

OVERWEIGHT AND OBESITY, WEIGHT PERCEPTION, AND WEIGHT MANAGEMENT
PRACTICES AMONG SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM
EDUCATION (SNAP-ED) PARTICIPANTS IN GEORGIA

by

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(Under the Direction of Jung Sun Lee)

ABSTRACT

Little is known about weight perception and weight-related practices among SNAP-Ed-eligible individuals. This study examined overweight and obesity, weight perception, and weight management practices in a convenience sample of SNAP-Ed participants in Georgia. Self-reported body weight, height, and weight-related practices were assessed in 270 SNAP-Ed participants (mean age 55.9 ± 20.4 years, 75.3% female, 73.3% black). Almost three-quarters of the study sample was overweight (31.1%) or obese (41.9%). About 69% and 39% of obese and overweight subjects accurately perceived themselves as overweight, respectively. More than half of the study sample reported desire for weight loss, and 43.7% reported attempting to lose weight in the past 12 months. Overweight/obese subjects who accurately perceived their weight were significantly more likely to desire and have attempted weight loss than those who underperceived their weight. High prevalence of overweight/obesity and desire to lose weight demonstrates the necessity to develop SNAP-Ed curricula emphasizing weight management.

INDEX WORDS: Overweight, obesity, weight perception, weight management practices, SNAP-Ed, low-income

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CHAPTER 1

INTRODUCTION

Overweight and obesity remain one of the nation's most serious health problems, putting more than two-thirds of adults in the United States (U.S.) (68.5%) at heightened risk for a variety of chronic diseases.¹ In Georgia, 30.5% of adults were obese, and an additional 35.2% were overweight in 2014.² Compounding the issue of overweight and obesity in the U.S. is the fact that nearly one-quarter of overweight or obese Americans under-perceived their weight.³ Overweight or obese individuals who misperceived their weight status were 71% and 65% less likely to report a desire to lose weight and 60% and 56% less likely to have attempted weight loss during the past year, respectively.³ Among individuals in the U.S. attempting to lose weight, only one third utilize both strategies recommended by the U.S. Department of Health and Human Services, dietary changes and increased physical activity.⁴

Although overweight/obesity affects people in the U.S. of all demographics, low-income and minority groups are disproportionately affected. The prevalence of overweight/obesity generally increased with decreasing income among women, though the prevalence of overweight/obesity was generally similar at all income levels and tended to increase with increasing income for men.³ Low-income Americans are less likely than the average to use ideal weight management strategies, but little is known about weight perception and weight management practices among this population.⁴

Over the past several decades, many obesity interventions have been conducted throughout the U.S.; however, very few have been specifically targeted toward the low-income

population. The Supplemental Nutrition Assistance Education Program Education (SNAP-Ed) program, one of the oldest and largest federally funded nutrition education programs targeted to the low-income population, has not focused on obesity prevention specifically. There are gaps in knowledge regarding the magnitude of overweight, weight perception, and weight management practices among low-income populations participating in SNAP-Ed. Under the Healthy, Hunger-Free Kids Act of 2010, SNAP-Ed has been reestablished as the Nutrition Education and Obesity Prevention Grant Program.⁵ For the first time in the program's history, weight management falls within its scope.

The purpose of this study was to understand and describe the weight status, weight perceptions, and weight management practices of SNAP-Ed participants in Georgia in order to inform the development of new SNAP-Ed curricula targeted to low-income populations to address obesity prevention. The goals of this study were to, among SNAP-Ed participants in Georgia, (1) determine prevalence of overweight and obesity, (2) determine accuracy of weight perception and assess correlation with weight management practices, and (3) determine weight management practices, including desire to lose weight, attempted weight loss, and weight loss methods utilized.

Chapter 2 is a review of the literature pertaining to the prevalence of overweight and obesity, risk factors for and consequences of overweight/obesity, weight perception, weight management strategies, SNAP-Ed, and obesity prevention curricula, with an emphasis on low-income populations.

Chapter 3 is a manuscript to be submitted to the Journal of Nutrition Education and Behavior. The chapter includes the abstract, introduction, methods, results, discussion, implications for research and practice, and relevant tables and figures.

Chapter 4 is a summary of the present study and provides implications for program development and further research.

CHAPTER 2

LITERATURE REVIEW

Defining Overweight and Obesity

A weight that is higher than what is considered healthy for a given height is described as overweight or obese.⁶ Body Mass Index (BMI) is one of the best methods for assessing the weight status of a population and is calculated in kg/m^2 ; BMI less than 18.5 is considered underweight, 18.5–24.9 is normal weight, 25.0–29.9 is overweight, 30.0–34.9 is obese class I, 35.0–39.9 is obese class II, and 40.0 and greater is obese class III.^{7,8}

BMI calculated utilizing self-reported height and weight is simple and very inexpensive, as it does not require collection of any physical measurements. However, BMI calculated from self-reported height and weight is limited by the validity of those self-reported measures. An analysis of data collected through the National Health and Nutrition Examination Survey (NHANES) from 2001 to 2006 showed that both men and women over-report their height and that men tend to overestimate their weight, while women tend to under-report their weight.⁹ The result of these deviations in reporting is an underestimation of BMI, particularly for women.⁹ Despite the limitation of reporting bias, BMI calculated from self-reported height and weight remains the best available measure of weight status of the target population for the proposed study.

Prevalence of Overweight/Obesity

According to the most recent data available from the National Health and Nutrition Examination Survey (NHANES), more than two-thirds of U.S. adults, 68.5% (95% CI 65.2–

71.6%) to be exact, are overweight or obese ($BMI \geq 25$), 34.9% (95% CI 32.0–37.9%) are obese ($BMI \geq 30$), and 6.4% (95% CI 5.2–7.7%) are extremely obese (obese grade 3, $BMI \geq 40$).¹

Overall, there is a higher prevalence of overweight/obesity among men (71.3%, 95% CI 68.2–74.2%) than women (65.8%, 95% CI 62.0–69.5%).¹ However, the prevalence of both obesity and extreme obesity are higher among women than men, 36.1% (95% CI 32.6–39.8%) versus 33.5% (95% CI 30.7–36.5%) and 8.3% (95% CI 6.9–9.8%) versus 4.4% (95% CI 2.8–6.8%) respectively.¹

Data from NHANES 2005–2008 demonstrated that the prevalence of overweight/obesity among women generally increased with decreasing income, though the prevalence of overweight/obesity was generally similar at all income levels and tended to increase with increasing income for men.¹⁰ Among women, 29.0% of those living in households with income $\geq 350\%$ of the poverty level were obese while 42.0% of those living in households with income $\leq 130\%$ of the poverty level were obese.¹⁰ This trend was similar among non-Hispanic white, non-Hispanic black, and Mexican-American women but was only statistically significant among non-Hispanic white women, of whom 27.5% with income $\geq 350\%$ of the poverty level were obese while 39.2% with income $\leq 130\%$ of the poverty level were obese.¹⁰ Among men, the relationship between obesity prevalence and income level varied by race and ethnicity.¹⁰ Of non-Hispanic black men, 44.5% of those living in households with income $\geq 350\%$ of the poverty level were obese, while 28.5% of those with income $\leq 130\%$ of the poverty level were obese.¹⁰ Similarly, among Mexican-American men, 40.8% of those with income $\geq 350\%$ of the poverty level were obese, and 29.9% of those with income $\leq 130\%$ of the poverty level were obese.¹⁰ There was no significant difference in obesity prevalence among non-Hispanic white men according to income.¹⁰

The prevalence of obesity tended to increase with decreasing education level during 2005–2008.¹⁰ About 23% of women with a college degree were obese, which is significantly less than the 42.1% of women with less than a high school education who were obese.¹⁰ The same general trend is observed among men; though not a statistically significant difference, 27.4% of those with a college degree were obese, and 32.1% of those with less than a high school education were obese.¹⁰ A threshold effect is seen among both women and men in which obesity prevalence decreases significantly among those with college degrees as compared to those with some college.¹⁰

Focusing specifically on Georgia, according to data from the 2014 Behavioral Risk Factor Surveillance System (BRFSS), 30.5% (95% CI 28.9–32.1%) of Georgians were obese (BMI \geq 30.0), and an additional 35.2% (95% CI 33.6–36.9%) were overweight (BMI \geq 25.0 and $<$ 30.0).² This is slightly lower than the national prevalence of obesity of 34.9% (95% CI 32.0–37.9%), but it is important to note that national data are based upon measurements collected through NHANES while state-level data are based on self-reported data.¹ Similarly to national statistics, the prevalence of obesity among Georgians varies by race and ethnicity. Of non-Hispanic white adults, 26.2% (95% CI 25.2–27.2%) were obese, while 37.2% (95% CI 35.3–39.0%) of non-Hispanic black adults were obese, and 28.1% (95% CI 24.3–32.3%) of Hispanic adults were obese.²

Risk Factors for and Consequences of Overweight/Obesity

The main causes of the current obesity epidemic have been recognized as genetic predisposition and environmental susceptibility to weight gain.¹¹ Individuals living in the United States are subject to an obesogenic environment of an abundance of high-calorie, low-quality foods combined with under activity.¹¹ However, food-insecure and low-income individuals are at

an increased risk for overweight/obesity in comparison to other Americans due to additional risk factors associated with poverty that increase barriers to adopting healthful behaviors.¹² Limited resources and lack of access to healthy, affordable foods are common risk factors affecting low-income individuals, who often reside in communities that lack full-service grocery stores and farmers' markets.¹³ When available, healthy foods are often more expensive than energy-dense foods such as those made with refined grains, added sugars, and fats and fast foods.¹⁴ In addition, low-income neighborhoods are often less conducive to being physically active than higher-income neighborhoods; fewer recreational facilities and other resources as well as barriers such as crime and traffic place individuals residing in low-income communities at greater risk for obesity.^{15,16} Furthermore, low-income individuals face additional risks for obesity including cycles of food deprivation and overeating, high levels of stress, greater exposure to marketing of obesity-promoting products, and limited access to healthcare.^{17,18,19}

It is widely accepted that individuals with overweight or obesity are at increased risk for many serious diseases and health conditions.²⁰ Increased BMI is associated with increased risk for fatal and nonfatal coronary heart disease, fatal and nonfatal stroke, fatal and nonfatal cardiovascular disease, type 2 diabetes, and all-cause mortality.⁸ A study by Flegal et al found the summary random-effect hazard ratio of all-cause mortality for obesity relative to normal weight to be 1.18 (95% CI 1.12–1.25).²¹ Furthermore, the hazard ratio increased to 1.29 (95% CI 1.18–1.41) for class II and III obesity.²¹ In addition, a reciprocal relationship has been found to exist between obesity and depression, each increasing the risk of the other.²²

