

African American Women and the Obesity Epidemic: A Systematic Review

by

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Abstract

Obesity in America has been labeled a national epidemic. The Centers for Disease Control and Prevention (CDC) estimates that more than one-third (approximately 35%) of the U.S. population are obese (BMI > 29.9 kg/m²) (Ogden, Carroll, Kit, & Flegal, 2014). African American women are disproportionately affected by obesity and chronic disease (Flegal, Carroll, Ogden, & Curtin, 2010). NHANES data has shown a steady increase in the prevalence of obesity for African American women (CDC, 2011). Almost half (47.8%) of African American women are considered obese (Ogden et al., 2014). With regards to African American women obesity research, there are minimal studies that explore the complex interactions at multiple levels (Yancey et al., 2004). For this literature review articles published in January 1990 through December 2013 were retrieved for inclusion. A total of 23 based on the inclusion criteria were reviewed and discussed. Attention was given to intervention studies, specifically focusing on at least 5% weight loss to delineate effective weight loss. Out of the 23 studies reviewed only 3 of the studies met the specifications for effective weight loss. Although, effective weight loss was achieved by the African American study participants in these three studies, they were not as successful as their White counterparts in the studies. Additional studies are needed to explore the outcome disparities.

Key Words: African American, Women, Obesity, Health Disparity.

The incidence of obesity in the U.S. has sparked a national conversation about how best to address this health crisis. In 2014, the National Institutes of Health (NIH) spent \$857 million on obesity research (NIH.gov, accessed April 22, 2015). Despite investment in obesity research, rates remain high and among African Americans the prevalence of obesity is disproportionate (<http://www.cdc.gov/obesity/data/adult.html>, accessed May 4, 2015). For African American women the obesity rate is staggering, and as such should be given substantial consideration. However, the research literature does not provide adequate attention to this issue with several literature reviews indicating a low number of studies conducted to examine African American women and obesity (Tussing-Humphreys, Fitzgibbon, Kong, & Odoms-Young, 2013). This study was undertaken to examine the current body of literature and to expand upon the knowledge through an interpretive framework situated in critical black feminism.

Obesity Prevalence. The prevalence of overweight and obesity among the U.S. population has increased dramatically since the 1970s. According to the Centers for Disease Control and Prevention (CDC), the rate of obesity among adults has doubled to 33.9% since 1980 to 2008 (Flegal et. al. 2010; Ogden, 2006). National Health and Nutrition Examination Survey (NHANES) data from 2009-2010 shows the obesity rate remains elevated with 36.0% of the population being obese (Fryar, Carroll, & Ogden, 2012). Data during this same time period shows similar obesity trends among racial/ethnic minorities. African American women during 2009-2010 showed a significant linear increase in obesity, with 58.5% of African American women being more likely to be obese than any other racial/ethnic group (Fryar et al., 2012).

Obesity Consequences. Obesity poses a number of significant problems, affecting the physical, mental, and financial health of the individual. Research indicates a correlation between weight, diabetes, and heart disease, with greater than 80% of overweight individuals suffering from type 2 diabetes (CDC, 2009). Overweight adults are at an increased risk for developing hypertension, type 2 diabetes, and orthopedic complications; and the incidence of hypertension in overweight adults is greater than the incidence in their non-overweight counterparts (Diaz, 2002). NHANES data shows a linear relationship between BMI and blood pressure with systolic blood pressure increasing 1 mmHg for every gain in BMI of 1.7kg/m² and 1.25kg/m² among men and women, respectively (Aneja, El-Atat, McFalane, & Sowers, 2004; Redon, 2001). Likewise, diabetes exhibits a linear relationship with obesity and has increased by 61% since 1990 (Mokdad, Ford, Bowman, Dietz, Vinicor, Bales, & Marks, 2003).

This trend of increased obesity, diabetes, and cardiovascular disease is nowhere more evident than in the African American community. National Health Interview Survey (NHIS) data indicates the majority of African Americans age 18 and over are overweight and/or obese, with African American women representing the most obese population in the U.S. today (CDC, 2009). African Americans are 2.5 times more likely to develop and die from complications of diabetes related to end stage renal disease (ESRD) than Caucasians (Karter et. al., 2002). Data has shown deterioration in health for African Americans in certain disease categories and a widening in standardized mortality rates (SMRs).

Obesity Etiology. The contributors to obesity are not entirely clear (Lahti-Koski, Pietinen, Heliövaara, & Vartiainen, 2002). Many of the factors that affect obesity are modifiable, including inactivity, dietary habits, the built environment, and socioeconomic status. Inactivity, dietary habits, and environmental conditions have received a great deal of attention in public health research, as these factors seem to be the most directly linked to obesity. Additionally, these three factors can be addressed at multiple levels through policy changes.

The activity level of an individual may play a large role in his/her predisposition to obesity. Westerterp (1999) reported a correlation between physical activity level (PAL) and body fatness, reporting a reduction in fat mass with increases in PAL for women and men. Work, school, and home life require limited energy expenditure, with most individuals sitting the vast majority of the day. Technological advances have mechanized much of the work force removing the physical labor that once dominated jobs. Additionally, schools have removed recess and physical education and home life is spent in front of a computer or television. Evidence supports the link between increased screen time and elevated BMI (Parsons, 2008). Investigators have hypothesized television viewing promotes an increased chance for obesity by one or more of three mechanisms: (1) displacement of physical activity, (2) increased calorie consumption while watching or caused by the effects of advertising, and (3) reduced resting metabolism (Robinson, 2001). Data from the 2000 Behavioral Risk Factor Surveillance Survey (BRFSS) found that 28.2% of Americans did not engage in regular physical activity and 27% did not participate in any leisure-time physical activities (Mokdad, Bowman, Ford, Vinicor, Marks, & Koplan, 2001). In 1999, the Surgeon General's report on Physical Activity and Health reported similar low rates of physical activity. Data from the National Health Interview Survey (NHIS) along with BRFSS showed approximately 22% of U.S. adults engaged in regular sustained activity, which is defined as rhythmic muscular movement for at least 30 minutes 5 days or more per week (Surgeon General, 1999).

