THE FEASIBILITY OF A BINGE EATING INTERVENTION IN AFRICAN-AMERICAN WOMEN WHO ARE OVERWEIGHT OR OBESE

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Abstract

African-American women have the highest rates of obesity in the United States, and are at increased risk for a variety of co-morbid health conditions. A significant number of African-American women may have untreated eating disorders that perpetuate their propensity toward obesity. A specific eating pattern that is of serious concern is binge eating, a condition associated with severe obesity. To our knowledge, no intervention research has attempted to treat binge eating among African-American women.

In light of this void in the intervention research literature, the purpose of this study was to investigate the feasibility of Appetite Awareness Treatment (AAT), an 8-week cognitive-behavioral binge eating intervention, to reduce binge-eating episodes among African-American women who are overweight and obese. Using a randomized controlled trial design, adult women were randomized to AAT or a Wait-list control (WLC) AAT condition.

The sample (N=31), had a mean (±SD) age of 48.81 ±12.79 years, and a body mass index of 33.70 ± 3.90. Within our sample, 83.8% (n=26) completed assessments at 0 and 8 weeks. Overall retention rates were as follows: AAT (n=14, 87.5%) and WLC (n=12; 80%). Moreover, participants completed an average of 2.73/5, or 55% of all homework assignments.

To examine the preliminary effectiveness of the AAT intervention, linear mixed modeling was used to examine the differences between the AAT and WLC, as a function of group, time,

and group X time interaction, on the outcome variables of BMI, waist circumference, blood pressure, binge eating, eating self-efficacy, and depressive symptoms. At the end of the 8-week intervention, the women in the AAT group had lower mean binge eating scores and higher eating self-efficacy scores than the women in the WLC group.

The results of the study suggest that the AAT may improve the eating behaviors and weight outcomes in African-American women who are overweight or obese. The results of this feasibility study highlight the need for the next phase of treatment – a study with a large enough sample (and the associated statistical power) to investigate the efficacy of the AAT in a sample of African-American women, with increased variability in the BMI.

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1.0 INTRODUCTION

Over 65% of adults in the US are overweight or obese; however, African-American women are disproportionately represented in this group. Researchers and healthcare professionals use the body mass index (BMI) to calculate obesity; adults with a BMI between 25 and 29.9 are categorized as overweight, and adults with a BMI ≥30 are obese. Based on these criteria, 82.6% of African-American women are considered overweight or obese (Flegal, Carroll, Kit, & Ogden, 2012). When the prevalence estimates are restricted to obesity (Class 1, 2 or 3), the over-representation of AA women is more pronounced; the prevalence of obesity among non-Hispanic AA women is significantly higher than rates for non-Hispanic whites, black men or Hispanic men (56.9% vs. 35.5% in non-Hispanic white women, 45.7% in Hispanic women, 33.6% in white men, 37.5% in black men, and 39.0% in Hispanic men) (Ogden, Carroll, Fryar, & Flegal, 2015).

African-American women who are overweight (BMI ≥ 25) or obese (BMI ≥ 30) are at risk for development of multiple physical health conditions that include type 2 diabetes, breast cancer, and cardiovascular disease (CVD) (American Heart Association, 2013). CVD risk increases with unhealthy lifestyle habits, the development of overweight/obesity, and diabetes. Currently, 48.9% of African-American women have CVD, which is the leading cause of death in this population (American Heart Association, 2013). Moreover, the risk of

type 2 diabetes is approximately two times higher in African-Americans than in European Americans (Cheng et al., 2012).

There are various reasons that may explain the high prevalence of obesity among African-American women. Common individual contributors include the reduced consumption of recommended amounts of fruits, vegetables, and whole grains; cultural attitudes that show preference to heavier body weight (Boyington et al., 2008); a decreased likelihood of being physically active, and lack of time and motivation directed toward behavior change to achieve weight loss (Barnes et al., 2007). Additionally, African-American women experience less social pressure to lose weight, thereby affecting motivation to pursue long-term weight management strategies (Boyington et al., 2008).

Furthermore, African-American women who desire to lose weight may encounter additional barriers if their current income is below the poverty level (Gaines, 2010). According to recent census estimates, 25.8% of African-Americans currently live below the federal poverty line (Macartney, Bishaw, & Fontenot, 2013). Over the past 20 years, researchers have consistently found an inverse relationship between obesity and socioeconomic status (SES). (McLaren, 2007; Sobal & Stunkard, 1989). SES, often defined as a combination of years of education, gross annual income, and employment, can influence an individual's likelihood to become overweight or obese as early as childhood (James, Fowler-Brown, Raghunathan, & Van Hoewyk, 2006). The relationship between SES and obesity is especially startling among women. Fully 42% of those with incomes below 130% of the poverty level are obese, compared with only 29% of women at or above 350% of the poverty level (Ogden, Lamb, Carroll, & Flegal, 2010). Among African-American women,

54.7% of those with incomes below 130% of the poverty line are obese (Ogden, Lamb, Carroll, & Flegal, 2010).

Despite the magnitude of resources committed to addressing obesity, researchers are still in search of an effective intervention that will demonstrate long-term change. Behavioral treatment of obesity has provided a necessary framework for weight-loss interventions for more than 20 years (Burke & Wang, 2011). An important concern, however, is that most clinical weight loss trials have not had an adequate representation of African-American women in the sample (Fitzgibbon et al., 2012; Samuel-Hodge et al., 2012). Moreover, when these women have been included, their consequent weight loss is less than what is observed in white participants, despite extensive cultural tailoring seen in recent trials (Fitzgibbon et al., 2012; McTigue, Hess, & Ziouras, 2006; Rubin et al., 2002).

Recently, there has been a growing body of research on the importance of the social environment and how it influences the ability of African-American women to engage in recommended weight loss practices (Fitzgibbon et al., 2012). As researchers seek to understand ethnic differences in obesity, more scholars are realizing that individuals who live in marginalized and underserved communities may be less likely to pay attention to weight gain, and may experience more significant stressful life situations, and reduced likelihood to engage in healthful weight control practices (Jeffery & French, 1996; Fitzgibbon et al., 2012).

African-American women manage their weight within the context of societal racism, discrimination, and gender inequalities (Everett, Hall, & Hamilton-Mason, 2010). At a 2007 meeting of the African-American Researchers Collaborative, the use of creativity was encouraged to address the complex nature of historical trauma African-Americans have faced

and how that relates to their eating choices (Kumanyika et al., 2007). While this cultural group has been focusing on managing social concerns, overeating may have served as an acceptable coping mechanism (Kumanyika et al., 2007).

1.1 THE PROBLEM OF BINGE EATING

In recent studies, investigators have observed that a significant number of African-American women have untreated eating disorders and mental health concerns that perpetuate their propensity toward obesity and limited success in weight-loss treatment (Chang, Nitzke, Guilford, Adair, & Hazard, 2008; Fitzgibbon et al., 2012; Harrington, Crowther, & Shipherd, 2010; Mastin, Campo, & Askelson, 2012; McTigue et al., 2006; Rubin et al., 2002). A particular behavior pattern that is of serious concern is binge eating or compulsive overeating, as it is associated with severe obesity (Hudson, Hiripi, Pope, & Kessler, 2007; Yanovski, Nelson, Dubbert, & Spitzer, 1993). Binge eating is described by patterns of eating more than a person without the eating disorder would eat in a discrete period, while concurrently experiencing a sense of loss of control (American Psychiatric Association, 2013). Susceptibility to binge eating places one at risk to develop Binge Eating Disorder (BED), which continues to be undertreated. Moreover, BED is strongly associated with other co-morbid conditions of serious concern, including that of severe obesity, substance disorders, and mood disorders (Guss, Kissileff, Devlin, Zimmerli, & Walsh, 2002; Pike, Dohm, Striegel-Moore, Wilfley, & Fairburn, 2001; Striegel-Moore, Wilfley, Pike, Dohm, & Fairburn, 2000; Wilson et al., 2012; Yanovski, 2003; Hudson et al., 2007)

In a secondary analysis of 3,570 African-American adults who participated in the National Institutes of Mental Health Collaborative Psychiatric Epidemiological Studies (CPES), the presence of any binge eating was markedly higher among African-Americans than Non-

Latino whites. The reported presence of any binge eating (regardless of clinical diagnosis) among African-American women was 4.83%, compared to only 2.53% in Non-Latino white women (Marques et al., 2011). Among African-American women who were severely obese (BMI ≥40), rates of binge eating were discovered to be higher than 35% (Mazzeo, Saunders, & Mitchell, 2005). Additionally, among African-American women who have experienced trauma (estimates indicate approximately 60%), binge eating may be more severe (Alim et al., 2006; Harrington et al., 2010). Researchers have speculated that African-American women may use binge eating as a way to regulate emotion and escape from painful reminders and memories (Harrington, Crowther, Henrickson, & Mickelson, 2006; Harrington et al., 2010; Thompson, 1992).

Since many adults with BED report becoming overweight *after* binge eating on a regular basis, early intervention among individuals at risk to develop BED may be a viable strategy in weight gain prevention (Fairburn, Cooper, Doll, Norman, & O'Connor, 2000; Mussell et al., 1995; Tanofsky-Kraff et al., 2010; Yanovski, 2003). Researchers have designed psychotherapeutic interventions (e.g. Cognitive Behavioral Therapy (CBT), Interpersonal Psychotherapy (IPT) that are effective in decreasing binge eating in adults (Dicker & Craighead, 2004; Tanofsky-Kraff et al., 2007). There is, however, a dearth of intervention research conducted among African-American women who reported binge eating, and they have been severely underrepresented in clinical trials (Franko et al., 2012; Thompson-Brenner et al., 2013). A specific CBT intervention, Appetite Awareness Training (AAT), has been successful in aiding participants to reduce binge eating and overeating. The intervention includes instruction on emotional eating, understanding biological signals of hunger and satiety, and also has aided in weight maintenance in samples of white adult women (Allen & Craighead, 1999; Craighead,

2006). An important next step is to test AAT in its current version in a sample of African-American women who are overweight and report binge eating behaviors. The testing of such an intervention may provide important data for the future development of interventions to increase effectiveness of weight management efforts, and reduce psychosocial barriers to adopting new behaviors to support dietary and physical activity changes among African-American women.

1.2 OVERVIEW OF STUDY

The goal of the proposed research is to test the feasibility and preliminary effects of an 8-week community-based, AAT intervention for African-American women. Feasibility research is the test of an intervention to determine whether it is appropriate for further testing {Bowen, 2009). A significant part of feasibility research is the investigation of acceptability, how the intended recipients of the intervention respond, e.g., withdraw or remain in the study (Bowen et al., 2009). The feasibility testing of AAT may lay a foundation for alternative non-eating coping skill development, and reduction of binge eating, as well as ultimately, aiding in reducing obesity and CVD risk.

To further understand the effect of specific treatment approaches on binge eating in African-American women who are overweight or obese, the proposed project will investigate two research questions. The specific questions are:

Research Question #1. What is the feasibility of an 8-week AAT intervention in a community-based sample of overweight African-American women at-risk for BED?

This research question will be answered by examining study recruitment, attendance, retention, and adherence to the intervention protocol.

<u>Research Question #2:</u> What are the changes in eating (binges, hunger, satiety, eating self-efficacy), cardiovascular risk factors (body weight, blood pressure, and waist circumference), quality of life, and depressive symptoms in participants in the intervention vs. the wait-list control group?

This research question will examine the preliminary differences in the effect of AAT on participants in the intervention group vs. the wait-list control group. These differences will provide preliminary data on the efficacy of AAT in a sample of African-American women who are overweight or obese. These data will be used to calculate a sample size and power analysis for a future, large-scale randomized clinical trial.

1.3 SIGNIFICANCE OF THE STUDY

The proposed project will serve as a foundation for future weight gain prevention interventions for African-American women with binge eating behaviors. Testing the feasibility of AAT will provide investigators with knowledge that may improve future intervention design and testing efforts. By pursuing the above aims, necessary data will be collected to evaluate the AAT program components and conduct a future efficacy trial. Additionally, the proposed research is innovative and seeks to close a gap (e.g. lack of intervention research on binge eating) currently present within the research literature. To the best of my knowledge, this project will be the first to:

- Pilot a community-based, intervention for African-American women reporting binge eating behaviors
- Investigate the associations among binge eating, barriers to healthy eating, self-efficacy in weight management, and obesity in African-American women.
- Provide feasibility data on engaging African-American women to learn appetite awareness skills designed to provide alternatives to the overconsumption of food.

1.4 RELEVANCE TO SOCIAL WORK

According to the National Association of Social Workers'(NASW) Code of Ethics, social workers are responsible to create environments that "enhance human well-being and help meet the basic needs of all people, with particular attention to needs and empowerment of people who are vulnerable, oppressed and living in poverty" (National Association of Social Workers, 2000). African-American women remain a vulnerable population within this country and are impacted by the intersectionality of race, gender, and class in their daily living environments. Additionally, within their research, social work scientists are responsible for understanding the environmental issues that affect identity of African-American women, such as Strong Woman Syndrome, trauma, chronic stress, and single parenting. These particular environmental concerns have been associated with compulsive overeating, food insecurity, and overweight/obesity within the population (Beauboeuf-Lafontant, 2003; Harrington et al., 2006; Harrington et al., 2010).

Moreover, social workers are concerned with the pursuit of *social justice*, and are to pursue social change in areas that affect underserved and marginalized populations. African-

American women are perpetually underserved, and a segment of the population is also low-income and in poor health (Coleman-Jensen, Gregory, & Singh, 2014; Geronimus, Hicken, Keene, & Bound, 2006). Residing in communities with neighborhood violence, food deserts, and having access to a plethora of fast food restaurants, and inadequate built environments may indirectly impact eating behaviors of African-American women (Woolf, Dekker, Byrne, & Miller, 2011).

A growing literature indicates a significant relationship between the local food environment and health outcomes, with lower BMI rates being in environments with supermarkets, and higher in areas with small convenience stores or fast food restaurants (Morland & Evenson, 2009). Furthermore, investigators are becoming increasingly aware of how types of food choices affect eating behaviors, and consequently, certain health-related outcomes (Inagami, Cohen, Finch, & Asch, 2006; Morland & Evenson, 2009). Often, these environmental disparities have been cited as barriers to the development of healthful behaviors among African-American women, and may be barriers to the prevention of obesity and cardiovascular disease. Despite these challenges, however, interventions are needed to help individuals who reside in these communities to improve their health.

Pursuing social justice in designing weight-management interventions may necessitate thoughtful dialogue on how to encourage the development of healthful behaviors in these women without "blaming the victim." This pursuit may require social workers to enact "behavioral justice," a term used to convey the principle that individuals are only held accountable for behaviors that they have appropriate resources to change (Adler & Stewart, 2009). Social workers have the opportunity to design interventions that recognize environmental barriers, but

still empower participants to use their internal and community strengths to make positive health change.

Designing these interventions may require that social workers adhere to one of the primary ethical principles associated with our profession - self-determination. Self-determination encourages social workers to pay attention to the desires of their clients, and allow them the free will needed to make a decision. This self-determination should be equally applied to the health behavior decisions of African-American women. The relative lack of weight loss among African-American women who participate in behavioral weight loss studies may be a silent message to convey a lack of motivation or interest to engage in significant weight loss efforts. While the greater research community may want African-American women to reduce their body weight, as social workers, a challenge exists to listen and learn about the health desires of African-American women. Being responsive to stated needs and designing future interventions that may address concerns that are relevant to the population (e.g. health, weight gain prevention) are critical next steps for the field of social work.

1.5 SUMMARY

African-American women are the most obese subgroup within the United States. Obesity increases the risk for the development of cardiovascular disease, various cancers, and diabetes. With current estimates of overweight and obesity exceeding 80%, viable strategies to reduce the incidence of the chronic disease are needed. One unexplored barrier to the development of a healthy weight among African-American women has been that of eating behaviors, and more specifically, binge eating. To the best of my knowledge, the proposed study will be among the

first to examine the feasibility of an appetite awareness intervention to reduce binge eating behaviors within a community sample of African-American women (ages 18-70).

Social work scientists have been challenged with the development of interventions that may serve to enhance the living conditions of the vulnerable and oppressed members of our society. African-American women experience societal and environmental challenges that may make the development of healthful behaviors difficult. Social workers are uniquely equipped to examine these barriers, and work alongside African-American women to create programs that will be helpful and sensitive to community needs.

This dissertation is organized into five different chapters. The current chapter, chapter 1, presents an overview of the study, and examines contributing health and eating behaviors of African-American women that necessitate further exploration. Chapter 2 presents a review of literature centered on obesity within African-American women and socio-historical factors that may contribute to the development of the chronic disease. Additionally, the chapter presents the theoretical framework (Cognitive Behavioral Theory) that guides the study, and includes a discussion on how the social construction of African-American womanhood may interact with the development of disordered eating behaviors and obesity-related outcomes. Relevant behavioral weight-loss interventions that have addressed overweight and obesity will also be presented. Finally, this section will explore the problem of binge eating and how the treatment of eating behaviors may contribute to reduced incidence of weight gain. Chapter 3 will present the methodology of the proposed research project. And finally, chapters 4 and 5 will present the results and the discussion from the analysis. Future research suggestions will be explored, as well as implications for future social work practice.

2.0 LITERATURE REVIEW

2.1 A SOCIO-HISTORICAL EXAMINATION OF OBESITY IN AFRICAN-AMERICAN WOMEN

Obesity rates within the U.S. remain troubling, and continue to require the need for national attention. Most recent estimates indicate that 68% of U.S. adults are considered overweight (BMI: 25-29.9) or obese (BMI ≥30) (Flegal et al., 2012). While some suggest the prevalence of the chronic condition has been leveling, there are still over 78 million U.S. adults and about 12.5 million children and adolescents who carry more weight than recommended (Ogden, Carroll, Kit, & Flegal, 2012).

While obesity rates are high among most racial and ethnic groups in the U.S., African-American women, are disproportionately represented. Current research indicates that 82.1% of African-American women are overweight or obese compared to only 61.2% of white women (Flegal et al., 2010). Furthermore, almost 50% of African-American women are obese, a rate that is 15% higher than African-American men, and Caucasian men and women (Flegal et al., 2010).

High obesity rates among African-American women and other subgroups within this country are troubling due to the association of obesity with numerous co-morbid health conditions. Obesity is associated with an increased health risk of type II diabetes, heart disease, cancer, and hypertension (Ogden et al., 2012). Breast cancer is the second leading cause of

cancer death among African-American women (Stolley, Fitzgibbon, et al., 2009). Additionally, current research indicates that the risk of type II diabetes is approximately 2 times higher in African-Americans than in European Americans (Cheng et al., 2012). Furthermore, this population is at an increased risk for coronary heart disease, high blood pressure, increased morbidity, and at risk of mortality (Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001).

2.1.1 History of Obesity in the United States

Historically, in the United States, nutrition and food policy decisions about what to eat were determined by the United States Department of Agriculture from 1930-1977. Most of their decisions represented the interest of farmers and those of the agricultural industry. Consequently, Americans were often encouraged to consume diets that would use the products of interest to farmers, such as meats, cheeses, and dairy products (Gifford, 2002).

These recommendations were largely met without opposition until 1977, when U.S. Senate Select Committee met to determine food and nutrition policy that would become a bridge to merge the interest of farmers and the health of American citizens. One of the reasons supporting the formation of the committee was the increasing rates of chronic disease among US citizens, and the concern that the recommendations by the USDA were contributing to increasing poor health (Gifford, 2002). As the result of testimony from leading nutritional professionals, the committee made seven recommendations, forming the first version of *Dietary Goals for Americans.* These goals were quite controversial, and encouraged calorie balance, changes in the amount of meat consumed by the American people, a decrease in the consumption of fat (40% of

calories to 30%), and a decrease in saturated fat (60% of calories to 10%), balanced by more polyunsaturated and monounsaturated fats (Gifford, 2002).

Not surprisingly, these recommendations were met with harsh resistance from the USDA, and motivated the department to release their own version of dietary goals in 1980. The 1980 version of the USDA Dietary Guidelines for Americans ignored the calorie balance approach proposed by the Senate, and overwhelmingly focused on the reduction of fat, and the consumption of foods with adequate starch and fiber, as eating these items would be what would help reduce the fat intake (Office of Disease Prevention and Health Promotion, 1980). From the 1970s to the 1990s, fat consumption as a proportion of total energy decreased significantly (Ludwig & Brownell, 2009).

The early 1980s marked a shift in the weight status of the citizens of the United States. Despite weights rising throughout the 20th century, this period signified the beginning of changes that were unparalleled (Cutler, Glaeser, & Shapiro, 2003). While there are many hypotheses as to what has driven the obesity epidemic, researchers have discovered that the increased supply of cheap, palatable, and energy dense food, improved distribution systems, making food more accessible and convenient, and the increase in food marketing have been significant (Cutler et al., 2003; Swinburn et al., 2011).

Furthermore, recent evidence suggests that the increase in energy intake (e.g. calories consumed) alone, has been enough to explain the increase weight of the US population (Swinburn, Sacks, & Ravussin, 2009). Food portions have increased significantly since 1970, and have exceeded federal dietary guidance standards (Young & Nestle, 2002). Additionally, during 1977-1996, there was a significant increase in the *frequency* of eating; Americans increased the number of snacks they consume (Cutler et al., 2003). Consuming these snacks has

likely been furthered by technological innovation in mass preparation of food. These advances – vacuum packing, improved preservatives, the freezing, artificial flavors, and microwaves – have been cited as the likely culprit in enabling individuals to consume more foods without having the deterrence of the long period of time it takes for preparation (Cutler et al., 2003). Furthermore, changes in the social environment are also linked to increasing obesity rates. For example, the country has seen an increase in sedentary lifestyles, larger portion sizes, high costs of fruits and nutrient rich foods, increased food processing (leading to high caloric and low nutrient food), and further reliance on fast food restaurants to provide nutrition (McKinnon et al., 2009).

The financial burden of obesity continues to mount for the United States. In 1998, 9.1% of the nation's health care spending ($78.5 billion) was dedicated to medical conditions related to obesity. In 2008, the number increased to $105.9 billion (McKinnon et al., 2009). Economists predict that total health care spending may reach almost $957 billion by the year 2030, accounting for 16-18% of all U.S. health expenditures (American Heart Association, 2012).

2.1.2 Prevalence

The rates of obesity among African-American women did not become a concern to U.S. health officials until the early 1970s. Several years earlier, in 1967, government officials became aware of severe hunger and malnutrition present among US citizens, and began official research and discussions to create solutions (Highlights from the Ten-State Nutrition Survey, 1972). During the reporting of the National Nutrition Survey of 1972, researchers acknowledged that obesity rates were the highest in adult women, specifically among African-American women, and they were at significant risk for the development of diabetes and cardiovascular diseases. Obesity was conceptualized as a result of malnutrition, and congressional hearings began to discuss the

appropriate form of treatment for all Americans, independent of cultural implications (Highlights from the Ten-State Nutrition Survey, 1972).

Since 1960, the National Health and Nutrition Examination Survey (NHANES), a program of the National Center for Health Statistics, Centers For Disease Control And Prevention, has been the method used to obtain a cross-sectional, nationally representative survey of the current health of US civilians. The study was designed by using a multistage probability cluster sampling method and participants were administered a home interview, as well as a physical examination (Ogden et al., 2004). The national surveys included between 2-6 years of data, and include relevant data on both U.S. adults, adolescents, and children (Ogden et al., 2004).

Researchers have discovered that the prevalence of overweight and obesity significantly increased between the years of 1976-1980 and 1980-1994 (Flegal, Carroll, Kuczmarski, & Johnson, 1998). Data for non-Hispanic African-American men and women were not available until the 1988 version of the NHANES. Trends for African-American men were similar to what was seen in Caucasian men, but researchers noticed significant differences among the rates of obesity noted in African-American women. African-American women were almost 20 pounds heavier than non-Hispanic white women, and during 1988-2002, the average weight increased approximately 13 pounds, compared to only a 10 pound increase among white women (Ogden, Fryar, Carroll, & Flegal, 2004).

Between the years 1999-2010, the weight of non-Hispanic African-American women continued to rise to unprecedented levels. For example, in 2005-2006, 52.9% of African-American women were considered obese, compared to 32.9% of non-Hispanic white women (Ogden, 2009). Moreover, among adolescents, 27.7% African-American teen girls had BMI rates

greater than the 95th percentile, compared with only 14.5% of non-Hispanic white teen girls and 18.5% of non-Hispanic black teenage boys (Ogden, 2009). Within data collected from the most recent NHANES (2009-2010), approximately 82.1% of African-American women were considered overweight or obese (BMI $\geq$ 25), and 56.9% of African-American women met criteria for obesity (BMI$\geq$ 30) (Flegal et al., 2012; Ogden et al., 2015). Currently, among data collected in the NHANES surveys, African-American women have the highest rates of overweight and obesity within the country (Flegal et al., 2012).

2.1.3 Historical Relationship between Food and Identity in African-American Women

The essence of African-American culture is made known by examining her stories, meanings, and love of soul food (Hughes, 1997). Of particular importance is the relationship African-American women have had with food. Like with the hands of a painter, African-American women were taught to create rich mosaics of bountiful ingredients to portray a landscape that would unify the culture and provide short-term pleasure in oppressive environments. In her chapter, "Soul, Black Women, and Food," Marvalene Hughes (1997) theorizes that, "food remains one of the Black woman's self-concept expressions . . . and may serve as symbolic of the ever-present determination to preserve the African culture through food (p.273). Thus, examining the historical relationship between black women and food is imperative to gain a full understanding of their current eating behaviors and subsequent weight outcomes.

From the beginning of slavery in the U.S., cooking and food preparation were tools African-American women used to provide voice and beauty to a lived experience that was brutal and oppressive at its best. From the beginning, the slaves had to contend with the reality that their eating environment was thoroughly regulated by the white slave masters who owned them

(Warnes, 2004). Their daily existence was surrounded with personal food shortage, while helping to produce bountiful harvests that fed their owners (Warnes, 2004). In the years following slavery, eating conditions worsened significantly. When previously, one's health was of concern to a slave master, it required the feeding of adequate nutrition to ensure the vitality of "property." However, now that the slaves were free, there was no incentive or way made for black southern farmers to ensure access to nutritious food (Warnes, 2004).

In the years following the Civil War, the lack of planning by the U.S. government to care for the needs of former slaves contributed to the poor conditions that many African-Americans experienced (Mjagkij, 2011). Unable to support themselves any other way, numerous African-Americans either relocated to the deeper South or stayed on their plantations, where they were forced to become sharecroppers (nearly 76% of black southern farmers by 1910). Due to the unexpected costs of beginning the life of a sharecropper (e.g. land, tools, paying debts, housing), and the fact that they were already extremely poor, many of the black southern families experienced extreme poverty. Often, families consumed foods high in starches, but devoid of any nutrients (Mjagkij, 2011). The typical diet consisted of bread, beans, corn, grits, molasses, yams, collard greens, and occasionally, a piece of pork or fish. Poor nutrition taxed the lives of the black sharecroppers, and exacerbated health problems, and early mortality (Mjagkij, 2011).

2.1.4 Socio-historical Images of African-American Women

As the Civil War ended and the quest toward freedom began, African-American women learned to endure the impact of controlling images that were tools of marginalization and hurt. One prominent image, the Mammy figure, was a common tool to promote that narrative of the

"faithful slave." Mammy was an idealization of a relationship that endured between African-American women domestics and their white families. Mammy would be responsible for all of the housework, childrearing, and emotional support – without uttering a word of complaint or ever needing to take care of her own family (McElya, 2007). She offered her obedient servitude to her white families, and accepted her role as an indentured servant, working tirelessly to meet any need that may arise. Mammy was often depicted as being asexual, heavy, dark-skinned, and full of "glorious" tales that told of the good ol' days on the plantation (McElya, 2007). Within popular media, Hattie McDaniels from *Gone with the Wind* was a familiar example of what some say white society loved about the domestic black woman – a smiling face who loved working with undying devotion toward serving the white family (McElya, 2007).