However, the consequences of obesity extend beyond health outcomes.²³ Obese individuals face higher medical care costs, lower wages, and a lower probability of

employment.²³ In 2010, the direct medical care costs of obesity for U.S. adults totaled \$315.8 billion, or 27.5% of health expenditures for non-institutionalized U.S. adults.²³

Weight Perception and Weight Management Strategies

An analysis of 2003–2006 NHANES data by Duncan et al showed that nearly one quarter of overweight or obese individuals misperceived their weight.³ Among the study population of overweight and obese adults (BMI \geq 25), weight misperception was defined as a response of “underweight” or “about the right weight” when asked whether they currently considered themselves to be “overweight, underweight, or about the right weight.”³ The study demonstrated weight misperception to be a strong predictor of weight loss attitudes and behaviors across genders and racial/ethnic groups.³ In comparison to subjects who accurately perceived themselves as overweight, men and women who misperceived their weight status were 71% (RR 0.29, 95% CI 0.25–0.34) and 65% (RR 0.35, 95% CI 0.29–0.42) less likely to report a desire to lose weight and 60% (RR 0.40, 95% CI 0.30–0.52) and 56% (RR 0.44, 95% CI 0.32–0.59) less likely to have attempted weight loss during the past year, respectively.³ Black men and women who misperceived their weight were 77% less likely to have attempted weight loss than blacks who accurately perceived their weight, showing a particularly strong correlation.³ White men and women were 55% and 56%, respectively, less likely to have attempted weight loss, and Hispanic men and women were 62% and 33%, respectively, less likely to have attempted weight loss than their counterparts.³

Among individuals in the United States attempting to lose weight, only one third utilize both strategies recommended by the USDHHS, dietary changes and increased physical activity.⁴ Low-income individuals are less likely than the average to use ideal weight management strategies.⁴ As demonstrated in an analysis of NHANES 1999–2010 data by Kakinami et al,

adults living in a household with an annual income <\$20,000 were 50% (OR 0.50, 95% CI 0.4–0.6) less likely to use multiple weight loss strategies consistent with recommendations than their counterparts with annual household income \geq \$75,000.⁴ Adults with an annual household income <\$20,000 were 50% (OR 0.50, 95% CI 0.4–0.6) less likely to exercise, 42% (OR 58, 95% CI 0.4–0.7) less likely to drink a lot of water, and 25% (OR 0.75, 95% CI 0.6–0.9) less likely to reduce intake of fats or sweets than adults with an annual household income \geq \$75,000.⁴

Despite evidence that accurate weight perception among overweight and obese individuals is associated with increased likelihood of desire to lose weight and of attempted weight loss, a recent publication by Robinson et al shows consistent evidence across 3 studies of a significant association between perceived overweight and increased weight gain, regardless of accuracy of weight perception.^{3,24} This association was found to be unlikely to be due to unobserved confounding psychological, health, or environmental factors.²⁴ However, the link between perceived overweight and increased weight gain was found to be mediated by stress-induced eating, which accounted for 37% of the association.²⁴

SNAP-Ed

The purpose of the SNAP-Ed program is “to improve the likelihood that SNAP participants and eligible low-income people will make healthy food choices within a limited budget and choose active lifestyles according to the current Dietary Guidelines for Americans (DGAs) and USDA food guidance.”⁵ SNAP-Ed currently operates according to the interim rule Supplemental Nutrition Assistance Program: Nutrition Education and Obesity Prevention Grant Program, under the Food and Nutrition Act of 2008, as implemented by the Healthy, Hunger Free Kids Act of 2010.⁵ The Food and Nutrition Act of 2008 defines individuals who are eligible for SNAP-Ed services as those who receive or are eligible for benefits from SNAP, National

School Lunch/Breakfast Program at free or reduced priced, Medicaid, Temporary Assistance for Needy Families (TANF), or other means-tested federal assistance programs or those who live in a community with a significant low-income population.⁵ SNAP-Ed is a federally funded program, but states are encouraged to seek other public and private sources of funding to augment their efforts.⁵ States may use SNAP-Ed funds to implement evidence-based nutrition education and obesity prevention services through individual or group-based nutrition education, health promotion, and intervention strategies; comprehensive, multi-level interventions; and community and public health approaches.⁵ The Food and Nutrition Service, which oversees states' SNAP-Ed programs, defines SNAP nutrition education and obesity prevention services as “any combination of educational strategies, accompanied by environmental supports, designed to facilitate voluntary adoption of food and physical activity choices and other nutrition-related behaviors conducive to the health and well-being of SNAP participants and low-income individuals eligible to participate in SNAP and other means-tested Federal assistance programs.”⁵

SNAP-Ed is primarily administered through the Land-Grant University System.²⁵ Land-grant colleges and universities may contract with partners such as state public health departments, tribal programs, and local health organizations to deliver SNAP-Ed.²⁵ Most Land-Grant institutions administer their SNAP-Ed programs through affiliated Cooperative Extension, as is the case in Georgia.²⁵ The University of Georgia (UGA) is the primary SNAP-Ed implementing agency in the state of Georgia.²⁵

Obesity Prevention Curricula for Low-Income Populations

A small number of nutrition and physical activity interventions have been found to be effective in changing behaviors associated with weight gain among low-income populations;

however, few have been broadly implemented.²⁶ Currently, Buscemi et al are studying the feasibility and efficacy of disseminating one such program, Hip Hop to Health, through SNAP-Education and the Expanded Food and Nutrition Education Program (EFNEP), which are both well-established, widespread, federally-funded programs.²⁶ Though obesity prevention is within the scope of both SNAP-Education and EFNEP, neither program has traditionally focused specifically on the topic.²⁶ Hip Hop to Health is an NIH-funded, school-based nutrition and physical activity obesity prevention program targeted at low-income preschool children and their families.²⁶ Hip Hop to Health, first implemented in 1999, is a 14-week program with 3 sessions per week, each comprised of a lesson and physical activity.²⁷ Studies conducted on the Hip Hop to Health program have shown mixed but positive results; one study demonstrated significantly smaller increases in BMI amongst the intervention group while another demonstrated positive influence on physical activity and screen time.^{27,28} For their current study, Buscemi et al have adapted the Hip Hop to Health program to align with established SNAP-Education and EFNEP programming by means such as reducing the number of sessions.²⁶

Recent studies by Perri et al have demonstrated the efficacy of lifestyle treatment with extended care in achieving and maintaining weight loss among adults residing in rural areas.^{29,30} Similarly to low-income populations, individuals residing in rural, medically underserved areas face additional barriers to weight maintenance, such as limited access to preventative health services.²⁹ The Treatment of Obesity in Underserved Rural Settings (TOURS) trial demonstrated the efficacy of delivering lifestyle interventions for weight loss through the Cooperative Extension Service, which, with its extensive established infrastructure, is a potentially effective and efficient means of dissemination.²⁹ Furthermore, the TOURS trial showed that delivering extended care via telephone was as effective for reducing regain of weight as face-to-face

counseling (regain of 1.3 ± 0.6 and 1.2 ± 0.7 kg respectively) in comparison with an education control (regain of 3.7 ± 0.6 kg, $P=0.02$ and 0.03 respectively) while costing less both to the program and the participants.²⁹ A subsequent study conducted by Perri et al assessed dose response of lifestyle intervention for weight loss and maintenance.³⁰ Utilizing similar methods employed by the original TOURS trial, the rural LITE trial found that a moderate dose (i.e. 32 sessions over two years) of behavioral treatment produced comparable weight loss to a high dose (i.e. 48 sessions over two years), such as that administered during the TOURS and other trials, but at a lower cost (6.7%, 95% CI 5.3–7.9% and 6.8%, 95% CI 5.5–8.1% reduction in body weight, respectively).³⁰

Rationale

Nationwide, very few SNAP-Ed programs collect height and weight data from their adult participants, and height and weight data have never before been collected from SNAP-Ed participants in Georgia. Furthermore, there is a gap in knowledge regarding weight perception and weight management practices among low-income populations, including individuals eligible for SNAP-Ed. Very few obesity prevention interventions have been specifically targeted toward low-income populations, and more information is needed to inform the development of obesity prevention curricula for the University of Georgia SNAP-Ed program.

CHAPTER 3
OVERWEIGHT AND OBESITY, WEIGHT PERCEPTION, AND WEIGHT MANAGEMENT
PRACTICES AMONG SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM
EDUCATION (SNAP-ED) PARTICIPANTS IN GEORGIA¹

¹Bailey, C. C., Lee, J. S., Olubajo, B. To be submitted to the Journal of Nutrition Education and Behavior

Abstract

Objective: Little is known about weight perception and weight-related practices among individuals eligible for SNAP-Ed, who are disproportionately affected by obesity. This study examined overweight and obesity, weight perception, and weight management practices in a convenience sample of SNAP-Ed participants in Georgia. **Design, Setting, and Participants:** Self-reported body weight, height, and weight-related practices were assessed using self-administered paper surveys collected by trained paraprofessionals in 270 SNAP-Ed participants (mean age 55.9 ± 20.4 years, 75.3% female, 73.3% black) upon entry to a direct nutrition education program in two urban counties in Georgia. **Variables Measured:** Body Mass Index, accuracy of weight perception, desire for and attempted weight loss, weight loss methods used, diet-related chronic conditions, and sociodemographic variables **Analysis:** Descriptive and bivariate logistic regression analyses were conducted using SAS (Version 9.4; Carry, NC). **Results:** Almost three-quarters of the study sample was overweight (31.1%) or obese (41.9%). About 60% of the study sample accurately perceived their weight status; 69.0% and 39.3% of obese and overweight subjects accurately perceived themselves as overweight, respectively. More than half (57.0%) of the study sample reported a desire for weight loss, and 43.7% reported having attempted to lose weight in the past 12 months. Overweight/obese subjects who accurately perceived themselves as overweight were more likely to desire (94.6% vs. 26.7%, $p < 0.0001$) and have attempted (73.9% vs. 18.6%, $p < 0.0001$) weight loss than those who underperceived their weight. Obese subjects were more likely to desire weight loss (OR 2.0; CI 1.1, 3.6; $p = 0.0229$) and to have attempted weight loss (OR 2.7; CI 1.5, 4.9; $p = 0.0008$) than

overweight subjects. Approximately 58.3% of subjects who had attempted to lose weight reported utilizing both of the methods suggested for weight loss, exercise and dietary changes.⁴

Conclusions and Implications: High prevalence of overweight and obesity combined with desire to lose weight among the study sample demonstrates the necessity to develop SNAP-Ed curricula emphasizing weight management.