There is a growing trend among Americans concerning their dietary habits. Despite the Surgeon General's endorsement for eating more fruits and vegetables, most Americans are consuming a record number of high fat, high sugar processed foods (Subar, 1992). Data suggest Americans are eating more high fat foods and less fruits, vegetables, and whole grains than recommended for good health. NHANES data from 1999-2002 found 62% and 75% of adults did not consume a whole fruit serving or fruit juice respectively. It is estimated that 29% of Americans consumed at least 2 servings of fruit per day meeting the United States Department of Agriculture (USDA) recommendations. NHANES and NHANES III data revealed a reduction in the consumption of vegetables between 1988-1994 and 1999-2002 (Casagrande, Wang, Anderson, & Gary, 2007). Approximately 27% U.S. adults met the recommendations of 3 vegetable servings per day, and only 11% of the population met the USDA guidelines for combined fruit and vegetable intake of 2 servings of fruit and 3 servings of vegetables per day (fried potatoes excluded) (Casagrande et. al., 2007).

More alarming than the inadequate intake of fruits and vegetables is the rise in fast food and sugary beverage consumption. Nutrient dense foods such as fruits, vegetables, and whole grains have been displaced in the American diet by high fat and/or refined carbohydrate nutrient depleted foods. French (2000) cited a 200% increase in the number of fast food sales from 1977 to 1995 along with a 150% increase in food consumption from other sources outside the home. On average, it is estimated that close to half of the American diet is from fast food outlets (Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003). The Continuing Survey of Food Intakes by Individuals (CSFII) indicates fast food consumption is associated with higher intakes of fried potatoes, high sugar beverages, refined carbohydrates, high saturated fats, and trans-fat. The USDA's Economic Research Service (ERS) found a 39% increase in refined sugar consumption from 1950-2000. Sodas accounted for approximately 22% of the refined sugars in the American diet in 2000 (USDA, 2002). Additionally, greater energy availability by 15% in the U.S. food supply has been linked to increased caloric intake by Americans (Binkley, Eales, & Jekanowski, 2000). Positive energy balance related to overconsumption or decrease in activity level has been shown to lead to increases in weight (Binkley et. al., 2000).

Beginning in 1980, the Dietary Guidelines for Americans were issued to provide nutrition and physical activity recommendations to prevent chronic diseases. The guidelines were developed jointly by the Departments of Agriculture (USDA) and Health and Human Services (HHS) and are reissued every five years. Current recommendations focus on weight management, foods to reduce, foods to increase, and building healthy eating patterns. For the reduction and prevention of weight gain the USDA recommends overweight individuals reduce caloric intake and increase caloric output. Individuals with a BMI between 18.5-24.9 kg/m² should aim for weight maintenance through balancing energy intake and output. Specific guidelines from HHS encourage at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic physical activity on at least 3 days during the week. Moderate to vigorous-intensity muscular strength exercises performed at least 2 days a week is also recommended for weight management (USDA, 2010).

Although the USDA and HHS have been providing recommendations for the last three decades, American dietary and physical activity habits have shown little improvement. Combined consumption of fruits and vegetables has remained at approximately 11%. American intake of dietary sodium, cholesterol, and fat all fail to meet USDA recommendations. On average, Americans consume 3400 mg of sodium, 350 mg of cholesterol, and 19% of saturated fat daily (USDA, 2010). Added sugars pose yet another threat to the health of Americans, contributing an estimated 16% of calories to the American diet. The primary source of added sugar in the diet is derived from sodas, energy drinks, sports drinks, and fruit juice; which collectively supplies 46.2% of sugar. The USDA (2010) recommends the minimal use of added sugar and saturated fat, stating that the average American diet can only support 5-15% of calories from these two sources. Increases in fat and sugar, in addition to several other foods listed as items to reduce in the diet, have been shown to contribute to weight gain and chronic disease.

Evidence suggests the deleterious impact of added sugar and saturated fat through at least two proposed mechanisms. One mechanism leading to obesity is energy imbalance through the addition of calories. Dietary fat provides 9 kilocalories per gram accounting for greater calorie consumption with a high fat diet. In addition to the high caloric load, high-fat diets have a lower satiety value, making the likelihood of overeating greater (Green, Wales, Lawton, & Blundell, 2000). Increases in saturated fat translates to weight gain due the higher level of kilocalories consumed. Added sugar increases caloric load as these calories tend to be dietary additions without removal of other food items that typically come from sugary drinks (USDA, 2010).

