full container of this food, they would consume 14 g of fat.

<b>Nutrition Facts</b>	
Serving Size 1/2 cup (115g)	
Servings Per Container About 4	
Amount Per Serving	
Calories 250	Calories from Fat 130
% Daily Value*	
Total Fat 14g	22%
Saturated Fat 9g	45%
Cholesterol 55mg	18%
Sodium 75mg	3%
Total Carbohydrate 26g	9%
Dietary Fiber 0g	0%
Sugars 26g	
Protein 4g	
Vitamin A 10%	Vitamin C 0%
Calcium 10%	Iron 0%

\*Percent Daily Values are based on a 2,000 calorie diet.

[http://nutritionu.files.wordpress.com/2012/02/nutritional\\_label.gif](http://nutritionu.files.wordpress.com/2012/02/nutritional_label.gif)

- 13. **True or false.** A 1-ounce portion of meat is about the size of the palm of your hand.
- 14. **True or false.** It is recommended that teens get 60 minutes of moderate physical activity every day.
- 15. **True or false.** Screen time for children and teens should be limited to 3 hours or less per day.



**16. True or false.** Brown sugar is a healthier alternative to white sugar.

**17. What factors do you think contribute to an adolescent becoming obese?**

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**18. Do you currently use any phone apps to monitor your nutrition or physical activity? If so, which ones?**

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**APPENDIX C-2**

**POST-QUESTIONNAIRE**

**THE IMPACT OF A NUTRITION EDUCATION INTERVENTION ON  
ACHIEVING HEALTHY WEIGHTS IN ADOLESCENTS ON THE  
KNOWLEDGE AND CONFIDENCE OF EFNEP AGENTS AND PROGRAM  
ASSISTANTS IN GEORGIA  
Post-Questionnaire**

**Participant ID:** \_\_\_\_\_

**Date (M/D/Y):** \_\_\_\_\_

This is not a test; please be honest with your answers. These answers will help us improve our training program.

**1. How do you feel about your ability to read a nutrition label?**

- 1- Not at all comfortable
- 2- Slightly comfortable
- 3- Moderately comfortable
- 4- Very comfortable
- 5- Extremely comfortable

**2. How do you feel about your ability to recognize disordered eating signs/symptoms?**

- 1- Not at all comfortable
- 2- Slightly comfortable
- 3- Moderately comfortable
- 4- Very comfortable
- 5- Extremely comfortable

**3. How do you feel about your ability to identify different sources of sugar?**

- 1- Not at all comfortable
- 2- Slightly comfortable
- 3- Moderately comfort able
- 4- Very comfortable
- 5- Extremely comfortable

**4. How do you feel about your ability to identify proper portion sizes of foods?**

- 1- Not at all comfortable

- 2- Slightly comfortable
- 3- Moderately comfortable
- 4- Very comfortable
- 5- Extremely comfortable

**Circle whether these statements are True or False.**

- 5. **True or false.** Soybean, cottonseed, and safflower oils are lower in calories than butter and lard.
- 6. **True or false.** Lifting weights is considered aerobic physical activity.
- 7. **True or false.** People with bulimia nervosa are usually underweight.
- 8. **True or false.** When interpreting a child/teen’s BMI, it must first be converted into a percentile based on weight and age.
- 9. **True or false.** Obese children have many of same health concerns as that of an obese 25 year old.
- 10. **True or false.** Weight loss is unnecessary for obese children because they grow into their weight.
- 11. **True or false.** 1 gram of fat contains 4 calories.
- 12. **True or false.** According to the nutrition label below, if someone were to eat the full container of this food, they would consume 14 g of fat.

<b>Nutrition Facts</b>	
Serving Size 1/2 cup (115g)	
Servings Per Container About 4	
Amount Per Serving	
Calories 250	Calories from Fat 130
% Daily Value*	
<b>Total Fat</b> 14g	<b>22%</b>
Saturated Fat 9g	<b>45%</b>
<b>Cholesterol</b> 55mg	<b>18%</b>
<b>Sodium</b> 75mg	<b>3%</b>
<b>Total Carbohydrate</b> 26g	<b>9%</b>
Dietary Fiber 0g	<b>0%</b>
Sugars 26g	
<b>Protein</b> 4g	
Vitamin A 10%	Vitamin C 0%
Calcium 10%	Iron 0%

\* Percent Daily Values are based on a 2,000 calorie diet.  
[http://nutritionu.files.wordpress.com/2012/02/nutritional\\_label.gif](http://nutritionu.files.wordpress.com/2012/02/nutritional_label.gif)

- 13. **True or false.** A 1-ounce portion of meat is about the size of the palm of your hand.
- 14. **True or false.** It is recommended that teens get 60 minutes of moderate physical activity every day.