The commercialization of "Mammy", a character better known as Aunt Jemima, was an effort on part of two businessmen to usher the United States into modernity and to recapture the nostalgia many whites felt about the years of slavery that forced black women to do domestic duties in the home. Aunt Jemima first appeared in 1893 at the Chicago World's Colombian Exposition. It was at this time, Nancy Green, was cast to portray an ex-slave who was making her famous pancakes. She sang spirituals, told stories, and recounted her joyful days as a slave, all the while selling a pancake batter that was "just so easy to make (McElya, 2007). Aunt Jemima was a visual image of the behavior expected from blacks – that of obedience, humility, and a joyful disposition (McElya, 2007). Those who attended the fair were being led to believe that they met the real "Aunt Jemima", but her true lived experience was hidden behind a mask of servility and faithfulness (McElya, 2007).

During the early twentieth century, African-American women were described and imaged by their labor (Williams-Forson, 2006). In fact, by 1920, 46% of all employed black women

were in the domestic and personal service field (McElya, 2007). It was not uncommon to see pictures of women who were heavyset and were standing by a pot or holding a cooking utensil in their hands. It was also not uncommon for these women to have the responsibility of creating environments that did not reflect that abysmal conditions that greeted their families as new life was created after slavery. These women "made a way out of no way," and took pride in their preparation of meals that were often made from scraps or other rotten leftovers (Williams-Forson, 2006). Black women were artists of the truest sense – gifted with the responsibility of capturing beauty out of utter darkness.

To survive, black women learned to cook use parts of *everything*. She cooked portions of animals that her masters discarded, and cooked leftovers that were transformed into special treats (Hughes, 2007). Preparing food was her opportunity to infuse spirituality and creativity into less than ideal eating conditions, and create a new self-definition of feasting. There was such pride in being able to cook, and historians report women enjoyed watching the development of "plumpness" in those who would partake in their cuisine. Among black women, soul food preparation was akin to the practice of a deeply, spiritual ritual (Hughes, 2007). In qualitative research with African-American women, several of the participants acknowledged that cooking was a way of "losing oneself" and serving it was the "quintessential" expression of love (Liburd, 1993).

2.1.5 Strong Black Woman/Superwoman Role

Among the many definitions of black womanhood, the dominant and controlling image of being "strong" has played a significant role in the choices of its women (Beauboeuf-Lafontant, 2003).

In her controversial book, *Black Macho & the Myth of the Superwoman,* Wallace (1978) describes the image this way:

> "From the intricate web of mythology which surrounds the black woman, a fundamental image emerges. It is of a woman of inordinate strength, with an ability for tolerating an unusual amount of misery and heavy distasteful work. This woman does not have the same fears, weaknesses, and insecurities as other women, but believes herself to be and is, in fact, stronger emotionally than most men. Less of a woman and that she is less "feminine" and helpless, she is really *more* of a woman – she is the embodiment of Mother Earth, the quintessential mother with infinite sexual, life-giving, and nurturing reserves. In other words, she is a Superwoman. (p. 107)

A "strong black woman" might be characterized as a woman who, because of the necessity of survival, is able to assume multiple roles of caretaking, financial provision, and emotional support (Woods-Giscombe, 2010; Beauboeuf-Lafontant, 2003). Often the experience for many African-American women, the "strong black woman" role often ensures that personal emotions will be moved to the bottom of the list, so as to represent the image of the "sacrificial lamb" whose death allows others to thrive and live. This image is a modern day adaptation of prevailing cultural stereotypes of black women as "mammies," the "faithful, obedient domestic servant" who accepts her place in white families as a subordinate (Collins, 2000). This asexual, heavy, and dark skinned woman was known and applauded for being a tireless servant, dedicated to the service of her white families, and would find herself to be an invisible part of the fabric of American society (Collins, 2000; Beauboeuf-Lafontant, 2003). The image of black women as "super women" arose because of a desire to counteract these harmful cultural stereotypes

(Woods – Giscombe, 2010). However, despite a new label, the sense that African-American women must "do it all" has become an image that, while allowing for survival, has also stolen permission for black women to state "they have had enough."

Data from eight different focus groups allowed qualitative researchers to examine the Superwoman role in African-American women and the messages that allowed the cultural image to persist. Within the conversations, researchers discovered that being a "Superwoman" comes with an obligation to suppress emotions, and obligation to be helpful to other people, an obligation to show strength, and a strong aversion to showing weakness or asking for help (Woods-Giscombe, 2010). Within another qualitative study, participants further expressed that being strong was modeled by mothers and female relatives, and was the only response that was acceptable to survive a life filled with adversity (Beauboeuf-Lafontant, 2005). Having to be "strong" has also increased levels of selflessness, self-silencing, and powerlessness in African-American women, and has increased the likelihood of the development of depressive symptoms (Beauboeuf-Lafontant, 2003).

While there are many comments about the outer life and experience of African-American women, their personal lives are far more hidden (Williams-Forson, 2006). It has been theorized that the economic and emotional deprivation experienced by these women may explain a historical relationship with "mouth-stuffing habits," serving as a tool to fill emptiness (Hughes, 2007). African-American women had to contend with social realities that did not provide permission to state that "enough was enough" and fed the necessity of creating dual identities in order to survive. With cultural mandates of strength prevailing, overeating may have been a quiet protest against the controlling images (Mammy, strength, service toward white families).

Moreover, eating may have been a tool used to quell the "hungers" that general social mistreatment and inequality served to perpetuate (Beauboeuf-Lafontant, 2005).

2.2 FACTORS CONTRIBUTING TO OBESITY IN AFRICAN-AMERICAN WOMEN

2.2.1 Eating Behaviors

Within the last decade, researchers have theorized that African-American women may be particularly affected by compulsive overeating (Beauboeuf-Lafontant, 2003, 2005; Lovejoy, 2001). Cultural norms may permit overeating as a tool to manage emotions, and may serve as a "survival strategy" to manage histories of oppression, victimization, and exclusion (Beauboeuf-Lafontant, 2003; Thompson, 1992). Overeating may be protective against the development of mood disorders among blacks, despite increasing the risk for physical health conditions (Jackson, Knight, & Rafferty, 2010). Recently, in an examination of the difference between the black-white obesity gap, researchers noticed the overconsumption of food accounts for 48% of the difference in BMI between black and white women (Johnston & Lee, 2011).

An emergent body of literature suggests overweight African-American women may use food to cope with stress and emotion, and may be susceptible to external cues of eating and disinhibition (Chang et al., 2008; Dressler & Smith, 2013; Johnson, Risica, Gans, Kirtania, & Kumanyika, 2012; S. Kumanyika, Wilson, & Guilford-Davenport, 1993; Porter & Johnson, 2011; Sims et al., 2014; R. Sims et al., 2008; Willig, Richardson, Agne, & Cherrington, 2014). Moreover, in a sample of African-American women engaging in weight-control behavior, approximately 60% of participants cited eating due to emotional reasons (Johnson & Wesley,

2012). Moreover, overweight African-American women may have difficulty determining biological cues of hunger and satiety (Dressler & Smith, 2013; Willig et al., 2014).

African-American women make decisions about eating within multidimensional environments and there are several considerations that must be made when examining their food choices. To start, the cultural heritage of African-Americans is a significant contributor to eating choices and weight maintenance behavior (Airhihenbuwa et al., 1996). In a focus group investigation with 53 African-American men and women, respondents described food preferences as being most closely associated with "soul food" (Airhihenbuwa et al., 1996). Soul food may be described as the consumption of foods typically including the following: rice, macaroni and cheese, collard greens, sweet potatoes or yams, southern fried chicken, potato salad, and/or spareribs (Airhihenbuwa et al., 1996). Preference for these foods have been woven into the culture, and many African-Americans express rich histories of pride from the consumption and the preparation of these meals (Befort, Thomas, Daley, Rhode, & Ahluwalia, 2008). However, despite the important established relationship, African-American women have reported that cultural traditions have been critical in preventing weight loss (Blixen, Singh, & Thacker, 2006).

In a qualitative study, researchers examined the impact of culture and community on food choices in an African-American population. Results indicated that "eating healthy" made the participants feel as if they were denying important aspects of their culture and being conformant to the ideals of the mainstream (James, 2004). Furthermore, the participants also cited that there was no sense of "urgency" to change their eating behaviors, and reported that lack of information, cost, and perceived poor taste decrease the desire to try and eat healthy (James, 2004).

Finally, African-American women have reported that their decisions about food choices are also made based on convenience and cost. In a recent qualitative study examining the choices of low-income African-American women, Antin and Hunt (2012) report that many of their participants report buying foods that can be prepared quickly. The convenience food items were cited to reduce stress, and allow the women to provide a food to their families, without the time constraint of preparation. Moreover, other samples of African-American women have reported the frequency of snacking behaviors, and eating in response to cravings and/or emotions (Hargreaves, Schlundt, & Buchowski, 2002). Furthermore, in another qualitative study, participants expressed that access to healthier food items were not readily available in the communities, and as a result, felt eating habits were negatively impacted (Bramble, Cornelius, & Simpson, 2009).

2.2.2 Alternative Definitions of Body and Weight

Within the context of obesity, African-American women have generated alternative ways of viewing food, weight, and cultural norms of "thinness" (Lovejoy, 2001; Parker, Nichter, Nichter, Vuckovic, & Ritenbaugh, 1995). Overall, African-American women tend to have a greater acceptance of various body weights, perceive themselves as thinner than they really are, and report their weight was acceptable to significant others (Capodilupo & Kim, 2014; Kemper, Sargent, Drane, Valois, & Hussey, 1994; Lovejoy, 2001; Thomas et al., 2013; Webb, Warren-Findlow, Chou, & Adams, 2013). In fact, while carrying excess weight is perceived negatively within the majority culture, African-American women have reported alternative conceptualizations of their extra weight. Within various research studies, women report larger ideal body sizes, and talk about themselves as being "thick" rather than obese, and as a woman

who has "extra meat on her bones" (Becker, Yanek, Koffman, & Bronner, 1999; Walcott-McQuigg, Sullivan, Dan, & Logan, 1995).

Moreover, while evidence has shown that Caucasian women associate BMI with attractiveness, African-American women, on the contrary, report higher perceived attractiveness, which is not associated with their BMI status (Chithambo & Huey, 2013). Furthermore, the word "obesity" appears to have a stigma associated with it, and when surveyed, several African American women prefer to use the term "overweight" (Blixen et al., 2006). There even seems to be more of a preference for carrying extra weight by African-American men, as some African-American women believe they are treated better when they are carrying extra weight, versus when they might be a little thinner (Blixen et al., 2006; Capodilupo & Kim, 2014).

While the media has been implicated as a factor in the development of distorted body image, recent evidence may suggest that black women are impacted less than other racial or ethnic groups. Within a cross-sectional study of 1445 ethnically diverse college-aged women, researchers found that black women were less likely to compare their bodies to those seen in mainstream media, be less aware of and/ or feel pressured to achieve the physical appearance standards set by the media (Quick & Byrd-Bredbenner, 2014). Moreover, a recent study has found that media and publications that are marketed for black women are less likely to use models that are ultra slim, which possibly may reflect a greater range of acceptable body sizes (Shoneye, Johnson, Croker, Steptoe, & Wardle, 2011).

Collectively, these differences may reflect an alternative self-definition of body weight, and may indicate how this definition may be more salient and important than what is traditionally conveyed within the mainstream. Within a qualitative study that examined body image ideals among African-American and white adolescent women, the investigators

discovered that the black women exhibited a greater "flexibility" in their definitions of beauty and were motivated to make use of what they were given (physically), instead of being constrained by rigidity and mainstream standards (Parker et al., 1995). These results led the authors to contend that African-American culture fosters the development of an improvisational approach to life, and constructing identity is done through creativity and style (Lovejoy, 2001; S. Parker et al., 1995). Instead of promoting a competitive ethos, African-American culture may work in a more egalitarian manner, and encourage the value of style, mutual appreciation, and admiration of someone who "has got it going on" (Parker et al., 1995, p. 111).

2.2.3 Stress

The relationship between stress and food consumption has been widely established within the literature (Appelhans, Whited, Schneider, Oleski, & Pagoto, 2011; Evers, Marijn Stok, & de Ridder, 2010; Greeno & Wing, 1994; R. Sims et al., 2008; Spoor, Bekker, Van Strien, & van Heck, 2007; Whiteside, 2007). The occurrence of stress appears to have an impact on eating behaviors, as individual differences are likely to impact whether or not one increases or lessens intake of food (Greeno & Wing, 1994; Torres & Nowson, 2007). Acute stress seems to lessen consumption of food (Torres & Nowson, 2007), while chronic stress results in increased intake of foods higher in sugar and fat, and weight gain (Torres & Nowson, 2007). Stressors appear to bias cognition toward emotional activity, encourage the forming of habits, and are related to increasing motivation for food. Consequently, chronic stress-induced eating has been linked with obesity, preference for foods high in fat and sugar, and has been associated with hypersecretion of insulin (Dallman, 2010; Torres & Nowson, 2007). Chronic stress is also responsible for the

increase in cortisol, which is suggested to contribute to the accumulation of abdominal fat mass (Torres & Nowson, 2007).

Chronic stress may be considered one of the predominant psychosocial concerns impacting the lives of African-American women. In general, African-Americans carry significantly higher levels of psychosocial stress compared to non-Hispanic whites (Turner & Avison, 2003). Low-income African-American women, however, are particularly at risk, as they bear a larger burden of physiological stress than either black men or white women (Geronimus et al., 2006).

Unfortunately, this chronic stress has not been resolved well throughout the body, and cultural ideologies encouraging the "strong woman syndrome" and lack of comfort with mental health treatment have been detrimental (Harrington et al., 2010). Researcher Arline Geronimus has spent several years investigating the relationship between chronic stress and health disparities in African-American women. Through her work, she has hypothesized that many women experience "weathering" or early health deterioration as a consequence of exposure to frequent instances of political, social, and gender-based discrimination and exclusion (Geronimus, 2001). Her hypothesis encourages further exploration of the consequences of persistent and constant stressors, and she encourages research to look beyond the consequence of individual behaviors and socioeconomic factors (Geronimus, 2001).

Findings from a study by Everett et al. (2010) reveal that African-American women reported financial stress, role strain, time management, and the challenge of balancing family and work responsibilities as their main sources of stress. Moreover, many African-American women carry the responsibility of being “head of the household” and are likely to be providing care to other family members (Kumanyika et al., 2007). These stressors have been found to affect the

weight of low-income African-American women, as weight gain has been associated with perceived constraints in life, difficulty paying bills, and strain in family relations (Block, He, Zaslavsky, Ding, & Ayanian, 2009).

Recent evidence has suggested that African-American women may use food to cope with their experience of chronic and frequent stressors (Andreyeva, Puhl, & Brownell, 2008; Cox et al., 2012). For example, in a study involving low-income women, participants reported using high-fat and high-caloric foods to cope with daily feelings of stress, boredom, loneliness, and negative emotions (Chang et al., 2008). In another study, African-American women described emotion-based eating - which is eating as a response to emotion instead of hunger - as a coping mechanism used to deal with stress (Cox, Zunker, Wingo, Jefferson, & Ard, 2011). Additionally, researchers have noted African-American women may also experience cultural norms that implicitly condone overeating as an acceptable way to manage feelings (Kumanyika et al., 2007).

2.2.4 Poverty

African-American women who desire to lose weight may encounter additional barriers if their current income is below the poverty level (Gaines, 2010). Existing census rates indicate that 25.8% of African-Americans currently live in poverty (Macartney et al., 2013). The relationship between SES and obesity is especially startling among women, as 42% of those with incomes below 130% of the poverty level are obese, compared with only 29% of women at or above 350% of the poverty level (Ogden, Lamb, Carroll, & Flegal, 2010). Among African-American women, 54.7% of those with incomes below 130% of the poverty line are obese. There are myriad reasons for the association between obesity and SES within African-American women and other racial and ethnic groups. To begin, partial contributors may include the development of eating behaviors that rise out of experiencing high levels of stress and mental illness (Broussard, Joseph, & Thompson, 2012). Moreover, low- income women have reported having a high knowledge of nutrition awareness, but not being able to purchase healthy foods due to cost (Valera, Gallin, Schuck, & Davis, 2009).

Recent investigations have encouraged consideration of the role that experiencing childhood poverty may have in the development of overweight and obesity in adulthood among African-Americans. Within a focus group study of 21 low-income African-American women ranging from 25-65 years old, participants described the foods within their childhood diets as chosen largely based on availability, rather than nutritional content (Baer Wilson, Musham, & McLellan, 2004). Food patterns and behaviors were learned by watching their mothers cook family meals, and by watching general family eating patterns. In addition, the participants also

recalled being taught to eat all the food that was served, and were not provided many options or alternatives. The authors suggest that eating patterns developed in childhood may be difficult to change, despite residing in environments where nutrition education is provided (Baer Wilson et al., 2004). In fact, there is some evidence to suggest that individuals who have a history of childhood poverty are more likely to engage in behaviors that create poor health outcomes, such as consuming a nutrition deficit diet and lack of participation in physical activity (James et al., 2006). Changing the behaviors of adults who grew up experiencing poverty may entail focusing on changing specific food behaviors and guidance on making healthy decisions (Baer Wilson et al., 2004).

2.2.5 Food Insecurity

The majority of households within the U.S. have access to an adequate amount of food. However, for a significant minority, food insecurity, or the limited access to food to meet daily need, is problematic. Food insecurity is a significant concern for African-American families. Poverty is closely associated with food insecurity, and 26% of all African-American families live in households where food insecurity is experienced (Coleman-Jensen et al., 2014). In addition, rates of very low food security were above the national average (5.6%) for black families, with current estimates at 10.1% (Coleman-Jensen et al., 2014).

Traditionally, researchers did not believe food insecurity was associated with obesity; but rather, the lack of food supply the predominant concern**.** Dr. William Dietz (1994) first suggested this paradoxical relationship in a case study about one of his patients. Within his clinical work, Dietz discovered that food insecure families are more likely to consume foods with higher fat content to prevent recurrent sensations of hunger in seasons of food shortage.

Moreover, obesity may also be the response of the body to episodic food shortage (Dietz, 1994). Through his assertions, researchers began investigating the relationship between food insecurity and the emerging obesity problem facing the country.

There are several reasons why food insecurity has been linked with obesity. To begin, the low-cost of foods that are energy dense may be implicated in the consumption of foods that are nutritionally deficient and promoters of weight gain (Dinour, Bergen, & Yeh, 2007). Additionally, households that are food insecure appeared to consume vegetables and fruits less frequently as food became less available (Dinour et al., 2007; Kendall, Olson, & Frongillo, 1996). Moreover, food insecurity has also been connected to psychological and behavioral changes, including that of increased stress, mental illness, and emotion and stress-related eating (Chang et al., 2008; Dinour et al., 2007).

Additionally, as food insecurity has primarily been associated with obesity in women, researchers have been investigating the role of single motherhood, and how that might be related to incidental weight gain. In a recent longitudinal study including African-American women, researchers have discovered that food insecure mothers are more likely to be overweight than other food insecure women who do not have children (M. A. Martin & Lippert, 2012). Moreover, food insecure mothers are at increased risk of gaining weight as they spend more years in household food insecurity, and as they increase their childcare duties. Reasons for this are likely some of the challenges of being the sole provider and caretaker within their families, as well as experiencing additional stress due to financial challenges and possible lack of support (Martin & Lippert, 2012). Additionally, food insecure mothers may also consume palatable foods as a coping strategy for poverty, loneliness, and the challenges of parenting (DeBono, Ross, & Berrang-Ford, 2012). Furthermore, the effects of food insecurity on single mothers may increase

if these women allocate more food to their children in response to declining benefits toward the end of the month (DeBono et al., 2012).

2.2.6 Obesogenic Food Environment

It has become quite evident that a major cause of obesity is the growth of the fast food industry and the change in how often consumers frequent these establishments (Fortuna, 2012). To begin, there were approximately 600 fast food restaurants in 1958; by 1970, there were about 30,000 fast food establishments, and within the next 10 years the number increased to 140,000 (Fortuna, 2012; Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003). By 2001, there were almost 222,000 fast food locations within the United States and estimated sales were reaching heights of $125 billion (Paeratakul et al., 2003). Moreover, Americans are eating away from home with extreme frequency, as approximately 47.9% of food budgets are spent eating out (Pomeranz & Brownell, 2008).

Eating at fast food restaurants has been associated with reduced intake of fruits and vegetables, and a higher intake of fat, saturated fat, carbonated soft drinks, and sodium (Paeratakul et al., 2003). Additionally, there has been a general consensus that the calories contained in fast food meals often are sufficient to satisfy an individual's calorie requirement for an entire day, and consuming these meals more than twice per week increases the likelihood of developing obesity and diabetes (National Institutes of Health, 2004; Pereira et al., 2005).

Almost as equally problematic is the consumption of sugar sweetened beverages. These beverages, typically including soft drinks, fruit drinks, energy, and vitamin water drinks, include high amounts of fructose or high fructose corn syrup (Malik & Hu, 2012). A growing body of evidence has verified that consumption of these beverages is associated with an increase of type

2 diabetes and obesity (Malik & Hu, 2012; Malik, Popkin, Bray, Despres, & Hu, 2010; Schulze et al., 2004). Most recent evidence has shown that sugar sweetened beverages contribute approximately 8% and 6.9% of energy intake among youth and adults, respectively (Kit, Fakhouri, Park, Nielsen, & Ogden, 2013). Use of sugar sweetened beverages continues to remain high in this country; recent reports indicate that in 1999, the average adult consumed the equivalent of 200 kcal/day of sugar sweetened beverages. In 2009-2010, energy intake from sugar sweetened beverages was approximately 151 kcal/day (Kit et al., 2013). Among African-Americans between the age range of 20-39, sugar sweetened beverage consumption was approximately 248 kcal/day.

2.2.6.1 Neighborhoods and Food Environment

Increasing evidence has highlighted the role of neighborhood and environment in the development of poor health behaviors and/or health outcomes. In particular, researchers have discovered associations between the local food environment and weight outcomes, and have become increasingly concerned with the healthy food resources that are present or not present (Cummins & Macintyre, 2002; Walker, Keane, & Burke, 2010). One factor of concern is a environment that is considered a "food desert," or a community that lacks a supermarket (Walker et al., 2010).

There are marked racial differences in the presence of supermarkets within communities. Compared to predominately white neighborhoods, African-American communities have only 52% as many grocery stores (Powell, Slater, Mirtcheva, Bao, & Chaloupka, 2007). These disparities continue to exist in even the most impoverished neighborhoods; within a recent study, poorer communities that were predominately African-American were, on, average, 1.1 miles further from the nearest grocery store, compared to impoverished white neighborhoods (Zenk et

al., 2005). Absence of a supermarket is quite concerning due to the evidence that suggests types of food choices affect eating behaviors, and consequently, may also contribute to health-related outcomes (Inagami et al., 2006; Morland & Evenson, 2009).

Recent evidence suggests that residing in a community with fewer healthy eating options may negatively impact weight gain and maintenance. Within a cross-sectional sample of 1295 adults living in the south, obesity prevalence was found to be higher in areas with small stores or fast food restaurants, and lower in neighborhoods with a supermarket (Morland & Evenson, 2009). Moreover, among African-Americans residing in Los Angeles County, California, researchers noticed that predominantly African-American and poorer neighborhoods appear to have less healthy eating options, and were more likely to have restaurants that promoted unhealthy food options (Lewis et al., 2005). Furthermore, eating at "fast food" restaurants has been shown to be positively correlated with the likelihood to have children who consume a high-fat diet, and have a high BMI (Jeffery, Baxter, McGuire, & Linde, 2006). Living by more fast food restaurants often indicates that an individual will have an increased chance of eating more meals at those restaurants, and also has been associated with more negative dietary practices (Jeffery et al., 2006; Wilcox, Sharpe, Turner-McGrievy, Granner, & Baruth, 2013) For example, within a prospective cohort study of participants in the Black Women's Health Study (N=19,479), higher intakes of burgers and sugar-sweetened beverages was associated with greater risk of obesity over a period of 14 years (Boggs et al., 2013).

2.2.7 Genetics and Body Composition

As researchers search for causes to explain the prevalence of obesity in African-American women, there has been some evidence to suggest that body composition and genetic influences

may be associated with the development of obesity and its related co-morbid conditions. There have been several studies that have examined the association between genetics and obesity among African-Americans. Nelson, Brandon, Wiggins, and Whitfield (2002) investigated the genetic and environmental influences on various measures of body fat (waist circumference, waist to hip ratio, and body mass index) for African-American men and women. Using the Carolina African-American Twin Study of Aging, and including 146 same-sex African-American twins (ages 22-88 years), the investigators discovered that for African-American women genetic effects have accounted for 77% of the variance in waist circumference, 59% in waist to hip ratio, and 73% of the variance in BMI. The remaining variance in the sample was attributed to the effects of the environment.

Additionally, researchers have also examined the genome-wide association of BMI in African-Americans (Cheng et al., 2012; Ng et al., 2012). Using admixture mapping, a technique that examines the genes of populations that were recently blended together, the results of 14 epidemiological studies, including that of 15,280 African-Americans, were analyzed to identify genetic loci that influenced BMI. In the analysis, the investigators discovered that possessing a higher percentage of European ancestry was correlated with possessing a lower BMI (Cheng, 2009). Briefly, these studies may be added to a developing database that may cause us to consider how African-American ancestry may influence one’s susceptibility to the retaining of excess weight, and the development of certain obesity-related health conditions.

One conceptual model that may be helpful in explaining the differential effects of obesity by race is the Thrifty Gene Theory (Neel, 1962). In short, this model implies there are historical reasons for the association of diabetes and obesity in certain populations. For most of man's life, obesity was not a major concern, as periods of "feast and famine” were more common (Neel,

1962). During this period in civilization, certain populations were able to retain extra fat during starvation periods, and may have also overproduced insulin. This overproduction was helpful when food was scarce, and allowed energy to be conserved. However, due to environmental changes, and decreased presence of these famine periods, this genetic susceptibility may now not be as beneficial (Neel, 1962).

Recent empirical evidence on the racial differences in the differential effects for obesity and its co-related morbidities may provide support for this model. To start, a small body of evidence has found that when compared to white women, African-American women who engage in overeating may be at an increased risk for obesity. African-American have lower resting energy expenditure (REE) than white women (DeLany et al., 2014; Foster, Wadden, Swain, Anderson, & Vogt, 1999). Resting Energy Expenditure (REE) represents approximately 50-70% of an individual's total daily energy expenditure, and is known to decrease when one engages in significant weight loss (Wang, You, Lenchik, & Nicklas, 2010). Among African-American women engaging in weight loss, however, investigators have discovered that the REE decreased to a greater extent than what would be associated with their body size ((Wang et al., 2010). This suggests that having a lower REE may make it more challenging for these women to lose weight, even if they engage in the similar eating and physical activity behaviors as other racial and ethnic groups (Wang et al., 2010).

To further investigate the relationship between eating behaviors and obesity, Brewer, Kolotkin, and Baird (2003) designed a cross-sectional study to examine the relevance of self-reported eating behaviors as risk factors for obesity. The sample include African-American women (n=580) and Caucasian women (n=398) who were randomly selected from an urban prepaid health plan. Of the eating behaviors evaluated (eating before bedtime, feeling hungry

within 3 hours of eating, eating between meals, and eating beyond satiation), the researchers found that eating beyond satiation was the only behavior associated with BMI. In fact, eating beyond satiation on a daily basis increased the odds of becoming obese 15-fold for African-American women, compared to only 6-fold for white women (Brewer et al., 2003).

Moreover, current research indicates that the risk of type II diabetes, a chronic condition associated with obesity, is approximately 2 times higher in African-Americans than in European Americans. Moreover, obesity is approximately 1.5 times more prevalent in African-Americans than European Americans, even after adjusting for socioeconomic factors (Cheng et al., 2009). Additionally, recent evidence has indicated overweight (BMI=25-29.9) and class I obesity (BMI =30-34.9) are associated with less cardiovascular risk in African-American women, and may imply that these women can carry more weight without the same health risks as Caucasian women (Stevens, Juhaeri, Cai, & Jones, 2002; Taylor et al., 2010).