Introduction

Overweight and obesity remain one of the nation's most serious health problems, putting more than two-thirds of U.S. adults (68.5%) at heightened risk for a range of chronic diseases.¹ In Georgia, 30.5% of Georgians were obese, and an additional 35.2% were overweight in 2014.² However, nearly one quarter of overweight or obese Americans misperceived their weight.³ Overweight or obese individuals who misperceived their weight status were 71% and 65% less likely to report a desire to lose weight and 60% and 56% less likely to have attempted weight loss during the past year, respectively.³ Among individuals in the U.S. attempting to lose weight, only one third utilize both strategies recommended by the U.S. Department of Health and Human Services, dietary changes and increased physical activity.⁴

Although overweight/obesity affects people in the U.S. of all socioeconomic statuses, genders, races, and ethnicities, low-income and minority groups are disproportionately affected. The prevalence of overweight/obesity among women generally increased with decreasing income, though the prevalence of overweight/obesity was generally similar at all income levels and tended to increase with increasing income for men.¹⁰ Little is known about weight perception and weight management practices among low-income Americans, but they are less likely than the average to use ideal weight management strategies.⁴

Many obesity interventions have been conducted throughout the U.S. in the last several decades; however, very few have been specifically targeted toward the low-income population. The Supplemental Nutrition Assistance Education Program Education (SNAP-Ed) program, one of the oldest and largest federally funded nutrition education programs targeted to the low-

income population, has not focused on obesity prevention specifically. Very little is known about the magnitude of overweight, weight perception, and weight management practices among low-income populations participating in SNAP-Ed. Under the Healthy, Hunger-Free Kids Act of 2010, SNAP-Ed has been reestablished as the Nutrition Education and Obesity Prevention Grant Program.⁵ For the first time in the program's history, weight management falls within its scope.

The purpose of this study was to understand and describe the weight status, weight perceptions, and weight management practices of SNAP-Ed participants in Georgia in order to inform the development of new SNAP-Ed curricula targeted to low-income populations to address obesity prevention. We hypothesized that (1) the prevalence of overweight/obesity would be higher among Georgians participating in the SNAP-Ed program than among the population of Georgia at large and (2) overweight/obese participants with misperception of their weight status would be less likely to desire and to have attempted weight loss in comparison to their counterparts who accurately perceive their weight.

Methods

Study Setting

This study was conducted in a convenience sample of low-income adults participating in the University of Georgia SNAP-Ed Food Talk program, a direct nutrition education program taught by paraprofessionals in a classroom setting in two selected urban counties in Georgia during the federal fiscal year 2015 (FY2015).

The Food Talk program is based on a culturally tailored curriculum founded on the Health Belief Model and the Dietary Approaches to Stop Hypertension diet. Food Talk was designed with the goal of decreasing dietary risk factors for hypertension by increasing self-

efficacy and perceived benefits while decreasing barriers to improved fruit, vegetable, and dairy consumption and limiting sodium intake.³¹ Information transmission, reevaluation, identification of barriers and potential and immediate solutions, and modeling are methods employed by the Food Talk program to influence behavior change among participants.³¹ Strategies used to implement these methods include learner-centered education with ample opportunity for dialogue, experiential learning activities, and recipe demonstrations.³¹

The Food Talk curriculum consists of 6 sessions, which are led by trained paraprofessionals recruited primarily from the program's target audience. Each session addresses the program goals in a variety of ways; for example, session 2 is designed to increase participants' perceived benefits of lowering blood pressure to improve health and reducing sodium intake to lower blood pressure. The session aims to increase participants' self-efficacy to prepare a healthy meal that includes vegetables, low-fat cheese, and low salt foods through demonstration of a healthy recipe for Chicken Divan. Sampling of the prepared recipe aims to decrease barriers, such as the taste of vegetables and low-fat cheese, participants may perceive to changing their food choices.

During FY2015, the University of Georgia SNAP-Ed Food Talk program was implemented in two urban counties in Georgia, Clarke and Fulton. Individuals who enrolled in the Food Talk program were invited to participate in a research study, allowing the researchers at the University of Georgia to use their Food Talk programming and evaluation data to examine the impact of program participation on eating and physical activity behaviors. Only individuals who gave written informed consent were included in this study.

Evaluation of the Food Talk program employed the pre-and post-test study design and a self-administered paper survey method including a behavioral checklist focusing on food

resource management and food safety practices, a 24-hour dietary recall, self-reported body weight and height, and selected sociodemographic characteristics. For the purpose of ongoing needs assessment efforts, four sets of short post-lesson surveys, “Questions of the day,” were also asked in the domains of food insecurity (6-item U.S. Department of Agriculture Household Food Security Survey Module), perceived body weight, perceived food environment, and perceived healthy diet.

Measures

Key measures used for this study were collected as part of the pre- and post-questionnaires (e.g. self-reported body height and weight, sociodemographics) as well as one of the four sets of post-lesson surveys, which focused on perceived body weight and weight management practices.

Weight status. Food Talk direct education participants were requested to self-report their height and weight on both the pre- and post-questionnaires (see Appendices A and B). Body Mass Index (BMI), measured in kilograms per meter squared, was calculated based on the best available data. Weight status was determined using standard BMI categories, where a BMI of less than 18.5 is considered underweight, 18.5–24.9 is normal weight, 25.0–29.9 is overweight, and 30.0 or higher is obese.⁷ For the purposes of this study, study participants were grouped into three categories according to weight status: underweight/normal (BMI of 24.9 or less), overweight (BMI of 25.0–29.9), and obese (BMI of 30.0 or greater).

Weight perception. Perceived weight status was assessed by one question, adopted from the National Health and Nutrition Examination Survey (NHANES), which asked if a participant felt his/her weight was “underweight,” “about the right weight,” or “overweight” (see Appendix C).³²

Accuracy of weight perception. Accuracy of weight perception was determined by comparing weight status as defined by calculated BMI with self-reported weight perception (i.e. underweight, about the right weight, or overweight). Accurate weight perception was defined as the instance in which an individual's weight status based on calculated BMI matched his/her perceived weight status. Inaccurate weight perception was defined as under- or over- perception of weight status. Under-perception of weight status was defined as the instance in which either (1) an individual with an overweight BMI perceived him/herself as underweight or about the right weight or (2) an individual with a normal-weight BMI perceived him/herself as underweight. Over-perception of weight status was defined as the instance in which either (1) an individual with an underweight BMI perceived him/herself as normal weight or overweight or (2) an individual with a normal-weight BMI perceived him/herself as overweight.

Weight management practices. Two questions included in the post-lesson survey focusing on perceived body weight assessed weight management practices. The first question, adopted from NHANES, asked the participant if he/she would like to weigh "more," "less," or "stay about the same."³² The second question asked whether or not the participant had attempted weight loss within the past twelve months and, if so, by what methods. The question went on to give thirteen options of weight loss methods, such as eating less food, exercising, taking diet pills, and drinking a lot of water, from which the participant could select all that applied. Weight loss methods were further categorized for use of exercise and dietary changes as strategies for weight loss, which are recommended by the U.S. Department of Health and Human Services.⁴ A participant was considered to have utilized exercise as a weight loss method if he/she chose "I exercised" as a response to the question regarding the methods that he/she had employed to attempt weight loss. A participant was considered to have made dietary changes as a weight loss

strategy if he/she chose any of the following options as responses to the question regarding weight loss methods utilized: “I ate less food,” “I ate ‘diet’ foods or products,” “I drank a lot of water,” “I stopped drinking soda or other sweetened beverages,” “I ate more fruits, vegetables, and salads,” “I ate less sugar, candy, or sweets,” “I stopped eating late in the evening,” “I began eating smaller meals throughout the day,” “I ate less junk food,” and/or “I ate less fast food.”

Other variables. Participants were asked to self-report any of the following five diet-related diagnoses that they had heard from their doctors: high blood pressure, high cholesterol, diabetes, pre-diabetes, and/or heart disease. Selected sociodemographic characteristics were collected as part of the pre- and post-questionnaires, including age, gender, race, household structure, education, and SNAP participation.

Analytic Sample

Of 910 Food Talk direct education participants during FY2015, 746 (82.0%) provided consent, 697 (76.6%) provided self-reported height and weight data, and 440 (48.4%) provided information on desire to lose weight. The analytic sample includes 270 participants (29.7%) who provided written informed consent and all other variables considered for this study. Most of the analytic sample provided self-reported height data during session 1 (n=267, 98.9% of the study sample), except 3 participants who provided self-reported height data during Session 6. Similarly, most of the analytic sample provided self-reported weight data during session 1 (n=264, 97.8% of the study sample), except 6 participants who provided self-reported weight data during session 6. Table 3.1 compares key characteristics of the study sample with FY2015 Food Talk participants excluded from the study (see also Appendix D). The only difference of note between those who were included and excluded is higher mean attendance among the analytic study sample, which was an expected discrepancy as data necessary for inclusion in this

study was collected over multiple sessions. The Institutional Review Board of the University of Georgia approved this study protocol with a full review.

Data Analysis

The study sample was analyzed for descriptive statistics. For continuous and categorical variables, differences across three BMI categories were evaluated using analysis of variance and chi square tests, respectively. A bivariate logistic regression was used to examine the relationship between weight perception and weight management practices across the three BMI groups. All statistical analyses were carried out using SAS version 9.4 (SAS Institute Inc., Carry, NC, 2015).

Results

Key characteristics of the study sample by BMI category can be found in Table 3.2 (see also Appendix E). Almost three-quarters of the study sample, 73.0%, was found to be overweight (31.1%) or obese (41.9%) (Figure 3.1). About 56% reported at least one diagnosis of the five selected diet-related chronic conditions. Among overweight/obese subjects, 64.5% reported at least one diagnosis.

Overall, 59.6% of the study sample accurately perceived their weight status (Appendix F). Among obese subjects, 69.0% accurately perceived themselves as overweight, but only 39.3% of overweight subjects accurately perceived their weight status as overweight (Figure 3.2). Overweight/obese subjects who accurately perceived themselves as overweight were significantly more likely to desire weight loss and to have attempted to lose weight during the preceding 12 months than those who did not perceive themselves as overweight (Figure 3.3).