**15. True or false.** Screen time for children and teens should be limited to 3 hours or less per day.

**16. True or false.** Brown sugar is a healthier alternative to white sugar.

**17. What is your gender?** (Please circle one.)      Male    Female

**18. What is your race/ethnicity?** (Please circle one.)      White    Black  
Hispanic/Latino    Asian    Other

**19. Please circle your highest level of education:**

High School diploma or GED    Some college or technical school      Technical school  
associate  
degree

College degree                      Graduate degree

**20. What is your age?** \_\_\_\_\_

**21. What is your height?** \_\_\_\_\_

**22. What is your weight?**\_\_\_\_\_

**23. How many years have you been an EFNEP Program Assistant?** \_\_\_\_\_

**24. Have you ever given nutrition education to obese individuals? If so, please explain your experience below.**

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**25. Have you ever given nutrition education to adolescents? If so, please explain your experience below.**

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**26. If you were going to teach an EFNEP class, would you like to incorporate any of the activities demonstrated throughout the nutrition education workshop with them? If so, which ones?**

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**27. Do you plan to use any phone apps to monitor your own nutrition or physical activity? If so, which ones?**

---

---

**28. What factors do you think contribute to an adolescent becoming obese?**

---

---

**29. What is your overall satisfaction with the adolescent obesity nutrition education workshop?**

Circle one: Poor (0) Fair (1) Good (2) Very good (3) Excellent (4)

**30. Do you have any comments on how we can improve our nutrition education materials?**

---

---



# My Screen Time Tally Sheet

Please write below your minutes spent watching TV or sitting at a computer today:

Minutes	TV	Computer

Please make a tally below of the food-related commercials you saw on TV today:

## Social Cues Role Playing Cards

Instructions: Print these situations on card stock and cut into individual cards. Make enough so that each pair of participants has two. Allow them to brainstorm solutions. Have each pair share possible solutions with entire group.

<p style="text-align: center;"><b>Situation</b></p> <p>You are at a party and your friends are urging you to eat a big pizza with them. You know they expect you to dig right in.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>	<p style="text-align: center;"><b>Situation</b></p> <p>Your church has a weekly supper before choir practice. Your family enjoys going, but you tend to overeat.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>
<p style="text-align: center;"><b>Situation</b></p> <p>You are at a movie with two friends. They want to buy a jumbo tub of popcorn and a large candy bar to share.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>	<p style="text-align: center;"><b>Situation</b></p> <p>You normally walk after school, but today it is very cold and rainy and your friend says "let's skip it."</p> <p style="text-align: center;"><b>How do you handle it?</b></p>



<p style="text-align: center;"><b>Situation</b></p> <p>Your mom is having a birthday party for you and she has made your favorite chocolate cake with homemade ice cream.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>	<p style="text-align: center;"><b>Situation</b></p> <p>Your friends are going out after a concert to have dessert at the best dessert place in town.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>
<p style="text-align: center;"><b>Situation</b></p> <p>You want to go to a 5:30 pm exercise class at the gym, but your family has dinner at 6 pm.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>	<p style="text-align: center;"><b>Situation</b></p> <p>Your family vacations at the beach where they sit in the sun, eat at buffets and play video games all evening.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>
<p style="text-align: center;"><b>Situation</b></p> <p>Several times a week you go out to fast food restaurants with your friends. You need to cut back on calories and fat.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>	<p style="text-align: center;"><b>Situation</b></p> <p>Your family loves to snack on high calorie food in front of the TV. You want to stop doing this.</p> <p style="text-align: center;"><b>How do you handle it?</b></p>



## Nutrition and Physical Activity Apps

App	Cost	Technology	What it does	Classroom use
<b>Nutrition and Physical Activity</b> MyNet Diary <i>Middle school and High school</i>	iPhone—Free iPad- \$9.99 Android-\$3.99	iPhone, iPad, Android, Blackberry, Online	Calorie counter that tracks your food intake and calories burned while exercising. Daily analysis that lets you know if you stayed on track and what areas of your diet need improvement. Online website that lets you interact with a community, where RDs write articles, blogs, and answer questions.	Type in what students ate the day before to show them how many calories they are actually consuming. A good way for students to see how quickly calories can add up, and what an impact making a healthier decision can be.
Calorie Counter & Diet Tracker by MyFitness Pal <i>Middle school and High school</i>	Free	iPhone, iPad, Android, Blackberry, Windows phone	Tracks food eaten and calories burned during exercise. Also, tracks important vitamins like Vitamin A and C, calcium, and iron. Online community where you can interact with your friends. However, the advice given is not by professionals.	Another good way to show students how many calories they are consuming in a day. The classroom can use the app to help motivate each other to make healthy decisions and stay on track. They can also see what kind of exercises their friends have performed.
Eat-And-Move-O-Matic <i>Middle school</i>	Free	iPhone	Tells you the calories in certain drinks and foods, and tells you how long you would have to perform different activities to burn off those calories.	Students compare how much time they have to do a certain activity, like playing soccer, to burn off the calories consumed from different types of foods.
LiVe <i>Middle school</i>	Free	iPhone and Android	Interactive app to teach kids about healthy habits like eating breakfast, limiting screen time, and increasing physical activity. Ability to track intake of foods. Includes indoor and outdoor activity ideas, and ideas for eating meals as a family.	Each week share a new idea with your classroom such as a new indoor physical activity, a breakfast idea, or a way to get conversation flowing at the dinner table.
<b>Physical Activity</b> Get Running-Couch to 5K <i>Middle school and High school</i>	\$2.99	iPhone and Android	Kid friendly training app for beginner runners. This app takes you from running one minute to running for a full 30 minutes through a nine-week program.	Start a class 5K training program to get kids exercising. For students who don't have access to the app, you can hand out a list of the running schedule for each week.