2.3 SUMMARY

African-American women are currently the subgroup with the highest obesity prevalence with the United States. Their rates of obesity are quite concerning, as the disease is associated with various cancers, cardiovascular disease, and diabetes. Reasons for their excess weight are quite complex, and will continue to prove elusive without an examination of their socio-historical identity, and the social construction of African-American womanhood. The preparation and communal nature of food are of critical importance within African-American history, and among the women, food has been a vehicle used to provide joy in many homes, despite the inescapable living conditions.

African-American women were artists, and were responsible for creating a mosaic of beauty. After slavery, these women also had to contend with the controlling images of the faithful slave and the idealization of Mammy, and her attitude of indebted servitude to white families. These women were often employed in domestic positions, and were skilled at the construction of dual identities. To protect themselves, African-American women constructed personas of strength and did not believe they had permission or support to admit the need for help or succumb to exhaustion and despair. These images and identities may set a foundation to explore the relationship black women have with food. It has been theorized that food is a coping resource within African-American communities, and may be a tool used to provide nourishment and self-care.

Although African-American women typically had larger body sizes than Caucasian women, racial disparities in rates of obesity did not become statistically significant until the 1980s. While their weight increased along with the rest of the United States, African-American women were more prone to become severely obese and had greater increases of weight gain, when compared to other racial/ethnic groups. Researchers are beginning to understand how the increase in the frequency of eating, and the consumption of cheaply made and palatable foods have come to significantly impact the weight of the nation. Moreover, dietary advice in the 1980s encouraged Americans to reduce fat intake, thereby increasing the intake of bread, pasta, and other carbohydrates. This advice was detrimental, and left a mark from which the country has not recovered.

Thus, when examining the obesity story from the national and African-American woman perspective, one can see several pathways to explain the excess weight that these women possess. First, African-American women were likely pre-disposed to carry excess weight due to

genetic design and body composition, and the social and cultural use of food as a coping skill. However, these eating behaviors were offset by the persistent poverty and lifestyles experienced by many blacks after the end of slavery and for much of the twentieth century, and did not result in significant amounts of overweight and obesity. It was not until the United States began to manufacture food products, and create a food environment where food that was devoid of any nutrients was available quickly and cheaply, that excess weight among black women began to rapidly accumulate. In addition, the urban blight experienced by many communities of color and the creation of neighborhood environments that were lacking access to fresh and healthy food worsened the problem. Their culturally sanctioned coping behavior became easier to satisfy, and due to body composition and food environment, became more problematic in that it resulted in greater amounts of excess weight.

Furthermore, because many blacks had experienced such impoverished living conditions and had survived the experience of "hunger", it may make it difficult to heed contemporary dietary advice and focus on nutrition. Food may have a different meaning within black communities, and these alternative definitions may be in direct opposition to mainstream nutrition advice. If these women are still eating by "cleaning the plate" and eating to fulfill hunger without regard to food content, their susceptibility to obesity may be heightened. Similarly, if black women have been socialized to see food as a tool of endearment, and to emphasize its presence over specific nutritional composition, then it also provides greater evidence to explain difficulty with weight loss success.

And finally, surviving the experience of chronic stress, poverty, and single parenthood may further exacerbate living conditions, and make it difficult to have the emotional energy to pay attention to eating behaviors that historically, have never been a necessary concern. It has

only been 30 years where obesity has been recognized as a problem with the United States. The relationship to food that is present within many black families has been persisting for over 200 years. A greater examination of their eating behaviors and practices will be paramount to guide future weight investigations within this population.

2.4 CONCEPTUAL FRAMEWORK

2.4.1 Cognitive Behavioral Theory of Eating Disorders

The theoretical framework for this investigation is based on Cognitive Behavior Theory. This theory describes the processes that allow the disordered eating behavior to continue. According to the theory, people with eating disorders often evaluate themselves on the basis of their eating habits, shape, and/or weight, and their ability to control them (Fairburn, Cooper, & Shafran, 2003b). Consequently, their lives because incredibly focused on the control of their eating behaviors and shape; this manifests in an aggressive pursuit of dietary control, thinness, and weight loss. On the contrary, overeating, weight gain, and "fatness" are things to be avoided. Thus, all eating disorders share the same common core pathology: over-evaluation of shape and weight and their control (Fairburn, 2008). This core pathology is expressed in several different ways: intense concern about one's weight, experiencing "fat as a feeling," vigilant scrutiny of one's body, and fear of weight gain and perceived/experienced fatness (Fairburn, 2008). As a consequence of this pathology, individuals who are experiencing eating disorders may engage in dietary restraint and restriction, be preoccupied with thoughts on food, eating, weight, and shape,

and may be prone to engage in extreme methods of weight control (Figure 1) (Murphy, Straebler, Cooper, & Fairburn, 2010).

Binge eating is the current exception to the core pathology; Cognitive Behavioral Theory suggests that binge eating episodes are largely the result of attempts to adhere to restrictive dietary rules, and the resulting "lapse" that occurs when rules are not followed. A response to a dietary lapse may be a negative, and a temporary leave from their common restricting behavior (i.e., binge eating) may occur. Engaging in binge eating behavior may serve to encourage more dietary restraint, and may thereby increase the risk of further binge eating.

Cognitive Behavioral Therapy also posits that further subgroups may experience one or more of four additional psychological processes that may serve to interact and further the core eating disorder. The first, mood intolerance, suggests that certain individuals may exhibit an inability to cope with appropriately with various emotional states, including those that are positive and negative in nature (Fairburn, Cooper, & Shafran, 2003a). Instead of being able to successfully navigate intense mood states, certain individuals may engage in a mood modulatory behavior, or an alternative, albeit dysfunctional action that may serve to neutralize the mood, despite not fully addressing antecedent factors. Binge eating may serve as an example of mood modifying behavior.

Alternatively, researchers posit that interpersonal difficulties also serve to exacerbate eating behaviors. Potential examples are seen through that of family tension, environments that increase concerns about eating, shape, and weight, adverse interpersonal events, and long-term relationship concerns which may decrease self-esteem. Third, clinical perfectionism, or the over concern with the pursuit and achievement of personally demanding standards, despite risk of adverse consequences (Fairburn et al., 2003a), may also interact with eating disorder pathology.

The client's perfectionist tendencies may also be applied to attempts to control eating, shape, and weight (Fairburn et al., 2003a).

Finally, among individuals who have a pervasive negative view of themselves, or core low self-esteem, eating disordered behavior may persist. This is seen in two main ways: 1) individuals are hopeless about their ability to change, thereby undermining treatment effectiveness, and 2) core low self-esteem may result, which may increase one's desire to achieve success in areas that are important (e.g. control over eating, shape, and weight behavior), thus making change to this area increasingly difficult (Fairburn et al., 2003a).

2.4.1.1 Overview of CBT-E

Currently, Enhanced Cognitive Behavioral Therapy (CBT-E) is the current gold-standard for eating disorder treatment. This theory views eating disorders in the "transdiagnostic" lens, which implies that eating disorder pathology may be more similar among the three DSM-V classified conditions (e.g. Anorexia Nervosa, Bulimia Nervosa, and Binge Eating Disorder) (R. Murphy et al., 2010). CBT-E is an updated version of the original cognitive behavioral intervention for eating disorders – CBT-BN. The strategy that undergirds CBT-E is the emphasis on the formulation of a hypothesis about what is maintaining a client's eating disorder pathology, and to use it to identify the relevant features that need to be identified in treatment (Fairburn, 2008). There are four stages in CBT-E: 1) Initial Treatment and Planning; 2) Transitional Stage – review progress and barriers to change; 3) Main Treatment –address central mechanisms that are impacting disordered eating behavior; and 4) Final Stage – focus on relapse prevention and maintenance of treatment (Fairburn, 2008).

In stage one, clients are engaged in treatment, receive a case conceptualization, and are educated about the treatment and disorder. Moreover, clients are introduced to two important

procedures: weekly weighing, and regular, structured eating (R. Murphy et al., 2010). Next, in stage two, clients are engaged in a joint review of current progress, and examine any current barriers to change, to revise the case conceptualization, and then to design stage three (R. Murphy et al., 2010). The third stage of treatment is where the main work is accomplished. The goal of this stage is to address the key thought processes that maintain the eating disorder, e.g. overvaluation of shape and weight, dietary rules, external events and mood changes, interpersonal problems. Finally, stage 4 is focused on maintaining progress and reducing risk of relapse.

2.4.1.2 Evidence Supporting Cognitive Behavioral Theory for the Treatment of Eating Disorders

Over the last 30 years, Cognitive Behavioral Theory (via Cognitive Behavioral Therapy) has amassed a significant literature that suggests its efficacy in the treatment of bulimia nervosa (Hay, Bacaltchuk, Stefano, & Kashyap, 2009; Shapiro et al., 2007; Wilfley et al., 2002; G. T. Wilson, Grilo, & Vitousek, 2007). CBT-BN, a treatment designed to target the mechanisms proposed by Cognitive Behavioral Theory is currently recognized as the treatment of choice for bulimia nervosa (Cooper & Fairburn, 2011; National Institute for Health and Clinical Excellence, 2004). Recently, this treatment has been reformulated so that it may be a treatment for eating disorder pathology – regardless of diagnosis (Fairburn et al., 2009).There has been consistent evidence to support the use of CBT for the treatment of eating disorders (citation). In a meta-analysis that examined 26 randomized studies and nine double-blind, placebo-controlled medication trials, Cognitive Behavioral Therapy emerged as the most preferred treatment, when compared with medication (Whittal, Agras, & Gould, 1999). In fact, CBT-BN appears to have a significant effect on the frequency of binge eating behaviors; for those who complete treatment

(80-85%), 40-50% cease binge eating and purging behaviors completely (Fairburn et al., 2003b). Additionally, in recent Cochrane review of 48 Studies (n=3054), CBT-BN was found to be more efficacious to reduce disordered eating symptoms than in other psychological therapies, and better than having no treatment (Hay et al., 2009). The most recent version of the eating disorder therapy – CBT-E, has also shown some early promise at being suitable for the outpatient treatment of eating disorders (Fairburn et al., 2009).

2.4.1.3 Criticisms

While CBT may be one of the most efficacious ways of treating eating disorders, far little is known about its impact in samples of multi-ethnic women, specifically those who are African-American (Taylor et al., 2013). The current theoretical model highlights over-concern with weight and shape for the core reason behind disordered eating behaviors (Fairburn, 2003). However, among African-American women, investigators have discovered evidence to suggest that disordered eating behaviors may be the result of external and societal factors, such as coping behaviors, trauma, and/or stress management (Harrington et al., 2006; Jackson et al., 2010). Moreover, body image concerns are quite different among African-American women, than compared to white women. Overall, African-American women have reported acceptance at larger body weights, and often viewed themselves as thinner than they really are (Capodilupo & Kim, 2014; Lovejoy, 2001). Moreover, when comparing Caucasian and African-American adolescents, investigators have reported that Caucasian women report far more instances of dietary restriction (M. A. White & Grilo, 2005).

As a result of these documented changes, there has been a recent call for culturally tailored criteria for eating disorder diagnosis – criteria that would reflect the life experiences of African-Americans (Taylor et al., 2013). Changing the criteria for diagnosis may also

necessitate the development of more culturally-relevant interventions. Currently, there is a considerable gap in our knowledge about eating disorders among African-American women. CBT may set an excellent foundation for the treatment of disordered eating behaviors among Caucasian women, but we need more evidence to see its impact within populations of non-white women.

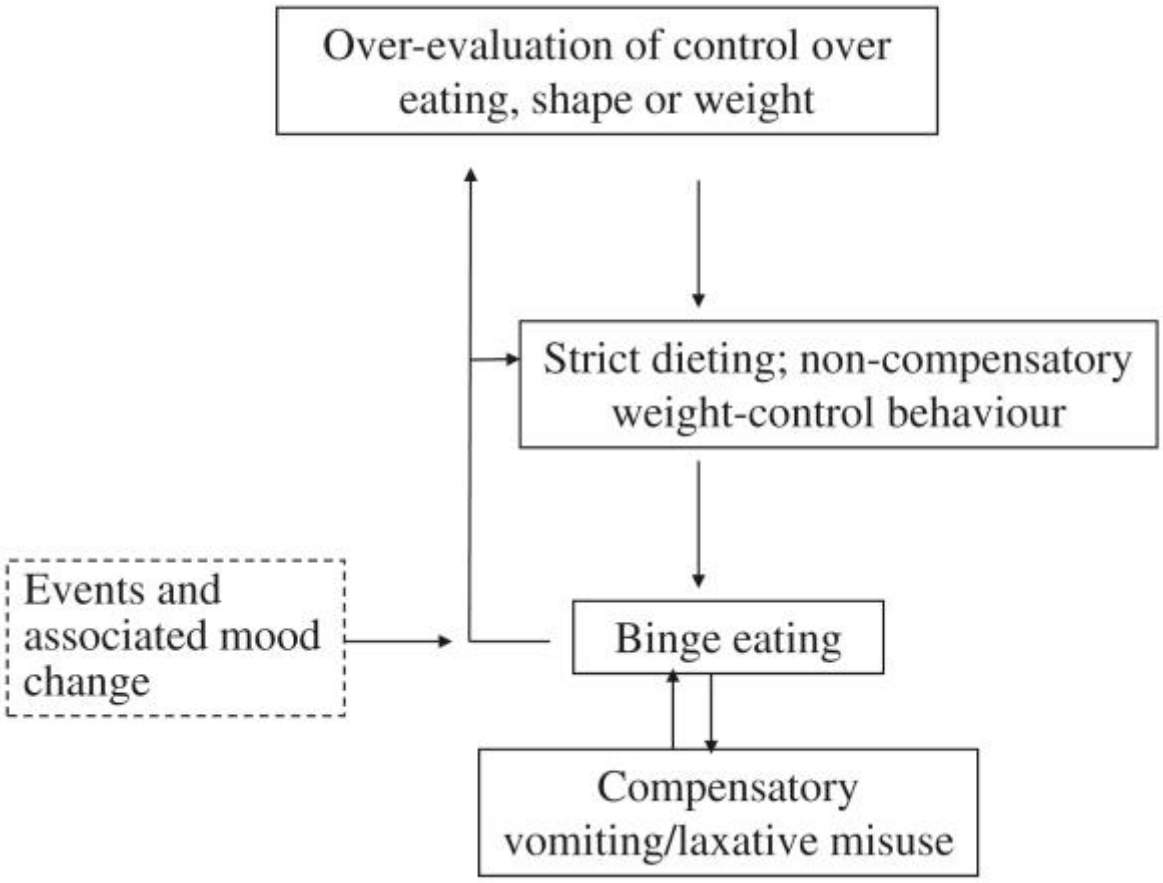

Figure 1. Cognitive Behavioral Theory of Bulimia Nervosa (Fairburn, 2003)

2.5 BEHAVIORAL INTERVENTIONS ADRESSING OBESITY IN AFRICAN-AMERICAN WOMEN

The following section will examine many of the attempts made by researchers to address overweight and obesity in African-American women. Over the last 30 years, researchers have been working diligently in order to find a solution to excess weight that is found within African-American women. Weight loss interventions have focused on nutrition counseling, exercise, daily food intake, activity records, behavior modification techniques, and goal setting (Bronner & Boyington, 2002). There have been weight loss models with cultural adaptations, models that base their work in communities, and models that implement faith-based interventions. Traditionally, Social Cognitive Theory, the health belief model, and behavioral self-management (no defined theoretical framework), have been developing tools used in order to shape treatment for African-American women (Fitzgibbon et al., 2012). This section will highlight the different approaches to designing behavioral interventions, and the resulting strengths and limitations. This section will end with a summary of the interventions, and suggestions for the future.

2.5.1 Cultural Tailoring and Leveraging

As researchers have attempted to alleviate health disparities, many have found value in designing interventions that are culturally tailored. This term falls under the umbrella of cultural competence, a term used to describe the alignment of behaviors, attitudes, and policies that enable professionals and systems to be effective in cross-cultural interactions (Fisher, Burnet, Huang, Chin, & Cagney, 2007). Recently, researchers have attempted to further the definition of cultural competence, and conceptualize these behaviors as cultural leverage. Cultural leverage is

a "focused strategy for improving the health of racial and ethnic communities by using our cultural practices, products, philosophies, or environments as vehicles that facilitate behavior change of patients and practitioners" (Fisher et al., 2007, p.244).

Several researchers have incorporated this advice into their interventions in order to help African-American women lose weight. Fitzgibbon, Stolley, Ganschow, et al. (2005) designed a faith-based weight loss intervention with cultural tailoring for African-American women. The researchers were intentional about integrating African American cultural values highlighting the importance of family commitment, respect for ancestors, and the importance of strong verbal communication skills. Furthermore, the intervention focused on training participants on healthier ways to prepare cultural foods, provided child care, and included discussions on how to manage multiple family responsibilities. Stolley, Fitzgibbon, et al. (2009) conducted focus groups with breast cancer survivors and utilized this information to design a culturally sensitive intervention for weight loss with African-American women. Their cultural considerations included highlighting the importance of food within the culture, discussing barriers to regular physical activity, creating an atmosphere that facilitated social support, including religion and faith, and acknowledging the challenges these women face in juggling multiple caretaking roles. These studies serve as brief examples of how researchers have chosen to interpret cultural leverage and tailoring and African-American communities.

One of the most recent culturally-tailored behavioral weight-loss trials designed for African-American women is the ORBIT trial, facilitated by Dr. Marian Fitzgibbon (Fitzgibbon et al., 2010; Fitzgibbon et al., 2008). This trial was designed to test the efficacy of a six-month weight loss intervention, followed by 12-month weight-loss maintenance intervention for obese black women (Fitzgibbon et al., 2010). Within this 18-month behavioral weight-loss trial, the

intervention team included African-American women, twice-weekly sessions, encouragement to develop a low-fat and high fiber diet, individual motivational interviewing sessions, and a support group during the maintenance phase of the trial. During the twice-weekly sessions, participants had a didactic session, and an aerobics portion – both designed to help participants incorporate behavioral lifestyle changes. At 18 months, participants randomized to the intervention group lost significantly more weight than control participants (-2.83 kg). While the participants did lose weight, researchers concluded that there is still much to learn about weight loss with African-American women. While helpful, behavior skills training may not have been enough to overcome an environment with components resistant to long-term weight loss (Fitzgibbon et al., 2010).

The most recent form of cultural tailoring has been to change weight management efforts with African-American women to those of weight gain prevention versus weight loss. This approach understands that African-American women are traditionally more tolerant of heavier body weights and overall less bodyweight dissatisfaction (Foley et al., 2012). Furthermore, as weight loss with this population has typically been a challenge, focusing on weight gain prevention may improve intervention engagement and enhance intervention outcomes (Foley et al., 2012). The SHAPE program (Foley et al., 2012), using a theoretical framework of Social Cognitive Theory, was designed to target mastery experiences, social modeling, social persuasion, and emotional reactions – all influencing self-efficacy. The intervention contains five different components: obesogenic behavior change goals, self-monitoring, tailored skills training materials, 12 interpersonal counseling calls from a dietitian, and a 12 month YMCA membership. Participants were followed over 18 months, with study visits at baseline, 6, 12, and 18 months. At 12 months, the weight change in the intervention group (-1.0 ± .5 kg) was greater

than in the usual care group (.5 ± .5 kg) (Bennett et al., 2013). Although the weight loss was modest, the investigators found that intervention participants maintained significant weight loss difference (- 1.7kg) at 18 months relative to usual care.

2.5.2 Lifestyle and Behavioral Weight Loss Interventions

Standard Behavioral and Lifestyle Intervention Weight Loss Treatment are two of the most successful modes of weight loss intervention in use today. Standard behavioral treatment (SBT) has been shown to be efficacious in achieving successful weight loss among those who are overweight and obese (Burke & Wang, 2011). The focus of SBT is to encourage individuals to reduce their body weight by at least 10%, consume a low-calorie, low-fat diet, exercise at least 150 minutes per week, and participate in behavioral skills that encourage self-monitoring and goal setting (Burke & Wang, 2011; Pinto, Gokee-Larose, & Wing, 2007). Standard behavioral treatment has been shown to produce a clinically significant weight loss of 5-10% of initial body weight (Burke & Wang, 2011).

Lifestyle intervention, a goal-based form of behavioral intervention, has been most commonly associated with the success of the Diabetes Prevention Program, a 27 site randomized clinical trial designed to prevent the onset of diabetes with high-risk individuals (Diabetes Prevention Program Research, 2002). This program included the use the following methods: individual case managers, frequent individual contact, 16 session core curriculum, supervised physical activity sessions, a flexible maintenance intervention, individualization program to increase adherence, tailoring the materials to address ethnic diversity, and a network of feedback and clinical support (Diabetes Prevention Program Research, 2002). This clinical trial included 45% racial and ethnic minorities, and more specifically, 204 African-Americans, or

approximately 18.9% of the sample (Diabetes Prevention Program Research, 2002). Information about gender by race and ethnicity was not provided.

Participants were encouraged to exercise approximately 150 min. per week, and lose 7% of their body weight at the end of the trial core curriculum (Diabetes Prevention Program Research, 2002). Participants were very responsive to meeting physical activity goals; 58% of African-Americans achieved the exercise goal, compared with 60% of Caucasian participants. In addition, approximately 30% of African-Americans participating in the trial achieved the 7% weight loss goal, compared with approximately 40% of Caucasian participants. Overall, the results of the DPP resulted in a 58% reduction in the rate of diabetes (Diabetes Prevention Program Research, 2002).

Because of the success of the Diabetes Prevention Program, various researchers have attempted to further its implementation with African-American women. The Weight Wise Program (Samuel-Hodge et al., 2009) began with the DPP intervention materials, and adapted them to include less writing, and use of more small group rather than individual activities. For activities involving food demonstration, all ingredients were purchased at stores that participants could access easily. Furthermore, an incentive program helped to provide motivation to attend, count calories, met program goals for physical activity, and maintain good records. Participants were encouraged to lose $\geq$ 4.5 kg for the duration of the trial. Results demonstrated that participants had average weight changes of -3.7 kg, and had systolic blood pressure changes of -6.5mm Hg. Approximately 19% lost at least between 3-7 % of their initial body weight (Samuel-Hodge et al., 2009).

Another intervention focused on the relationship between chronic stress and weight management efforts for African-American women, a combined lifestyle intervention with stress

management tools (Cox et al., 2012). This stress management behavioral intervention used the DPP intervention, and added instruction of a different stress management technique, providing in class practice and instructions for self-monitoring of stress during the next week (Cox et al., 2012). Stress management techniques included relaxation methods, behavioral methods, and cognitive strategies, all designed to address the chronic stress often seen with African-American women. For this three-month trial, the researchers were able to retain 86% of the sample, and participants who were in the lifestyle & stress intervention group lost approximately 2.7kg of weight. Despite the lack of clinical significance between the intervention and control group, this intervention demonstrated the feasibility of including stress management within future weight-loss trials (Cox et al., 2012).

2.5.3 Interventions in Primary Care Clinics

There have been four weight management interventions that have taken place in primary care clinics and have focused on the predominant African-American population (Bennett et al., 2013; Davis Martin et al., 2006; Foley et al., 2012; S. K. Kumanyika et al., 2012). Primary care clinics have been optimal sites for recruitment and intervention delivery due to accessibility, inclusion of primary care physician (PCP), and the ability to recruit low-income African-American women, a group that traditionally is difficult to retain within interventions (Davis Martin et al., 2006). Three of the primary care interventions focused on using the PCP as an intervention agent. Researchers utilized physicians to provide tailored health recommendations during monthly outpatient visits (Davis Martin et al., 2006), and serve as part of a low - intensity intervention by maintaining appointments with study participants (Kumanyika et al., 2012). Specific intervention components ranged from having a team of health professionals encouraging

participants to make healthier food and physical fitness choices (Davis Martin et al., 2006), using the DPP intervention materials and a lifestyle coach (Kumanyika et al., 2012), or an internet-based behavioral weight-loss intervention (Bennett et al., 2012; Foley et al., 2012). Instead of commonly used group intervention sessions, primary care interventions were individually based, and focused on the strength of the relationship between the participant and the PCP, health educators, and/or, and e-health individualized Internet program. One-year weight loss within these intervention modalities was modest and consistent with commonly reported losses in earlier trials. In the Davis-Martin (2006) trial, mean intervention weight loss was -2.0kg and -1.61 kg within the Kumanyika (2012) trial. Within the Bennett intervention participants lost -1.03 kg.

Researchers noted that primary care clinics are excellent sites from which to recruit racial and ethnic minorities, as the primary care physician is typically included, benefit of develop rapport) and feasibility of conducting intervention has been demonstrated (Davis Martin et al., 2006; Kumanyika et al., 2012). However, weight-loss, while achieved, remains difficult and did not differ from the findings of previous trials (Davis Martin et al., 2006; Kumanyika et al., 2012). Moreover, interaction with the e-health intervention was less than desired, and more work is needed to address the needs of low income individuals/families participating in the trial (Bennett et al., 2012)

2.5.4 Spiritually-Informed Weight Loss Interventions

There have been five behavioral interventions that have included elements of spirituality in either their design or the delivery of the intervention. Four of the interventions were housed within a church setting (Fitzgibbon, Stolley, Ganschow, et al., 2005; McNabb, Quinn, Kerver, Cook, &

Karrison, 1997; Parker, Coles, Logan, & Davis, 2010; Yanek et al., 2001), while the other was implemented within a community setting (Djuric et al., 2009). When incorporated into intervention, spirituality is either present actively (involving principals or beliefs) or peripherally (using spiritually-influenced sites). Two of the interventions chose to have their treatment sessions at local churches, with only one choosing to just involve spirituality peripherally.

McNabb et al (1997) recruited 39 African-American women and over 14 weeks, provided 90 minute sessions encouraging participants to reduce dietary fat, increase fiber intake, and increase physical activity. Content was delivered in a small group format and community educators (lay educators within the church) were important tools to facilitate intervention adherence. Spirituality was not directly involved with the intervention. Participants in the intervention group achieved a 5% weight loss, while those in the control group gained 1% of additional weight.

Parker et al. (2010) recruited 35 African-American women from two rural churches, and offered a 10 week group intervention, weekly 1.5 hour sessions, and provided education about dietary practices, physical activity, and discussing concerns with health providers. Two different group formats were used – curriculum with spirituality (scripture verses were added) and curriculum without spirituality. Participants in both groups achieved weight loss between 1-3 pounds over 10 weeks; analyses were unable to detect differences between groups.

The three other interventions conducted their treatment within the community. Djuric et al. (2009) recruited 31 African-American survivors of breast cancer, and provided 18 months of dietitian- lead phone counseling and Weight Watchers™ coupons. At six months into the intervention, participants were randomized to either receive spirituality counseling or not within the program. Results indicate that most of the weight loss achieved by participants occurred

during the first 6 months. Spirituality did not seem to influence weight loss, but did positively impact health and spiritual well-being.

Similar results were found in the work of Yanek et al. (2001) and Fitzgibbon et al. (2005), as both reported the positive influence of spirituality, in spite of little change in weight. In the 529 African-American women who enrolled in her 20-week community-based trial, Yanek (2001) examined the impact of three interventions: behavioral standard group (SI), behavioral with spiritual component, and the control group with the non-spiritual component. SI intervention components included 20 weeks of sessions led by health educators, with each individual session beginning with a weigh in, group discussion, and nutrition education module. Intervention components were the same with the spiritual group, except for the addition of group prayers and health messages enriched with scripture. The control group received self-help material. At 12 months, researchers reported achieved weight loss was 1.1 kg for all groups together.

In the work of Fitzgibbon et al. (2005), researchers randomized 59 women to either a faith-based or non-faith-based weight-loss intervention group. Both groups received an intervention that talked about daily self-monitoring food intake, physical activity, and social support. Participants in the faith-based weight-loss intervention had additional scriptures, incorporated each week, and had a group leader who had a thorough knowledge of the Bible as Scripture readings. Those in the group with the spiritual component lost 2.6 kg compared to the 1.6 kg lost in the group with the non-spiritual intervention. However, despite the apparent impact, the difference in weight change between the two groups was not statistically significant.