Research has linked sugar to the increase in disease susceptibility through the inflammatory process. Evidenced has shown a positive relationship between the consumption of sugary beverages and glucose as well as lipid metabolism dysfunction (Welsh, Sharma, Abramson, Vaccarino, Gillespie, & Vos, 2010). For instance, Aeberli et al. (2011) conducted a study on twenty-nine healthy men exposing the subjects to different loads and types of sugar sweetened beverages. After consumption of high fructose and high sucrose beverages, participants experienced a decrease in low density lipoprotein (LDL) particle size along with an increase in a more atherogenic subclass of LDL (Aeberli et al., 2011). The increased consumption of all sugar containing beverages, from fructose, sucrose, or glucose, resulted in elevations of C-reactive protein (i.e. a marker for inflammation, and fasting glucose). Similarly, Teff et al. (2009) found alterations in postprandial triglyceride levels, insulin secretion, and leptin levels, with consumption in sugar, predisposing individuals to the development of insulin resistance and obesity.

Data from NHANES (1988-1994) indicates African Americans are least likely to meet fruit and vegetable recommendations in comparison to Caucasians (Casagrande et al., 2007). Although not statistical significant NHANES data from 1999-2002 did reveal a difference between African American and Caucasian fruit and vegetable intake. The same data demonstrated individuals with the most poverty and least educational attainment were at greatest risk for not meeting USDA recommendations (Casagrande et al., 2007). Data from the 2005 BRFSS showed lower fruit and vegetable intake, as well as physical activity levels for African American women. Non-Hispanic Caucasian women in comparison to African American women exhibited a greater acceptance of dietary and physical activity, meeting both recommendations 17.4% versus 12.6% of the time (CDC, 2007). French, Harnack, and Jeffery (2001) showed a greater consumption of high fat low-nutrient foods among girls from low socioeconomic status, supporting finds from NHANES. Data have made the correlation with race/ethnicity and socioeconomic status, reporting greater incidence of poverty among African Americans. Research shows African American women at greater risk for non-adherence to recommendations for modifiable behaviors that have been shown to prevent obesity and subsequent chronic diseases (Kumanyika, Morssink, & Agurs, 1991). The increased rates of obesity, hypertension, hyperlipidemia, and type 2 diabetes among African American women have been well documented, with several studies paying attention to health disparities that exist for this population (Flegal et al., 2010).

Research has shown greater rates of obesity and co-morbid disease prevalence among African Americans, and in particularly African American women. National data continues to show an upward trend for obesity, which impacts minority populations at a disproportionate rate (Dodor, Shelley, & Hausafus, 2010). Ljungvall and Zimmerman (2012) performed an analysis of NHANES data from the 1960's to the present day and found the greatest prevalence for obesity in African American women, with an obesity and severe obesity increase over time of 32% and 24% respectively. Dodor et. al. (2010) shows a statistically significant standardized direct effect between socioeconomic status (SES), sedentary activity and fruit and vegetable intake. The study results suggested SES had an impact on activity and dietary intake, which may influence BMI. Numerous individual-based interventions, as well as community-based initiatives focused solely on modifying diet and exercise habits with little impact on the staggering obesity statistics (Breland, Fox, Horowitz & Leventhal, 2012; Ljungvall & Zimmerman, 2012). In order to improve health outcomes, the USDA has recommended shifting to a culture of health, promoting easily accessible and affordable healthful foods and “walkable” communities.

The 2010 Dietary Guidelines for Americans cites the shifting American environment as one of the contributing factors of obesity. The environment has been structured in such a way that it promotes a sedentary lifestyle and over consumption of energy dense foods, creating a positive caloric imbalance (Pappas et al., 2007; Giskes, van Lenthe, Avendano-Pabon, & Brug, 2011). Due to links between access to healthy foods and outdoor spaces for recreation the built environment has been receiving more research attention. Pappas et al. (2007) conducted a systematic review examining the built environment and obesity and was unable to discern a clear relationship between the two variables across multiple studies. Food availability studies also demonstrate discrepancies, indicating a nuanced relationship between the built environment, individual behaviors and obesity (Gordon-Larsen, 2014). Although the built environment plays a role in the external structure of an individual's environment, there is still a larger context that shapes how an individual acts on and within the environment and vice versa (Pappas et al., 2007).

Urban development in America is informed by economic and political ideologies. As money and power move through geographical spaces growth moves with it, as such in urban spaces there is a waxing and waning of basic resources. The built environment is a multidimensional conception, encompassing land use (i.e. transportation, green space/parks, housing, retail, etc.), urban design, and human activity patterns within the environment. Swinburn, Egger, and Razza (1999) discussed the built environment through the construction of an ecological model which incorporated the sociocultural, defined as society's attitudes, beliefs, and values. These social norms are influenced by ethnicity, age, gender, and subgroup affiliations (Swinburn, Egger, & Razza, 1999). The examination of the built environment from a black feminist theory standpoint would add the context of sociocultural expanding upon the definition to include lived experiences and representations of African American women as expressed by African American women (hooks, 1984).

To understand the built environment from a sociocultural perspective one must first comprehend what is meant by culture along with discerning production and reproduction of it. In cultural studies culture is defined by a fluid complex sharing of meanings. Culture is based on individual and societal perceptions of social roles and is strongly influenced by power dynamics (Johnson, 1986). The construction of “acceptable” cultural images is then a process enacted by those with power derived from ideologies (Johnson, 1986).

Identities and realities are socially constructed representations based on ideologies. Ideologies are developed through dominant discursive thought and disseminated through the larger society. Circulation of these ideologies begins the process of cultural production through constructed meaning (Johnson, 1986). African American women in particular have their identities constructed based on racialized and engendered narratives (Monnat, 2008). The process of racializing and gendering produces essentialized representations of African American women, which in turn exerts control through shaping societal perceptions (Monnat, 2008).