App	Cost	Technology	What it does	Classroom use
RunKeeper <i>Middle school and High school</i>	Free	iPhone and Android	Uses GPS to track your running, walking, cycling, and hiking activities. You can set a mileage or calorie goal for the month and track your progress.	Encourage the class to join RunKeeper and track their activities. The class can keep up with each other's progress and motivate each other. Competitions are always fun! Students who don't have access to the app can write down their activities and share in class.
Monumental <i>Middle school</i>	Free	iPhone	Encourages kids to take the stairs instead of elevators by tracking the amount of stairs they climb each day. Once they climb a certain number of stairs, they reach the top of a monument where they explore and collect souvenirs.	If your school has stairs, you can use the app to track the amount of steps your class climbs. If your students have access to the app outside of class, you could encourage a little classroom competition to see who reaches the top of a monument the quickest.
Iron Kids <i>Middle school</i>	\$3.99	iPhone	Created by the American Academy of Pediatrics to provide workouts for young athletes to build strength, balance, and fitness while preventing injuries.	Demonstrate different workouts that the kids can do at home.
<b>Nutrition</b> Healthy Diet and Grocery Food Scanner by ShopWell <i>Middle school and High school</i>	Free	iPhone	Scans the barcode of food products to let you know if they are a good match or not for your nutrition goals. If the product is not a good match, it will suggest other products that are.	Have different scenarios written on handouts for students, and different labels placed around the classroom. Let them scan the labels and determine which product is the best option for each scenario.
Munch 5-a-Day <i>Middle school</i>	Free	iPhone	Tracks how many fruits and vegetables you eat each day. Earn badges when you meet your goals. You can also monitor your progress through 7 and 30 day graphs.	Encourage students to track the amount of fruits and vegetables they are eating each day. You can make a handout for kids who don't have access to the app to track their intake.
Smash Your Food HD <i>Middle school and High school</i>	\$2.99	iPhone	Smash up foods like hamburgers and pizza, and watch drinks explode while learning about nutrition. Designed to teach kids and parents how much sugar, fat, and salt are in the foods they consume.	Review one video per week to teach students about sugar, salt, and fat in the foods they consume in a way they won't forget.

**Publication # FDNS-E 173-4**

**Date 3/2013**

**Megan Lindler, Dietetics Student and Connie Crawley, MS, RD, LD Nutrition and Health Specialist**

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## **How to Control Binging**

- **Keep an emotional eating record on a 3x5 card labeled with TIME, LOCATION, FOOD and EMOTION across the top to record unplanned snacks.** Then analyze it honestly to see what stimulates your emotional eating and how you can change it.
- **Find other ways to reward yourself besides food.** People actually overeat more when they are happy than when they are sad, depressed or lonely.
- **Pre-plan how much you will eat, especially when eating away from home.**
- **Take a walk or do other physical activity to handle anxiety, depression or other emotions .**
- **Relax when stressed by breathing deeply, meditating, writing in a diary or doing yoga or tai chi.**
- **Limit exposure to the kitchen and vending machines late in the day or early in the evening.** Do something away from the food. Don't carry money for the machines.
- **Make food harder to eat.** Eat raw vegetables and fruits that you have to chew. Use a utensil to eat everything including sandwiches and other foods you typically eat with your hands. Only eat nuts if they are in the shell.
- **Get more sunlight to improve your mood.**
- **Watch happier TV shows and movies.**
- **Attend religious services so you learn to respect your body.** Skip the church dinners.
- **Try a support group either face-to-face or online.**

***Adapted from content on WebMD***



(iPhone Only)



## Eat-and-Move-O-Matic

### Scenario A

How long would you have to walk at a light pace to burn off 1 large soda?

- VS 1 cup of water?

### Scenario B

How long would you need to play basketball to burn off a ¼ lb. burger combo that includes 1 burger, a 12-ounce soda and small fries?

- VS a spinach salad with grilled chicken?

### Scenario C

If you ate a full-size candy bar, how long would you need to play video games to burn it off?

- How about watching TV?
- What about if you went outside and played soccer?