Spirituality appears to be of some benefit to African-American women participating in weight loss interventions, but researchers have not discovered how the cultural strength may be used to cause significant weight changes within the population.

2.5.5 Community-Based Interventions

In attempts to reach a broader segment of the population, researchers often initiate their research trials within a community setting. This provides an opportunity for participants to associate research participation with a location they frequently attend, rather than just in a clinical setting that may be used under circumstances where an individual may be sick (McNabb et al., 1997).

One of the most important outcomes of the 7 community weight-loss interventions were the rates of significant weight loss that followed. Within the research literature, African-American women have historically lost less weight than white participants when included in behavioral weight-loss interventions (Fitzgibbon et al., 2012). However, within these selected community trials, the weight loss achieved by some of the African-American participants ranged between 2.0kg (Kennedy et al., 2009) and 5 kg (McNabb et al., 1997). Several of the community interventions were held at community health centers (Befort et al., 2008; Samuel-Hodge et al., 2009) while others took place at community centers (Domel, Alford, Cattlett, & Gench, 1992; Kennedy et al., 2009), churches (McNabb et al., 1997), and YMCA's (Annesi, 2007; Fitzgibbon, Stolley, Schiffer, et al., 2005).

Some of the intervention components included individual and group sessions, the provision of fruits, vegetables and nutrition education (Annesi, 2007; Kennedy et al., 2009) (Annesi et al., 2007; Kennedy et al., 2009), lay/peer health advisors (McNabb et al., 1997; Kennedy et al., 2009) and offering multiple meeting times for intervention sessions (Fitzgibbon

et al., 2005; Samuel-Hodge et al., 2009). Two of the interventions were able to recruit low-income African-American women to participate within structured weight loss treatment (Befort et al., 2008; Samuel-Hodge et al., 2009). Both interventions were adapted from the DPP and conducted 16 weekly group sessions with participants. Samuel-Hodge et al. (2009) recruited 58 AA women and held intervention sessions four times per week to accommodate schedules of participants. Befort et al. (2008) recruited 44 African-American women and offered 90 min. weekly intervention sessions to examine whether adding motivational interviewing impacts treatment adherence. Unfortunately, attrition was difficult and approximately 22% (Befort et al., 2008) and 12% (Samuel-Hodge et al., 2009) of participants did not complete the study. Researchers concluded women with less education were less likely to be retained and self-monitoring was less successful with this population. Additionally, as attendance is predictive of weight loss, scheduling sessions throughout the week was helpful (Befort et al., 2008; Samuel-Hodge et al., 2009).

2.5.6 Interventions for Breast Cancer and Hypertension

Six different interventions were designed to engage African-American women who had either been diagnosed with breast cancer or hypertension (Banks - Wallace, 2007; Fitzgibbon, Stolley, Schiffer, et al., 2005; Greenlee et al., 2013; S. K. Kumanyika, Obarzanek, Stevens, Hebert, & Whelton, 1991; Stolley, Sharp, Oh, & Schiffer, 2009; Svetkey et al., 2005). Creating interventions to attract participants with overarching health concerns may be an appropriate way to recruit participants, as health has been cited as one of the main reasons individuals become concerned about engaging in weight-loss treatment (Fitzgibbon et al., 2012).

Of the interventions that addressed health concerns, reducing levels of hypertension with African-American was the priority for two large multi-site trials (Kumanyika et al., 1991; Svetkey et al., 2005) and one pre-post design (Banks-Wallace, 2007). Interventions were designed to engage participants in home-based walking and cardiovascular health education (Banks-Wallace, 2007), intensive nutrition and behavioral counseling (Kumanyika et al., 1991), and incorporating the DASH (increased fruits and vegetables, reduced sodium intake, decreased alcohol consumption, increased physical activity) diet with an established behavioral intervention (Svetkey et al., 2005). Unfortunately, the consensus was that African-American participants loss less weight than other racial/ethnic participants, as weight loss at study conclusion for intervention participants was -0.2 kg (black) vs. -2.5kg (white) (Kumanyika et al., 1991), -3.2kg (black) vs. -6.7kg (white) (Svetkey et al., 2005), and +4% weight (Banks-Wallace, 2007) . However, major lifestyle changes were evident and researchers cited their interventions has helpful for maintaining lowered systolic blood pressure (Banks-Wallace, 2007), and encouraging positive lifestyle change (Svetkey, 2005).

Four interventions addressed breast health and reducing future risk among breast cancer survivors (Djuric et al., 2009; Fitzgibbon, Stolley, Schiffer, et al., 2005; Greenlee et al., 2013; Stolley et al., 2009). Intervention content focused on increasing the efficacy of participants to complete a breast self-exam (Fitzgibbon et al., 2005), providing weekly exercise classes (Stolley et al., 2009), providing memberships to commercial weight loss facilities and programs (Djuric et al., 2009; Greenlee et al., 2013) and providing participants opportunities to receive social support and engage in discussion on barriers to weight loss (Stolley et al., 2009). Mean weight loss varied among interventions: -3.4kg (Fitzgibbon et al., 2005); -2.5kg (Stolley et al., 2009); +0.4kg (Djuric et al., 2009); -1.76kg (Greenlee et al., 2013). Conclusions encouraged future

development of financially feasible commercial programs (Greenlee et al., 2013), reflected on the importance of social support, and that participants made positive dietary and physical activity changes (Stolley et al., 2009).

2.5.7 Large Multi-Site Interventions

There have been five significant multi-site trials that have include a significant sub-sample of African-American women: Weight Loss Maintenance Trial WLM (Hollis et al., 2008), PREMIER (Svetkey et al., 2005); DPP (Diabetes Prevention Program Research, 2002), Hypertension Prevention Trial (HPT) and Trials of Hypertension Prevention (TOHP) (Kumanyika et al., 1991). These trials have been successful in recruiting samples with large numbers of participants. The HPT trial recruited 246 participants (28 African-American women) and the TOHP trial recruited 303 participants, 33 of which were African-American women. Both of these trials were designed to assess the effects of weight loss on reduction in blood pressure. Intervention components included an intensive nutrition and behavioral counseling program, and information on cooking, shopping, and eating practices.

The WLM trial recruited 1685 participants (540 African-American women) and offered over six months, with 20 sessions, approximately once per week. Intervention was delivered in a group format, and participants received training on nutrition, physical activity, and the development of behavioral skills. The PREMIER trial enrolled 810 participants, 207 of which are African-American women participants. Participants in this trial met for approximately 6 months, and attended 14 group meetings, and four individual meetings. Intervention consisted of nutrition and physical activity training. Finally, the DPP trial enrolled 1079 participants and 204 were African-American (Fitzgibbon et al., 2012).

One noteworthy thing to mention about these multisite trials is the high rates of retention. Among all participants, researchers report retention rates between 92-100% (Fitzgibbon et al., 2012). Moreover, African-American women were able to achieve larger mean weight losses within the DPP (-4.7 kg/m²) and the WLM (-4.1 kg/m²) (Fitzgibbon et al., 2012). Contributing factors included strict inclusion criteria, intensive group and/or individual treatment implemented with fidelity, and the availability of resources designed to help with retention and to monitor adherence (Fitzgibbon et al., 2012).

2.5.8 Summary and Critique of Intervention Research

There have been some important conclusions reached from the many weight loss interventions that have been conducted with African-American women. Overall, African-American women tend to lose less weight, and are less successful in behavioral weight-loss trials (Fitzgibbon et al., 2012). However, despite the overall lack of effectiveness, there are still things yet to learn from the work researchers have already done.

To begin, successful weight loss programs including African-American women have encouraged participants to increase their use of behavioral self-management skills, reduce dietary fat and caloric intake, utilize physical activity, monitor portions, and to be consistent with session attendance (Fitzgibbon et al., 2012). Furthermore, group sessions appear to be a very important aspect of successful weight loss programs (Bronner & Boyington, 2002). The model allowed for uniform delivery of expectations and intervention guidelines, the presence of lay facilitators to offer support, efficiency with allocated funds and hired staff, and the ability for participants to experience community support (Bronner & Boyington, 2002).

Additionally, interventions for African-American women that address physical activity, eating, and counseling are more effective than interventions that just address one or two (Seo & Sa, 2008). Furthermore, lifestyle interventions with a focus on incorporating changes in eating and exercise routines have been effective, along with encouraging participants to reduce 7% of their body weight (Diabetes Prevention Program Research, 2002; Seo & Sa, 2008). Interventions involving African-American women should address environmental resources to be of added advantage, as there is a link between access and limited affordability of helpful foods to difficulty with weight management (Fitzgibbon et al., 2012).

Addressing obesity within the context of community was another important component. Often, the community consisted of previously established groups where a strong supportive network was already formed. Within the African-American community, the church is an example of this type of network and has been an important site for many past weight loss interventions. Partnering with a similar type of structure might allow researchers to access potential participants.

There are also several strengths and weaknesses that were associated with previous behavioral interventions for African-American women. Cultural tailoring has offered researchers the opportunity to create interventions incorporating some of the best elements of African-American culture, and to achieve the goal of meeting the participants at a relevant starting point. Some of the highlights are teaching participants healthier ways to prepare traditional African-American cuisine, including support systems within the intervention, offering childcare, and utilizing spirituality.

Moreover, the education about nutrition and general health has been invaluable, and it is likely that many African-American women have benefited from learning about proper nutrients

that should be consumed in daily diets. However, many of the interventions have lacked focus on the environment, and the multidimensional realities that surround many overweight and obese African-American women. Additionally, there is a paucity of literature on the mental health needs of overweight and obese African-American women. African-American women manage untreated depression, anxiety, and trauma on a regular basis; increasing the platform for these discussions may offer researchers more insight into comorbid conditions, thus strengthening the effectiveness of future behavioral work (Harrington et al., 2010).

Prospective research would benefit from examining some of the other reasons for weight gain within African-American population. Excess weight might reflect coping strategies including stress management and overreliance on food (Kumanyika et al., 2007). An expanded paradigm was encouraged, one that would include more holistic methods serving to explain the role of weight as coping in the attempts African-American women make to seek control over their lives (Kumanyika et al., 2007). Additionally, as attrition was a significant problem in previous weight loss studies, incentives, free transportation, and babysitting were offered as helpful strategies that might offer improvement (Bronner & Boyington, 2002). Finally, future interventions need to be relevant to the needs of African-American women, as there are unique societal, racial, and cultural factors that contribute to the obesity epidemic (Kumanyika et al., 2007).

Weight loss interventions with African-American women have been both challenging and informative. Obesity within this population likely has many reasons for its occurrence, and it will be essential for future research to consider more environmental concerns within the development of future intervention trials. Furthermore, uncovering the relationship between eating behaviors,

psychological coping, and weight outcomes within this population may yield relevant evidence that may be effective in future weight-loss trials.

2.6 BINGE EATING: AN UNEXPLORED RISK FACTOR FOR OBESITY

Treating binge eating, also known as compulsive overeating, may be of particular importance for prevention efforts to decrease the incidence of obesity among African-American women. Binge eating is defined by engaging in compulsive overeating in a discrete period of time, while concurrently, experiencing a sense of loss of control. Susceptibility to binge eating places one at risk to develop Binge Eating Disorder (BED), which remains recurrently undertreated (Hudson et al., 2007; Yanovski et al., 2003). Moreover, BED is strongly associated with other co-morbid conditions of serious concern, including that of severe obesity, substance disorders, and mood disorders (Cheng et al., 2012; Guss et al., 2002; Hudson et al., 2007; Pike et al., 2001; Striegel-Moore et al., 2000).

While most obese individuals do not have BED, it is clear that a significant portion of these individuals experience stress and dysfunction due to binge eating (Yanovski, 2003). Binge eating is associated with severe obesity, and is an eating behavior that may precede the development of obesity (Yanovski, 2003). Investigators have identified growing concerns for the lack of treatment and identification of disordered eating behaviors among racial and ethnic minorities, and have issued a call for increased attention within this area (Pike et al., 2001; Taylor, Caldwell, Baser, Faison, & Jackson, 2007).

2.6.1 Binge Eating in African-American Women

Of recent, investigators have been exploring the presence of binge eating within samples of African-American women (Marques et al., 2011; J. Y. Taylor et al., 2007; J. Y. Taylor et al., 2013). In a secondary analysis of pooled data from the NIMH Collaborative Psychiatric Epidemiological Studies (CPES), a nationally representative survey including 3,570 African-American adults, the presence of any binge eating was markedly higher among African-Americans than Non-Latino whites. The reported presence of any binge eating (regardless of clinical diagnosis) among African-American women was 4.83%, compared to only 2.53% in Non-Latino white women (Marques et al., 2011). In fact, the presence of any binge eating has been associated with functional impairment among African-Americans (Marques et al., 2011). Among African-American women who were severely obese (BMI ≥40), rates of binge eating were discovered to be higher than 35% (Mazzeo et al., 2005).

Traditionally, eating disorders have been identified as a concern of affluent, upper class white women, and racial/ethnic minorities have been believed to be far less at risk (O'Neill, 2003; Taylor et al., 2007). However, recent evidence suggests that eating disorders are as common in racial/ethnic minorities as in whites (Marques et al., 2011; Mazzeo et al., 2005). Mental health treatment utilization, however, is not equal, and African-Americans have some of the lowest rates of access to care (Marques et al., 2011). Eating disorders may be misunderstood, underreported, and recurrently untreated among racial/ethnic minorities in the U.S. (Taylor et. al., 2013). Moreover, eating disorders are associated with other co-morbid conditions of serious concern (e.g. obesity, substance disorders, and mood disorders) (Taylor et al., 2013).

BED is the most common eating disorder among all racial and ethnic groups (Hudson et al., 2007; Taylor et al., 2007). Among blacks, lifetime prevalence of BED has been estimated to

be at 5.02% (Taylor et al., 2013). Recent evidence has found that, among African-American women seeking bariatric weight loss surgery, the prevalence of BED is reported to be 33.3% (Mazzeo et al., 2005). Moreover, depression, higher body fat percentages, and high ratings of perceived stress have been associated with binge eating among community-samples of African-American women (Adamus-Leach et al., 2013; Azarbad, Corsica, Hall, & Hood, 2010; Mazzeo et al., 2005). There is evidence that weight loss participants diagnosed with BED tend to do worse in treatment and relapse more quickly than those without BED (Gluck, Geliebter, & Lorence, 2004; Yanovski et al., 1993). Given the strong association between BED and obesity, the presence of this eating disorder has the potential to hinder weight gain prevention interventions.

2.6.2 Treatment of Binge Eating

Treatment for binge eating normally targets the reduction of binge eating, weight and shape concerns, inducing weight loss, and the prevention of excess weight gain (Tanofsky-Kraff et al., 2013). Several psychological treatment models have been found effective as treatment for binge eating and BED (Brownley, Berkman, Sedway, Lohr, & Bulik, 2007; Tanofsky-Kraff et al., 2013; G. T. Wilson et al., 2007). Currently, Cognitive Behavioral Therapy (CBT) and interpersonal psychotherapy (IPT) are the most recommended approaches (Tanofsky-Kraff et al., 2013).

CBT proposes that successful treatment of eating disorders will improve attitudes toward eating and body image, which will then work to decrease binge eating (Tanofsky-Kraff et al., 2013). In a meta-analysis of randomized clinical trials for eating disorders, Brownley et al. (2007) report that CBT has been found effective to reduce binge eating episodes and/or the

number of binge eating days. Additionally, CBT has been associated with high treatment completion rates, and improvements in psychosocial functioning and depressive symptomatology (Jarosz, Dobal, Wilson, & Schram, 2007).

In contrast to CBT, IPT proposes that binge eating is a result of poor social functioning and negative affect (Tanofsky-Kraff, 2012). By improving interpersonal functioning and self-esteem, negative affect is reduced, and binge eating behaviors can be lessened (Tanofsky-Kraff et al., 2013). IPT has also been found efficacious at reducing binge eating behaviors and inducing modest weight loss, and also helping participants continue to maintain those gains in the follow-up period (Wilfley et al., 2002; Hilbert et al., 2012).

2.6.3 Binge Eating and Obesity

A growing body of research reports on the association between binge eating and severe obesity (Hudson et al., 2007;Yanovski, 2003). Recent clinical trial evidence provides a foundation for the increased importance of treating risk factors (e.g., binge eating) for excess weight gain in adults and youth. Treatment of binge eating may offer the possibility of coordinating treatment for eating disorders and obesity, and provide opportunities for those who may not seek mental health treatment to get appropriate care (Pike et al., 2001; Tanofsky-Kraff et al., 2007). Within trials for BED, researchers have been surprised to discover that individuals who cease to binge eat have a higher likelihood of maintaining their body weight and/or losing modest body weight for the duration of and/or following treatment (Agras, Telch, Arnow, Eldredge, & Marnell, 1997; Hilbert et al., 2012; Tanofsky-Kraff et al., 2007; Wilfley et al., 2002).

After evaluating 93 women (92% Caucasian) who were diagnosed as having BED and were treated with CBT followed by a behavioral weight loss program, in the one-year follow-up,

Agras et al. (1997) discovered that both the treatment and the intervention group were able to reduce their binge eating behaviors. For those who stopped binge eating during treatment, a weight loss of 4.0 kg was able to be sustained in the follow-up period. Conversely, those who continued to binge eat gained 3.6 kg. In another study, investigators randomized 162 participants (over 90% Caucasian, 67% female) diagnosed with BED to either 20 sessions of group CBT or group IPT (Wilfley et al., 2002). At one-year follow-up, rates of binge eating recovery were 79% for the CBT group and 73% within the IPT group. Binge eating remained significantly below pretreatment level. Among participants who were abstinent from binge eating post-treatment, BMI was reduced by .5 ± 1.5kg/m² during treatment, compared to those who were still binge eating.

Finally, in a recent investigation of the long-term efficacy of psychological treatments (CBT, IPT) for BED, Hilbert et al. (2012) assessed 90 people (over 90% Caucasian) with BED four years after treatment ceased. Within both groups, long-term recovery rates for binge eating was between 72-84% among participants. Additionally, when it is likely that those who binge eat risk gaining .88lb of weight per year, investigators discovered that body mass index had been stable throughout the follow-up period.

Collectively, the results of these studies present a promising foundation from which to consider the benefit of treating binge eating as a risk factor for the development of overweight and obesity. While the current evidence is limited by its inclusion of a predominantly Caucasian samples, these studies do provide some evidence to suggest that the treatment of binge eating, by psychological or behavioral weight-loss treatment, is associated with decreased incidence of subsequent weight gain. By helping participants manage their eating behaviors and decrease their binge eating, researchers have an opportunity to design behavioral weight management

interventions that may address this important risk factor. These results may be particularly salient for African-American women - a cultural group where behavioral weight-loss treatment has been less effective. Moreover, these interventions may enable us to further explore the presence of binge eating and obtain more information on how pervasive it is among African-American women.

2.6.4 Summary and Future Research

Current evidence has laid groundwork to encourage investigators to consider the role of eating disorders among racial and ethnic minorities, and not as a problem only seen within white women. African-American women are as likely to have an eating disorder as any other racial and ethnic group. When compared with white and Hispanic women, African-American women have higher rates of observed binge eating, and higher levels of functional impairment as a result of these eating behaviors. Furthermore, due to evidence that suggests African-American women may be less likely to seek eating disorder treatment, and are more willing to participate in weight management interventions, addressing the risk factor of binge eating within weight-related contexts may be critical.

Of critical importance, however, may be the evidence of overconsumption of food, psychological reliance upon food, and lack of awareness of hunger and satiety signals experienced by African-American women. A growing body of evidence suggests these eating behaviors appear to place black women at a far greater risk for the development of overweight and obesity than is seen within Caucasian women. Additionally, with reported discomfort with mental health treatment, and historic lack of inclusion within research trials, rates of binge eating may be more severe than is currently documented within literature.

Currently, there is scant intervention research in African-American women addressing binge eating (Franko et al., 2012). Certain psychotherapeutic interventions, e.g., CBT and IPT, are effective in decreasing binge eating and preventing weight gain among white adults, and have shown preliminary feasibility in African-American adolescents (Dicker & Craighead, 2004; Tanofsky-Kraff et al., 2007; Tanofsky-Kraff et al., 2010). Testing a binge eating intervention in African-American women may be an important first step to weight gain prevention efforts. The testing of such an intervention may increase effectiveness of weight management efforts, and reduce psychosocial barriers to adopting dietary and physical activity changes. Moreover, this may also set a foundation for reducing the risk of CVD, diabetes, and other co-morbid conditions among this population.

3.0 METHODS

The proposed research is a pilot study to determine the feasibility of delivering the Appetite Awareness Training (AAT) intervention, which is an evidence-based approach to reduce binge-eating episodes among African-American women who are overweight or obese. This research project used a combination of quantitative and qualitative methods to explore the impact of AAT, and to collect data for intervention development and efficacy trials. The following section describes the study design, procedures, relevant measures, as well as the plan for data analysis.

3.1 STUDY DESIGN

The present investigation is a randomized wait-list, control feasibility study. A randomized clinical trial (RCT) design was used to assess feasibility and preliminary efficacy data in a community-based, AAT for African-American women who are overweight or obese and report at least one weekly binge eating episode.

To examine the feasibility, acceptability, and preliminary effects of the 8-week AAT intervention, we recruited African-American women who were overweight and obese (BMI=25-40) and who reported at least one binge eating or loss of control eating episode monthly. Recruitment sites included community centers, physicians' offices, and churches serving an African-American population. We randomized eligible participants to one of two groups: 1)

AAT condition or 2) wait-list control. An outside consultant assisted with randomization through the use of Microsoft Excel. We examined the feasibility of the following: recruitment, retention, and adherence to the intervention protocol (**Aim #1)**. Additionally, we examined the preliminary effect of the intervention on the participants in the AAT group compared to the wait-list control group, by examining differences between the two groups in weight, blood pressure, waist circumference, binge eating, eating self-efficacy, and depressive symptoms (**Aim #2)**.

3.2 RESEARCH QUESTIONS

Several research questions enabled us to understand the treatment of binge eating in African-American women who were overweight and obese. The specific questions were:

Research Question #1. What is the feasibility of implementing an 8-week AAT intervention in a community-based sample of overweight African-American women at-risk for BED?

We answered this question by examining study recruitment, attendance, retention, and treatment adherence to delivery and content of the intervention.

Research Question #2: What are the changes in eating (binges, eating self-efficacy), cardiovascular risk (body weight, blood pressure, and waist circumference) and psychosocial factors (self-efficacy), quality of life and depressive symptoms among participants in the intervention vs. wait-list control group?

We answered this question by examining the preliminary differences among participants in the intervention group vs. the wait-list control group. These differences provided additional information to test the future efficacy of AAT in a larger, powered sample.

3.3 SETTING AND SAMPLE

We conducted this study in Pittsburgh, PA, a city where 27.1% of the residents identify as African-American. According to the most recent community report (2011), 67.8% of African-Americans in Allegheny County are overweight and obese, compared to 58% of whites (Rao, 2011). ***Eligibility Criteria***: Individuals were eligible if they identified as non-Latino African-American women, over 18 years of age, had a BMI between 25-40 kg/m² *(rationale: BMI ≤35 is associated with less CVD risk in* African-American *women*) (Monda et al., 2013; Stevens et al., 2002); report experiencing at least one loss of control eating episode monthly (assessed by the Eating Disorder Examination Questionnaire), and complete the screening component of the proposed study. ***Exclusion Criteria****:* Individuals were excluded if they were currently pregnant, in substance abuse treatment, involved in another weight reduction program, had a history of anorexia, were purging, currently in treatment for eating difficulties, or self-reported intravenous drug use or the consumption of >4 alcoholic beverages/day. The rationale for these exclusion criteria are that the presence of these conditions may interfere with adhering to the intervention protocol or completing the study**.**

Intervention Group (AAT) Assessments. Data collection occurred at baseline/pre-intervention (0 weeks), post-AAT intervention (8 weeks) (see Table 1).

Wait-list Control Group Assessments. At 8 weeks, after the first group completed the AAT intervention, this group received the AAT intervention. We assessed the wait-list control participants at baseline (0 weeks) and pre-AAT intervention (8 weeks).

3.4 INTERVENTION

3.4.1 Appetite Awareness Training

The foundation of AAT rests on the belief that binge eating is the result of the failure to adhere to internal appetite signals that enable individuals to be conscious of whether or not they have overeaten (Brown, Smith, & Craighead, 2010). The goal of AAT is to enable participants to relearn their stomach's hunger signals and begin to obey and monitor functions of satiety (Craighead, 2006). Participants are encouraged to discover hunger signals, avoid allowing themselves to become too hungry, and to develop appropriate coping skills to manage urges to eat when not hungry (Craighead, 2006).

AAT has been successful in helping participants diagnosed with BED and bulimia nervosa reduce binge eating, overeating, urges to eat in response to non-appetite stimuli and prevent weight gain (Allen & Craighead, 1999; Dicker & Craighead, 2004; Hill, Craighead, & Safer, 2011). More recently, AAT also been evaluated as part of a lifestyle intervention (ENCORE study) to lower blood pressure and cardiovascular biomarkers of risk (Blumenthal et al., 2010). The participants (n = 144), comprised of predominantly higher income, white (60%) and African-American (39%) women, were randomly assigned to one of three 16-week conditions: DASH diet alone, DASH combined with AAT + exercise, or a usual diet control

group. More significant improvements were noted for DASH + AAT in blood pressure reduction, pulse wave velocity, left ventricular mass, and baroreflex sensitivity ($p_s < .05$)**.** In a follow-up study, researchers discovered continued changes in blood pressure and diet content in the DASH intervention groups (Hinderliter et al., 2013).

The AAT intervention includes eight 90-min group sessions providing education designed to inform participants about appetite monitoring, emotional eating, and the establishment of a connection between coping skills and eating choices (Craighead, 2006). All sessions involve didactic training, review of eating episodes as recorded in self-monitoring (REE), interactive activities, and homework assignments to enable participants to practice learned skills. In our session, we provided a workbook, which included session content, self-monitoring forms, and coping skills. Primary components of the intervention were the following:

1. Education about four paths of eating, such as: normal eating, normalized overeating, binge eating/getting stuffed, restrictive eating, and how the latter three serve to maintain and promote binge-eating behaviors.
2. Self-Monitoring of Eating Episodes: Participants used the REE to learn how to increase awareness of hunger and satiety cues, thus enabling development of skills to enable participants to make eating choices based upon those cues.
3. Training in the development of healthy, non-eating coping skills: Participants learned the difference between psychological and physical hunger, and were exposed to alternative coping skills that will aid in addressing potential mental health concerns.
4. Training to reduce episodes of overeating and binge eating: Participants engaged in a process of problem-solving to address external influences for eating, emotional correlates that precede binge eating behavior, and tips on managing "unplanned" food experiences.

3.5 STUDY PROCEDURES

We recruited our sample with flyers and bulletin announcements in urban community centers, doctor's offices and churches in the Greater Pittsburgh Metropolitan Area. We held the intervention at Mount Ararat Baptist Church and the Hill House Association. We selected both locations because of their central community location. Both locations provided letters of support. While initially there were three months allotted for recruitment, the PI added an additional three months due to the challenges in recruitment women with an eligible BMI. Recruitment flyers included a message that the group sessions could help potential participants "improve their relationship with food and begin to feel in control of their weight management efforts." Potential participants responded to the flyers by calling the Principal Investigator (PI), and were screened to determine presence of behaviors meeting eligibility criteria. If participants were eligible for the study, they were given a date and time to meet with the PI. At this appointment, participants provided signed informed consent, completed self-report measures, and were evaluated through a structured interview to determine the presence of at least one weekly episode of experiencing loss of control or binge eating using the overeating section of the Eating Disorder Examination. Participants also had their height, weight, blood pressure, and waist circumference measured at this visit. The baseline appointment took place in a private room at Mt. Ararat Baptist Church or the Hill House Association, or the participant's home. If all inclusion criteria were met, participants were randomly assigned to one of the two treatment conditions. Participants were compensated $25 for their time at the completion of the study.