African American women have a unique experience being positioned in two identities that face marginalization (hooks, 1984). As racial identity is an important determinant of self and impacts one's overall sense of well-being gender identity has similar implications. Research has found a link between what is termed the womanist identity, self-esteem, and perception of social as well as physical environment (Thomas, Witherspoon, & Speight, 2004). Racist and sexist ideology has constructed two polarizing African American female images that can be traced back to slavery; the mammy and the jezebel (Collins, 2004).

The mammy archetype was depicted as obese, self-sacrificing and obedient. The mammy image has been identified as an acceptable image and thus was able to traverse dominant “White” spaces relatively unnoticed and unharmed (Collins, 2004). This ability to be afforded safe passage in American society, through the portrayal of a specific constructed identity is interpellated throughout the culture and within the individual. The interpellation (i.e. the process by which an individual assumes the identity role ascribed to him/her through social and political ideology [Althusser, 1972]) of controlling images, particularly the image of the mammy can hinder African American women from focusing on their weight (Thomas et. al., 2004). The lack of focus on weight can lead to a general disinterest in engaging in physical activity, eating healthy, and self-monitoring.

African American Women Health Studies. Previous research has investigated the etiology of weight gain and its implications, citing decreases in energy expenditure and increases in energy intake as primary causes for obesity. Although numerous studies have examined dietary and physical activity habits as factors in obesity few studies have included a large sample of African American women (Boggs et al., 2011). A meta-analysis reviewing studies from 1997-2007 conducted by the American Heart Association (AHA) found 25 studies reporting evidence on racial/ethnic minorities or low-income populations (Artinian, et. al., 2010).

Similarly, Yancey et al. (2004) aggregated studies conducted during the mid-1990's-2003 targeting minority populations scarce (n= 16). Half of the studies conducted on minority samples did not record behavioral outcomes (Yancey et. al., 2004). Over the last couple of decades, several studies have examined health disparities impacting African American women which indicated a strong relationship between cultural, socioeconomic, and health outcomes. Findings from the recent Well Integrated Screening and Evaluation for Women Across the Nation (WISEWOMAN) program and the Black Women's Health Imperative, previously the National Black Women's Health Project, suggested obesity is a complex issue and requires careful analysis to address (Allison, Edlen-Nezin, & Clay-Williams, 2014). However, intervention studies including African American women remain scarce (Tussing-Humphreys, et al., 2013). The purpose of this review was to aggregate previous intervention studies that included and stratified African American women and obesity.

Methodology

Search Strategies and Inclusion and Exclusion Criteria

The articles retrieved for this review used Healthy People 2000 to develop a timeframe for article selection. Articles published in January 1990 through December 2013 were included in the systematic review of literature. The use of this timeframe coincides with the initiation of Healthy People 2000 and the goal to eliminate health disparities. Although, health disparities is a vast area of research and encompasses more than just obesity, racial and ethnic health disparities, for the purpose of this article the focus is limited to racial/ethnic disparities in obesity.

The Medline database and Cochrane Library was searched for peer-reviewed articles published during January 1990 through December 2013, using a combination of the following search terms: obesity, African American, Women, weight loss, and black. The criteria for inclusion included; 1) English language, 2) a sample of adults greater than or equal to age 18, 3) a sample population of black females, 4) primary outcome related to weight loss, 5) racial/ethnic determinants of obesity, 6) sociocultural determinants of obesity, 7) intervention strategies targeting behavior modification for weight loss, 8) description of the intervention. Studies were excluded from the review if they, 1) were published in any language other than English, 2) were not conducted in the United States of America, 3) used a post-partum sample, 4) relied on solely a surgical or pharmacological intervention, 5) did not include weight loss results, or 6) did not stratify race and sex.

The initial database search used the term African American and weight loss yielded 701 articles, which was reduced to 300 publications by adding filters for language, gender, and publication date. Article abstracts were reviewed for inclusion and were further reduced to 64 articles. The remaining 64 articles were thoroughly reviewed and were further reduced to 23 articles.

The reduction from 64 articles to 23 articles was due to lack of post-intervention weights or BMI data, weight loss data not being stratified by race and gender, the article being secondary data or a review article. The 23 articles were reviewed with particular attention paid to post-intervention weight change to assess effectiveness of the study interventions. The CDC recommends at least 5-10% reduction of initial body weight for disease management. Based on these recommendations, interventions were deemed effective if they were able to achieve a 5-10% weight loss from baseline.

For all 23 of the studies the following information was extracted and placed in (Table 1), 1) author and publication year, 2) sample size and participant characteristics, 3) study design, 4) study setting, 5) length of trial, 6) intervention description, 7) baseline weight (kg) or BMI, 8) follow-up mean weight (kg) or follow-up mean BMI, and 9) mean weight change (kg). The categories listed do not appear in all of the articles reviewed. Additionally, some articles reported long-term follow-up in addition to immediate post-intervention data, both time points were included for articles that included them.

Results

Table 1 shows the characteristics of all the selected review articles. Out of the 23 studies selected for this review 17 solely recruited African American women, five included African American and Caucasian women, and one included African American and Caucasian men and women. All studies targeted adults from 18 to 70 years of age. Nine studies recruited participants classified as obese based on a BMI of ≥ 30 , another eight studies recruited both overweight and obese participants based on a BMI between 25-50, one study included normal weight participants alongside the overweight/obese, one study recruited participants based on having a percent body fat greater than 27, one study recruited participants based on having an ideal body weight (IBW) above 20%. Finally three studies did not make distinctions towards BMI, IBW, or percent body fat.