About 57.0% of the study sample reported a desire for weight loss, and 43.7% reported having attempted to lose weight in the past 12 months (Appendices G and H). Obese subjects

were more likely to desire weight loss (OR 2.0; CI 1.1, 3.6; $p=0.0229$) and to have attempted weight loss (OR 2.7; CI 1.5, 4.9; $p=0.0008$) than overweight subjects. Additionally, overweight/obese participants reporting at least one of the selected diagnoses were more likely to desire weight loss than those who reported none (OR 3.0; CI 1.6, 5.6; $p=0.0004$).

Among all subjects reporting attempted weight loss during the preceding 12 months, the most popular weight loss methods reported were eating less food (62.6%), eating less junk food (60.0%), exercising (60.0%), drinking a lot of water (58.3%), and eating more fruits, vegetables, and salads (54.8%) (Figure 3.4, Appendix I). Approximately 58.3% of subjects who had attempted to lose weight reported utilizing both of the methods suggested for weight loss, exercise and dietary changes.⁴ Among overweight subjects who had attempted weight loss during the previous 12 months, 75.9% reported utilizing both exercise and dietary changes as strategies for weight loss while only 53.0% of obese subjects reported using both strategies. Overweight subjects had almost three times increased odds of using both recommended strategies (OR 2.8; CI 1.0, 7.4; $p=0.0403$) and 3.4 times increased odds of exercising to lose weight (OR 3.4; CI 1.2, 9.4; $p=0.0189$) than obese subjects.

Discussion

Both the prevalence and the severity of overweight and obesity among the study sample of SNAP-Ed direct education participants in Georgia are higher than those of the state of Georgia and of the United States as a whole.^{2,33} Not only are a greater number of SNAP-Ed participants overweight or obese, but a greater proportion of overweight or obese SNAP-Ed participants are obese. A review of data from the 2005-2008 NHANES by Ogden et al found that, among men, the prevalence of obesity is similar at all income levels with a tendency to be slightly higher at

higher income levels, while, among women, the prevalence of obesity increases with decreasing income.¹⁰ Considering that our study sample consisted of 75.2% females, this is consistent with our finding of a greater prevalence of obesity among the study sample of SNAP-Ed direct education participants in comparison to Georgia and the United States on average.

The higher prevalence of overweight and obesity among study subjects may be attributed to risk factors associated with poverty that increase barriers to adopting healthful behaviors for food-insecure and low-income individuals.¹² Low-income individuals may lack access to healthy, affordable foods, as they often reside in communities that lack full-service grocery stores and farmers' markets.¹³ In addition, low-income neighborhoods are often less conducive to being physically active than higher-income neighborhoods, with fewer recreational facilities as well as barriers such as crime and traffic.^{15,16} Furthermore, low-income individuals face additional risks for obesity including cycles of food deprivation and overeating, high levels of stress, greater exposure to marketing of obesity-promoting products, and limited access to healthcare.^{17,18,19}

Among overweight and obese subjects, this study found that those who under-perceived their weight status were less likely to desire weight loss and to have attempted weight loss than those who accurately perceived themselves as overweight. These findings are consistent with the results of a review of data from the 2003-2006 NHANES by Duncan et al, who found that overweight and obese individuals who misperceived their weight were 70% less likely to desire weight loss and 60% less likely to have attempted weight loss than their counterparts who accurately perceived their weight status.³ The Health Belief Model of health behavior provides a useful perspective from which to view the positive correlation between misperception of weight status and lack of desire for and attempts at weight loss among overweight/obese study subjects,

as overweight/obese individuals who under-perceive their weight status may lack perceived susceptibility to overweight/obesity and the negative health outcomes with which these conditions are associated.³⁴

A review of data from the 1999-2010 NHANES by Kakinami et al found that, among subjects who had attempted weight loss within the previous year, 68% reduced food or dieted and 60% exercised.⁴ Kakinami et al found that, in comparison to adults with an annual household income greater than or equal to \$75,000, adults with an annual household income less than \$20,000 were less likely to exercise, drink a lot of water, or reduce intake of fats and sweets as weight loss strategies.⁴ Though Kakinami et al did not find a difference in the utilization of eating less food as a method of weight loss between groups of differing income levels, 62.6% of SNAP-Ed direct education participants included in this study who had attempted weight loss employed this method in comparison to 68% among individuals of all socioeconomic levels included in the review by Kakinami et al.⁴ This study also deviates from the findings of Kakinami et al with regards to the use of exercise as a weight loss strategy.⁴ Kakinami et al found that individuals from low-income households were less likely to utilize exercise as a weight loss strategy, but this study found that 60.0% of subjects who had attempted weight loss exercised, which is the same proportion of individuals of all socioeconomic statuses included in the study by Kakinami et al who exercised.⁴

Limitations

One limitation of this study is the bias inherent to the use of self-reported height and weight data. During FY2015, self-report was the only feasible method of collecting anthropometrics from participants, and this data is the first collected on height and weight among SNAP-Ed participants in Georgia. In general, men tend to over-report both height and weight,

while women tend to over-report height and under-report weight.⁹ The result is an underestimation of BMI in both sexes.⁹ Thus, overweight and obesity is likely even more prevalent among SNAP-Education participants in Georgia than this study suggests. To minimize the impact of this discrepancy, comparisons reported here were made to state- and national-level data which were also based on self-reported height and weight, from the Behavior Risk Factor Surveillance System.^{2,32}

Another limitation of this study is the convenience sampling design. Though demographic variables did not differ significantly between participants excluded and included in the study sample, University of Georgia SNAP-Education direct education participants are not a representative sample of all individuals in Georgia who are eligible for SNAP-Education. In comparison to individuals receiving SNAP benefits during FY2014, the study sample over-represented elderly adults (60 years of age or older), blacks, and females.³⁵ However, due to the fact that University of Georgia SNAP-Education direct education participants self-selected to take part in the program, the study sample may, in fact, be representative of eligible individuals who would be interested in participating in future programming focusing on weight management and obesity prevention.

Implications for Research and Practice

The recent shift in policy that reestablished the SNAP-Education program as the Nutrition Education and Obesity Prevention Grant Program, implemented by the Healthy, Hunger-Free Kids Act of 2010, has opened the door for this wide-spread program to address the growing problem of obesity in the United States.⁵ As demonstrated by the high prevalence of overweight and obesity among this study sample, low-income individuals are disproportionately affected by

overweight and obesity. Culturally-appropriate interventions must be developed to aid this population in weight management and obesity prevention.

The high prevalence of inaccurate perception of weight status among overweight SNAP-Ed participants indicates a prime opportunity for intervention. BMI screening could be used to raise awareness of personal weight status among SNAP-Ed participants. For obese participants, as demonstrated by the significantly lower use of exercise as a weight loss strategy among these individuals in comparison to overweight individuals, instruction with an emphasis on exercise is indicated.

Further research is needed to determine if desire for weight loss, having attempted weight loss, and weight loss methods utilized among overweight and obese individuals are mediated by accuracy of weight perception to inform development of a new SNAP-Ed curriculum addressing obesity prevention.

Table 3.1: Key Characteristics of SNAP-Ed Direct Education Participants in Georgia during FY2015 Included and Excluded in the Analytic Sample

	Included n=270	Excluded n=640
Body Mass Index (kg/m ² , mean \pm SD)	30.42 \pm 8.21	29.35 \pm 7.07
Age (years, mean \pm SD)	55.87 \pm 20.38	54.71 \pm 19.83
Female (%)	75.19	77.88
Black (%)	73.33	71.30
Household size (mean \pm SD)	2.11 \pm 1.54	2.20 \pm 1.76
Completed high school or GED (%)	79.63	77.25
Attendance (sessions, mean \pm SD)	5.33 \pm 1.17	3.79 \pm 2.17
SNAP participation (%)	41.11	40.47

Table 3.2: Key Characteristics of the Study Sample of SNAP-Ed Direct Education Participants in Georgia during FY2015 by Body Weight Status

	Total n=270	Underweight/ Normal n=73, 27.04%	Overweight n=84, 31.11%	Obese n=113, 41.85%
Body Mass Index (kg/m ² , mean \pm SD)*	30.42 \pm 8.21	22.39 \pm 1.96	27.70 \pm 1.36	37.63 \pm 7.62
Age (years, mean \pm SD)	55.87 \pm 20.38	52.27 \pm 24.65	59.43 \pm 18.46	55.56 \pm 18.35
Female (%)	75.19	63.01	71.43	85.84
Black (%)	73.33	61.64	77.38	77.88
Household size (mean \pm SD)	2.11 \pm 1.54	2.40 \pm 1.96	1.88 \pm 1.38	2.11 \pm 1.33
Completed high school or GED (%)	79.63	79.45	83.33	76.99
Attendance (sessions, mean \pm SD)	5.33 \pm 1.17	5.42 \pm 1.10	5.15 \pm 1.28	5.40 \pm 1.12
SNAP participation (%)	41.11	43.84	32.14	46.02
Diagnosed health conditions				
High blood pressure (%)*	48.89	24.66	53.57	61.06
High cholesterol (%)*	20.37	9.59	21.43	26.55
Diabetes (%)*	18.15	6.85	19.05	24.78
Pre-diabetes (%)	3.33	4.11	2.38	3.54
Heart disease (%)*	5.56	5.48	10.71	1.77
None of these (%)*	43.70	65.75	38.10	33.63

* Significantly different across the three BMI groups at p<0.005.