### Scenario D

How long would you need to dance to burn off one breaded chicken sandwich?

- VS a grilled chicken sandwich?

### Scenario E

If you ate a snack of celery and peanut butter, how long would you need to swim to burn it off?

- VS if you had a snack of chips and a soda?



## **HOT TAMALE**

### How to play:

- On the board or overhead, the teacher should write each direction and corresponding activity to make it easier for the students to remember.
  - Move backwards—back stroke (swimming motion)
  - Move forward—march in place
  - Move to either side—side stretch in the direction of the hot tamale
  - Up higher—climbing ladder motion
  - Down lower—squats
  - Within one foot of the tamale—students pretend they are stepping on hot coals (in place)
- The teacher should choose one student to exit the classroom.
- The rest of the class will watch the teacher hide the “hot tamale”, which can be any object, somewhere in the classroom.
- The student who left the classroom may now re-enter the room.
- The rest of the class will try to guide him/her to the hidden tamale by performing the various physical activities, with each activity corresponding to a different direction. Students should remain quiet throughout this activity.
- Once the student locates the “hot tamale”, another student may be selected to exit the classroom and the “hot tamale” is hidden in another location so the game can be repeated until 10 minutes of physical activity has been completed.

Adapted from Walter L. Parsley Elementary School. Classroom Based Physical Activities.  
Internet:<http://teacherpages.nhcs.net/schools/parsley/karlysokolowski/Pages/ClassroombasedPhysicalActivities.aspx>



## **TRUE OR FALSE**

### How to play:

- The teacher should instruct the students to get up and stand beside their desk.
- When reviewing a subject, the teacher will call out a series of true or false statements.
- Students will answer the statements by either running in place if the answer is true or doing squats if the answer is false for at least 15 seconds.
- This can be used for any type of review session, and different types of movements can be chosen.

### Examples of Movements:

- Squats
- Forward lunges
- Backward lunges
- Jogging in place
- Running in place
- Jumping jacks
- Dancing
- Push-ups
- Sit-ups
- Pretend to jump rope
- Touch toes

Adapted from Walter L. Parsley Elementary School. Classroom Based Physical Activities.  
Internet: <http://teacherpages.nhcs.net/schools/parsley/karlysokolowski/Pages/ClassroombasedPhysicalActivities.aspx>





## **ZERO IN**

### How to play:

- Students will use clues from the class in order to “zero in” on a secret number.
- The teacher will choose a student to come to the front of the classroom and be the first one to guess the “secret number.”
- The student will face the front of the class with their back to the board, while the teacher is writing the “secret number” on the board. The number can be anywhere from 1 to 1,000.
- The class and the student begin to march in place.
- The student will then guess a number, and the class will answer by giving a clue. If the “secret number” is higher than the guess, the class will do jumping jacks as the clue. If the “secret number” is lower than the guess, the class does squats as the clue. The class will continue giving clues until another number is called so that they are continuously active. The student guessing continues to march the whole time.
- The student guessing continues to guess until they “zero in” on the correct number.
- Once the student has chosen the correct number, chose another student to “zero in” on a new secret number until the game has been played for 10 minutes.

Adapted from Take 10! ILSI Research Foundation. Hasbrouck Heights: Flaghouse Inc., 2011.

# Healthy Eating

## Snack Tips and Ideas

**BROUGHT TO  
YOU BY THE  
UNIVERSITY  
OF GEORGIA  
COOPERATIVE  
EXTENSION**

Based on information  
from the Academy of  
Nutrition and Dietetics,  
Shape magazine, Fitness  
magazine, Tuft's  
University, and Health  
magazine

Contact your local office at



College of Agricultural and Environmental Sciences  
College of Family and Consumer Sciences



- Snacks can come from all the food groups in MyPlate
- Serve the correct portion sizes
- Establish set snacking times
- Don't snack too close to a meal
- Keep sugar at a minimum
- Have a bowl of fresh fruit on the table and fresh cut vegetables in the refrigerator

### **Under 100 Calories**

- \* 2 tablespoons of hummus with 1 cup of fresh vegetables
- \* 100 calorie pack of popcorn
- \* Chocolate pudding cup topped with 1 crushed graham cracker
- \* 1/2 cup of edamame (green soy beans) in shell with a dash of coarse salt
- \* 1 ounce of pretzels
- \* 1 cup of strawberries and 2 tablespoons of fat free whipped topping
- \* 100 calorie Greek yogurt cup
- \* 1 fresh peach, apple, pear, orange



### **100-200 Calories**

- \* 1 medium apple and 1 tablespoon of peanut butter
- \* 1 cup of grapes and 11 almonds
- \* 1/2 cup of lemon sorbet and 3/4 cup of raspberries
- \* 5 Hershey's Special Dark kisses
- \* 1 cup of strawberries with 2 tablespoons of chocolate syrup
- \* 10 reduced fat wheat thins and 1 mozzarella cheese
- \* Frozen banana, sliced
- \* 49 pistachios and 1/2 fresh fruit
- \* 1 ounce baked chips and 1/2 cup of salsa
- \* 1/4 cup of guacamole and 1 sliced bell pepper



**Publication** FDNS-E 174-8

**Date** May 2013

Adapted by Megan Lindler, Dietetics Student and Connie Crawley, MS, RD, LD Nutrition and Health Specialist

The University of Georgia and Ft. Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. Cooperative Extension, the University of Georgia Colleges of Agricultural and Environmental Sciences and Family and Consumer Sciences, offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, gender or disability.