Baseline and outcome data were collected and managed using REDCap electronic data capture tools hosted at the University of Pittsburgh (Harris et al., 2009). REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for

research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. We collected baseline data prior to randomization. Subsequent assessments were conducted at completion of the intervention and 8 weeks later – refer to Table 1 below for details for each treatment condition.

N=40	0-8 weeks (T1)	9-16 weeks (T2)
Intervention/Tx Group (n=20)	O_1 X(AAT)	O_2
Control Group (n=20)	O_1	O_2 X (AAT)

Table 1. Randomized Clinical Trial Design

3.6 MEASUREMENTS

3.6.1 Screening Measures

1. **Eating Disorder Examination – Overeating Section (EDE) (Fairburn & Cooper, 1993)** is a semi-structured interview to assess symptoms and DSM-IV diagnoses for Bulimia Nervosa, Anorexia Nervosa, and BED. The EDE assesses eating disorder symptoms are on four subscales: restraint, eating concern, shape concern, and weight concern. The EDE has well-established validity, reliability, and is as an established

measure of disordered eating behavior. The EDE has also been used in samples of African-American women (Kelly, Cotter, & Mazzeo, 2012).

2. **Modified Sociodemographic Questionnaire** will collect the following data: age, marital status, education, neighborhood residence, employment status, household size, religious background, income, and income adequacy.

3.6.2 Feasibility Measures

We completed the following measures at week 8 (T2).

1. **Percentage of screened and eligible participants**
2. **Attrition/retention for intervention**
3. **Means for attendance at intervention sessions**
4. **Adherence to the Record of Eating Episodes (REE)** was used to self-monitor feelings of hunger and fullness, and measured the frequency of overeating and binge eating. Participants rated hunger on a scale of 1(very hungry) to 7(full).

3.6.3 Baseline and End-of-Treatment Measures

The following measures were completed at Baseline (T1), 8 weeks (T2).

1. **Height/Weight:** was measured on a digital scale and a portable stadiometer. BMI was calculated as weight in kilograms divided by height in meters squared (kg/m^2).
2. **Waist Circumference** was measured twice with a Gullick II measuring tape. If the two values are within 2cm of each other, they were averaged to obtain a mean value; if not, measurements were taken again until they were within 2cm.

3. **Blood pressure** assessment was measured using an GE Dinamap Procare Auscultatory 400 Multi-Parameter Patient Monitor with the subject in a sitting position after at least a one-minute rest period.
4. **Binge Eating Scale (BES) (Gormally, Black, Daston, & Rardin, 1982)** is a 16-item scale to assess behavior and feelings associated with a binge-eating episode. Individuals rated responses on a four-item Likert scale, ranging from 0 to 3. Scores were calculated from adding items; higher scores indicated greater severity of binge eating symptoms. Presence of severe binge eating is associated with scores ≥27, and scores ≤17 indicate mild or no binge eating. The BES has strong psychometric properties, and has high internal consistency in populations of African-American women. Example: (instructed to pick one) "*1) I don't feel any guilt or self-hate after I overeat; 2) After I overeat, occasionally, I feel guilt or self-hate; 3) Almost all the time I feel strong hate or guilt after I overeat"* (Harrington et al., 2006; P. L. Wilson et al., 2012).
5. **Beck Depression Inventory (BDI)** (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a 21-item questionnaire that measures symptoms and attitudes associated with depression. Individuals rated their response on a four- item scale (from 0 to 3), with larger number indicating greater intensity. This questionnaire takes 5-10 minutes to complete, has been used with samples of African-American women, is well-validated and yields high internal consistency (.81). Example: (instructed to pick one of the four)"*1) I am not discouraged about my future; 2) I feel more discouraged about my future than I used to be; 3)I do not expect things to work out for me; 4) I feel my future is hopeless and will only get worse* (Beck, 1988).

6. **Weight Efficacy Life-Style Questionnaire (WEL)** (Clark, Abrams, Niaura, Eaton, & Rossi, 1991): The WEL assesses participants' level of confidence in resisting eating in varied situations and in different emotional states, with higher scores indicating more confidence. Responses to this 20-item questionnaire are rated on a 10-point Likert scale from 0 (not confident) to 9 (very confident). The questionnaire takes 5-10 minutes to complete and has been tested among samples of African-American women. The scale is well-validated and yields high internal consistency. Example: "*I can resist eating when I am anxious (or nervous)*" (Dutton, Martin, Rhode, & Brantley, 2004).

3.6.4 Treatment Fidelity

Dr. Linda Craighead supervised the PI in the facilitation of AAT within a group treatment setting. Preparation materials for leading the AAT Intervention include reading The Appetite Awareness Workbook (Craighead, 2006) and a review of AAT session materials previously conducted in Dr. Craighead's laboratory. Dr. Craighead would review the session material for the week, and provide the PI guidance by telephone and email with what elements to focus on during the conversation. Additionally, the PI and Dr. Craighead would also review the previous session, and discuss any questions, and troubleshoot areas to improve from the previous week.

3.7 ANALYSIS

3.7.1 Preliminary Analyses

We analyzed quantitative data using Stata (version 14, StataCorp LP, College Station, TX). Since feasibility trials are not designed to detect treatment differences, our analyses were descriptive and focused on components to aid in effect size estimation. Before analyzing the data, we completed exploratory analyses to determine outliers, and discover any missing data that may undermine study findings. We assessed the data distribution for skewness, kurtosis, and analyzed Q-Q plots and histograms (examining non-normality). Remedial measures (e.g. data transformation, imputation of missing data) were applied as appropriate after data screening.

3.7.2 Analysis of Specific Aims

The following analyses tested the specific aims associated with this project:

Aim #1: *Investigate the feasibility and acceptability of an 8-week AAT intervention.*

Analysis for Specific Aim 1: The feasibility of recruiting overweight/obese AA women to participate in the AAT intervention was determined by the following: response to recruitment strategies, percent of participants who met inclusion criteria and agreed to participate, attendance, adherence to the intervention protocol and study retention. We also documented and explored reasons for ineligibility and non-participation.

Analysis for Aim 2:

We performed linear mixed models to evaluate the impact of the AAT intervention on the secondary outcomes of binge eating, depressive symptoms, eating self-efficacy, waist circumference, blood pressure, and BMI. Data that collected in the EDE observed the number of times a particular eating behavior occurred; we defined that as count data. Moreover, due to the presence of overdispersion in the EDE variable (variance is greater than the mean), on that variable, we used mixed effects negative binomial regression. We used intention-to-treat, meaning all participants were analyzed according to their treatment assignment, and all participants were included in the final analyses. Participants who did not attend the final assessment had their baseline data carried forward, assuming no change in outcome variable. Within each model, the random effect was the individual variation within groups and within time; group (AAT vs. Wait-List Control), time, and time by group interaction served as the fixed effects. In the case of an interaction effect, simple effects testing determined where the effect of the variable was significantly different from zero. We examined residuals for normality after linear mixed modeling analyses were completed. Additionally, we also calculated between-group effect sizes (Cohen's *d*) by observing the difference between the means of the AAT and the Wait-List Control group on each outcome variable, $M_1 - M_2$, divided by the pooled standard deviations to determine the impact of the AAT intervention. Due to the presence of multiple comparisons (n=11) and the possibility of a false discovery, the Bonferroni Correction was used. The new p-value was set to p=.004

3.7.3 Sample Size Justification

The goal was to recruit a sample size of 40 African-American women (20 per group). This is based on the assessed feasibility of participant recruitment, the expected attrition at the 8-weeks post-intervention for the AAT group (T2) and following cross-over to AAT intervention for the wait-list control group (T3) and the desired precision (or margin of error) when estimating feasibility parameters (Aim 2). Attrition at T2 and T3 is expected to be at most 20-30% respectively, given intervention research with African-American (Fitzgibbon et al., 2012).

3.7.3.1 Power Analysis

We set the target sample size by examining the goal of achieving adequate power for the secondary outcome. The criterion for statistical significance will be set at .05. On the basis of observed means and standard deviations in earlier intervention research using AAT among samples of women diagnosed with Binge Eating Disorder, the effect size for group differences was 1.01 (Allen & Craighead, 1999). All power analyses were conducted *a priori* using G*Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007). Based on these criterion, approximately 17 participants would be needed per group in order to achieve a power of .80 for the difference in binge eating between participants receiving AAT and controls (see Figure 2).

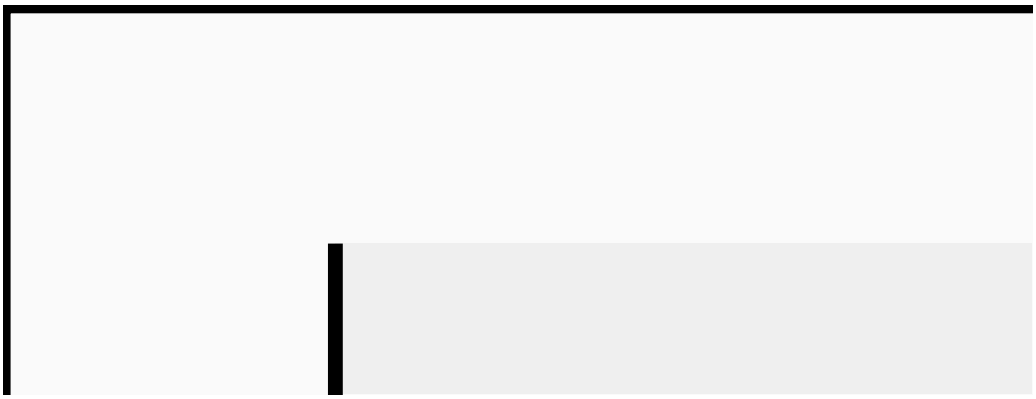

Figure 2. Power Analysis for Sample Size

4.0 RESULTS

The primary aim of this study was to examine the feasibility of AAT as an intervention to reduce binge eating in a community-based sample of overweight and obese African-American women who were randomized to two groups: AAT Intervention (AAT) and Wait-List Control AAT (WLC). In addition, a secondary aim was to examine changes in blood pressure, waist circumference, body mass index, binge eating and depressive symptoms. Assessments were performed at 0 and 8 weeks. The results of this investigation are presented below:

4.1 PRELIMINARY ANALYSES

Before determining the results of the study, several preliminary analyses were performed to examine the distribution of the continuous variables, and the presence of normality, skewness, and any outliers (Tables 2 and 3). These investigations also helped to ensure that these variables met the assumptions of parametric testing.

To assess for normality, there was visual inspection of histograms, and an examination of the measure of skewness. Every variable that had a skewness value > 1.00 or <-1.00 was considered a departure from normality, and was further inspected to determine the need for transformation, and the presence of any outliers (Doane & Seward, 2011). In addition, the data for each randomized group was examined to determine the presence of any significant

differences at baseline on the primary outcome variables. After inspecting the BDI scores, it became apparent that those values violated the rule for skewness. An additional analysis demonstrated that the square root value of the BDI score provided the best fit for normality. As a result, the variables were transformed, and the new values were used in data analysis.

Variable	N (observations)	NMiss	Mean ± SD	Kurtosis	Skew (Pre)	Skew (Post)
Age	31	0	48.81 ± 12.79	1.60	-.252	
Weight	26	5	199.71 ± 30.23	2.10	-.242	
Waist Circumference	26	5	104.54 ± 10.99	2.30	-.325	
Systolic Blood Pressure	26	5	123.40 ± 14.12	3.04	.328	
Diastolic Blood Pressure	26	5	82.39 ± 10.22	2.96	-.029	
BDI£	25	6	13.18 ± 11.16	4.26	1.30	.356
WEL	25	6	82.18 ± 36.12	2.93	-.090	
BES	25	6	20.80 ± 6.96	3.22	.388	

£Data transformation method: BDI^2

Table 2. Description and Skewness at Eight Weeks

At baseline, for one participant, there were items of the WEL that had responses missing (n=2), and similarly on the BDI (n=1). Because of the nature of this feasibility study, and the importance of obtaining a complete picture of the preliminary treatment effect of AAT, we did not use complete case analysis. When participants were missing baseline data in randomized trials, investigators have recommended imputing the sample mean for the variable at baseline, provided the missingness at baseline does not predict outcome (White & Thompson, 2005). Thus, we imputed question-specific sample means at baseline for participants (n=2) who were missing responses on the WEL and BDI; missingness at baseline was examined with and without the sample mean imputation. There were no differences on the prediction in the outcome variable.

To examine the presence of any significant differences between randomized groups, we performed independent sample t-tests on the mean values of each outcome variable. Independent sample t-tests revealed no significant differences at baseline between the randomized intervention and control groups in BMI, blood pressure, waist circumference, and scores on the Binge Eating Scale (BES), Weight Efficacy Lifestyle Questionnaire (WEL), and the Beck Depression Inventory –II. Results are provided in Table 4.

Measure	Total	AAT	Wait-List Control AAT	p-value
Age	48.81 ±12.79	48.44 ± 12.47	49.20 ± 13.56	p=.872
Education (yrs.)	14.93 ± 2.74	14.19 ± 2.64	15.73 ± 2.71	p=.119
Income (No., %)				p=.534
$<29,999		5 (31.25)	4 (26.67)	
$30-69,999		4 (25.00)	7 (46.67)	
$>70,000		6 (37.50)	4 (26.67)	
Marital Status (No., %)				p=.585
Never Married	12 (38.71)	5 (31.25)	7 (46.67)	
Currently Married	12 (38.71)	7 (43.75)	5 (33.33)	
Divorced	5 (16.13)	3 (18.75)	2 (13.33)	
Other	2 (6.45)	1(6.25)	1 (6.60)	
Systolic Blood Pressure	123.11 ± 12.37	121.88 ± 11.62	124.43 ± 13.40	p=.574
Diastolic Blood Pressure	81.67 ± 9.42	81.16 ± 7.18	82.20 ± 11.60	p=.764
Waist Circumference (cm)	105.03 ± 11.86	103.56 ± 10.36	106.60 ± 13.47	p=.485
BMI	33.70 ± 3.91	33.19 ± 4.19	34.24 ± 3.64	p=.464
WEL Total	76.00 ± 33.11	80.88 ± 30.41	70.8 ± 36.09	p=.406
Binge Eating Scale	22.58 ± 6.98	23.75 ± 7.33	21.33 ± 6.60	p=.344
Objective Binge Eating, days, 1 month	2.64 ± 5.43	2.00 ± 3.32	3.33 ± 7.09	p=.503
Objective Binge	2.81 ± 5.49	2.19 ± 3.58	3.47 ± 7.06	p=.526

Measure	Total	AAT	Wait-List Control AAT	p-value
Eating, episodes, 1 month				
Sense of loss of control w/eating, days, 1 month	12.32 ± 9.00	13.13 ± 9.51	11.47 ± 8.68	p=.617
Sense of loss of control w/ eating, episodes, 1 month	16.77 ± 15.53	18.19 ± 17.12	15.27 ± 14.08	p=.609
Beck Depression Inventory	13.58 ± 10.74	12.50 ± 8.89	14.73 ± 12.63	p=.572

Table 3. Differences at Baseline by Treatment Group

4.2 APPROACH TO MISSING DATA

Missing data were present at baseline and the end of 8 weeks. At 8 weeks, five participants either were lost to follow-up (n=3) or did not wish to continue (n=2). In addition, there was one participant in the intervention group who did not complete the self-report measures (WEL, BDI, BES) at 8-weeks due to cognitive impairment. The choice of how to manage outcome data was informed by use of the intent-to-treat (ITT) approach to analysis, which includes all randomized participants in the final analysis, regardless of attendance, attrition, and/or non-compliance (Fisher et al., 1990; Gupta, 2011). At the 8-week assessment, we managed any missing responses using last observation carried forward (LOCF). That is, for participants who were missing outcome data, baseline scores were carried forward. There were two advantages to this method: 1) it minimizes the number of subjects who were eliminated from the analysis; and 2) allows the analysis to examine trends over time (Streiner & Geddes, 2001). Within the current guidelines on products for weight management, the FDA recommends the use of last observation carried

forward management (U.S. Department of Health and Human Services, 2007). We observed patterns of missingness among the data, and no clear path was observable to order the variables. When this happens, recommendations have been to consider the data missing at random (MAR) (Soley-Bori, 2013).

4.3 AIM 1: FEASIBILITY OF AAT INTERVENTION

4.3.1 Participant Characteristics

Eligible participants (N=31) included overweight and obese African-American women between the ages of 18-70, with a BMI between 25-40 kg/m². Assessments and intervention sessions were held at Mt. Ararat Baptist Church, the Hill House Association, or in the participant's home. Descriptive statistics for the sample are shown in Table 2. Participants had a mean (±SD) age of 48.81 ±12.79, and a BMI of 33.70 ± 3.90. Additionally, 29.03% of the sample reported a gross annual income <$29,999, 35.48% in the range of $30,000 - 69,999; and 32.26% reported income over $70,000.

Descriptor	(N=31) (Mean ± SD) or (%)
Age	48.81 ±12.79
Body Mass Index (BMI), kg/m²	33.70 ± 3.90
Education (yrs).	14.93 ± 2.74
Marital Status, No. (%)	
Never Married	12 (38.71%)
Currently Married	12 (38.71%)
Divorced	5 (16.13%)
Income, No. (%)	
$<29.999	9 (29.03%)

$30-69,999	11 (35.38%)
$>70,000	9 (32.26%)

Table 4. Description of Sample

4.3.2 Study Recruitment and Retention

Figures 1 and 2 provide details for participant recruitment, randomization, retention, and reasons for attrition. Thirty-one (N=31) participants were randomized to one of two treatment groups: AAT or WLC. All participants received the intervention. A total of 66 participants were excluded from participating in our study for the following: BMI out of range (n=40), no report of loss of control eating (n=8), age out of range (n=2), loss of control eating <1 per month (n=1), participating in another weight loss program (n=2), not African-American (n=1), and currently in substance abuse treatment (n=1), declined to participate (n=11). Within our sample, 83.8% (n=26) of participants completed assessments at 0 and 8 weeks. Overall retention rates were as follows: AAT (n=14, 87.5%) and WLC (n=12; 80%).

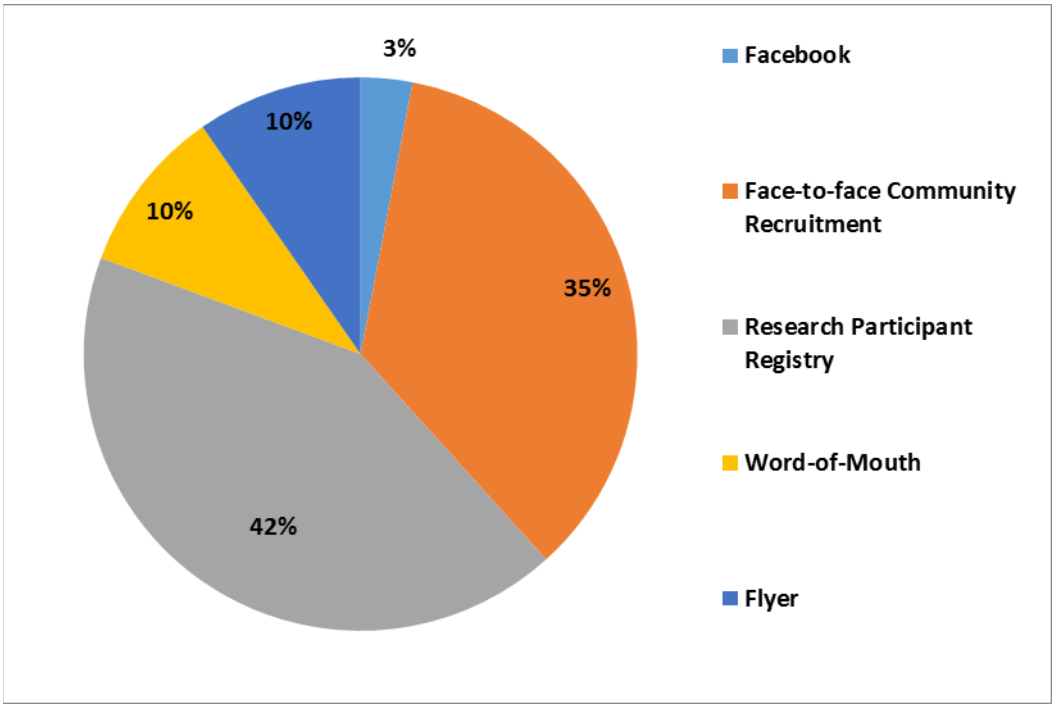

Figure 3. Sources of Participant Recruitment

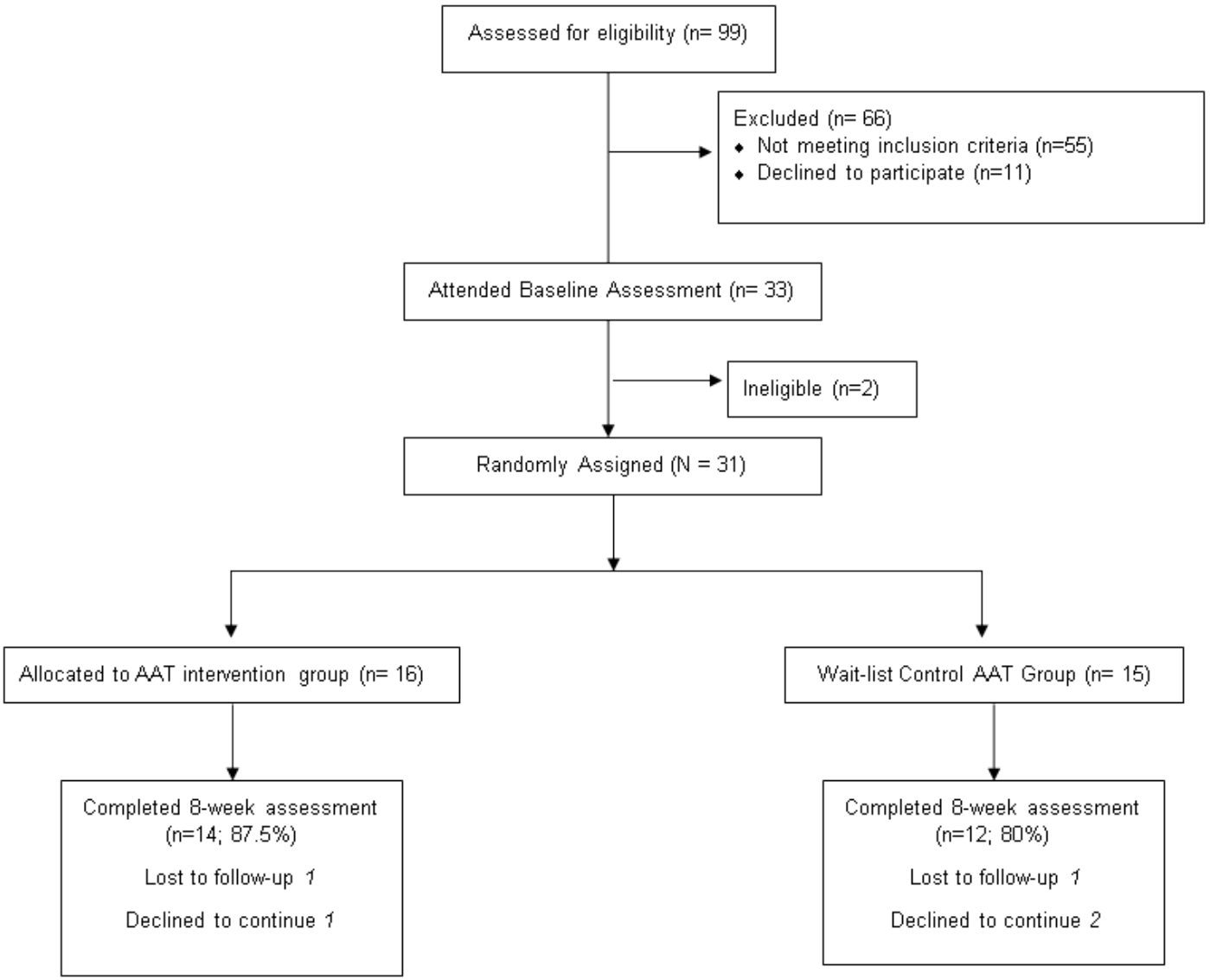

Figure 4. CONSORT Figure for Study

4.3.3 Attendance and Adherence to the AAT Intervention

The AAT intervention protocol included eight 60-minute sessions. On average, those in the intervention group (n=16) attended 4.7 (59%) of the 8 sessions. In contrast, those in the WLC

group (waited for 8 weeks to receive AAT) (n=15), attended 6.57 (82%) of the 8 sessions. Adherence to the AAT intervention was defined as completion of the weekly homework forms. We provided the participants five different homework assignments. Within the intervention group, participants completed 2.73/5 (55%) of all homework assignments. Within the control group, participants completed 3.12/5 (63%) of all homework assignments.

4.3.4 Summary of Aim 1

The primary purpose of this investigation was to determine the feasibility of delivering the AAT intervention to a sample of African-American women who were overweight and self-reported binge eating behaviors. We recruited participants at community events, through the University of Pittsburgh participant registry, word of mouth, bulletin announcements in churches, and use of social media. Originally, we allotted three months for recruitment. However, to enroll enough eligible women, we extended recruitment to six months. In total, we screened 99 participants for the study, and 31 were eligible and consented to randomization. We held intervention sessions at Mt. Ararat Baptist Church and/or the Hill House Association. Exceeding the BMI inclusion criteria (BMI ≥40) was the most common reason for exclusion. Attrition, defined as not completing the final assessment, was 16.1% (n=5).

4.4 AIM 2: OUTCOME DIFFERENCES BETWEEN TREATMENT GROUPS

Linear Mixed Modeling was performed on weight, waist circumference, blood pressure, binge eating, self-efficacy for weight loss, and depressive symptoms as a function of group, time, and group X time to determine the differences between the variables. The main effect of time examined differences between 0 and 8 weeks; the main effect of group examined the differences between each treatment group (AAT, WLC) at baseline. The group X time interaction examined the pattern of change over time among each treatment group. Data that were not present was considered missing at random. An intent-to-treat analysis was used, and baseline data was carried forward in the case of missing data at 8 weeks (Table 6). A completers analysis was also performed to determine if there were any differences in results (see Table 7). All significant variable remained the same with both analyses. Due to multiple comparisons, and to protect against a false positive result, the Bonferroni Correction will be used = (.05/11 = .004). The new p-value for significance will be p=.004.