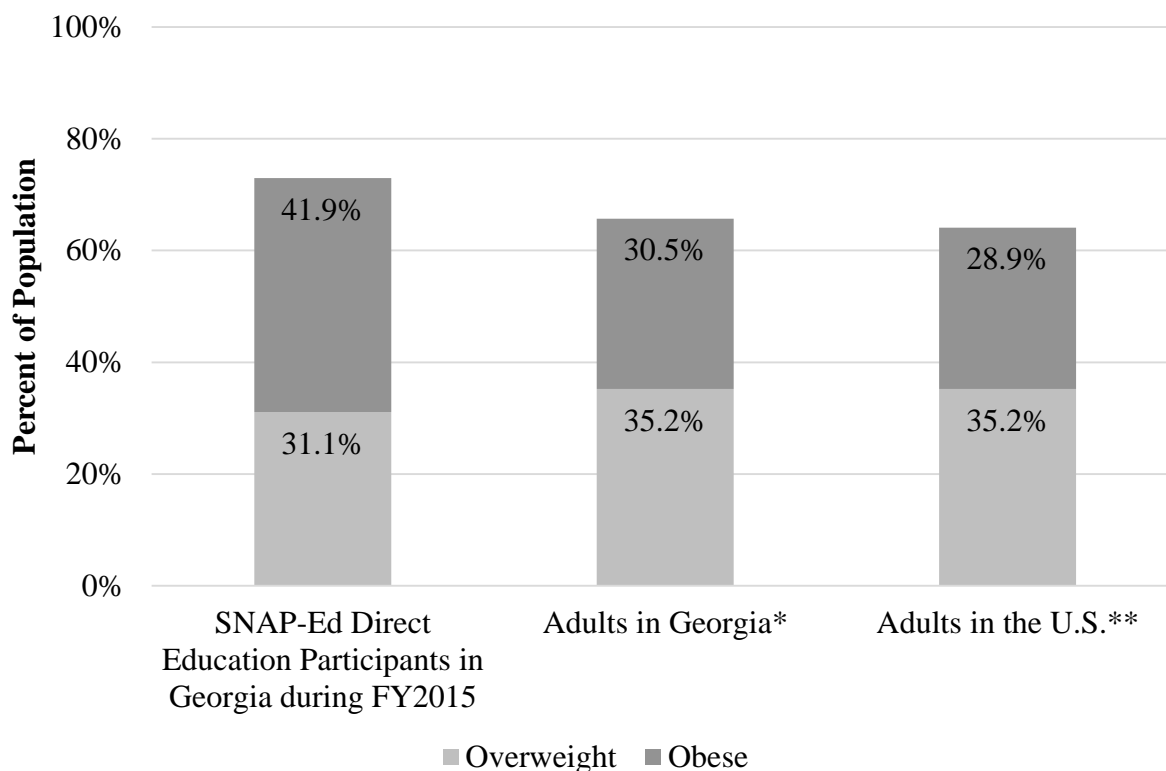


Figure 3.1: Prevalence of Overweight and Obesity

* Nutrition, physical activity and obesity: Data, trends and maps. Centers for Disease Control and Prevention Web site.

https://nccd.cdc.gov/NPAO_DTM/LocationSummary.aspx?state=Georgia. Updated 2015.

Accessed February 23, 2016.

** Nutrition, physical activity and obesity: Data, trends and maps. Centers for Disease Control and Prevention Web site.

https://nccd.cdc.gov/NPAO_DTM/LocationSummary.aspx?statecode=94. Updated 2014.

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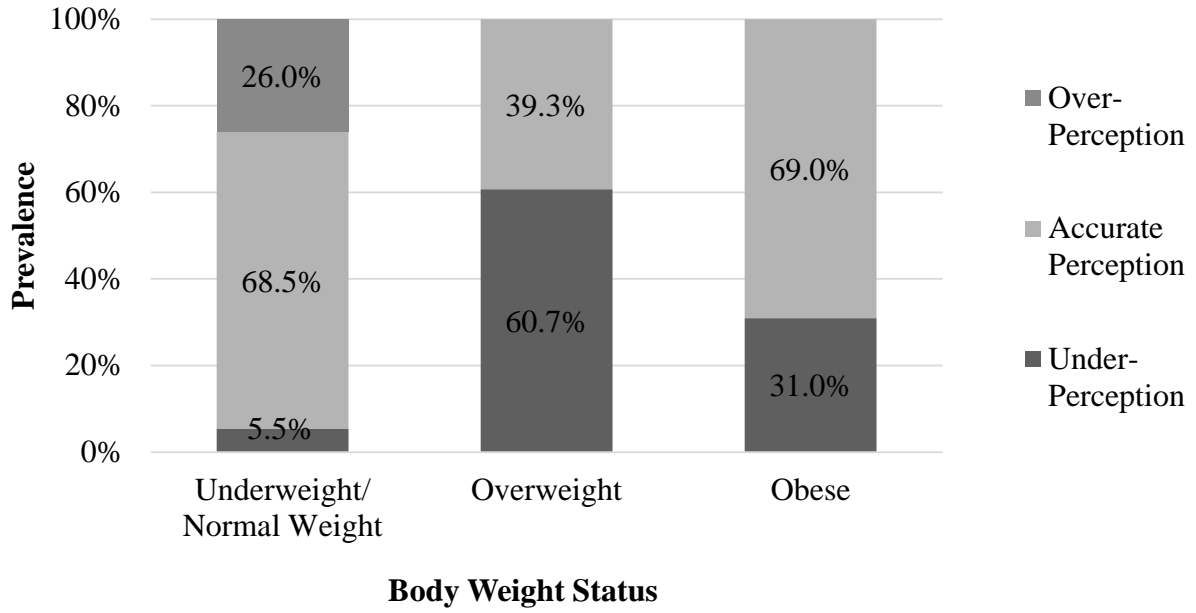


Figure 3.2: Accuracy of Weight Perception by Body Weight Status among SNAP-Ed Direct Education Participants in Georgia during FY2015

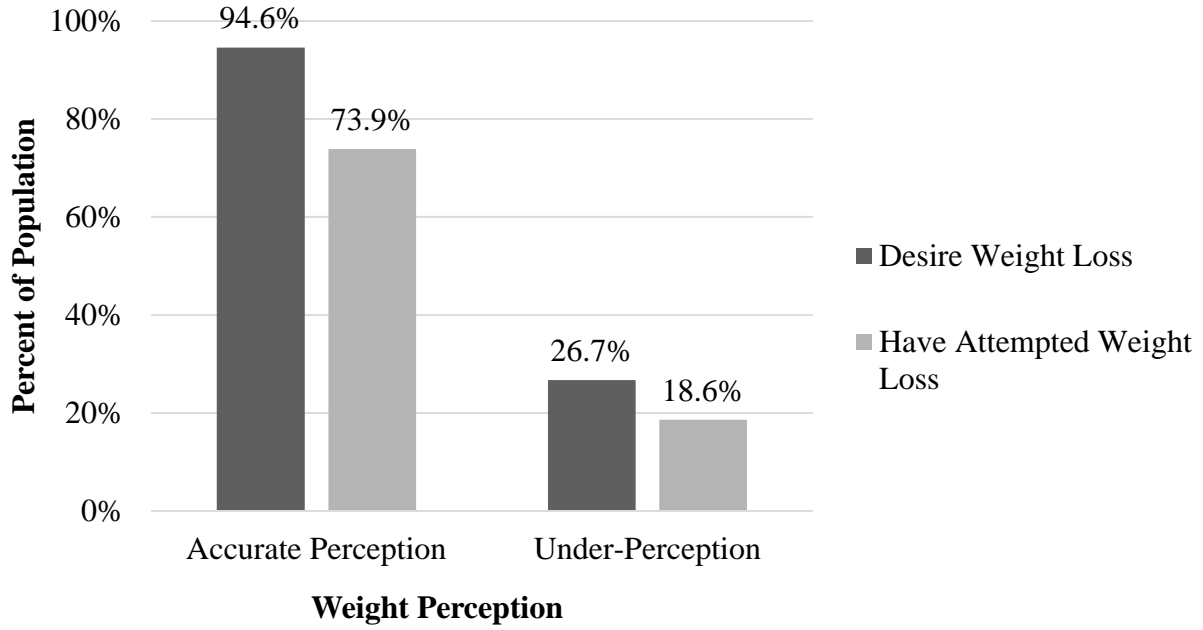


Figure 3.3: Desire for Weight Loss and Attempted Weight Loss by Weight Perception among Overweight/Obese SNAP-Ed Direct Education Participants in Georgia during FY2015

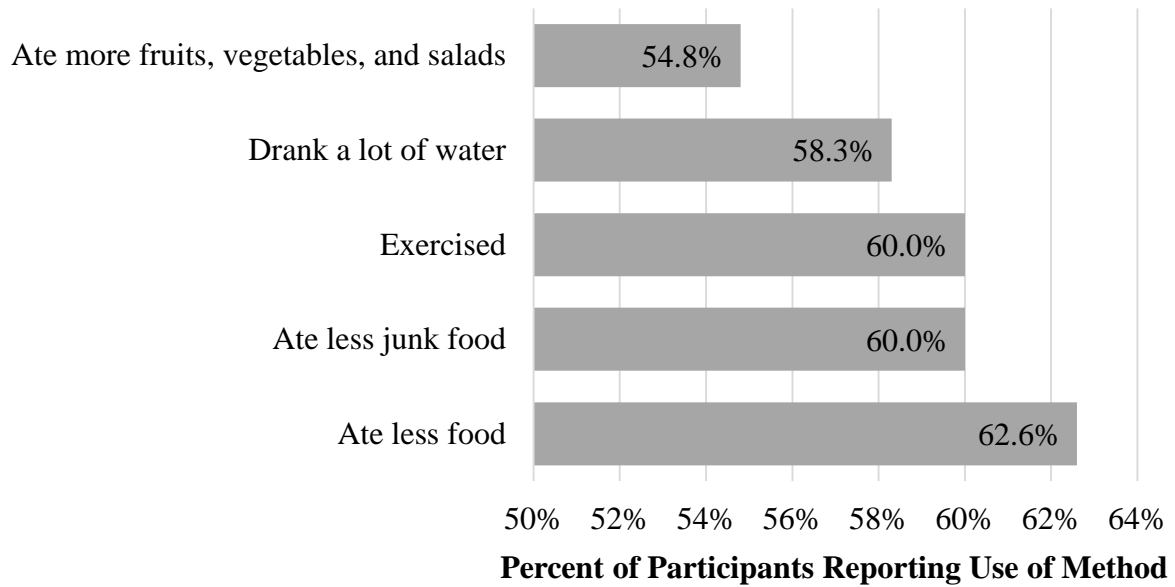


Figure 3.4: Top 5 Most-Popular Attempted Weight Loss Methods among SNAP-Ed Direct Education Participants in Georgia during FY2015

CHAPTER 4

CONCLUSION

The purpose of this study was to describe overweight and obesity, weight perception, and weight management practices among SNAP-Ed participants in Georgia. The goals of this study were to, among SNAP-Ed participants in Georgia, (1) determine prevalence of overweight and obesity, (2) determine accuracy of weight perception and assess correlation with weight management practices, and (3) determine weight management practices, including desire to lose weight, attempted weight loss, and weight loss methods utilized.

This study found that both the prevalence and the severity of overweight and obesity among the sample of SNAP-Ed direct education participants in Georgia are higher than those of the state of Georgia and of the United States as a whole, demonstrating that low-income individuals are disproportionately affected by overweight and obesity.^{2,33} The recent shift in policy that reestablished the SNAP-Ed program as the Nutrition Education and Obesity Prevention Grant Program, implemented by the Healthy, Hunger-Free Kids Act of 2010, has opened the door for this wide-spread program to address the growing problem of obesity in the United States.⁵ Culturally-appropriate interventions must be developed to aid this population in weight management and obesity prevention.