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## High on Fat Activity

### Purpose:

- Participants will visualize the amount of fat in common foods.
- Participants will learn to convert grams of fat into teaspoons so they can understand how much fat they are consuming.

### Materials:

10 measuring spoons

10 small paper plates

10 small plastic storage bags - each containing 1  $\frac{1}{2}$  cups of shortening

Paper towels

10 inexpensive calculators

10 Index cards with the information for one food to be analyzed attached to each one of them

10 plastic knives

1-2 long tables covered with disposable tablecloths

Clean up supplies

### Before the Activity:

- Print off the sheet of foods with their fat content. Cut the squares apart and paste each square onto a different index card.
- Set up a different station for each food to be analyzed on a long table. Each station should have a paper towel as a

placemat, 2 paper plates, a plastic knife, a calculator (if needed two stations can share one calculator), a set of measuring spoons, a folded paper towel as a napkin, and a bag of sugar or shortening.

- At the top of each placemat, place one of the index cards with the food information.

Instructions for the Activity:

- Assign 2 -4 people to each station as a team.
- Have each team to use the calculator to figure out how many teaspoons of fat are in the food on their index card.
- Tell them to find the number of teaspoons of fat, they should divide the total grams by 4.
- Then have them measure out from each bag of shortening, the number of teaspoons of fat in their particular food. Have them measure over one plate and then place the required amount on the other plate.
- Once all measurements are done, have everyone visit each station to see how much fat is in each food on the index cards.
- Ask people what they learned. Point out that they can do the same thing with grams of fat on nutrition labels. For restaurant foods, they will need to go to the web sites of each restaurant to find the nutrition information.

How Much Fat?	
<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>Burger King's Cheese, Sausage and Egg Croissan'Wich</b></p> <p style="text-align: center;"><b><u>32 grams of fat</u></b></p> <p style="text-align: center;"><b>Medium Hash Brown Rounds <u>28 grams of fat</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>	<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>Zaxby's House Salad with Fried Chicken Fingers</b></p> <p style="text-align: center;"><b><u>50 grams of fat</u></b></p> <p style="text-align: center;"><b>2 packets of Ranch Dressing</b></p> <p style="text-align: center;"><b><u>40 grams of fat</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>
<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>McDonald's Quarter Pounder with Cheese</b></p> <p style="text-align: center;"><b><u>26 grams of fat</u></b></p> <p style="text-align: center;"><b>Medium Fries</b></p> <p style="text-align: center;"><b><u>19 grams of fat</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>	<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>8 Honey BBQ Wings</b></p> <p style="text-align: center;"><b><u>60 grams of fat</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>

<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>Large Dairy Queen Hot Fudge Sundae</b></p> <p style="text-align: center;"><b><u>20 grams of fat</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>	<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>2 large slices of Meat Lovers Pizza</b></p> <p style="text-align: center;"><b><u>54 grams of fat</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>
<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>On the Border Grande Taco Salad with NO Dressing</b></p> <p style="text-align: center;"><b><u>102 grams of fat</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>	<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>2 Chocolate Donuts</b></p> <p style="text-align: center;"><b><u>38 grams of fat</u></b></p> <p style="text-align: center;"><b>1 large Coffee with cream</b></p> <p style="text-align: center;"><b><u>12 grams</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>

<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>3 pieces of Popeye's Fried Chicken (<u>37 grams</u>) with Red Beans and Rice (<u>19 grams</u>), Biscuit (<u>13 grams</u>) and Coleslaw (<u>23 grams</u>)</b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>	<p style="text-align: center;"><b>How Much Fat?</b></p> <p style="text-align: center;">Fill the plate with the appropriate amount of fat for</p> <p style="text-align: center;"><b>1 piece Oreo Cheese Cake</b></p> <p style="text-align: center;"><b><u>61 grams of fat</u></b></p> <p style="text-align: center;"><b>(4 grams equals one teaspoon and 12 grams equals 1 tablespoon)</b></p>
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## ***Jason Junker***

### **Breakfast**

1. Type in "Lucky Charms", and choose "Lucky Charms (General Mills with Whole Grain)." Make sure the serving size is "3/4 cup", and change the number of servings to "2".
2. Type in "whole milk", and choose "Milk-Whole, 3.25% milkfat." Make sure the serving size is "1 cup", and the number of servings is "1".