Table 5. Outcome Differences between Treatment Groups at Eight Weeks: ITT Analysis

Outcome Variable	AAT (n=16) (mean ± sd)	Wait-list Control AAT (n=15) (mean ± sd)	Group	Time	Group X Time
Objective Binge Eating (episodes per month)					
Baseline	2.19 ± 3.58	3.47 ± 7.06	p=.644	p=.003	p=.097
Week 8	0.25 ± .683	2.80 ± 7.24			
Objective Binge Eating (days per month)					
Baseline	2.00 ± 3.36	3.33 ± 7.09	p=.694	p=.002	p=.055
Week 8	.250 ± .683	2.8 ± 7.24			
Binge Eating Scale					
Baseline	23.75 ± 7.33	21.33 ± 6.60	p=.336	p<.001	**p=.002**
Week 8	17.88 ± 6.72	21.33 ± 6.61			
Sense of loss of Control with Eating (episodes per month)					
Baseline	18.82 ± 17.12	15.11 ± 14.08	p=.558	p<.001	p<.01
Week 8	2.31 ± 2.81	7.81 ± 9.79			
Sense of loss of Control with Eating (days per month)					
Baseline	13.29 ± 9.51	11.29 ± 8.68	p=.550	p<.001	p=.043
Week 8	3.02 ± 3.59	**7.62** ± 9.79			
Weight Efficacy Lifestyle Questionnaire					
Baseline	80.77 ± 31.31	70.80 ± 36.08	p=.411	p<.001	**p=.002**
Week 8	106.81 ± 37.98	69.53 ± 31.93			
Weight (lbs.)					
Baseline	196.70 ± 20.10	203.16 ± 31.31	p=.552	p=.378	p=.521
Week 8	195.88 ± 29.34	203.20 ± 31.19			
Body Mass Index (kg/m^2)					

Outcome Variable	AAT (n=16) (mean ± sd)	Wait-list Control AAT (n=15) (mean ± sd)	Group	Time	Group X Time
Baseline	33.19 ± 4.19	34.24 ± 3.64	p=.458	p=.356	p=.491
Week 8	33.04 ± 4.24	34.24 ± 3.61			
Waist Circumference (cm.)					
Baseline	103.56 ±10.36	106.60 ± 13.47	p=.479	p=.128	p=.791
Week 8	101.99 ±9.54	104.65 ± 10.84			
Systolic Blood Pressure					
Baseline	121.88 ± 11.62	124.43 ± 13.41	p=.570	p=.920	p=.652
Week 8	122.19 ± 17.63	122.73 ± 11.98			
Diastolic Blood Pressure					
Baseline	81.16 ± 7.18	82.20 ± 11.60	p=.762	p=.657	p=.444
Week 8	80.19 ± 11.08	83.63 ± 11.27			
Beck Depression Inventory					
Baseline	12.73 ± 9.15	14.73 ± 12.63	p=.717	p=.003	p=.057
Week 8	8.47 ± 11.54	13.87 ± 10.38			

Table 6. Outcome Differences between Treatment Groups at Eight Weeks: Completers Analysis

Outcome Variable	AAT (n=14) (mean ± sd)	Wait-list Control AAT (n=12) (mean ± sd)	Group	Time	Group X Time
Objective Binge Eating (episodes per month)					
Baseline	2.19 ± 3.58	3.47 ± 7.06	p=.564	p=.010	p=.789
Week 8	0.14 ± .530	0.33 ± 1.15			
Objective Binge Eating (days per month)					
Baseline	2.00 ± 3.36	3.33 ± 7.09	p=.523	p=.013	p=.816
Week 8	0.14 ± 0.53	0.33 ± 1.15			
Binge Eating Scale					
Baseline	23.75 ± 7.33	21.33 ± 6.60	p=.336	p<.001	**p=.001**
Week 8	16.43 ± 6.48	21.08 ± 5.68			
Sense of loss of Control with Eating (episodes per month)					
Baseline	18.66 ± 17.12	15.24 ± 14.08	p=.584	p<.001	p=.01
Week 8	1.62 ± 1.65	5.40 ± 8.00			
Sense of loss of Control with Eating (days per month)					
Baseline	13.41± 9.51	11.62 ± 8.68	p=.646	p<.001	p=.01
Week 8	1.59 ± 1.65	**4.85** ± 7.76			
Weight Efficacy Lifestyle Questionnaire					
Baseline	80.88 ± 30.41	70.80 ± 36.08	p=.399	p<.001	**p=.001**
Week 8	111.90 ± 31.72	68.84 ± 33.65			
Weight (lbs.)					
Baseline	196.70 ± 20.10	203.16 ± 31.31	p=.552	p=.397	p=.550
Week 8	195.73 ± 31.02	203.20 ± 32.78			
Body Mass Index (kg/m^2)					

Outcome Variable	AAT (n=14) (mean ± sd)	Wait-list Control AAT (n=12) (mean ± sd)	Group	Time	Group X Time
Baseline	33.19 ± 4.19	34.24 ± 3.64	p=.458	p=.356	p=.491
Week 8	33.04 ± 4.24	34.24 ± 3.61			
Waist Circumference (cm.)					
Baseline	103.56 ±10.36	106.60 ± 13.47	p=.449	p=.136	p=.748
Week 8	102.12 ± 8.74	106.07 ± 11.30			
Systolic Blood Pressure					
Baseline	121.88 ± 11.62	124.43 ± 13.41	p=.570	p=.920	p=.853
Week 8	122.19 ± 18.91	126.00 ± 12.67			
Diastolic Blood Pressure					
Baseline	81.16 ± 7.18	82.20 ± 11.60	p=.762	p=.657	p=.193
Week 8	79.89 ± 11.86	88.15 ± 8.86			
Beck Depression Inventory					
Baseline	12.73 ± 9.15	14.73 ± 12.63	p=.623	p=.061	p=.218
Week 8	8.19 ± 12.31	14.50 ± 10.10			

4.4.1 CHANGES IN BINGE EATING

We measured changes in binge eating behaviors in two separate ways within this treatment study: Binge Eating Scale (BES) (self-report) and Eating Disorder Examination (EDE) (Interviewer-Administered). The BES assessed the presence of binge eating behaviors that may be indicative of an eating disorder. Higher scores indicate greater severity of binge eating behaviors. At eight weeks, there was a significant group X time interaction (p=.002). In the test of simple effects following the interaction, there were significant mean differences observed on the BES between the AAT (-5.87 ± 0.61) and the WLC groups (0 ± 0.01) (p<.001) at 8 weeks. Cohen's d is =.52, indicating a medium treatment effect, favoring AAT.

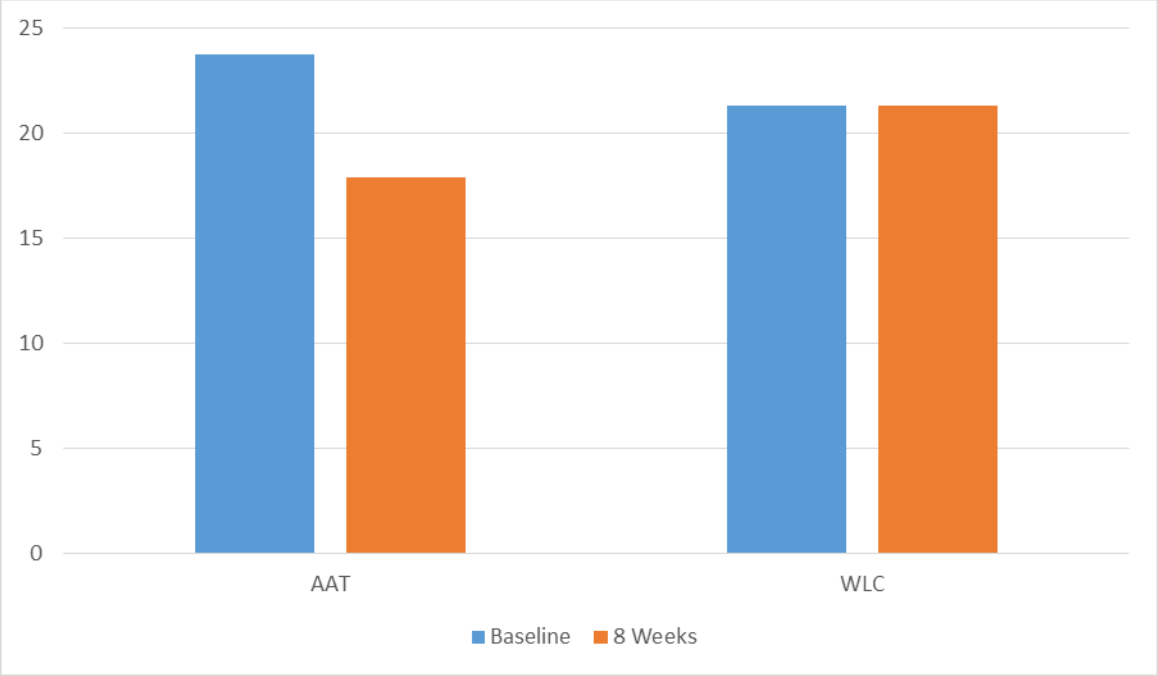

Figure 5. Mean Score on Binge Eating Scale by Treatment and Time

The Eating Disorder Examination measured five distinct factors of binge eating behaviors over the last 28 days: objective binge eating, subjective binge eating, objective overeating,

subjective overeating, and sense of loss of control over eating. These behaviors were assessed in days and episodes. There were no significant mean differences in objective binge eating (days) between the AAT (-1.75 ± 2.68) and the WLC (-0.53 ± 0.15) groups between baseline and 8 weeks and no significant effects by group (p=.694) or on group X time interaction (p=.055). There was a significant time effect (p=.002). The effect size, d= .36, indicated a medium treatment effect, favoring AAT. Similarly, in the assessment in objective binge eating (episodes), there was no significant group effect (p=.644), time (p=.003) or group X time interaction (p=.097); d= .36.

Loss of control is defined as the experience of feeling like one cannot stop eating, even if he/she may wish to do so in a distinct time period. At eight weeks, we assessed changes in days and episodes of loss of control eating episodes between the AAT and the WLC groups. When examining the outcome difference on sense of loss of control eating (days), there was no significant effect by group (p=.644) and no group X time interaction (p=.043). There was a significant effect on time (p=.003). The effect size, d=.62, indicated a large treatment effect, favoring AAT. When examining the outcome of loss of control (episodes), there was a marginally significant group X time interaction (p=.017) observed (see Figure 3). That is, there was a marginally significant difference in the change in mean score of loss of control eating days over time between the AAT (-10.38 ± 5.92) and the WLC (-3.80 ± 1.11) groups. The effect size, d= .76, indicated a large treatment effect, favoring AAT.

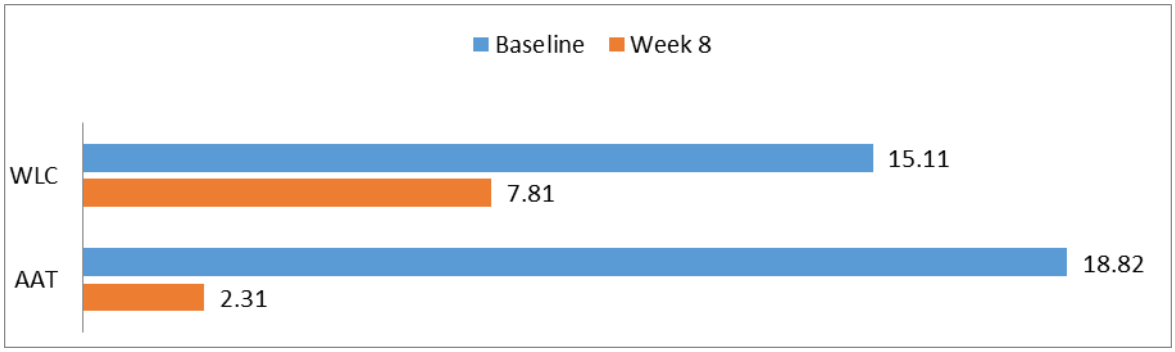

Figure 6. Mean Score in Sense of Loss of Control Episodes by Treatment and Time

4.4.2 Changes in Eating Self-Efficacy

We used the Weight Efficacy Lifestyle Questionnaire (WEL) to measure one's ability to resist eating in varied situations and emotional states. Higher scores indicate more eating self-efficacy. In the test of simple effects following the interaction, there was a significant mean difference in WEL total score between the AAT (25.14 ± 6.67) and the WLC (-1.27 ± 4.15) group at 8 weeks (p=.04, CI: -46.29, -.92). There was a significant group X time interaction (p=.002) (Figure 1). The effect size, d= 1.06, indicated a large treatment effect, favoring AAT.

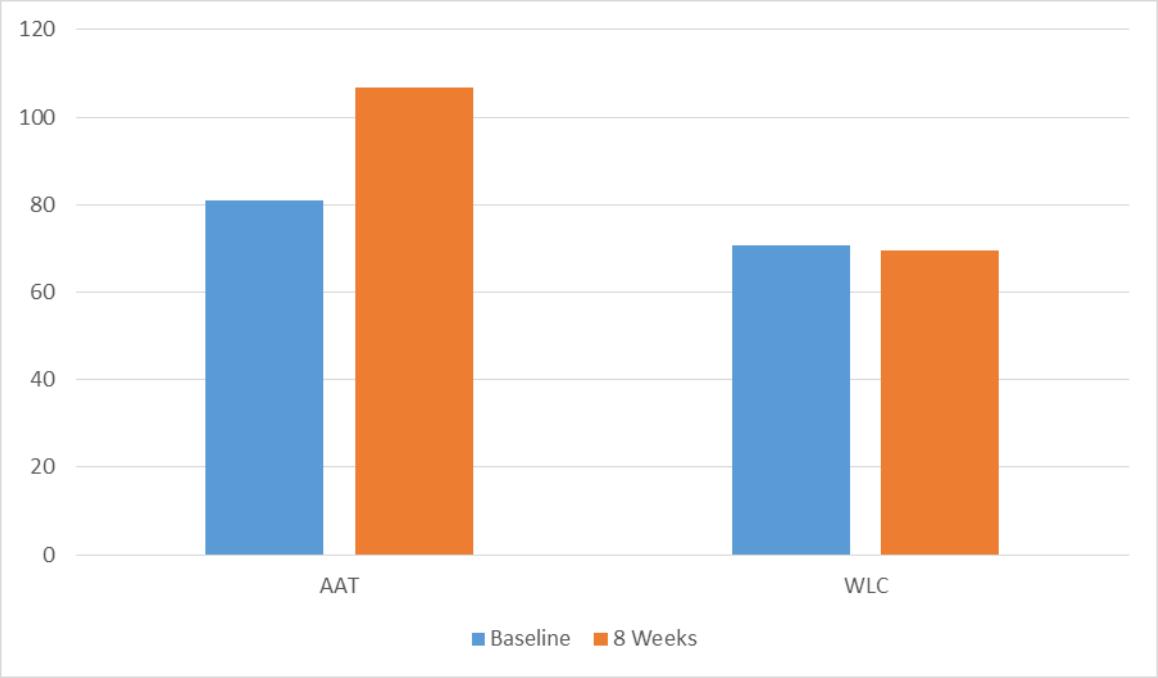

Figure 7. Mean Eating Self-Efficacy Scores by Treatment and Time

4.4.3 Changes in Weight

We examined changes in weight (lbs.) for all randomized participants between baseline and eight weeks. At baseline, the average weight in the AAT group was 196.70 ± 20.10 compared to 203.16 ± 31.31 in the Wait-list control AAT group. At eight weeks, we observed the following changes on mean change in weight: AAT (-.82 ± .02 kg/m²); WLC group (.04 ± .03 kg/m²). There were no significant differences between groups (p =.552), over time (p=.378), and in the group X time interaction (p=.521). The effect size, d=-24, indicated a small treatment effect, favoring AAT.

4.4.4 Changes in Waist Circumference

We examined changes in waist circumference between the AAT and the WLC group from baseline to eight weeks. The mean (±SD) change in waist circumference was (- 1.57 ± .82 cm.) in the AAT and (-1.95 ± 2.63 cm.) in the WLC group at 8 weeks. There was no significant effect of group (p=.479) at baseline, by time (p=.128), and in the group X time interaction (p=.791). The effect size, d= .26, indicated a small treatment effect, favoring AAT.

4.4.5 Changes in Blood Pressure

Changes in blood pressure between baseline and eight weeks were examined between groups and revealed that the mean (±SD) change in systolic blood pressure at week-8 was 0.31 ± 6.01 (AAT) and -1.95 ± 2.63 (WLC). The mean change in diastolic blood pressure at week-8 was -.97 ± 3.90 (AAT) and - 1.70 ± 1.43 (WLC). When examining systolic blood pressure, there was no significant effect of group (p=.570), time (p=.920), or a group X time interaction (p=.652); d=.03. Similarly, for diastolic blood pressure, there were no significant effects of group (p=.762), time (p=.657), or a group X time interaction (p=.444). The effect size, d=.30, indicated a small treatment effect, favoring AAT.

4.4.6 Changes in Depressive Symptoms

We used the BDI to measure changes in depressive symptoms over the eight-week study. Higher scores indicate the presence of more severe depressive symptoms. At week 8, there was a mean (±SD) score difference of -4.26 ± 2.39 (AAT) and -.86 ± 2.25 (WLC). There was a significant

time effect (p=.003). There were no significant differences by group (p=.717), nor on the group X time interaction (p=.055). The effect size, d= .49, indicated a medium treatment effect, favoring AAT.

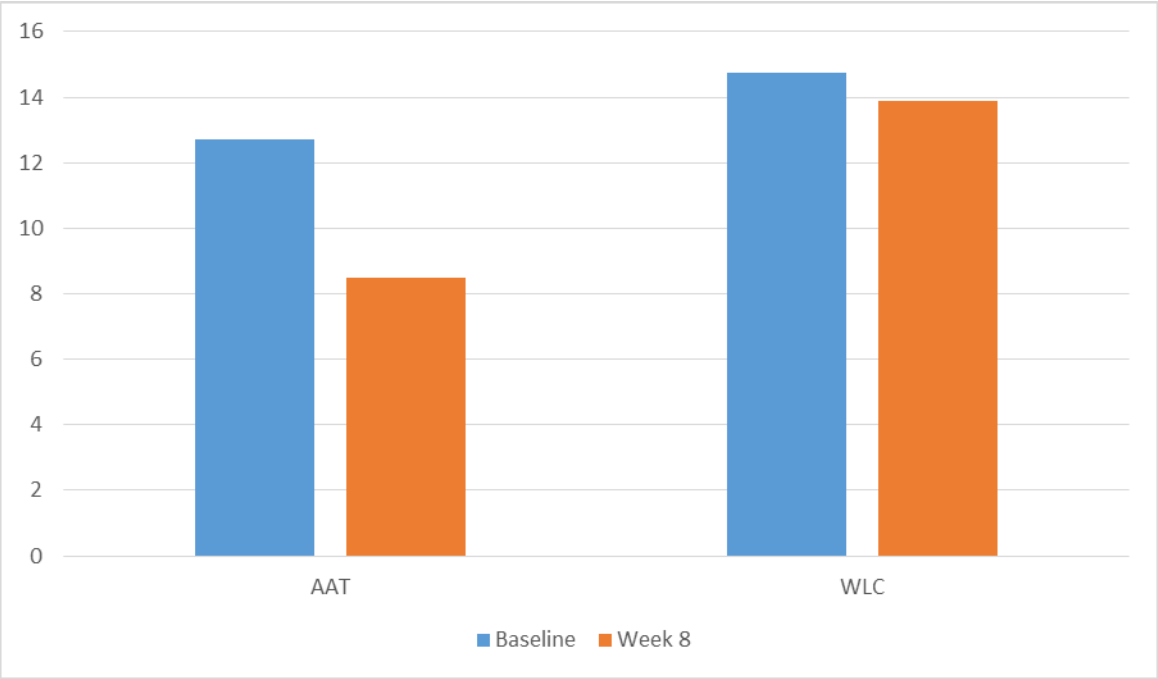

Figure 8. Mean BDI Scores by Treatment and Time

4.4.7 Summary of Aim 2

To examine the preliminary effectiveness of the AAT intervention, we used linear mixed modeling to examine the differences between the AAT and WLC, as a function of group, time, and group X time interaction, on the outcome variables of weight, waist circumference, blood pressure, binge eating, eating self-efficacy, and depressive symptoms. We used the Intention-to-Treat approach; all participants who were randomized were included in the final analyses. Participants who did not attend the final assessment had their baseline data carried forward for the purpose of analysis. Due to multiple comparisons, we used the Bonferroni Correction, and p-

value was set at p=.004. We observed significant group X time interactions on the outcome of binge eating and eating self-efficacy. For both outcomes, the AAT group had lower mean scores at 8 weeks, compared to the WLC group. There was a trend toward significance observed in the group x time interaction on sense of loss of control over eating (days and episodes over a 28-day period), and in depressive symptoms. That is, participants randomized to AAT reported lower mean scores of loss of control of eating and depressive symptoms at 8 weeks, compared to WLC. There were no significant group X time interactions observed on the outcome variables of BMI, waist circumference, blood pressure, depressive symptoms, objective binge eating episodes (EDE), and sense of loss of control while eating (EDE).

5.0 DISCUSSION

The United States has severely underserved African-American women in the treatment of obesity. Currently, African-American women represent a sub-population group with the most severe degree of obesity within the United States. In multi-center NIH-funded clinical trials, African-American women have lost less weight than white women at 6 months (AA: −1.6 to −7.5 kg; whites: −3.8 to −8.2 kg), which is the critical period for observed weight loss (Wingo, Carson, & Ard, 2014). Investigators have observed that a significant number of African-American women have untreated eating behaviors (e.g., binge eating) that perpetuate their propensity toward obesity and lack of success in weight-loss treatment (Chang, Nitzke, Guilford, Adair, & Hazard, 2008; Fitzgibbon et al., 2012; Harrington, Crowther, & Shipherd, 2010; Mastin, Campo, & Askelson, 2012; McTigue et al., 2006; Rubin et al., 2002). A particular behavior pattern that is of serious concern is binge eating or compulsive overeating, as it is associated with severe obesity (Hudson, Hiripi, Pope, & Kessler, 2007; S. Z. Yanovski, Nelson, Dubbert, & Spitzer, 1993).

Recent evidence demonstrated that the presence of any binge eating is markedly higher among African-Americans (4.83%) than Non-Latino whites (2.53%) (Marques et al., 2011). Among African-American women who were severely obese (BMI ≥40), rates of binge eating were discovered to be greater than 35% (Mazzeo et al., 2005). Binge eating may be a coping

mechanism tool African-American women use to regulate emotion and escape from painful reminders and memories (Harrington et al., 2006; Harrington et al., 2010; Thompson, 1992).

Since many adults with BED report becoming overweight *after* engaging in binge eating on a regular basis, early intervention in individuals at risk to develop BED may be a viable strategy for weight gain prevention (Fairburn et al., 2000; Mussell et al., 1995; Tanofsky-Kraff et al., 2010; Yanovski, 2003). There has been a serious lack of intervention research in a representative sample of African-American women who report binge eating, and they have been severely underrepresented in clinical trials (Franko et al., 2012; Thompson-Brenner et al., 2013). Thus, the purpose of this investigation was to test the feasibility of a binge eating intervention, Appetite Awareness Training (AAT) within a community-based sample of African-American women. The primary objective of this investigation was to test AAT and explore if it would inform the future development of interventions aimed at increasing the effectiveness of weight management efforts as well as reduce psychosocial barriers to adopting new lifestyle behaviors.

5.1 SUMMARY OF MAIN FINDINGS

5.1.1 Aim 1: Feasibility of Binge Eating Intervention in Overweight and Obese African-American Women (BMI: 25-40 kg/m^2)

The primary aim of this study was to evaluate Appetite Awareness Treatment (AAT) as a feasible intervention for binge eating among African-American women who are overweight/obese (BMI=25-40). The goal of the study was to recruit at least 40 eligible participants within 3 months. As recruitment began, it became readily apparent that many

women with a BMI ≥40 were showing interest in the study. While 99 women screened for the study, approximately 40% were not eligible due to their high BMI, which became a significant barrier to recruitment. After allowing six months for recruitment, only a third of those who expressed an interest in the study met the BMI eligibility criteria.

We used several approaches to recruit participants for the study. Sources that were most helpful included advertising at the local community centers, word-of-mouth references, use of the University of Pittsburgh Participant Registry, and Facebook announcements. In addition, the PI, who was an African-American female, made announcements at various community functions.

Once randomization was complete, we sought to examine whether participants would consistently attend the eight weekly sessions. On average, those in the intervention group (n=16) attended 4.7 of the 8 sessions, or 59% of all sessions. In contrast, those in the WLC group (n = 15) attended 6.57 (82%) of the 8 sessions. Attendance within this study was comparable, or even slightly higher than has been observed in other group-based behavioral weight loss interventions in African-Americans. For example, within the WLM trial, 57% of AA men and 51% of AA women attended over 80% of sessions during the 6-month weight loss program (Hollis et al., 2008). Additionally, within the first 6 months of the ORBIT trial, participants attended an average of 53% of classes, with approximately 60% of participants attending at least half of all classes offered (Fitzgibbon et al., 2010).

Moreover, we scheduled intervention sessions in the evening, and chose to place them at familiar community locations (e.g. church, neighborhood association). Placing the intervention within this community context may have also positively contributed to recruitment and attendance. Due to their geographic placement and community relevance, churches have great potential to reduce health disparities, and are often an excellent place to hold interventions when

engaging African-Americans (Campbell et al., 2007; Yeary et al., 2015). Additionally, holding an intervention in a community location with strong communal ties may be particularly beneficial for engaging this population in weight and eating behavior interventions (Yeary et al., 2015).

Furthermore, participants received the support of other members of the intervention group, which may have possibly increased their incentive to continue to attend. Social support is a strategy that is helpful in weight loss interventions among African-American women (Wolfe, 2004; Stolley et al., 2009; Kumanyika et al., 2009). Kumanyika et al., (2009) attempted to leverage this among African-Americans by examining the benefit of enrolling with friends and family for support. For participants who were randomized to the family arm, weight loss was reported at 5 to 6 kg at 6 months compared to the 3 to 4 kg in the control arm (Kumanykia et al., 2009). Additonally, Stolley et al. (2009) also included social support in a weight management intervention for breast cancer survivors, and noted that positive social support likely contributed to attendance and retention.

As part of the treatment, we asked participants to complete five homework assignments, assigned weeks 2-6 of the intervention. The purpose of these homework assignments was to help the participants practice their appetite monitoring, and receive feedback on their associated behaviors. This form took about 2-5 minutes to complete per eating episode, and we asked participants to record their eating episodes, and assess hunger and satiety at the start and end of each meal. Completing the homework was one of the central tools used to transmit the knowledge of the AAT Intervention. On average, participants completed 2.73 (55%) of the five homework assignments. With only 55% of all homework completed, future research should assess the utility of the current homework structure and obtain participant feedback on which

parts of the homework to improve. The self-monitoring form was in paper format, with participants receiving a packet of seven different forms every week. Potential barriers may have been the structure of the form, and/or the use of a paper form. In recent trials, investigators used technology to reduce the burden of self-monitoring (Burke et al., 2011; Burke et al., 2016); a change to an electronic version of self-monitoring may be a viable tool in future AAT intervention development.

Five participants withdrew from the study, thus making the rate of attrition 16.13%. The reasons for withdrawal varied among participants: lost to follow-up (2), no longer interested in participating a in the wait-list control group (1), and could not attend weekly group intervention (2). Attrition is a common problem when engaging AA women in weight-related intervention research. Typical estimates range from 12-41% in exclusively African-American lifestyle programs (Samuel-Hodge, Johnson, Braxton, & Lackey, 2014) and 8% for participant in multi-center behavioral weight loss trials (Fitzgibbon et al., 2013). Future research may benefit from the use of a web-based intervention approach to reduce participant burden. Other investigators have found success in using these strategies in samples of low-income African-Americans (Bennett et al., 2013; Bennett et al., 2012).

5.1.2 Aim 2: Evaluation of AAT on Outcome Differences between binge eating, eating self-efficacy, depressive symptoms, waist circumference, blood pressure, and BMI.

While feasibility of the AAT intervention was the primary outcome, it was also important to explore outcome differences between several predictors within our study: binge eating, eating self-efficacy, depressive symptoms, waist circumference, blood pressure, and BMI. In summary, there were significant group X time interactions in eating self-efficacy and binge eating within

our study. That is, the treatment groups varied in their response on the assessment of eating self-efficacy and binge eating over time. Compared to those in the WLC group, participants randomized to AAT had significantly lower eating self-efficacy scores and lower binge eating scores (BES) at 8 weeks. Additionally, there was a significant main effect of time on depressive symptoms. There were no significant group, time, or group X time effects on BMI, waist circumference, blood pressure, objective binge eating (EDE), and sense of loss of control over eating (EDE).

A great deal is unknown about the binge eating behaviors of African-American women. At baseline, both groups had a mean score that indicated the presence of moderate binging activity (AAT: 23.75; WLC: 21.33; score range: 18-26) on the BES (Gormally et al., 1982). However, at 8 weeks, participants in the AAT group had decreased their binge eating score (-5.87), compared to no decrease observed among participants in the WLC group. While preliminary, these results indicate the potential that AAT has as a treatment to reduce binge eating in African-American women who are overweight. Binge eating remains undertreated within African-American women, and they have been severely underrepresented in clinical trials (Franko et al., 2012; Thompson-Brenner et al., 2013). To the best of our knowledge, this is the first intervention study to target binge eating behaviors among overweight African-American women.