Results of this study showed that accuracy of weight perception played a key role in weight management. Among overweight and obese subjects, those who under-perceived their weight status were less likely to desire weight loss and to have attempted weight loss than those who accurately perceived themselves as overweight. High prevalence of inaccurate perception of

weight status among overweight SNAP-Ed participants indicates a prime opportunity for intervention. BMI screening could be used to raise awareness of personal weight status among SNAP-Ed participants.

Overall, more than half of all study subjects reported a desire for weight loss, and over 40% reported having attempted weight loss within the past 12 months. In comparison to obese subjects, overweight subjects were almost three times as likely to use both recommended strategies for weight loss, exercise and dietary changes, and over three times as likely to exercise to lose weight. These results indicate that instruction with emphasis on exercise as a recommended weight loss method should be incorporated into SNAP-Ed obesity prevention curricula.

There is a need for continued research for the development, implementation, and evaluation of University of Georgia SNAP-Ed obesity prevention curricula. Further research is also needed to elucidate the underlying mechanisms of the relationship between accuracy of weight perception and weight management practices.

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APPENDICES

Appendix A: Pre-questionnaire for University of Georgia SNAP-Ed Food Talk Program

 <h1>ENROLLMENT FORM</h1>	
Today's Date: _____ Name: _____ Address: _____ Phone Number: _____ Age: _____ Sex: <input type="radio"/> Male <input type="radio"/> Female Are you pregnant? <input type="radio"/> Yes <input type="radio"/> No Are you nursing? <input type="radio"/> Yes <input type="radio"/> No	How many children do you prepare meals for regularly? _____ List their ages: _____ How many other adults live with you? (Do not count yourself.) _____
Check which you or your children receive: <input type="radio"/> Free or Reduced Price Lunch <input type="radio"/> TANF <input type="radio"/> Food Stamps/SNAP <input type="radio"/> Temporary Emergency Foods or Commodity Foods <input type="radio"/> Head Start <input type="radio"/> WIC	
Do you consider yourself Hispanic/Latino ? <input type="radio"/> Yes <input type="radio"/> No Which race do you identify with? (Check all that apply.) <input type="radio"/> Black or African American <input type="radio"/> White <input type="radio"/> Asian <input type="radio"/> American Indian or Alaskan Native <input type="radio"/> Native Hawaiian or Other Pacific Islander	Last Grade Completed: <input type="radio"/> 6 or less <input type="radio"/> 12 <input type="radio"/> 7 <input type="radio"/> GED <input type="radio"/> 8 <input type="radio"/> Some college <input type="radio"/> 9 <input type="radio"/> Graduated 2 year college <input type="radio"/> 10 <input type="radio"/> Graduated college <input type="radio"/> 11 <input type="radio"/> Post Graduate Height: _____ Weight: _____

Appendix A continued

FOOD
TALK

FOOD SURVEY

As you read each question, think about how you usually do things.
This is not a test! There are no wrong answers.






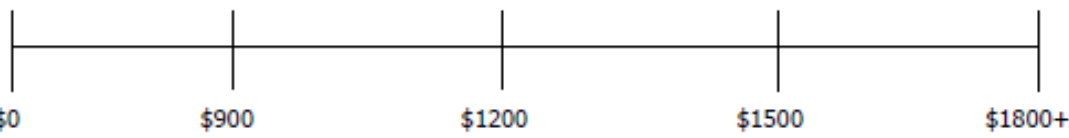

1. Do you plan meals ahead of time?
 Do not do Seldom Sometimes Most of the time Almost always
2. Do you compare prices before you buy food?
 Do not do Seldom Sometimes Most of the time Almost always
3. Do you run out of food before the end of the month?
 Do not do Seldom Sometimes Most of the time Almost always
4. Do you shop with a grocery list?
 Do not do Seldom Sometimes Most of the time Almost always
5. This question is about meat and dairy foods.
How often do you let these foods sit out for more than two hours?
 Do not do Seldom Sometimes Most of the time Almost always
6. Do you thaw frozen foods on the counter?
 Do not do Seldom Sometimes Most of the time Almost always
7. Do you think about healthy food choices when deciding what to feed your family?
 Do not do Seldom Sometimes Most of the time Almost always
8. Do you prepare foods without adding salt?
 Do not do Seldom Sometimes Most of the time Almost always
9. Do you use the "Nutrition Facts" label to compare foods when shopping?
 Do not do Seldom Sometimes Most of the time Almost always
10. Do your children eat something in the morning within two hours of waking up?
 Do not do Seldom Sometimes Most of the time Almost always

A. Do you take vitamins most days?
 Yes No

B. About how much do you spend on food each month? _____

C. How much do you exercise every day?
 Less than 30 minutes 30-60 minutes More than 60 minutes

Appendix B: Post-questionnaire for University of Georgia SNAP-Ed Food Talk Program

		<h1>EXIT FORM</h1>	
Date: _____ Name: _____		Height: _____	Weight: _____
<p>Check which you or your children receive:</p> <p> <input type="radio"/> Free or Reduced Price Lunch <input type="radio"/> TANF <input type="radio"/> Food Stamps/SNAP <input type="radio"/> Temporary Emergency Foods or Commodity Foods <input type="radio"/> Head Start <input type="radio"/> WIC </p>			
<p>Could you please show with an "X" your monthly income?</p> <p>  </p>			
<p>What is something that you learned in Food Talk to help your family eat healthier?</p> 			
<p>What types of food did you try at home for the first time? (Check all that apply.)</p> <p> <input type="radio"/> Broccoli <input type="radio"/> Brown Rice <input type="radio"/> Canned Chicken <input type="radio"/> Ground Turkey <input type="radio"/> Lactose Free Milk <input type="radio"/> Low-Fat Cheese <input type="radio"/> Red Bell Pepper <input type="radio"/> Yogurt <input type="radio"/> Other: _____ </p>			
<p>How has Food Talk impacted your life? (Check all that apply.)</p> <p> <input type="radio"/> I now plan meals. <input type="radio"/> I cook more. <input type="radio"/> I am more physically active. <input type="radio"/> I am less stressed about my food budget. <input type="radio"/> I now eat more yogurt. <input type="radio"/> I tried one of the Food Talk recipes at home. </p>			

Appendix B continued



FOOD SURVEY

As you read each question, think about how you usually do things.
This is not a test! There are no wrong answers.



1. Do you plan meals ahead of time?
 Do not do Seldom Sometimes Most of the time Almost always

2. Do you compare prices before you buy food?
 Do not do Seldom Sometimes Most of the time Almost always

3. Do you run out of food before the end of the month?
 Do not do Seldom Sometimes Most of the time Almost always



4. Do you shop with a grocery list?
 Do not do Seldom Sometimes Most of the time Almost always

5. This question is about meat and dairy foods.
How often do you let these foods sit out for more than two hours?
 Do not do Seldom Sometimes Most of the time Almost always



6. Do you thaw frozen foods on the counter?
 Do not do Seldom Sometimes Most of the time Almost always

7. Do you think about healthy food choices when deciding what to feed your family?
 Do not do Seldom Sometimes Most of the time Almost always



8. Do you prepare foods without adding salt?
 Do not do Seldom Sometimes Most of the time Almost always

9. Do you use the "Nutrition Facts" label to compare foods when shopping?
 Do not do Seldom Sometimes Most of the time Almost always

10. Do your children eat something in the morning within two hours of waking up?
 Do not do Seldom Sometimes Most of the time Almost always


A. Do you take vitamins most days?
 Yes No

B. About how much do you spend on food each month? _____

C. How much do you exercise every day?
 Less than 30 minutes 30-60 minutes More than 60 minutes

Appendix C: Session Two Post-Lesson Survey for University of Georgia SNAP-Ed Food Talk Program

Question of the Day



Name: _____

Please circle the response that best fits the way you feel about your health.

1. I would say my health in general is...

- 1) Excellent
- 2) Very good
- 3) Good
- 4) Fair
- 5) Poor

2. I feel like my weight is...

- 1) Underweight
- 2) About the right weight
- 3) Overweight

3. I would like to weigh...

- 1) More
- 2) Less
- 3) Stay about the same

4. During the past 12 months, I have tried to lose weight...


- 1) Yes
- 2) No

If yes to **question 4.**, I tried to lose weight by ... *(Circle all that apply)*

- a. I ate less food
- b. I exercised
- c. I ate "diet" foods or products
- d. I took diet pills, medicines, herbs, or supplements
- e. I smoked cigarettes
- f. I drank a lot of water
- g. I stopped drinking soda or other sweetened beverages
- h. I ate more fruits, vegetables, and salads
- i. I ate less sugar, candy, sweets
- j. I stopped eating late in the evening
- k. I began eating smaller meals more often throughout the day
- l. I ate less junk food
- m. I ate less fast food


5. My doctor has told me I have... *(Circle all that apply)*

- 1) High blood pressure
- 2) High cholesterol
- 3) Diabetes
- 4) Pre-diabetes
- 5) Heart disease
- 6) None of these



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Supplemental Nutrition Assistance Program Education

Appendix D: Characteristics of Food Talk Participants Included and Excluded in the Analytic Sample