Health promotion has long used the SEM to develop interventions. Many of the most recognized social models that have succeeded in generating change have targeted change at the institutional (family, religion, education) and societal (economic and political systems) levels (Marx, 1998). Combating obesity requires the SEM, which addresses the individual as well as the social and environmental (Hill, Wyatt, Reed, & Peters, 2003). The CDC (2003) recommends that communities mount a coordinated collaborative effort to promote the prevention of obesity. This coordinated program should include health education, physical education, health services, school counseling and social services, nutrition services, the psychosocial and biophysical environment, faculty and staff health promotion, and integrated efforts of schools, families, and communities (Kolbe, 1995).

To impact obesity the approach must be comprehensive, factoring the social and historical contexts that inform the health landscape of African American communities. Changes in health behaviors require an intervention and commitment to action at multiple levels of SEM. The levels at which change can occur are generally described as individual, group, organizational, institutional, and societal. Interventions that target the individual level have struggled to achieve desired long-term health outcomes (Yancey et al., 2004). Additionally, interventions that are beneficial in an intensive clinical setting struggle to yield the same outcomes in real life settings. Greaves et al. (2011) advocates for an intervention targeting both physical activity and diet by fostering greater social support. It is well documented that a long-term community based programs in comparison to clinical weight loss trials yield better weight loss and management results (Agurs-Collins, Kumanyika, Ten Have, & Adams-Campbell, 1997). Data has also shown benefits to culturally adapted programs (Fitzgibbon et al., 2005). A systematic review from the Cochrane Database examining diabetes interventions and culturally adapted programming reported low-term to medium-term effects on diabetes management outcomes (Attridge, Creamer, Ramsden, Cannings-John, & Hawthorne, 2014).

The weight loss outcomes for the articles ranged from modest to significant. Of all the studies selected for review only three studies met the specified criteria for an effective intervention with at least a 5% weight loss (Klein et al., 2004). One successful/effective intervention used an online group based behavioral weight control program (Carson et al., 2013). In this study, participants were randomly assigned to the online behavioral weight management group or the online group plus motivational interviewing. In addition to the interventions, the study examined participant social contact with previous or current participants in the program. Previous research has indicated that social networks and social support is positively correlated to weight loss (Wing & Jeffrey, 1999). Additionally, SEM identifies intrapersonal relationships and community supports as determinants of health (www.healthypeople.gov). The study was among a mixed racial/ethnic population including both African American and Caucasian women. Study results revealed that individuals with social support lost more weight and had better adherence than those who did not have a social support. The mean weight loss was 5.8% for all of the participants, data for African American women with social support showed a 5.1% weight loss in 6 months. Caucasian women with social support loss 7.1% of body weight from baseline, which was not statistically significantly different from African American women (Carson et al., 2013).

The next study that showed effective weight loss in this review was the Treatment of Obesity in Underserved Rural Settings (TOURS) study. TOURS was a randomized trial that reported African American participants losing 6.8% of their body weight in 6 months. Although this study showed a significant amount of weight loss, African American women lost significantly less weight than their Caucasian counterparts (11.2% body weight loss). Additionally, Phase II of the study an extended-care weight maintenance program (the extended-care phase provide an additional 12-months of follow-up) showed no significant difference in weight regain (Rickel et al., 2011).

Out of the 23 articles the final study that showed effective weight was the Tripler Army Medical Center LE³AN program for weight management (Simpson, Earles, Folen, Trammel, & James, 2004). The program consisted of two phases. Phase I was an intensive week long day program, beginning at 6:45am in the morning and ending at 4:30pm. The program used a multidisciplinary team to deliver nutrition, physical activity, and medical information, along with two daily 45-minute exercise bouts. Phase II consisted of a 60-minute weekly follow-up visits for a year. Study results reported a 5.3% weight loss over six months for African American participants which was not significantly different from Caucasian participants (Simpson et al, 2004).

Based on an average mean reduction of 5% of the study participants' body weight, the three above studies were able to elicit effective weight loss. The examination of these three studies yielded the following similarities; expert led content, group based intervention, social cognitive theory (SCT) theoretical framework, and an intervention with follow-up period lasting at least six months. Additionally, these studies did not report the inclusion of culturally adapted programming, which has now been accepted as an imperative in program development for public health (Fitzgibbon et al., 2005). The above studies demonstrated the ability of African American women to be successful at weight loss strategies in mixed populations without culturally adapted materials. These results deserve further consideration and will be discussed in greater detail in the discussion.

Only two other studies came close to meeting the criteria for effective weight loss; the Weight-Loss Maintenance (WLM) trial, and PATHWAYS (a weight loss program for inner-city African American women with NIDDM). The WLM trial is a mixed racial/ethnic and gender randomized trial, conducted over four-centers. Data for this article examined Phase I of the trial, which consisted of 20 group weight loss session for 6 months. Participants were encouraged to restrict calories, engage in moderate intensity physical activity, and utilized the DASH (dietary approaches to stop hypertension) dietary pattern (Hollis et al., 2008). Among all participants with follow-up data, the mean percentage decrease from baseline weight was 6.0%. African American women had a mean percentage decrease in initial weight of 4.3% and Caucasian women 6.5%.