We did not observe any reduction in objective binge eating as measured by the Eating Disorder Examination. Part of this may be due to the fact many of our participants did not meet the current EDE standards for objective binge eating, which is the consumption of an objectively large amount of food accompanied by the loss of control. Moreover, when examining the sense of loss of control, participants in both groups reported a change between baseline and 8 weeks.

This may have affected the ability to determine a significant change by treatment group over time. The pressure to exhibit socially desired behavior (e.g., reporting binge eating) may have influenced how all participants approached their eating behaviors, regardless of whether the intervention was received immediately.

Among women who have a lifetime history of eating disorders, there are disparities in utilization of mental health treatment options; African-Americans have some of the lowest rates of access to care (Marques et al., 2011). Treatment of binge eating may offer the possibility of coordinating treatment for eating disorders and obesity, and provide opportunities for those who may not seek mental health treatment to receive needed care (Pike et al., 2001; Tanofsky-Kraff et al., 2007). Among African-American women, treating eating disordered behavior in the context of weight management interventions may offer an opportunity for coordinated care of both of these conditions, and further progress toward reducing the well-documented disparity in obesity rates.

Another positive outcome of this study was the increase in eating self-efficacy observed in our sample. At baseline, both groups had a mean eating self-efficacy score that was rather low (AAT: 80.78 ± 31.31; WLC: 70.88 ± 36.08; WEL Score Range: 0-180). By the end of 8 weeks, the AAT group had significantly improved their score (+26.04 ± 6.67), compared to an observed decrease in the WLC group (-1.27 ± 4.15). Improving self-efficacy is an important goal of behavioral weight loss interventions; past evidence has found the increase in eating and diet self-efficacy is associated with improved dietary intake, physical activity and weight loss (Hays, Finch, Saha, Marrero, & Ackermann, 2014; Nezami et al., 2016). Among African-American women, investigators have observed the decrease in self-efficacy over time, and its association with less achieved weight loss and/or weight gain (Martin, Dutton, & Brantley, 2004; Murphy &

Williams, 2013). AAT exhibits significant promise to aid African-American women in improving their confidence to resist eating in varied emotional states and situations.

Although we did not observe any significant group x time interaction in depressive symptoms, we did observe differences in the mean scores, and the scores of the AAT group were lower than that of the WLC group. This is encouraging because the lack of significant group x time effect may be due to sample size and/or treatment duration. In addition, the participants in our sample reported minimal depressive symptoms; overeating may be protective against the development of mood disorders among African-Americans, despite increasing the risk for physical health conditions (Jackson, Knight, & Rafferty, 2010). Eating has been reported as a coping strategy to manage emotions within this population (Chang et al., 2008; Cox, Zunker, Wingo, Jefferson, & Ard, 2011; DeBono, Ross, & Berrang-Ford, 2012). While these behaviors may impact the physical health of African-American women, depressive symptoms may be avoided.

We did not observe any changes in BMI, blood pressure, or waist circumference. Traditionally, African-American women have not been able to achieve the same weight loss as white participants in behavioral weight loss trials (Fitzgibbon et al., 2012; Wingo et al., 2014). Due to this well-documented outcome, and recent evidence suggesting that overweight and Class I obesity are associated with reduced CVD risk in AA women, there has been a call to develop more interventions to help AA women maintain their weight and prevent the progression to more severe obesity and increased CVD risk (Bennett et al., 2013; Stevens et al., 2002; Taylor et al., 2010). Consequently, when viewing our results from the lens of weight gain prevention, AAT may show early potential to achieve these aims among African-American women. Weight, blood pressure, and waist circumference remained stable over the 8 weeks. Future research may

benefit from extending the intervention to follow-up with participants at least six additional months to observe the long-term effects of the AAT intervention.

5.2 IMPLICATIONS FOR FUTURE RESEARCH

AAT shows early promise as an intervention to reduce binge eating and improve eating self-efficacy in overweight/obese African-American women. This is particularly important due to the well-documented disparity in obesity, and in behavioral weight loss outcomes in this population sub-group. The results of this feasibility study provide important next steps to consider for future research.

This is the first study to examine the effect of a binge eating behavior intervention in a sample of African-American women who are overweight and/or obese. During the course of the study, it became obvious that there is much that is not known about the eating behaviors of African-American women. With such a rich, and vivid history describing the relationship of food to the culture (Beauboeuf-Lafontant, 2003; Harrington et al., 2006; Jackson et al., 2010), it is very likely that not addressing eating behaviors (binge eating, overeating, ignoring hunger) may be a barrier to the success of African-American women in traditional weight loss approaches. While future binge eating intervention work is warranted, the first step may be additional qualitative research to further understand the relationship many of these women have with food. Moreover, it would also be necessary to parse out the effects of economic and environmental barriers on observed eating behaviors. While we are certain that there is some relationship between the two, the pathway has not been clearly defined.

A growing body of literature has demonstrated that binge eating behaviors are a problem within the population of African-American women who are overweight/obese. However, in the BMI range selected for this study (25-40 kg/m²), many of the women were not diagnosed as having binge eating disorder or engaging in ≥1 monthly binge eating episode. In fact, it is likely that we would observe many of the severe binge eating behaviors among women with a BMI ≥ 40 (Mazzeo et al., 2005). Thus, future research should demonstrate the feasibility of this intervention among women with more severe binge eating behaviors to understand its true impact. While treating binge eating may serve to prevent the development of obesity, with over 50% of African-American women meeting established criteria for obesity, there is clear evidence to suggest the need for further exploration of binge eating behaviors among women who are already severely obese.

Additionally, these results provide further evidence to increase eating behavior education within our weight management interventions. With eight weeks of training on eating behaviors, participants were able to increase their eating self-efficacy, and reduce their binge eating, and loss of control eating episodes. If our participants do not fully understand the mechanisms of eating (hunger, satiety, regular eating episodes), we may be naïve to believe they will understand and excel at making healthful choices and engage in regular physical activity behavior. Part of the reason for relapse within behavioral weight loss interventions may be because participants still are managing binging, overeating, and emotional eating behaviors that have not been addressed. Future eating behavior intervention studies may of great benefit to increase our understanding of the course and nature of obesity treatment.

Finally, the results of this feasibility study highlight the need for the next phase of treatment – a longer term, powered pilot study to provide preliminary efficacy data on the on the

AAT intervention in a larger sample of African-American women, with a greater range of BMI variability. It would be important to understand the differential impact that AAT has on women of varied stages of obesity so that we could understand the factors that increase optimal treatment outcomes. Moreover, a larger pilot may help us to understand the trajectory of stress and emotion-related eating, binge eating, and eating self-efficacy over the course of the intervention. In addition, a longer trial may also aid us in determining whether or not AAT has an effect on physiological changes (e.g. weight, blood pressure) typically observed in weight management interventions.

5.3 IMPLICATIONS FOR SOCIAL WORK RESEARCH

The field of social work has an incredible opportunity to make a significant contribution to the field of obesity research. Currently, there is a considerable disparity in the inclusion, treatment, and reporting of outcomes for racial and ethnic minorities engaged in behavioral weight loss treatment. Trained public health social workers are an excellent profession to fill this gap due to the expertise and skill set obtained through extensive engagement with underserved and marginalized populations.

Social work researchers also have the opportunity to design and test behaviorally just interventions, or those that require participants to change only the behaviors for which they have the appropriate resources to address (Adler & Stewart, 2009). These interventions would consider environmental and economic limitations, and develop programming that enhances its reach to those who may have less access to supportive healthful behaviors (e.g. grocery stores,

walkable neighborhoods). Moreover, these programs would support the person in their environment, and acknowledge the contribution of any socio-cultural forces may shape eating behaviors.

Traditionally, social workers have not had an active voice in the decision-making regarding future strategies for the treatment of overweight and obesity, which may be due in part to the limited amount of behavioral research among individuals who are overweight conducted by social work researchers. The findings of this study may provide a small contribution to the empirical evidence to support to continued development of tailored interventions for specific treatment of obesity among racial and ethnic minorities, and those of low socio-economic status. With the passing of the Patient Protection and Affordable Care Act (P.L. 111-148), social workers are gaining increased opportunities to participate in integrated health teams, and may be uniquely positioned to provide culturally-relevant care to vulnerable populations who may be most impacted by the obesity epidemic. The assessment and treatment of disordered eating behaviors affecting the presence of overweight and obesity in racial and ethnic minorities may be an optimal opportunity for social workers to collaborate with medical professionals.

Additionally, social workers may also aid current obesity investigators in the recruitment and management of typically hard-to-reach subgroups. Having a social worker on the team may lend itself to increased community involvement, advertising, and the development of methods to reduce attrition. Moreover, the training many social workers receive in understanding the person in their environment may provide distinct insight to aid investigators in the true care and concern needed to include racial and ethnic groups in a thoughtful and relevant manner.

5.4 LIMITATIONS AND STRENGTHS

There were several limitations to this study. The sample was small and was predominately comprised of African-American women who were over the age of 40. There is still much to learn about the eating behaviors of younger women, specifically those aged 18-35, due to this being a period prior to the development of many co-morbid conditions associated with overweight and obesity.

Additionally, the restriction on the BMI range resulted in many women being ineligible to participate in the study. Moreover, since women with severe obesity have reported binge-eating behaviors, our experience of low reporting of objectively large binge eating episodes may be directly related to not having women with a BMI ≥40 in our sample.

Another limitation was the use of self-report measures to assess binge eating and eating self-efficacy, depressive symptoms, and quality of life; the use of these self-reported measures may increase the risk of, social desirability, and recall bias, and errors in self-observation. Additionally, the PI was responsible for the conduct of the intervention, and all assessments. This may increase the risk of bias of study findings.

Missing data was also a limitation to this investigation. There were several measures that had data missing on single items at baseline (WEL, BDI) and at the 8-week assessment (overall attrition: n=5). Since the sample was so small, any missing data is a problem toward determining the preliminary effect of AAT within this population.

There are several strengths within this investigation. First, this study demonstrated the feasibility of recruiting a typically underrepresented group to participate in a randomized clinical trial in a community-based setting. We held the intervention in two different neighborhoods that were both easily accessible by public transportation. Additionally, intervention sessions were

held on a weekday, during the evening. Moreover, we provided participants the flexibility of having their assessments done on site and/or at their individual home. It is likely that this contributed to participants being able to participate in the end-of-study assessment and the modest to low rate of attrition (16.1%). While the financial incentive for participating in the study was modest, participants still exhibited positive attendance.

Additionally, this study also generated preliminary data on an intervention that has the potential to be efficacious in increasing self-efficacy, coping, and to reduce binge eating, and emotion-and stress-related eating in overweight, African-American women. These data may provoke additional evidence on the role of eating behaviors in the disparate rates of obesity seen among African-American women. Solutions for the obesity epidemic are exceedingly difficult to achieve; any insight on possible mediators is warranted and helpful.

Finally, this intervention is "behaviorally just" because participants were able to be successful in spite of numerous environmental barriers that persist. Several of the participants expressed difficulty purchasing affordable food, and lived in neighborhoods that did not present many opportunities for physical activity. The NASW Code of Ethics encourages social workers to affect change for the marginalized and underserved, and to work under the theme of social justice **(**National Association of Social Workers, 2000). AAT created an opportunity for learning that allowed the participants to succeed, and to understand hidden eating behaviors.

5.5 CONCLUSION

The purpose of this investigation was to examine the feasibility of an Appetite Awareness Training (AAT) intervention among overweight and obese African-American women. Previous

literature provides evidence of the overconsumption of food, psychological reliance upon food, and lack of awareness of hunger and satiety signals endorsed by African-American women. Moreover, these eating behaviors appear to place black women at a far greater risk for the development of overweight and obesity than is seen within Caucasian women. Since African-American women have not responded as well to current behavioral weight loss treatment, there has been a call to investigate the role of socio-cultural barriers in their weight loss success (Kumanyika et al., 2007).

The results of this study indicate the viability of AAT as an intervention to help engage African-American women in the development of healthful eating behaviors. Though preliminary, early results indicate that participating in AAT results in reduced binge eating and increased self-efficacy at 8 weeks. Moreover, it may result in the improvement of depressive symptoms. However, future studies may consider widening the inclusion criteria, particularly in the BMI range. Moreover, making modifications to the intervention homework, and considering e-health methods to improve participation may serve to strengthen its impact in this population. Future research should extend the follow-up period to examine the effect of the intervention on eating behaviors, weight, blood pressure, and waist circumference.

This study contributed several important insights to our current knowledge of engaging African-American women in weight management interventions. First, future research may benefit from examining the role of eating behaviors and culture in addressing any weight change goals among this population. There are strong historical roots that have passed down the meaning, amount, and type of food that individuals may believe is acceptable. Moreover, if cultural norms permit the eating of large quantities of food as a tool for self-care or for

enjoyment, then it may be important for behavioral weight loss interventions to address this behavior before the addition of any alternative weight loss skills.

To the best of our knowledge, this is the first investigation to engage African-American women in an intervention to reduce their binge eating behaviors. Future research should continue to expand our knowledge on the relationship these women have with food, and the role eating behaviors have in the development and continuation of disordered eating behaviors and obesity. While addressing the prevalence of obesity is a significant public health concern, there is great opportunity to extend the reach of our science by taking care to develop culturally-informed programs to change health behaviors. As we continue to learn about the presence of racial health disparities in obesity and with other cardiovascular diseases, the next step is to rise to challenge, and effectively leverage our current knowledge to benefit those who have been underserved.

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EATING DISORDER EXAMINATION

(Edition 17.0D; April, 2014)

OVERVIEW OF EDE 17.0D

The seventeenth edition of the EDE is the latest version of this widely used instrument. All the changes from the previous edition (EDE 16.0D; Fairburn, Cooper, and O'Connor, 2008) arise from the need to generate DSM-5 eating disorder diagnoses. The major changes are as follows:

i. The item on menstruation has been removed as it is no longer a diagnostic criterion for anorexia nervosa
ii. The diagnostic items focus exclusively on the past three months as the six-month time frame for binge eating disorder has been reduced to three months
iii. References to "whose weight might make them eligible for the diagnosis of anorexia nervosa" have been replaced by "whose weight might be viewed as 'significantly low'"

In all other significant respects the instrument is the same as EDE 16.0D. Edition 17.0D generates EDE 16.0D-compatible data.

GENERAL GUIDELINES FOR INTERVIEWERS

The EDE is an *investigator-based interview*. This may be contrasted with respondent-based interviews in which the participant's answers to specified questions are rated without additional questioning. Respondent-based interviews are in essence verbally administered self-report questionnaires. They work well where the concepts being assessed are simple and there is general agreement as to their meaning, but they are unsatisfactory when the concepts are complex or key terms do not have a generally accepted specific meaning. With investigator-based interviews interviewers need training to ensure that they fully understand the concepts being assessed. The structure in such interviews lies in the detailed specifications provided for the interviewer of the concepts to be rated and the rating scheme, rather than in the precise wording of individual questions. In summary, investigator-based interviews such as the EDE require that interviewers be trained both in the technique of interviewing and in the concepts and rules governing the ratings.

When using the EDE, it is essential that the participant understands the purpose of the interview. The interviewer should explain why the interview is being conducted and, before starting formal questioning, should aim to establish good rapport. The interviewer and participant together should be trying to obtain an accurate picture of the participant's current eating behaviour and attitudes. It is important to explain that a standard set of questions is being asked and that some may not apply. Participants also need to know in advance how long the interview will take. At a minimum this will be 45 minutes but it can take as long as an hour and a quarter. (EDE interviews should rarely be allowed to take longer than this since otherwise interviewer and participant fatigue will affect the quality of the

ratings.)

The interviewer should explain that the interview mainly focuses on the preceding four weeks (28 days), although if the interview is also being used for diagnostic purposes certain questions extend out to cover the previous three months. To help the participant accurately recall the primary period of interest, time should be devoted at the beginning of the interview to the identification of events which have taken place during these 28 days. For example, the interviewer should establish whether the participant has been at home or away and what has happened on each of the four weekends. It can be helpful referring to a prepared calendar to locate the four weeks in question (see below). If the interview is also being used for diagnostic purposes events of note in (28-day) months 2 and 3 (counting back from the present 28 days) should also be noted together with their boundaries. Rarely should the orientation to the time frame be allowed to take more than 10 minutes.

Each of the items in the EDE has one or more (asterisked) obligatory questions in bold type which must be asked. Special emphasis should be placed upon the words and phrases that are underlined. The obligatory questions should be supplemented with additional questions of the interviewer's choice. The phrase "over the past four weeks" which precedes most obligatory question may be varied as seems appropriate (e.g., "over the past month" or "over the past 28 days") and inserted at any point within the question, but otherwise the obligatory questions should be asked as specified in the schedule. The items in the interview may be covered in any order although for most purposes the sequence presented in the schedule will be found to be satisfactory. It is perfectly appropriate to return to earlier items if further information emerges during the interview which is of relevance to prior ratings. The interview should never be undertaken in the absence of the full schedule as even the most experienced interviewers need to refer to the questions, definitions, and rating schemes.

The interviewer should pay careful attention to everything that the participant says. The interview should never be hurried. It should proceed at a steady relaxed pace with the interviewer not moving on to the next item until he or she is satisfied that all the necessary information has been obtained. The interviewer should not be rushed along by rapid, and possibly impatient, replies. Apparently glib answers which do not seem to have been given thought should be sensitively explored. Conversely, participants who are loquacious and over-detailed in their replies need to be kept to the point. Care must always be taken to ensure that the participant understands what information the interviewer is trying to elicit. It is good practice to check back with the participant before making each rating.

The physical circumstances under which the interview is conducted are also important. The interviewer and participant need to be comfortably seated and the interviewer needs to be able to have the schedule in front of him/her together with the rating sheet. There should be as few distractions as possible and except under unusual circumstances no one else should be present since otherwise participants tend not be to be frank and forthcoming.

Guidelines for making ratings are provided for most items. Ratings should be made as the interview proceeds (although certain calculations may be delayed until afterwards). The instructions for making the ratings are given in square brackets and they are followed by the rating scheme itself. Frequency ratings should be based on a 28-day month: if a feature is not present, rate 0; if a feature is present on up to and including 5 days, rate 1; if it is present half the time, rate 3; if it is present almost every day (with up to and including 5 exceptions), rate 5; if it is present every day, rate 6. Some items are rated on a seven-point severity scale ranging from 0 to 6. In these cases 0 represents the absence of the feature in question and 6 represents its presence to an extreme degree; a rating of 1 should be made only if the feature is barely present, and a rating of 5 should be made only if the feature is present to a

degree not quite severe enough to justify a rating of 6. A rating of 3 should be used for degrees of severity midway between 0 and 6. *If it is difficult to decide between two ratings, the lower rating (i.e., the less symptomatic) should be chosen.* [The exception is the first item "Pattern of eating" in which higher scores are (with the exception of nocturnal eating) less symptomatic.] This general rating scheme is summarised in Table 1.

SCORING

The EDE, and its self-report version, the EDE-Q, generate two types of data. First, they provide frequency data on key behavioural features of eating disorders in terms of number of episodes of the behaviour and in some instances number of days on which the behaviour has occurred. Second, they provide subscale scores reflecting the severity of aspects of the psychopathology of eating disorders. The subscales are Restraint, Eating Concern, Shape Concern and Weight Concern. To obtain a particular subscale score, the ratings for the relevant items (listed below) are added together and the sum divided by the total number of items forming the subscale. If ratings are only available on some items, a score may nevertheless be obtained by dividing the resulting total by the number of rated items so long as more than half the items have been rated. To obtain an overall or 'global' score, the four subscales scores are summed and the resulting total divided by the number of subscales (i.e. four). Subscale scores are reported as means and standard deviations.

Subscale Items (the numbers are the item number on the EDE-Q):
Restraint
1 Restraint over eating
2 Avoidance of eating
3 Food avoidance
4 Dietary Rules
5 Empty stomach

Eating Concern
7 Preoccupation with food, eating or calories
9 Fear of losing control over eating
19 Eating in secret
21 Social eating
20 Guilt about eating

Shape Concern
6 Flat stomach
8 Preoccupation with shape or weight
23 Importance of shape
10 Fear of weight gain
26 Dissatisfaction with shape
27 Discomfort seeing body
28 Avoidance of exposure
11 Feelings of fatness

BULIMIC EPISODES AND OTHER EPISODES OF OVEREATING

(Diagnostic item)

Classificatory Scheme

[Four forms of episodic "overeating" are distinguished. The distinction is based upon the presence or absence of two characteristics:

i) **loss of control** (required for both types of "bulimic episode")

ii) **the consumption of what would generally be regarded as a "large" amount of food** (required for "objective bulimic episodes" and "objective overeating").

The classificatory scheme is summarised below.

	"Large" amount eaten (EDE definition)	Amount eaten not "large" but viewed by participant as excessive
"Loss of control" present	Objective bulimic episodes	Subjective bulimic episodes
No "loss of control"	Objective overeating	Subjective overeating

Guidelines for Proceeding Through the Overeating Section

The interviewer should ask about each form of overeating. It is important to note that *the four forms of overeating are not mutually exclusive*: it is possible for participants to have had several different forms within the time period being considered. With some participants it is helpful to explain the classificatory scheme.

There are five steps in making this series of ratings:

1. In general it is best to start by asking the asterisked questions to identify the various types of perceived or true overeating that have occurred over the previous 28 days.
2. Each form should be noted down on the blank section of the coding sheet.
3. Then, detailed information should be obtained about a *representative example* of each form of overeating to decide whether or not it involved eating a "large" amount of food and whether or not there was "loss of control" (as defined below).
4. The next task is to establish for each form of overeating the number of days on which it occurred and the total number of occasions. Where there is possibility of overlap (i.e., two types of episode may have occurred on the same day, this should be clarified since this will affect the “days” ratings).
5. Finally, check with the participant to ensure that no misunderstandings have arisen (e.g., that no types of episode have been omitted).

It is advisable to make comprehensive notes.

Definition of Key Terms

"**Loss of control**". The interviewer should ask the participant whether he or she experienced a sense of loss of control over eating at any point in the episode. If this is clearly described, "Loss of control" should be rated as present. Similarly, if the participant describes having felt "driven" or "compelled" to eat, "Loss of control" should be rated as present.

If the participant reports having had no sense of loss of control yet describes having felt unable to stop eating once eating had started or having felt unable to prevent the episode from occurring, "Loss of control" should be rated as present. If participants report that they are no longer trying to control their eating because overeating is inevitable, "Loss of control" should once again be rated as present. Thus "Loss of control" may be rated positively even if the episode had been planned (i.e., the participant knew that he or she was going to overeat and had made provision for this).

The decision whether or not "loss of control" was present should be made by the interviewer; it does not require the agreement of the participant. If the interviewer remains in doubt, "Loss of control" should be rated as absent.

"**Large amount of food**". The decision whether or not the amount eaten was "large" should also be made by the interviewer; it does not require the agreement of the participant. The notion of "large" may refer to the amount of any particular type of food consumed or the overall quantity of food eaten. The amount should have been unequivocally large but it does not have to have been enormous. In deciding whether the amount was "large", *the interviewer must take into account what would be the usual amount eaten under the circumstances.* This requires some knowledge of the eating habits of the participant's general, but not necessarily immediate, social group (e.g., those of female students, women in their 50s) as well as circumstances that tend to influence eating (e.g., Thanksgiving Day, Christmas Day). What else was eaten during the day is not taken into account when making this rating, nor is the speed of eating or whether or not the participant subsequently spat out or vomited the food.

If the interviewer remains in doubt, the amount should not be classified as "large".

Interviewers should not share with the patient their view on the amount eaten and they should avoid using potentially emotive terms such as such as "binge" and "large".

The number of episodes of overeating. When calculating the number of episodes of overeating, the participant's definition of separate episodes should be accepted unless, within a period of eating, there was an hour or more when the participant was not eating. In this case the initial episode should be regarded as having been completed. An exception is if the episode was temporarily interrupted by an outside event and then restarted afterwards, and it was experienced as one single episode (somewhat like operating the pause button on a recorder). When estimating the length of any gap, do not count the time spent vomiting. *Note that "purging" (self-induced vomiting or laxative misuse) is not used to define the end of individual episodes of overeating.*]

QUESTIONS FOR IDENTIFYING BULIMIC EPISODES AND OTHER EPISODES OF OVEREATING

[See preceding section "Guidelines for Proceeding Through the Overeating Section". The asterisked questions should be asked in every case.]

Main Probe Questions (to get the overall picture)

***I would like to ask you about any episodes of overeating, or loss of control over eating, that you might have had over the past four weeks.**

***Different people mean different things by overeating. I would like to you describe any times when you have felt that you have eaten, or might have eaten, too much at one time.**

***And any times you have felt you have lost control over eating?**

Additional Probe Questions

***Have there been any times when you have felt that you have eaten too much, but others might not agree?**

***Have there been any times when you have felt that you have eaten an ordinary amount of food but others might have regarded you as having overeaten?**

[N.B. For subjective bulimic episodes to be eligible, they must have been viewed by the participant as having involved eating an excessive amount of food (i.e., they involved "overeating").]

Subsidiary Probe Questions (to classify any episodes of overeating)

To assess the amount of food eaten:
Typically what have you eaten at these times?

For subjective bulimic episodes (i.e., where the amount is not viewed by the interviewer as "large")
Did you view this amount as excessive?

To assess the social context:
What were the circumstances?
What were others eating at the time?

To assess "loss of control":
Did you have a sense of loss of control at the time?
Did you feel you could have stopped eating once you had started?

Did you feel you could you have prevented the episode from starting?

[For objective bulimic episodes, subjective bulimic episodes and episodes of objective overeating the following two ratings should be made:

i) number of days (rate 00 if none)
ii) number of episodes (rate 000 if none)

In general, it is best to calculate the number of days first and then the number of episodes. Rate 777 if the number of episodes is so great that their frequency cannot be calculated. Episodes of subjective overeating are not rated.]

Objective bulimic episodes
days [ ][ ]
episodes [ ][ ][ ]

Subjective bulimic episodes
days [ ][ ]
episodes [ ][ ][ ]

Episodes of objective overeating
days [ ][ ]
episodes [ ][ ][ ]

[Ask about each of the preceding two months referring back to the relevant dates and any events of note. For objective and subjective bulimic episodes, rate the number of episodes over the preceding two months and the number of days on which they occurred. Rate 0s if none and 9s if not asked.]

Objective bulimic episodes
days - month 2 [ ][ ]
month 3 [ ][ ]

episodes - month 2 [ ][ ][ ]
month 3 [ ][ ][ ]

Subjective bulimic episodes
days - month 2 [ ][ ]
month 3 [ ][ ]

episodes - month 2 [ ][ ][ ]
month 3 [ ][ ][ ]

[Also rate the longest continuous period in weeks free (not due to force of circumstances) from objective bulimic episodes over the past three months. Rate 99 if not applicable.]

[ ][ ]

Instrument Number: 0 0 7

Study ID: 1 5 1

SOCIODEMOGRAPHIC QUESTIONNAIRE
(Short Form)

Center for Research and Evaluation
University of Pittsburgh School of Nursing

ID Number: | | | | | | | | | | |

Administration Date: | | | / | | | / | | | | | (month) (day) (year)

Visit Number: 0 ○ **Baseline**

(FOR STAFF USE ONLY)

Shade circles like this: ●
Not like this: ⊗ ✓

Please use BLACK Pen Only!

For optimum accuracy, it is recommended that characters be written block style without touching the sides of the blocks, such as in the following example. Place only one letter or one number in each box as shown . . .

0	1	2	3	4	5	6	7	8	9

The following information requested is important in helping us understand more about you and your health. The information that you provide will be used for research purposes ONLY and will be held in confidence.

Please do not skip any questions. Thank you!

1. **What is your sex?**
   - ○ 1 Male
   - ○ 2 Female

2. **What is your date of birth?** | | | / | | | / | | | | | **(month) (day) (year)**

3. **What was your age at your last birthday?** | | | | **(years)**

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4. Which one of the following best describes your *current* relationship status?