	Included n=270, 29.67%	Excluded n=640, 70.33%	Excluded with Height and Weight Reported n=427, 46.92%	Excluded without Height and/or Weight Reported n=213, 23.41%
Body Mass Index (kg/m², mean ± SD)	30.42 ±8.21 (n=270)	29.35 ±7.07 (n=427)	29.35 ±7.07 (n=427)	-
<u>BMI category</u>				
Underweight/normal (%)	27.04 (n=270)	28.81 (n=427)	28.81 (n=427)	-
Overweight (%)	31.11 (n=270)	32.55 (n=427)	32.55 (n=427)	-
Obese (%)	41.85 (n=270)	38.64 (n=427)	38.64 (n=427)	-
Age (years, mean ± SD)	55.87 ±20.38 (n=270)	54.71 ±19.83 (n=558)	53.10 ±19.65 (n=394)	58.57 ±19.80 (n=164)
<u>Age distribution</u>				
<60 years (%)	46.67 (n=270)	52.51 (n=558)	55.33 (n=394)	45.73 (n=164)
≥60 years (%)	53.33 (n=270)	47.49 (n=558)	44.67 (n=394)	54.27 (n=164)
Female (%)	75.19 (n=270)	77.88 (n=633)	78.45 (n=427)	76.70 (n=206)
<u>Race</u>				
Black (%)	73.33 (n=270)	71.30 (n=575)	73.22 (n=407)	66.67 (n=168)
White (%)	22.96 (n=270)	21.22 (n=575)	22.11 (n=407)	19.05 (n=168)
Other (including multi-racial) (%)	3.70 (n=270)	7.48 (n=575)	4.67 (n=407)	14.29 (n=168)
Has 1 or more child (%)	18.89 (n=270)	24.64 (n=633)	28.57 (n=427)	16.50 (n=206)
Household size (mean ± SD)	2.11 ±1.54 (n=270)	2.20 ±1.76 (n=633)	2.36 ±1.86 (n=427)	1.87 ±1.50 (n=206)
Completed high school or GED (%)	79.63 (n=270)	77.25 (n=523)	77.13 (n=376)	77.55 (n=147)
<u>Daily exercise</u>				
Less than 30 minutes (%)	52.96 (n=270)	49.71 (n=523)	48.29 (n=381)	53.52 (n=142)
30-60 minutes (%)	40.37 (n=270)	39.39 (n=523)	40.94 (n=381)	35.21 (n=142)
More than 60 minutes (%)	6.67 (n=270)	10.90 (n=523)	10.76 (n=381)	11.27 (n=142)
<u>Perceived general health</u>				
Fair-Poor (%)	25.93 (n=270)	18.93 (n=169)	16.83 (n=101)	22.06 (n=68)
Good-Excellent (%)	74.07 (n=270)	81.07 (n=169)	83.17 (n=101)	77.94 (n=68)
Accurately perceive weight (%)	59.63 (n=270)	57.84 (n=102)	57.84 (n=102)	-
Desire weight loss (%)	57.04 (n=270)	58.93 (n=168)	61.39 (n=101)	55.22 (n=67)
Attempted weight loss (%)	43.70 (n=270)	38.18 (n=165)	39.00 (n=100)	36.92 (n=65)
<u>Diagnosed health conditions</u>				
High blood pressure (%)	48.89 (n=270)	43.64 (n=165)	40.40 (n=99)	48.48 (n=66)

High cholesterol (%)	20.37 (n=270)	27.88 (n=165)	24.24 (n=99)	33.33 (n=66)
Diabetes (%)	18.15 (n=270)	12.12 (n=165)	11.11 (n=99)	13.64 (n=66)
Pre-diabetes (%)	3.33 (n=270)	4.24 (n=165)	3.03 (n=99)	6.06 (n=66)
Heart disease (%)	5.56 (n=270)	7.88 (n=165)	3.03 (n=99)	15.15 (n=66)
None of these (%)	43.70 (n=270)	32.30 (n=161)	32.63 (n=95)	31.82 (n=66)
Number of reported health conditions (mean \pm SD)	0.96 \pm 1.03 (n=270)	0.96 \pm 1.08 (n=165)	0.82 \pm 1.01 (n=99)	1.17 \pm 1.16 (n=66)
Attendance (sessions, mean \pm SD)	5.33 \pm 1.17 (n=270)	3.79 \pm 2.17 (n=640)	3.71 \pm 2.21 (n=427)	3.95 \pm 2.07 (n=213)
SNAP participation (%)	41.11 (n=270)	40.47 (n=640)	42.15 (n=427)	37.09 (n=213)

Appendix E: Characteristics of the Study Sample by Body Weight Status

	Underweight/Normal n=73, 27.04%	Overweight n=84, 31.11%	Obese n=113, 41.85%	Total n=270	p-value
Body Mass Index (kg/m ² , mean± SD)	22.39 ±1.96	27.70 ±1.36	37.63 ±7.62	30.42 ±8.21	<0.0001
Age (years, mean ± SD)	52.27 ±24.65	59.43 ±18.46	55.56 ±18.35	55.87 ±20.38	0.0878
Age distribution					0.0321
<60 years (%)	56.16	35.71	48.67	46.67	
≥60 years (%)	43.84	64.29	51.33	53.33	
Female (%)	63.01	71.43	85.84	75.19	0.0013
Race					0.1134
Black (%)	61.64	77.38	77.88	73.33	
White (%)	34.25	19.05	18.58	22.96	
Other (including multi-racial) (%)	4.11	3.57	3.54	3.70	
Has 1 or more child (%)	20.55	14.29	21.24	18.89	0.4274
Household size (mean ± SD)	2.40 ±1.96	1.88 ±1.38	2.11 ±1.33	2.11 ±1.54	0.1122
Completed high school or GED (%)	79.45	83.33	76.99	79.63	0.5497
Daily exercise					0.2177
Less than 30 minutes (%)	47.95	53.57	55.75	52.96	
30-60 minutes (%)	39.73	40.48	40.71	40.37	
More than 60 minutes (%)	12.33	5.95	3.54	6.67	
Perceived general health					0.0660
Fair-Poor (%)	17.81	23.81	32.74	25.93	
Good-Excellent (%)	82.19	76.19	67.26	74.07	
Accurately perceive weight (%)	68.49	39.29	69.03	59.63	<.0001
Desire weight loss (%)	35.62	55.95	71.68	57.04	<.0001
Attempted weight loss (%)	27.40	35.71	60.18	43.70	<.0001
Diagnosed health conditions					
High blood pressure (%)	24.66	53.57	61.06	48.89	<.0001
High cholesterol (%)	9.59	21.43	26.55	20.37	0.0188
Diabetes (%)	6.85	19.05	24.78	18.15	0.0080
Pre-diabetes (%)	4.11	2.38	3.54	3.33	0.8237
Heart disease (%)	5.48	10.71	1.77	5.56	0.0254
None of these (%)	65.75	38.10	33.63	43.70	<.0001
Number of health conditions (mean ± SD)	0.51 ±0.85	1.07 ±1.05	1.18 ±1.05	0.96 ±1.03	<.0001
Attendance (sessions, mean ± SD)	5.42 ±1.10	5.15 ±1.28	5.40 ±1.12	5.33 ±1.17	0.2536
SNAP participation (%)	43.84	32.14	46.02	41.11	0.1263

Appendix F: Self-Reported Perceived Body Weight Status by Body Weight Status as Determined by BMI

	Underweight n=3, 1.11%	Normal n=70, 25.93%	Overweight n=84, 31.11%	Obese n=113, 41.85%	Total n=270	p-value
Perceived Weight Status						<.0001
Underweight (%)	33.33	5.71	0	0.88	2.22	
About the right weight (%)	66.67	70.00	60.71	30.09	50.37	
Overweight (%)	0	24.29	39.29	69.03	47.41	

Appendix G: Characteristics of Overweight/Obese Subjects by Desired Weight Change

	Increase (%)	Decrease (%)	No Change (%)	p-value
<u>BMI category</u>				0.0328
Overweight (n=84, 42.64%)	4.76	55.95	39.29	
Obese (n=113, 57.36%)	6.19	71.68	22.12	
<u>Perceived weight status</u>				<.0001
Underweight (n=1, 0.51%)	100.00	0.00	0.00	
About the right weight (n=85, 43.15%)	8.24	27.06	64.71	
Overweight (n=111, 56.35%)	2.70	94.59	2.70	
<u>Perception agreement</u>				<.0001
Under-perception (n=86, 43.65%)	9.30	26.74	63.95	
Accurate perception (n=111, 56.35%)	2.70	94.59	2.70	
<u>Perceived general health</u>				0.5892
Fair-Poor (n=57, 28.93%)	7.02	59.65	33.33	
Good-Excellent (n=140, 71.07%)	5.00	67.14	27.86	
<u>Presence of selected diagnoses</u>				0.0008
1 or more (n=127, 64.47%)	5.51	74.02	20.47	
None (n=70, 35.53%)	5.71	48.57	45.71	
<u>Age</u>				0.6409
<60 years (n=85, 43.15%)	7.06	65.88	27.06	
≥60 years (n=112, 56.85%)	4.46	64.29	31.25	
<u>Gender</u>				0.3319
Male (n=40, 20.30%)	7.50	55.00	37.50	
Female (n=157, 79.70%)	5.10	67.52	27.39	
<u>Race</u>				0.0710
Black (n=153, 77.66%)	7.19	60.78	32.03	
White (n=37, 18.78%)	0.00	83.78	16.22	
Other (including multi-racial) (n=7, 3.55%)	0.00	57.14	42.86	
<u>Children</u>				0.9700
None (n=161, 81.73%)	5.59	64.60	29.81	
One or more (n=36, 18.27%)	5.56	66.67	27.78	
<u>Household size</u>				0.0797
One individual (n=102, 51.78%)	6.86	70.59	22.55	
Two or more individuals (n=95, 48.22%)	4.21	58.95	36.84	
<u>High school or GED</u>				0.0058
Did not complete (n=40, 20.30%)	12.50	45.00	42.50	
Completed (n=157, 79.70%)	3.82	70.06	26.11	
<u>Attendance</u>				0.1923
5 or fewer sessions (n=66, 33.50%)	1.52	69.70	28.79	
6 sessions (n=131, 66.50%)	7.63	62.60	29.77	
Total (n=197)	5.58	64.97	29.44	

Appendix H: Characteristics of Underweight/Normal Subjects by Desired Weight Change