The PATHWAYS program was developed to encourage lifestyle change that would lead to long-term weight loss among inner-city African American women. The program was a 12-week program focused on goal setting, problem solving, physical activity, and nutrition education. Program participants were encouraged to make dietary changes that reflected the American Diabetes Association carbohydrate and fat recommendations. The study had a 77% completion rate with a higher attrition rate for African American women. Research literature has indicated a problem with attrition and program attendance for African American women. The study results reported a 4.4% weight loss from baseline at 16 weeks. Previous studies have shown weight regain after a year follow-up. McNabb, Quinn, and Rosing (1993) reported a mean percentage decrease from baseline weight of 4.8% at one year.

The remaining 18 studies range from .44% to 3.5% mean weight loss from baseline. Although weight loss below 5% has not been shown to be beneficial in the management of chronic disease, low levels of weight loss of this nature for African American women may still be beneficial (Hollis et al., 2008). African American women have the highest prevalence of weight gain of any other group, modest weight loss and/or maintenance can aid in delaying the development of chronic disease or reduce potential complications of chronic disease (Hollis et al., 2008).

Discussion

This article reported on a systematic review of behavioral weight loss interventions that included or targeted African American women. The purpose of this review was to summarize the current literature as it relates to the management of obesity in African American women as well as provide insight for future research in this area. The results of this review showed all studies yielded weight loss through their selected interventions. Based on a percentage reduction of at least 5% of the baseline weight, only three studies demonstrated effective weight loss.

In promoting improved health outcomes a number of models exist and are used in varying combinations. The four most prominent models used in health promotion are the SCT, health belief model, transtheoretical model, and the theory of reasoned action/theory of planned behavior (Sallis et al., 2006). In the three studies that yielded the most effective weight loss, SCT was used in conjunction with behavioral change strategies. Behavioral strategies utilized in the studies focused on nutrition education, self-monitoring, and physical activity. Each study had an initial weight loss phase and long-term follow-up of at least 6 months. Two of the studies were randomized trials and the other was a retrospective study from a convenience sample. The approaches taken in these studies were not novel interventions. These interventions (i.e. caloric restriction, physical activity, health education, and self-monitoring) along with SCT were used to some degree by the other 20 studies. The primary difference between the three studies in which the participants lost a mean weight of 5% or great and the other 20 studies were the length of the programming and the involvement of experts in the development and delivery of the content. Behavioral change literature has long reported the length of effective interventions to be at least 3 months. It would stand to reason that the extension of the program by an additional few months would enable greater adherence to behavior modifications.

Of the 23 studies reviewed the following included culturally adapted interventions: Befort et al. (2008), Djuric et al. (2009), Fitzgibbon et al. (2010), Fitzgibbon et al. (2005), Kanders et al. (1994), Karanja, Stevens, Hollis, and Kumanyika (2002), McNabb et al. (1993), Murphy and Williams (2013), Parker, Coles, Logan, and Davis (2010), Risica, Gans, Kumanyika, Kirtania, and Lasater (2013). All three of the studies that demonstrated effective weight loss had a racially mixed study population and did not appear to include cultural adaptations for African American women study participants.

Interestingly, researchers have posited that cultural adaptations are needed for successful weight loss (Kumanyika, Morssink, & Agurs, 1992). Further examination of the studies identified as having effective weight loss showed African American women being less successful in comparison to the Caucasian women. However, the African American women in these studies were still able to achieve significant weight loss to impact chronic disease. Studies that were less successful in eliciting effective weight loss among African American women applied culturally tailored interventions. Bronner and Bovington (2002) reported similar findings, indicating that culturally tailored programs were not any more successful than non-tailored programs.

Culturally tailored health promotion interventions are readily accepted as an effective means to improve African American women weight management outcomes (Risica, Gans, Kumanyika, Kirtania, & Lasater, 2013). Although there is a general acceptance, no clear definition and guidelines exist to establish consistent parameters in the development of culturally tailored programs (Tussing-Humphreys, Fitzgibbon, Kong, & Odom-Young, 2013; Kumanyika et al., 2007). The cultural adaptations of the weight loss interventions varied from changing foods to reflect preference of African Americans, providing an intervention staff that was majority African American, providing educational material with images that were relevant to African Americans, or simply only including African Americans in the study sample (Tussing-Humphreys et al., 2013). The cultural adaptations due to the lack of guidelines are often superficial. Resnicow, Baranowski, Ahluwalia, and Braithwaite (1999) described the adaptations as “surface” and proposes “deep” interventions addressing the varied racial/ethnic identities of African Americans. African American culture is heterogeneous, but frequently interventions provide generalized adaptations (Ard et al., 2013). Culture is a complex and evolving construct that first must be defined and understood prior to its use in structuring an intervention tailored to a specific group.

All studies included in this review used a group approach to weight loss along with the SCT and behavioral change strategies, adhering to study interventions that have demonstrated successful weight loss. Studies that demonstrated greater weight loss in addition to these characteristics had greater treatment and follow-up time frames, with the exception of the Black American Lifestyle Intervention (BALI). African American women participants in BALI achieved a 3.44% mean weight loss over a 10 week timeframe (Kanders et al., 1994). While BALI provided behavioral change strategies to participants, they also provided two daily meal replacement shakes at no charge to maintain a low-fat 1,200 kcal diet. Additionally, interventions guided by experts on a multidisciplinary team in structured trials appeared to have more success with weight loss. Based on the review of the current literature it would appear that a contributing factor to weight loss success in interventions for African American women is length of time and guidance from experts, with no impact of cultural relevance.