- ○ 1 Never married
- ○ 2 Currently married
- ○ 3 Living with partner/significant other
- ○ 4 Widowed
- ○ 5 Separated
- ○ 6 Divorced
- ○ 7 Other; specify ----> _____

(for office use only) [ ]

5. How many years have you been in your *current* relationship:
*(If **less** than one year, write in "**00**")*

[ ] **(years)**

(-2) ○ ***N/A; I am not currently in a relationship***

Given the ever-increasing ethnic diversity of the population in the United States of America, the following questions are being asked to gather information on your racial/ethnic background . . .

6. What is your race:

a. Do you consider yourself to be Hispanic or Latino, that is, of Mexican, Puerto Rican, Cuban, or of Latin American descent?

- ○ 1 Yes
- ○ 2 No
- ○ 3 Unknown

b. Please choose the one category that best applies to you . . . .

- ○ 1 White
- ○ 2 Black or African American
- ○ 3 American Indian; please specify: _____
- ○ 4 Alaska Native
- ○ 5 Native Hawaiian or other Pacific Islander
- ○ 6 Asian
- ○ 7 Other; specify: _____
- ○ 8 Unknown

c. Are you of more than one racial/ethnic background?

- ○ 1 Yes ----------> Please specify all categories that apply to you . . . .
- ○ 2 No
- ○ 3 Unknown

(1)
- ○ 1 White
- ○ 2 Black or African American
- ○ 3 American Indian
- ○ 4 Alaska Native
- ○ 5 Native Hawaiian or other Pacific Islander
- ○ 6 Asian
- ○ 7 Other

7. Is English your first language?

○ **1 Yes**
○ **2 No ----> a. What was your first language:** _____

(for office use only)

8. We'd like to know where you live. Please enter the 5-digit ZIPCODE of your PRIMARY RESIDENCE:
(where you live most of the time)

9. In what type of area did you live most of your childhood?

○ 1 Urban, large city
○ 2 Urban, small city
○ 3 Suburb of large city
○ 4 Suburb of small city
○ 5 Rural, farm
○ 6 Rural, non-farm
○ 7 Other; specify --> _____

(for office use only)

10. How many years of formal education have you completed?

(For example, if you completed high school in the USA, you would have had 12 years of education.)

(years)

11. Select the *highest* diploma or degree you have completed:

○ 1) Grade school [grades 1-8]
○ 2) High school [grades 9-12]
○ 3) Earned G.E.D. [Graduate Equivalent Diploma]
○ 4) Vocational/Technical school certificate
○ 5) 2-year college [Associate's level]
○ 6) 4-year college [Bachelor's level]
○ 7) Graduate school [Master's level]
○ 8) Professional school [i.e., MD; D.V.M.; JD]
○ 9) Graduate school [Doctoral level, i.e., PhD; Ed.D.]
○ 10) Unknown

12. What is your *current* employment status?

○ 1 Full time (working at least 35 hours a week)
○ 2 Part time (working less than 35 hours a week)
○ 3 Laid off or unemployed, but looking for work
○ 4 Laid off or unemployed, but not looking for work
○ 5 Retired, not working at all
○ 6 Retired, but working part or full time
○ 7 Disabled, unable to work
○ 8 Full time homemaker
○ 9 Other; specify: _____

(for office use only)

13. Are you *currently* a student?

○ 1 Yes ----> What is your student status?
  ○ 1 Part time
  ○ 2 Full time
○ 2 No

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14. Have you *ever* been employed?

○ **1 Yes ----> Are you *currently* employed?**

○ **2 No**

→ **SKIP to Question 15**

○ 1 Yes

a. What is your *primary* occupation? *(the one where you work the most hours per week):*

Job title: _____

(for office use only)

b. Has this been your *primary* occupation for most of your working life?

○ 1 Yes

○ 2 No ---> **c. What was your *primary* occupation?**

Job title: _____

(for office use only)

d. Did you change occupations because of health reasons?

○ 1 Yes ○ 2 No

Please select all reasons that apply to you . . . .

(1)

○ 1. I changed because of the **physical** demands of my job.

○ 2. I changed because of the **mental** demands of my job.

○ 3. Other; specify:

_____

(for office use only)

○ 2 No

a. When you were employed, what was your *primary* occupation? *(the one where you worked the most hours per week):*

Job title: _____

(for office use only)

b. When was the last year that you were employed:

c. Did you stop working because of health reasons?

○ 1 Yes ○ 2 No

Please select all reasons that apply to you . . . .

(1)

○ 1. I changed because of the **physical** demands of my job.

○ 2. I changed because of the **mental** demands of my job.

○ 3. Other; specify:

_____

(for office use only)

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15. Do you have any children?

○ **1 Yes ---->** **a. How many:** ☐☐

○ **2 No**

16. *Including yourself*, how many people *currently* live in your household?

a. ☐☐ (adults)

b. ☐☐ (children under age 18)
If NONE, enter 00.

17 a.) Do you have a religious preference?

○ **1 Yes ---->**

○ **2 No**

1. Please specify:
(Choose ONE response only.)

○ 1 Christianity
○ 2 Judaism
○ 3 Islam
○ 4 Hinduism
○ 5 Buddhism
○ 6 Other; specify: _____

(for office use only) ☐☐☐

2. To what extent do you follow the customs and practices of your religion?

○ 1 Never
○ 2 Sometimes
○ 3 Frequently
○ 4 Always

b.) How important is religion in your life?

○ 1 Not at all ○ 2 Somewhat ○ 3 Extremely

18. Do you have health care insurance?

○ 1 Yes ----> a. What type(s) of insurance do you have? *(Please choose ALL that apply.)*

○ 2 No

V

SKIP to Question 19

(1)

○ 1 Medicare

○ 2 Medicaid

○ 3 Supplemental Social Security (SSI) income

○ 4 Veterans Administration

○ 5 Disability income

○ 6 Private health insurance

○ 7 Other; specify: _____

(for office use only)

b. Does your insurance cover the cost of <u>medication</u>?

○ 1 Yes, all

○ 2 Yes, some of the cost -----> Please specify in what way:

_____

_____

_____

○ 3 No

○ 4 Unknown

c. Does your insurance cover the cost of <u>health care</u>?

○ 1 Yes, all

○ 2 Yes, some of the cost -----> Please specify in what way:

_____

_____

_____

○ 3 No

○ 4 Unknown

The following questions concern family and individual income. We recognize the sensitive nature of these questions. This information is important in order to understand the economic impact of the chronic illness on the family and individual. Your answers will be held in strict confidence.

19. What are all the sources of <u>your own</u> total gross <u>annual</u> income (before taxes and deductions):

(1)

- ○ a. Wages, salaries, commisions, bonuses, or tips from all jobs
- ○ b. Self-employment income from tax or non-farm business
- ○ c. Interest, dividend, net rental income, royalty income, or income from estates or trusts
- ○ d. Social security or railroad retirement
- ○ e. Supplemental security income or other public assistance income
- ○ f. Retirement, survivor, or disability pensions
- ○ g. Workers Compensation
- ○ h. Other; specify: _____

(for office use only)

20. If you are currently employed, please select <u>your own</u> gross annual income from wages only (before taxes and deductions):

- ○ (1) Under $10,000
- ○ (2) $10,000 to $14,999
- ○ (3) $15,000 to $19,999
- ○ (4) $20,000 to $29,999
- ○ (5) $30,000 to $39,999
- ○ (6) $40,000 to $49,999
- ○ (7) $50,000 to $59,999
- ○ (8) $60,000 to $69,999
- ○ (9) $70,000 to $79,999
- ○ (10) $80,000 to $99,999
- ○ (11) $100,000 to $150,000
- ○ (12) Over $150,000
- ○ (13) Unknown
- ○ (14) Refused

(-2)
○
N/A
(not employed)

21. What is the total gross <u>annual</u> income for your <u>household</u> from all sources (before taxes and deductions):

- ○ (1) Under $10,000
- ○ (2) $10,000 to $14,999
- ○ (3) $15,000 to $19,999
- ○ (4) $20,000 to $29,999
- ○ (5) $30,000 to $39,999
- ○ (6) $40,000 to $49,999
- ○ (7) $50,000 to $59,999
- ○ (8) $60,000 to $69,999
- ○ (9) $70,000 to $79,999
- ○ (10) $80,000 to $99,999
- ○ (11) $100,000 to $150,000
- ○ (12) Over $150,000
- ○ (13) Unknown
- ○ (14) Refused

22. Does your *current* household income meet your financial needs?

- ○ 1 Yes
- ○ 2 No

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Instrument Number: 3 5 4
(For internal use only)

Study ID: 0 5 4

EATING HABITS CHECKLIST

Center for Research in Chronic Disorders

ID Number: | | | | | | | | | | |

Administration Date: | | / | | / | | | | |
(month) (day) (year)

(FOR STAFF USE ONLY)

Please use the following example to answer all questions:

Shade circles like this: ●
Not like this: ⊗ ✓

Below are groups of statements. Read all of the statements in each group and choose the ONE statement in each group that best describes the way you feel about your eating behavior.

1.

○ 1 I don't feel self-conscious about my weight or body size when I'm with others.

○ 2 I feel concerned about how I look to others, but it normally does not make me feel disappointed with myself.

○ 3 I do get self-conscious about my appearance and weight, which makes me feel disappointed in myself.

○ 4 I feel very self-conscious about my weight and frequently I feel intense shame and disgust for myself. I try to avoid social contacts because of my self-consciousness.

2.

○ 1 I don't have any difficulty eating slowly in the proper manner.

○ 2 Although I seem to "gobble down" foods, I don't end up feeling stuffed because of eating too much.

○ 3 At times, I tend to eat quickly and then I feel uncomfortably full afterwards.

○ 4 I have the habit of bolting down my food, without really chewing it. When this happens, I usually feel uncomfortably stuffed because I've eaten too much.

3.

○ 1 I feel capable of controlling my eating urges when I want to.

○ 2 I feel like I have failed to control my eating more than the average person.

○ 3 I feel utterly helpless when it comes to feeling in control of my eating urges.

○ 4 Because I feel so helpless about controlling my eating, I have become very desperate about trying to get into control.

4.

○ 1 I don't have the habit of eating when I'm bored.

○ 2 I sometimes eat when I'm bored, but often I'm able to "get busy" and get my mind off food.

○ 3 I have a regular habit of eating when I'm bored, but, occasionally, I can use some other activity to get my mind off eating.

○ 4 I have a strong habit of eating when I'm bored. Nothing seems to help me break a habit.

5.

○ 1 I'm usually hungry when I eat something.

○ 2 Occasionally, I eat something on impulse even though I am not really hungry.

○ 3 I have a regular habit of eating foods that I might not really enjoy to satisfy a hungry feeling, even though, physically, I don't need the food.

○ 4 Even though I'm not physically hungry, I get a hungry feeling in my mouth that only seems to be satisfied when I eat a food, like a sandwich, that fills my mouth. Sometimes, when I eat the food to satisfy my mouth hunger, I then spit out the food so I won't gain weight.

6.

○ 1 I don't feel any guilt or self-hate after I overeat.

○ 2 After I overeat, occasionally, I feel guilt or self-hate.

○ 3 Almost all the time I experience strong guilt or self-hate after I overeat.

7.

○ 1 I don't lose total control of my eating when dieting, even after periods when I overeat.

○ 2 Sometimes when I eat a "forbidden food" on a diet, I feel like I "blew it" and eat even more.

○ 3 Frequently, I have the habit of saying to myself, "I've blown it now, why not go all the way" when I overeat on a diet. When that happens, I eat even more.

○ 4 I have a regular habit of starting strict diets for myself, but I break the diets by going on an eating binge. My life seems to be either a "feast" or "famine."

8.

○ 1 I rarely eat so much food that I feel uncomfortably stuffed afterwards.

○ 2 Usually about once a month, I eat such a quantity of food, I end up feeling very stuffed.

○ 3 I have regular periods during the month when I eat large amounts of food, either at mealtime or snacks.

○ 4 I eat so much food that I regularly feel quite uncomfortable after eating and sometimes a bit nauseated.

9.

○ 1 My level of calorie intake does not go up very high or go down very low on a regular basis.

○ 2 Sometimes after I overeat, I will try to reduce my calorie intake to almost nothing to compensate for the excess calories I've eaten.

○ 3 I have a regular habit of overeating during the night. It seems that my routine is not to be hungry in the morning but overeat in the evening.

○ 4 In my adult years, I have had week-long periods where I practically starve myself. This follows periods when I overeat. It seems I live a life of either "feast" or "famine."

10.

○ 1 I usually am able to stop eating when I want to. I know when "enough is enough."

○ 2 Every so often, I experience a compulsion to eat which I can't seem to control.

○ 3 Frequently, I experience strong urges to eat which I seem unable to control, but at other times I can control my eating urges.

○ 4 I feel incapable of controlling urges to eat. I have a fear of not being able to stop eating voluntarily.

11.

○ 1 I don't have any problem stopping eating when I feel full.

○ 2 I usually can stop eating when I feel full, but occasionally overeat, leaving me feeling uncomfortably full.

○ 3 I have a problem stopping eating once I start, and usually I feel uncomfortably stuffed after I eat a meal.

○ 4 Because I have a problem not being able to stop eating when I want, I sometimes have to induce vomiting to relieve my stuffed feeling.

12.

○ 1 I seem to eat just as much when I'm with others (family, social gatherings) as when I'm by myself.

○ 2 Sometimes, when I'm with others, I don't eat as much as I want to eat because I'm self-conscious about my eating.

○ 3 Frequently, I eat only a small amount of food when others are present, because I'm very embarrassed about my eating.

○ 4 I feel so ashamed about overeating that I pick times to overeat when I know no one will see me. I feel like a "closet eater."

13.

○ 1 I eat three meals a day with only an occasional between-meal snack.

○ 2 I eat 3 meals a day, but I also normally snack between meals.

○ 3 When I am snacking regularly, I get into the habit of skipping regular meals.

○ 4 There are regular periods when I seem to be continually eating, with no planned meals.

14.

○ 1 I don't think much about trying to control unwanted eating urges.

○ 2 At least some of the time, I feel my thoughts are pre-occupied with trying to control my eating urges.

○ 3 I feel that frequently I spend much more time thinking about how much I ate or about trying not to eat any more.

○ 4 It seems to me that most of my waking hours are pre-occupied by thoughts about eating ***or*** not eating. I feel like I'm constantly struggling not to eat.

15.

○ 1 I don't think about food a great deal.

○ 2 I have strong cravings for food but they last only for brief periods of time.

○ 3 I have days when I can't seem to think about anything else but food.

○ 4 Most of my days seem to be pre-occupied with thoughts about food. I feel like I live to eat.

16.

○ 1 I usually know whether or not I'm physically hungry. I take the right portion of food to satisfy me.

○ 2 Occasionally, I feel uncertain about knowing whether or not I'm physically hungry. At these times, it's hard to know how much food I should take to satisfy me.

○ 3 Even though I might know how many calories I should eat, I don't have any idea what is a "normal" amount of food for me.

Instrument Number: 5 0 2
(For internal use only)

Study ID: 1 1 5

BDI - II

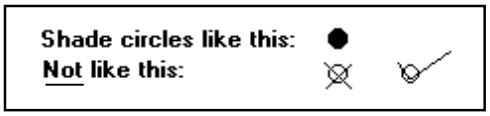
Center for Research in Chronic Disorders

ID Number: | | | | | | | | | | |

Administration Date: ( ) ( ) / ( ) ( ) / ( ) ( ) ( ) ( )
(month) (day) (year)

Visit Number: 1 ○ Pre 2 ○ Post

(FOR STAFF USE ONLY)



This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the *one statement* in each group that best describes the way you have been feeling during the *past two weeks, including today*. Blacken in the circle next to the statement you have picked. If several statements in the group seem to apply equally well, choose the highest number for that group.

Please be sure that you do not choose more than one statement for any group, including Question 16 (Changes in Sleeping Pattern) or Question 18 (Changes in Appetite).

1. Sadness

○ 0 I do not feel sad.
○ 1 I feel sad much of the time.
○ 2 I am sad all the time.
○ 3 I am so sad or unhappy that I can't stand it.

2. Pessimism

○ 0 I am not discouraged about my future.
○ 1 I feel more discouraged about my future than I used to be.
○ 2 I do not expect things to work out for me.
○ 3 I feel my future is hopeless and will only get worse.

3. Past Failure

○ 0 I do not feel like a failure.
○ 1 I have failed more than I should have.
○ 2 As I look back, I see a lot of failures.
○ 3 I feel I am a total failure as a person.

4. Loss of Pleasure

- ○ 0 I get as much pleasure as I ever did from the things I enjoy.
- ○ 1 I don't enjoy things as much as I used to.
- ○ 2 I get very little pleasure from the things I used to enjoy.
- ○ 3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings

- ○ 0 I don't feel particularly guilty.
- ○ 1 I feel guilty over many things I have done or should have done.
- ○ 2 I feel quite guilty most of the time.
- ○ 3 I feel guilty all of the time.

6. Punishment Feelings

- ○ 0 I don't feel I am being punished.
- ○ 1 I feel I may be punished.
- ○ 2 I expect to be punished.
- ○ 3 I feel I am being punished.

7. Self-Dislike

- ○ 0 I feel the same about myself as ever.
- ○ 1 I have lost confidence in myself.
- ○ 2 I am disappointed in myself.
- ○ 3 I dislike myself.

8. Self-Criticalness

- ○ 0 I don't criticize or blame myself more than usual.
- ○ 1 I am more critical of myself than I used to be.
- ○ 2 I criticize myself for all of my faults.
- ○ 3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes

- ○ 0 I don't have any thoughts of killing myself.
- ○ 1 I have thoughts of killing myself, but I would not carry them out.
- ○ 2 I would like to kill myself.
- ○ 3 I would kill myself if I had the chance.

10. Crying

- ○ 0 I don't cry anymore than I used to.
- ○ 1 I cry more than I used to.
- ○ 2 I cry over every little thing.
- ○ 3 I feel like crying, but I can't.

11. Agitation

- ○ 0 I am no more restless or wound up than usual.
- ○ 1 I feel more restless or wound up than usual.
- ○ 2 I am so restless or agitated that it's hard to stay still.
- ○ 3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

- ○ 0 I have not lost interest in other people or activities.
- ○ 1 I am less interested in other people or things than before.
- ○ 2 I have lost most of my interest in other people or things.
- ○ 3 It's hard to get interested in anything.

13. Indecisiveness

- ○ 0 I make decisions about as well as ever.
- ○ 1 I find it more difficult to make decisions than usual.
- ○ 2 I have much greater difficulty in making decisions than I used to.
- ○ 3 I have trouble making any decisions.

14. Worthlessness

- ○ 0 I do not feel I am worthless.
- ○ 1 I don't consider myself as worthwhile and useful as I used to.
- ○ 2 I feel more worthless as compared to other people.
- ○ 3 I feel utterly worthless.

15. Loss of Energy

- ○ 0 I have as much energy as ever.
- ○ 1 I have less energy than I used to have.
- ○ 2 I don't have enough energy to do very much.
- ○ 3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

- ○ 0 I have not experienced any change in my sleeping pattern.
- ○ 1a I sleep somewhat more than usual.
- ○ 1b I sleep somewhat less than usual.
- ○ 2a I sleep a lot more than usual.
- ○ 2b I sleep a lot less than usual.
- ○ 3a I sleep most of the day.
- ○ 3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability

- ○ 0 I am no more irritable than usual.
- ○ 1 I am more irritable than usual.
- ○ 2 I am much more irritable than usual.
- ○ 3 I am irritable all the time.

18. Changes in Appetite

- ○ 0 I have not experienced any change in my appetite.
- ○ 1a My appetite is somewhat less than usual.
- ○ 1b My appetite is somewhat greater than usual.
- ○ 2a My appetite is much less than before.
- ○ 2b My appetite is much greater than usual.
- ○ 3a I have no appetite at all.
- ○ 3b I crave food all the time.

19. Concentration Difficulty

- ○ 0 I can concentrate as well as ever.
- ○ 1 I can't concentrate as well as usual.
- ○ 2 It's hard to keep my mind on anything for very long.
- ○ 3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

- ○ 0 I am no more tired or fatigued than usual.
- ○ 1 I get more tired or fatigued more easily than usual.
- ○ 2 I am too tired or fatigued to do a lot of the things I used to do.
- ○ 3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

- ○ 0 I have not noticed any recent change in my interest in sex.
- ○ 1 I am less interested in sex than I used to be.
- ○ 2 I am much less interested in sex now.
- ○ 3 I have lost interest in sex completely.

Instrument Number: 4 0 4
(For internal use only)

Study ID: 1 1 2

SF-36v2™ HEALTH SURVEY

Center for Research in Chronic Disorders

ID Number: | | | | | | | | | | |

Administration Date: (month) / (day) / (year)

Visit Number:

0	1	2	3	4
○	○	○	○	○
Baseline	**6 mo.**	**12 mo.**	**18 mo.**	**24 mo.**

(FOR STAFF USE ONLY)

Please use the following example to answer questions:

Shade circles like this: ●
Not like this: ⊗ ✓

1. In general, would you say your health is: (Choose one response only.)

   ○ 1 excellent
   ○ 2 very good
   ○ 3 good
   ○ 4 fair
   ○ 5 poor

2. **Compared to one year ago**, how would you rate your health in general **now**?
   (Choose one response only.)

   ○ 1 much better now than one year ago
   ○ 2 somewhat better now than one year ago
   ○ 3 about the same as one year ago
   ○ 4 somewhat worse now than one year ago
   ○ 5 much worse now than one year ago

3. The following questions are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much? (Choose one response on each line.)

		Yes, limited a lot	Yes, limited a little	No, not limited at all
		1	2	3
a.	**vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	○	○	○
b.	**moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	○	○	○
c.	lifting or carrying groceries	○	○	○
d.	climbing **several** flights of stairs	○	○	○
e.	climbing **one** flight of stairs	○	○	○
f.	bending, kneeling, or stooping	○	○	○
g.	walking **more than a mile**	○	○	○
h.	walking **several hundred yards**	○	○	○
i.	walking **one hundred yards**	○	○	○
j.	bathing or dressing yourself	○	○	○

4. **During the past 4 weeks**, how much of the time have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**? (Choose one response on each line.)

		All of the time	Most of the time	Some of the time	A little of the time	None of the time
		1	2	3	4	5
a.	cut down on the **amount of time** you spent on work or other activities	○	○	○	○	○
b.	**accomplished less** than you would like	○	○	○	○	○
c.	were limited in the **kind** of work or other activities	○	○	○	○	○
d.	had **difficulty** performing the work or other activities (for example, it took extra effort)	○	○	○	○	○

5. **During the past 4 weeks**, how much of the time have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)? (Choose one response on each line.)

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	1	2	3	4	5
a. cut down on the **amount of time** you spent on work or other activities	○	○	○	○	○
b. **accomplished less** than you would like	○	○	○	○	○
c. did work or other activities **less carefully than usual**	○	○	○	○	○

6. **During the past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups? (Choose one response only.)

○ 1 not at all
○ 2 slightly
○ 3 moderately
○ 4 quite a bit
○ 5 extremely

7. How much **bodily** pain have you had **during the past 4 weeks**? (Choose one response only.)

○ 1 none
○ 2 very mild
○ 3 mild
○ 4 moderate
○ 5 severe
○ 6 very severe

8. **During the past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)? (Choose one response only.)

○ 1 not at all
○ 2 a little bit
○ 3 moderately
○ 4 quite a bit
○ 5 extremely

9. These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling. (Choose one response on each line.)
How much of the time **during the past 4 weeks . . . .**

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
	1	2	3	4	5
a. did you feel full of life?	○	○	○	○	○
b. have you been very nervous?	○	○	○	○	○
c. have you felt so down in the dumps that nothing could cheer you up?	○	○	○	○	○
d. have you felt calm and peaceful?	○	○	○	○	○
e. did you have a lot of energy?	○	○	○	○	○
f. have you felt downhearted and depressed?	○	○	○	○	○
g. did you feel worn out?	○	○	○	○	○
h. have you been happy?	○	○	○	○	○
i. did you feel tired?	○	○	○	○	○

10. **During the past 4 weeks**, how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting friends, relatives, etc.)?
(Choose one response only.)

○ 1 all of the time
○ 2 most of the time
○ 3 some of the time
○ 4 a little of the time
○ 5 none of the time

11. How **TRUE** or **FALSE** is <u>each</u> of the following statements for you?
(Choose one response on each line.)

	Definitely TRUE	**Mostly TRUE**	**Don't Know**	**Mostly FALSE**	**Definitely FALSE**
	1	**2**	**3**	**4**	**5**
a. I seem to get sick a little easier than other people.	○	○	○	○	○
b. I am as healthy as anybody I know.	○	○	○	○	○
c. I expect my health to get worse.	○	○	○	○	○
d. My health is excellent.	○	○	○	○	○

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

Instrument Number: 353
(For internal use only)

Study ID: 054

WEL

Center for Research in Chronic Disorders

ID Number: | | | | | | | | | | |

Administration Date: ( ) / ( ) / ( )
(month) (day) (year)

Visit Number: 0 ○ Baseline 1 ○ 6 months 2 ○ 12 months 3 ○ 18 months

(FOR STAFF USE ONLY)

Please use the following example to answer all questions:

Shade circles like this: ●
Not like this: ⊗ ✓

This form describes some typical eating situations. Everyone has situations which make it very hard for them to manage their weight. The following pages contain a number of situations relating to eating patterns and attitudes.

Please read each situation listed below and decide how confident (or certain) you are that you will be able to resist eating in each of the difficult situations. On a scale from 0 ("Not Confident") to 9 ("Very Confident") choose ONE number that reflects how confident you feel now about being able to successfully resist the desire to eat. Fill in the circle below the number that you have chosen for your answer.

I am confident that . . . .

	Not Confident At All									***Very Confident***
	0	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***
1. I can resist eating when I am anxious (or nervous).	○	○	○	○	○	○	○	○	○	○
2. I can control my eating on the weekends.	○	○	○	○	○	○	○	○	○	○
3. I can resist eating even when I have to say "no" to others.	○	○	○	○	○	○	○	○	○	○
4. I can resist eating when I feel physically run down.	○	○	○	○	○	○	○	○	○	○
5. I can resist eating when I am watching TV.	○	○	○	○	○	○	○	○	○	○

40433

ID Number: _ _ _ _ _ _ _ _ _ _
(for internal use only)

Date: _ _ / _ _ / _ _
(for internal use only)

Study ID: 0 5 4

I am confident that . . . .

	Not Confident At All									***Very Confident***
	0	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***
6. I can resist eating when I am depressed (or down).	○	○	○	○	○	○	○	○	○	○
7. I can resist eating when there are many different kinds of food available.	○	○	○	○	○	○	○	○	○	○
8. I can resist eating even when I feel it's impolite to refuse a second helping.	○	○	○	○	○	○	○	○	○	○
9. I can resist eating even when I have a headache.	○	○	○	○	○	○	○	○	○	○
10. I can resist eating when I am reading.	○	○	○	○	○	○	○	○	○	○
11. I can resist eating when I am angry (or irritable).	○	○	○	○	○	○	○	○	○	○
12. I can resist eating even when I am at a party.	○	○	○	○	○	○	○	○	○	○
13. I can resist eating even when others are pressuring me to eat.	○	○	○	○	○	○	○	○	○	○
14. I can resist eating when I am in pain.	○	○	○	○	○	○	○	○	○	○
15. I can resist eating just before going to bed.	○	○	○	○	○	○	○	○	○	○
16. I can resist eating when I have experienced failure.	○	○	○	○	○	○	○	○	○	○
17. I can resist eating even when high calorie foods are available.	○	○	○	○	○	○	○	○	○	○
18. I can resist eating even when I think others will be upset if I don't eat.	○	○	○	○	○	○	○	○	○	○
19. I can resist eating when I feel uncomfortable.	○	○	○	○	○	○	○	○	○	○
20. I can resist eating when I am happy.	○	○	○	○	○	○	○	○	○	○

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