	Increase (%)	Decrease (%)	No Change (%)	p-value
<u>BMI category</u>				0.4174
Underweight (n=3, 4.11%)	33.33	0.00	66.67	
Normal weight (n=70, 95.89%)	22.86	37.14	40.00	
<u>Perceived weight status</u>				<.0001
Underweight (n=5, 6.85%)	60.00	20.00	20.00	
About the right weight (n=51, 69.86%)	23.53	21.57	54.90	
Overweight (n=17, 23.29%)	11.76	82.35	5.88	
<u>Perception agreement</u>				0.0013
Under-perception (n=4, 5.48%)	50.00	25.00	25.00	
Accurate perception (n=50, 68.49%)	26.00	22.00	52.00	
Over-perception (n=19, 26.03%)	10.53	73.68	15.79	
<u>Perceived general health</u>				0.6364
Fair-Poor (n=13, 17.81%)	23.08	46.15	30.77	
Good-Excellent (n=60, 82.19%)	23.33	33.33	43.33	
<u>Presence of selected diagnoses</u>				0.1702
1 or more (n=25, 34.25%)	16.00	28.00	56.00	
None (n=48, 65.75%)	27.08	39.58	33.33	
<u>Age</u>				0.0008
<60 years (n=41, 56.16%)	29.27	48.78	21.95	
≥60 years (n=32, 43.84%)	15.63	18.75	65.63	
<u>Gender</u>				0.2923
Male (n=27, 36.99%)	33.33	29.63	37.04	
Female (n=46, 63.01%)	17.39	39.13	43.48	
<u>Race</u>				0.0007
Black (n=45, 61.64%)	33.33	17.78	48.89	
White (n=25, 34.25%)	8.00	60.00	32.00	
Other (including multi-racial) (n=3, 4.11%)	0.00	100.00	0.00	
<u>Children</u>				0.1102
None (n=58, 79.45%)	18.97	34.48	46.55	
One or more (n=15, 20.55%)	40.00	40.00	20.00	
<u>Household size</u>				0.7321
One individual (n=38, 52.05%)	23.68	31.58	44.74	
Two or more individuals (n=35, 47.95%)	22.86	40.00	37.14	
<u>High school or GED</u>				0.5705
Did not complete (n=15, 20.55%)	33.33	33.33	33.33	
Completed (n=58, 79.45%)	20.69	36.21	43.10	
<u>Attendance</u>				0.6978
5 or fewer sessions (n=21, 28.77%)	23.81	28.57	47.62	
6 sessions (n=52, 71.23%)	23.08	38.46	38.46	
Total (n=73)	23.29	35.62	41.10	

**Appendix I: Characteristics of Subjects Who Have Tried to Lose Weight in the Past 12 Months
by Weight Loss Methods Utilized**

	Ate less food (%)	Exercised (%)	Ate "diet" foods or products (%)	Took diet pills, medicines, herbs, or supplements (%)	Smoked cigarettes (%)	Drank a lot of water (%)	Stopped drinking soda or other sweetened beverages (%)
<u>BMI category</u>	p=0.1187	p=0.0486	p=0.2989	p=0.0172	p=0.6049	p=0.4130	p=0.2311
Underweight/Normal (n=20, 17.39%)	45.00	55.00	15.00	0.00	15.00	45.00	35.00
Overweight (n=29, 25.22%)	58.62	79.31	3.45	0.00	10.34	62.07	24.14
Obese (n=66, 57.39%)	69.70	53.03	13.64	15.15	7.58	60.61	42.42
<u>Perceived weight status</u>	p=0.2777	p=0.2297	p=0.9363	p=0.1716	p=0.8555	p=0.3143	p=0.3014
Underweight (n=1, 0.87%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
About the right weight (n=27, 23.48%)	55.56	70.37	11.11	0.00	7.41	66.67	25.93
Overweight (n=87, 75.65%)	65.52	57.47	11.49	11.49	10.34	56.32	40.23
<u>Perception agreement</u>	p=0.0656	p=0.2155	p=0.7754	p=0.2543	p=0.3582	p=0.1951	p=0.2765
Under-perception (n=16, 13.91%)	50.00	62.50	6.25	0.00	0.00	68.75	18.75
Accurate perception (n=92, 80.00%)	67.39	61.96	11.96	10.87	10.87	58.70	39.13
Over-perception (n=7, 6.09%)	28.57	28.57	14.29	0.00	14.29	28.57	42.86
<u>Perceived general health</u>	p=0.1340	p=1.0000	p=0.0406	p=0.0038	p=0.1634	p=0.4014	p=0.3851
Fair-Poor (n=31, 26.96%)	74.19	61.29	22.58	22.58	16.13	51.61	29.03
Good-Excellent (n=84, 73.04%)	58.33	59.52	7.14	3.57	7.14	60.71	39.29
<u>Presence of selected diagnoses</u>	p=0.1523	p=0.3129	p=0.7563	p=1.0000	p=1.0000	p=0.0165	p=0.3042
1 or more (n=77, 66.96%)	67.53	63.64	10.39	9.09	10.39	66.23	40.26
None (n=38, 33.04%)	52.63	52.63	13.16	7.89	7.89	42.11	28.95
<u>Age</u>	p=0.8493	p=0.2614	p=0.0066	p=0.0065	p=0.1142	p=0.1353	p=0.3327
<60 years (n=55, 47.83%)	63.64	54.55	20.00	16.36	14.55	50.91	41.82
≥60 years (n=60, 52.17%)	61.67	65.00	3.33	1.67	5.00	65.00	31.67
<u>Gender</u>	p=0.8074	p=0.1490	p=0.4571	p=0.2048	p=1.0000	p=0.0015	p=0.4606
Male (n=22, 19.13%)	59.09	45.45	4.55	0.00	9.09	27.27	27.27
Female (n=93, 80.87%)	63.44	63.44	12.90	10.75	9.68	65.59	38.71
<u>Race</u>	p=0.2318	p=0.8052	p=0.1032	p=0.3439	p=0.1194	p=0.8229	p=0.3002
Black (n=76, 66.09%)	61.84	57.89	15.79	10.53	6.58	59.21	31.58
White (n=33, 28.70%)	69.70	63.64	3.03	3.03	18.18	54.55	45.45
Other (including multi-racial) (n=6, 5.22%)	33.33	66.67	0.00	16.67	0.00	66.67	50.00
<u>Children</u>	p=0.8148	p=0.8128	p=0.0222	p=0.0004	p=0.2263	p=1.0000	p=0.8113
None (n=92, 80.00%)	61.96	60.87	7.61	3.26	7.61	58.70	35.87
One or more (n=23, 20.00%)	65.22	56.52	26.09	30.43	17.39	56.52	39.13

Household size	p=0.5618	p=0.8494	p=0.0706	p=0.0948	p=1.0000	p=1.0000	p=0.4387
One individual (n=66, 57.39%)	65.15	59.09	6.06	4.55	9.09	57.58	33.33
Two or more individuals (n=49, 42.61%)	59.18	61.22	18.37	14.29	10.20	59.18	40.82
High school or GED	p=0.7888	p=0.2875	p= 1.0000	p=0.3540	p=0.2071	p=1.0000	p=0.7860
Did not complete (n=17, 14.78%)	58.82	47.06	11.76	0.00	17.65	58.82	41.18
Completed (n=98, 85.22%)	63.27	62.24	11.22	10.20	8.16	58.16	35.71
Total (n=115)	62.61	60.00	11.30	8.70	9.57	58.26	36.52

Appendix I continued

	Ate more fresh fruits, vegetables, and salads (%)	Ate less sugar, candy, sweets (%)	Stopped eating late in the evening (%)	Began eating smaller meals more often throughout the day (%)	Ate less junk food (%)	Ate less fast food (%)
BMI category	p=0.3323	p=0.2754	p=0.2257	p=0.6011	p=0.0654	p=0.0654
Underweight/Normal (n=20, 17.39%)	45.00	35.00	15.00	30.00	40.00	30.00
Overweight (n=29, 25.22%)	65.52	44.83	27.59	37.93	55.17	37.93
Obese (n=66, 57.39%)	53.03	54.55	34.85	42.42	68.18	56.06
Perceived weight status	p=0.4995	p=0.2203	p=0.1194	p=0.3521	p=0.0262	p=0.2998
Underweight (n=1, 0.87%)	100.00	0.00	0.00	0.00	0.00	100.00
About the right weight (n=27, 23.48%)	48.15	37.04	14.81	29.63	40.74	37.04
Overweight (n=87, 75.65%)	56.32	52.87	34.48	42.53	66.67	49.43
Perception agreement	p=0.3033	p=0.8360	p=0.5853	p=0.7774	p=0.0001	p=0.1820
Under-perception (n=16, 13.91%)	50.00	43.75	18.75	31.25	25.00	43.75
Accurate perception (n=92, 80.00%)	57.61	48.91	31.52	40.22	69.57	50.00
Over-perception (n=7, 6.09%)	28.57	57.14	28.57	42.86	14.29	14.29
Perceived general health	p=0.5269	p=1.0000	p=0.8183	p=0.2023	p=0.3919	p=0.4000
Fair-Poor (n=31, 26.96%)	48.39	48.39	32.26	29.03	67.74	54.84
Good-Excellent (n=84, 73.04%)	57.14	48.81	28.57	42.86	57.14	44.05
Presence of selected diagnoses	p=0.0731	p=0.0792	p=0.0831	p=0.3108	p=0.0687	p=0.0285
1 or more (n=77, 66.96%)	61.04	54.55	35.06	42.86	66.23	54.55
None (n=38, 33.04%)	42.11	36.84	18.42	31.58	47.37	31.58
Age	p=0.0628	p=0.0935	p=0.5420	p=0.5729	p=0.4542	p=0.1372
<60 years (n=55, 47.83%)	45.45	40.00	32.73	36.36	56.36	54.55
≥60 years (n=60, 52.17%)	63.33	56.67	26.67	41.67	63.33	40.00
Gender	p=0.0609	p=0.0086	p=0.2984	p=0.0294	p=0.0157	p=0.1545
Male (n=22, 19.13%)	36.36	22.73	18.18	18.18	36.36	31.82
Female (n=93, 80.87%)	59.14	54.84	32.26	44.09	65.59	50.54
Race	p=0.3470	p=0.5099	p=0.7269	p=0.4904	p=0.8052	p=0.5580

Black (n=76, 66.09%)	52.63	50.00	31.58	39.47	57.89	43.42
White (n=33, 28.70%)	54.55	42.42	24.24	42.42	63.64	54.55
Other (including multi-racial) (n=6, 5.22%)	83.33	66.67	33.33	16.67	66.67	50.00
Children	p=1.0000	p=0.1651	p=1.0000	p=0.4743	p=0.6396	p=0.8167
None (n=92, 80.00%)	54.35	52.17	29.35	41.30	58.70	47.83
One or more (n=23, 20.00%)	56.52	34.78	30.43	30.43	65.22	43.48
Household size	p=0.7074	p=0.0139	p=0.5430	p=0.4437	p=1.0000	p=0.8503
One individual (n=66, 57.39%)	53.03	59.09	27.27	42.42	60.61	45.45
Two or more individuals (n=49, 42.61%)	57.14	34.69	32.65	34.69	59.18	48.98
High school or GED	p=0.2928	p=0.1155	p=0.7744	p=1.0000	p=0.2875	p=0.7932
Did not complete (n=17, 14.78%)	41.18	29.41	23.53	41.18	47.06	41.18
Completed (n=98, 85.22%)	57.14	52.04	30.61	38.78	62.24	47.96
Total (n=115)	54.78	48.70	29.57	39.13	60.00	46.96