### **Morning Snack**

1. Type in "Doritos", and choose "Nacho Cheese (Doritos Small Box)." Make sure the serving size is "1 bag (1 oz)" and the number of servings is "1".

### **Lunch**

1. Type in "Tyson chicken nuggets", and choose "Fully Cooked Chicken Nuggets (Tyson)." Make sure the serving size is "5 nuggets" and the number of servings is "1".
2. Type in "Ore-Ida French fries", and choose "Ore-Ida Golden Crinkle French Fried Potatoes." Make sure the serving size is "12 pieces (3oz)" and the number of servings is "1".
3. Type in "Green beans", and choose "Del Monte (Green Beans)." Make sure the serving size is "1/2 cup" and the number of servings is "1".
4. Type in "Corn", and choose "Corn- Sweet, yellow, canned, whole kernel, drained solids." Make sure the serving size is "1 cup" and the number of servings is "1/2".
5. Type in "Ketchup", and choose "Tomato Ketchup (Hunt's)." Make sure the serving size is "1 tbsp", and change the number of servings to "3".

### **Afternoon Snack**

1. Type in "Bagel Bites", and choose "Cheese & Pepperoni (Ore Ida Bagel Bites)." Make sure the serving size is "4 pieces (88g)" and the number of servings is "1".

### **Dinner**

1. Type in "Taco bell beefy 5-layer burrito", and choose "Beefy 5-Layer Burrito- From Taco Bell Website." Make sure the serving size is "1 Burrito" and the number of servings is "1".

2. Type in "Taco bell nachos," and choose "Nachos (Taco Bell)." Make sure the serving size is "1 side" and the number of servings is "1".

3. Type in "Taco bell cinnamon twist", and choose "Taco Bell Cinnamon Twist (Taco Bell)." Make sure the serving size is "1 serving (35 g)" and the number of servings is "1".

**Nutritional Facts**

- Calories- 2,281
- Fat- 94 grams/ 37%
- Carbohydrate- 294 grams/ 52%
- Protein- 65 grams/ 11%
- Sodium-4,713 mg

**Nutritional Goals for Girls Age 14-18**

- Calories- 1,800
- Fat- 25-35%
- Carbohydrate- 130 grams/ 45-65%
- Protein- 46 grams/ 10-30%
- Sodium- < 2300 mg

***Felicia Fitzgerald***

**Breakfast**

1. Type in "Whole wheat English muffin", and choose the "English Muffin 100% Whole Wheat (Thomas's Hearty Grain Whole Wheat English Muffin)." Make sure the serving size is "1 whole wheat muffin" and the number of servings is "1".

2. Type in "Egg whites", and choose the "100% Liquid Egg Whites by Hinterland Ranch." Make sure the serving size is "3 Tbsp", and change the number of servings to "2".

3. Type in "Reduced fat cheddar cheese slice", and choose "Reduced Fat Medium Cheddar Cheese Slices (Sargento)." Make sure the serving size is "1 slice" and the number of servings is "1".

4. Type in "Skim milk", and choose "Milk-Nonfat (fat free or skim)." Make sure the serving size is "1 cup" and the number of servings is "1".

5. Type in "Cantaloupe", and choose "melons- raw". Change the serving size to "1 cup, diced, and make sure the number of servings is "1".

**Morning Snack**

1. Type in "Apple", and choose "Apples-Raw, with skin." Make sure to change the serving size to "1 small", and change the number of servings to 1.

2. Type in "Grapes", and choose "Grapes-raw". Make sure the serving size is on "1 cup", and change the number of servings to "1/2"

### **Lunch**

1. Type in "Arnold nutty grain bread", and choose "Arnold Nutty Grain Healthfull Bread." Make sure the serving slice is "1 slice" and change the number of servings to "2".
2. Type in "Boars head low sodium turkey", and choose "Boar's Head (Turkey Breast Low Sodium Skinless)." Make sure the serving size is "2 oz" and the number of servings is "1".
3. Type in "Avocado", and choose the "Avocado Raw". Make sure the serving size is "1/2 avocado", and change the number of servings to "1/2".
4. Type in "Roma tomato", and choose "Tomatoes Med Size (Roma)." Make sure the serving size is "1 whole tomato" and the number of servings is "1".
5. Type in "Carrots", and choose "Carrots-raw." Make sure the serving size is "1 cup, chopping", and change the number of servings to "1/2".
6. Type in "Broccoli", and choose "Broccoli- Raw." Make sure the serving size is "1 cup, chopped", and change the number of servings to "1/2".
7. Type in "Ranch dressing", and choose "Class Ranch Dressing (Kraft Salad Dressing)". Change the serving size to "1 Tbsp", and make sure the number of servings is "1".

### **Afternoon Snack**

1. Type in "Horizon organic reduced fat chocolate milk", and choose "Reduced Fat 1% Milk-Chocolate (Horizon Organic)." Make sure the serving size is "1 container (8 oz)" and the number of servings is "1".