African American women continue to struggle with weight loss and when included in mixed racial/ethnic trials, data clearly demonstrates differences in weight loss between African American and Caucasian women (Kumanyika et al., 2010). Also, research continues to show lower success rates in achieving target weight loss goals for African American women. A number of variables have the potential to complicate weight loss, such as physiological, cultural, social, and psychological differences in experiences between the two groups. Little research has been conducted to examine these differences to fully elucidate the confounding variables. Based on emerging data, all of the physiology, psychology, culture, and social variables have a role to play; however, cultural, social, and psychological variables should be considered in future interventions. Culture is of particular interest as it transects the social and the psychological.

Culture is a dynamic construct that is mutable and broad. Simply, providing African American group facilitators or “enhancing” a program with images of African Americans, along with providing ethnic foods and including focus group suggestions may not go far enough to address cultural tailoring. These nuances of culture need to be explored in order to be effectively put into use for obesity management.

Limitations

One major limitation was that in the reviewed studies there was no distinction made between ethnic groups within the African American population. African Americans are typically treated as one homogenous group, not accounting for recent immigrants that can range in origins from the West Indies, Caribbean, the continent of Africa, and Latin America. All of which have a multitude of ethnic groups, food preference, social structures, and life experiences (Agyemang, Bhopal, & Bruijnzeels, 2005). Additionally the quality of the studies for inclusion were not evaluated, thus poorly designed studies or nonrandomized studies were not excluded. Finally, given limited intervention research targeting behavioral weight loss among overweight/obese African American women, the reviewed studies varied in design (i.e. RCT, retrospective, etc.).

Conclusions

Interventions in this review focused on individual behavior change for weight loss outcomes. Research demonstrated a complex interplay between the individual’s environment and public policy and weight. The SEM was developed to address this interplay and is thought to be a more productive model in terms of addressing health, as there is not just one factor impacting health, rather many functioning at different levels (Sallis et. al., 2006). The socio-ecological model places an emphasis on environmental and policy variables that influence behavior change in addition to social and psychological indicators (Glanz, 2008; Sallis et. al., 2006). Future studies examining African American women obesity would benefit from the use of this model to examine co-variables and confounding factors to develop a more concise understanding of their implications.

Overall this review indicated that African American women continue to struggle with weight loss, as previously reported in recent literature reviews (Fitzgibbon et al., 2012; Tussing-Humphrey et al., 2013). Studies reporting the most weight loss were conducted over an extended period of time and study materials were developed and delivered by content experts. Studies indicating participants reaching at least 5% mean weight loss, all were greater than 6 months in length. These studies also used their own content experts for the delivery of the program, which poses problems of sustainability and self-efficacy. Interventions that lack community inclusiveness and do not garner the support of the community experience short-term results, with the program declining and weight loss diminishing once researchers are no longer able to commit to the intervention (Yoshikawa, 2006). Cultural adaptations to weight loss programs did not appear to have an impact on weight loss, with the three studies achieving greater than 5% weight loss being racially mixed with no mentioned cultural adaptations.

Although this review indicated cultural adaptations had no impact on effective weight loss, further examination is needed to examine the heterogeneity within African American culture. Future research on African American women is greatly needed and the focus should begin with the development of a trans-disciplinary team, to address the complexities of culture. Culture transects all the spheres of SEM and interacts to varying degrees on each level. The interactions between these spheres and culture may have an impact on weight that could explain the difference between African Americans and Caucasians. Also, attention should be paid to developing specific standardized guidelines for cultural tailoring and examining differences between culturally tailored and non-culturally tailored weight intervention programs. Racial/Ethnic disparities in obesity rates persist. Culture deserves further examination to demystify (i.e. make clearer) the construct of race, which is intertwined with class, gender, and sexuality all of which creates differences in social status, access, quality of life, and lifestyle (hooks, 1984).

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Table 1. Descriptions of African American Weight Loss Interventions and Outcomes.

Author and publication year	Participant Characteristics	Study design, setting, length of trial	Intervention	Baseline Weight(kg)/ BMI	Follow-up Weight , (kg)/ BMI, weight change
Befort et al. 2008	AA women, obese (BMI 30-50)	Randomized Trial, participants randomized to MI or health education group, community health center	16-week culturally-targeted behavioral weight loss program based on DPP. 90-min weekly education sessions MI group: 4 30-min sessions HE group: 4 sessions	Mean BMI and weight MI: 39.4(7.1) 103.7(20.8) HE:40.4(5.8) 109.6(18.2)	BMI and weight change MI: BMI-1.0(1.5) WT -2.6(4.2) HE: BMI -1.1(2.0) WT -3.2(5.7)
Bennett et al. 2013 (Bennett 2009, Foley 2012) (Duke Obesity Prevention Program)	194 overweight and class I obese premenopausal black women aged 25-44 were recruited Attrition rate n=169	Two-arm RCT (The Shape Program) 6-site community health center system Intervention 12 months with a 18 month f/u	Primary care-based behavioral weight gain prevention. Usual Care-every 6 months participants received a wellness Newsletter Weight gain prevention-treatment designed to create a 200kcal/d deficit	Mean weight 81.1 (8.8) BMI 30.2 (2.5)	Usual care .8 (.6) Intervention: -.9 (.6)