### **Dinner**

1. Type in "Whole wheat spaghetti noodle", and choose "Whole Wheat Spaghetti Noodles (Great Value)." Make sure the serving size is "1 cup, cooked", and change the number of servings to "1/2".
2. Type in "Spaghetti with lean ground beef", and choose "Spaghetti Sauce Lean Ground Beef (Homemade)." Make sure the serving size is "1 cup" and the number of servings is "1".
3. Type in "Green Giant steamed asparagus", and choose "Simply Steam- Asparagus Cuts (Green Giant)." Change the serving size to "1 cup cooked", and make sure the number of servings is "1".
2. Type in "Texas toast garlic bread", and choose "Garlic Bread-Texas Toast (Pepperidge Farm)". Make sure the serving size is "1 Slice" and the number of servings is "1".

### **Dessert**

1. Type in "Kroger deluxe chocolate ice cream", and choose "Deluxe Chocolate Ice Cream (Kroger)". Make sure the serving size is "1/2 cup" and the number of servings is "1".

### **Nutritional Facts**

- Calories- 1,763
- Fat- 41 grams/ 26%
- Carbohydrates- 195 grams/ 53%
- Protein-76 grams/ 20%
- Sodium-2,237 mg

### **Nutritional Goals for Girls Age 14-18**

- Calories- 1,800
- Fat- 25-35%
- Carbohydrate- 130 grams/ 45-65%
- Protein- 46 grams/ 10-30%
- Sodium- < 2300 mg

## ***Cindy Clueless***

### **Breakfast**

1. Type in "Buttermilk Pancakes", and choose "Pancakes-Buttermilk." Make sure the serving size is "1 pancake (6" diameter)", and the number of servings is "2".

2. Type in "Bacon", and choose "Pork- Cured, bacon, cooked, pan-fried." Make sure the serving size is "1 slice cooked", and the number of servings is "2".

3. Type in "Butter", and choose "Butter-Salted." Make sure the serving size is "1 tbsp", and the number of servings is "1".

4. Type in "Mrs. Butterworths original syrup", and choose "Syrup, Original (Syrup, Mrs. Butterworth's)." Make sure the serving size is "1/4 cup", and the number of servings is "1/2".

5. Type in "Tropicana orange juice", and choose "Orange Juice (Tropicana)." Make sure the serving size is "8 fl oz", and the number of servings is "1".

### **Afternoon Snack**

1. Type in "Nature valley oats 'n honey", and choose "Nature Valley: Crunchy Granola Bar Oats 'n Honey (Granola Bars)." Make sure the serving size is "2 bars", and the number of servings is "1".

### **Lunch**

1. Type in "Arnold Oatnut Bread", and choose "Whole Grains Oatnut Bread (Arnold)." Make sure the serving size is "1 slice (43g)", and the number of servings is "2".

2. Type in "Boars head oven gold roasted turkey", and choose "Oven Gold Roast Breast Turkey (Boar's Head)." Make sure the serving size is "1 Slices", and the number of servings is "3".
3. Type in "Kraft sharp cheddar cheese", and choose "Sharp Cheddar Cheese (Diary-Kraft)." Make sure the serving size is "1 slice", and the number of servings is "1".
4. Type in "Kraft mayonnaise", and choose "Mayonnaise 1 Tbs (Kraft)." Make sure the serving size is "15 g", and the number of servings is "1".
5. Type in "Lays salt and vinegar chips", and choose "Salt Vinegar Potato Chips (Frito Lay)." Make sure the serving size is "1.5 oz (42.5 g)", and the number of servings is "1".
6. Type in "Coca-cola", and choose "Regular Can Coke 355 ml (12 oz) (Coca-Cola)." Make sure the serving size is "355 ml", and the number of servings is "1".

#### **Dinner**

1. Type in "Papa Johns the works", and choose "Slice Pizza (Papa John's the Works Pizza-Large)." Make sure the serving size is "1 slice", and the number of servings is "2".
2. Type in "Papa John's cheese bread", and choose "Cheese Bread (Papa John's)." Make sure the serving size is "1 sticks", and the number of servings is "1".
3. Type in "Coca-cola", and choose "Regular Can Coke 355 ml (12 oz) (Coca-Cola)." Make sure the serving size is "355 ml", and the number of servings is "1".

#### **Dessert**

1. Type in "Double stuffed oreo", and choose "Double Stuff\*\* (Oreo)." Make sure the serving size is "1 cookie", and the number of servings is "3".
2. Type in "2% milk", and choose "Milk- Reduced fat, 2% milkfat." Make sure the serving size is "1 cup", and the number of servings is "1".

#### **Nutritional Facts**

- Calories- 3,406
- Fat- 126 grams/ 36%
- Carbohydrates- 402 grams/ 52%
- Protein-94 grams/ 12%
- Sodium-5,267 mg

#### **Nutritional Goals for Women Age 31-50**

- Calories- 1,800-2,000
- Fat- 20-35%
- Carbohydrate- 130 grams/ 45-65%
- Protein- 46 grams/ 10-35%
- Sodium- < 2300 mg

## **Jane Holsum**

### **Breakfast**

1. Type in "Quaker 1 minute oats", and choose "Oats, Quick-1 Minute 40 g (Quaker)." Make sure the serving size is "1 cup" and the number of servings is "1".
2. Type in "Splenda", and choose "No Calorie Sweetener Packet (Spenda)." Make sure the serving size is "1 packet" and the number of servings is "1".
3. Type in "Sliced strawberries", and choose "Raw (Sliced Strawberries)." Make sure the serving is "1/2 cup" and the number of servings is "1".
4. Type in "Small banana", and choose "Banana Small (6"-7")(101g)(Fruit)." Make sure the serving size is "1 Banana" and the number of servings is "1".
5. Type in "Hard-boiled egg", and choose "Egg, Hard-Boiled (Egg)." Make sure the serving size is "60 g" and the number of servings is "1".
6. Type in "Skim milk", and choose "Milk-Nonfat (fat free or skim)." Make sure the serving size is "1 Cup" and the number of servings is "1".

### **Morning Snack**

1. Type in "Dannon Light N Fit yogurt", and choose "Light N Fit Yogurt- Vanilla (Dannon)." Make sure the serving size is "1 cup" and the number of servings is "1".
2. Type in "Raspberries", and choose "Raspberries-Raw." Make sure the serving size is "1 cup" and the number of servings is "1/2".

### **Lunch**

1. Type in "Romaine lettuce", and choose "Lettuce- Cos or romaine, raw." Make sure the serving size is "1 cup shredded" and the number of servings is "2".
2. Type in "Grilled chicken", and choose "Grilled Chicken Breast- Skinless, Boneless (John)." Make sure the serving size is "1 oz" and the number of servings is "3".
3. Type in "Cooked quinoa", and choose "Quinoa Cooked (Cooked)." Make sure the serving size is "1 cup" and the number of servings is "1/2".
4. Type in "Diced tomatoes", and choose "Tomato- Fresh, Raw, Diced, Chopped or Sliced (Tomato (Nutrition Data)." Make sure the serving size is "1 cup" and the number of servings is "1/4".

5. Type in "Bell peppers", and choose "Bell Peppers (Raw)." Make sure the serving size is "1 cup" and the number of servings is "1/4".

6. Type in "Whole wheat pita bread", and choose "Bread- Pita, whole-wheat." Make sure the serving size is "1 pita, small (4" dia)" and the number of servings is "1".

7. Type in "Fat Free Zesty Italian Dressing", and choose "Zesty Italian Fat Free Salad dressing (Kraft)." Make sure the serving size is "2 Tbsp" and the number of servings is "1".

#### **Afternoon Snack**

1. Type in "Dean's guacamole", and choose "Guacamole Dip (Dean's)." Make sure the serving size is "2 tbsp" and the number of servings is "1".

2. Type in "Kashi tlc 7 grain crackers", and choose "Tlc Tasty Little Crackers-Original 7 Whole Grain (Kashi)." Make sure the serving size is "15 crackers" and the number of servings is "1".

#### **Dinner**

1. Type in "Grilled salmon", and choose "Salmon- Grilled Plan (Salmon)." Make sure the serving size is "1 ounces" and the number of servings is "4".

2. Type in "Asparagus", and choose "Asparagus- Cooked, boiled, drained." Make sure the serving size is "0.5 cup" and the number of servings is "2".

3. Type in "Cauliflower", and choose "Cauliflower- Cooked, boiled, drained without salt." Make sure the serving size is "0.5 cup" and the number of servings is "1".

4. Type in "Wild rice", and choose "Wild rice- Cooked." Make sure the serving size is "1 cup" and the number of servings is "1".

5. Type in "Del Monte low sodium corn", and choose "Whole Kernel Corn- Low Sodium (Del Monte)." Make sure the serving size is "1/2 cup" and the number of servings is "1".

#### **Dessert**

1. Type in "Jell-O sugar free cheesecake pudding", and choose "Sugar Free Fat Free Instant Cheesecake Pudding (Jell-O)." Make sure the serving size is "1 cup" and the number of servings is "1".

#### **Nutritional Facts**

- Calories- 1,798
- Fat- 43 grams/ 21%
  
- Carbohydrates- 261 grams/ 56%
- Protein-108 grams/ 23%
- Sodium-2,220 mg

#### **Nutritional Goals for Women Age 31-50**

- Calories- 1,800-2,000
- Fat- 20-35%
- Carbohydrate- 130 grams/ 45-65%
- Protein- 46 grams/ 10-35%
- Sodium- < 2300 mg