Brandon & Elliott-Lloyd 2006	75 sedentary women (45 AA and 30 White) between the age of 18-50 and body fat greater than 27%	Randomized, 16-week walking program	Exercise group: Met 3 days a week for 18 weeks, the first two weeks were used for conditioning & instruction Control group:	AAE: Mean wt =90.9 +/- 22.5; Mean BMI =34.4 +/- 8.2 AAC: Mean wt =83.1 +/- 15.5; Mean BMI = 33.0 +/- 7.1	AAE: Mean wt =90.5 +/- 22.5; Mean BMI =34.2 +/- 8.4 AAC: Mean wt =85.5 +/- 15.3; Mean BMI = 33.3 +/- 7.1
Carson et al. 2013	92 women with a BMI between 25-50, greater than 18 years old	RCT, Participants grouped based on identification of a social contact Behavioral weight intervention delivered online weekly for 6 months, multicenter	Online group based behavioral weight control program with and without individual online motivational interviewing counseling	Mean weight 101.7 (17.7) Mean baseline BMI of 38.1 (All participants)	AA women subgroup No Social Contact Social Contact previous study participant 5.2 kg weight loss
Cox et al. 2012	44 overweight/obese AA women	Randomized, 12-week adaption of the Diabetes Prevention Program	Behavioral lifestyle intervention Stress management and lifestyle intervention	Lifestyle intervention: Mean wt = 92.1 +/- 13.8 Stress+lifestyle: Mean wt= 100.6 +/- 14.9	Mean weight loss at 3-months 2.0 +/- 3.1% LS: 1.3 +/- 2.1 S+LS: 2.7 +/- 3.9
Djuric et al. 2009	31 AA women obese (BMI 30-45kg/m ²) breast cancer survivors Attrition rate n=22	Randomization was conducted after 6 months to dietitian led counseling or to dietitian led counseling + spirituality counseling	Study Assessments performed baseline, 6, 12, and 18 months 18 months of individualized dietitian led	Dietitian only 94.9 BMI=36 Spirituality group 93.8; BMI=36	Mean loss of 2% of baseline weight at 6 months Baseline to 6 months Dietitian led

			counseling		arm 2.5% Spiritual arm 1.5%
			First 3 months of weekly contact Biweekly for 3-6 months Monthly for 6-18		18 months mean weight loss 1.9% of baseline in RD arm and 1.5% in spirituality arm
					6 to 18 month indicated a slight gain in RD group of .7%
Fitzgibbon et al. 2010, (2008; provides only baseline data)	213 obese black women aged 30- 65 years 107 intervention group 106 control group	Obesity Reduction Black Intervention Trial (ORBIT) RCT, 6-month weight loss intervention followed by a 1-year maintenance program	Control group received weekly health related newsletters for 6-months Intervention group Monthly Motivational Interviewing (MI) met in small groups twice weekly for 6-months; Maintenance newsletters received every other month months 7-12 group met twice weekly for 45-60 min and received monthly motivational interviewing counseling	Mean weight Control 105.9 (17.4) BMI 39.8 (5.8) Men weight Intervention 103.9 (15.7) BMI 38.7 (5.5)	6 months to 18 months Control: 106.0 (17.7) Intervention: 101.3 (16.4)

			Months 13-15 weekly exercise class + MI		
			Months 16-18 MI continued		
Fitzgibbon et al. 2005	59 AA/black women, age 21 or greater with a BMI of 25 or greater were randomized to faith based weight loss (n=30) or to weight loss intervention (n=29) Attrition rate n=52	RCT, Faith on the Move was conducted in a hospital setting in Cook County, 12 week	Groups were randomized to culturally tailored weight loss program or culturally tailored weight loss program + faith base component	FB wt. loss mean wt. 105.6 (20.7) BMI 39.9 (8.1) Wt. loss mean wt. 105.0 (18.2) BMI 39.3 (7.5)	FB wt. loss mean wt. 103.0 (20.7) BMI 39.0 (8.1) Wt. loss mean wt. 103.4 (19.0) BMI 38.7 (7.7)
Gerber et al. 2013	88 obese or overweight AA women, age 35-65 years, with a BMI of 25-50, were randomized to monthly telephone counseling or home telehealth	RCT, "Exercise Your Faith" a video telehealth weight maintenance program, home based delivery of interventions, weight maintenance phase lasted for 9 months.	All groups were provided with a 3 month group-based weight loss program Women were randomized to video telehealth + telephone support or telephone support	Control: 93.3 (16.0) BMI 34.8 (6.0) Intervention: 91.5 (17.4) BMI 34.5 (6.1)	Control: weight change 0.0 (3.8) Intervention: weight change 0.5 (4.1) (use of DVR)
Hollis et al. 2008	1685 adults, aged 25 or greater with a BMI classification of overweight or obese (BMI= 25-45) AA women n=540	RCT, WLM (Weight Loss Maintenance Trial) a 30-month multi-centered randomized trial. This paper reviews phase I (6-month),	Phase-I intensive weight loss program was offered, providing 20 weekly group weight loss sessions over 6 months.	95.1(15.1) BMI= 35.6(4.9)	Overall mean weight loss 4.1(2.9) kg BMI decrease of 1.5(1.2)

which is an uncontrolled observational study

Kanders et al. 1994	67 AA women age 40-64; classification of obese (BMI= 30-40)	The Black American Lifestyle Intervention (BALI)	10 week weight loss phase; 1,200kcal diet (two meals consumed as meal replacement) 1-hr weekly group session Encouraged increase in activity to 200 min/wk	Mean weight:92.3 +/- 12.3	Mean weight:89.1 +/-12.3 Overall mean weight loss 3.0 +/- 2.4
Karanja et al. 2002	66 AA women	Steps to Soulful Living (STEPS)	26-weekly group meetings, women encouraged to attend weekly supervised exercise class	107 +/- 21 BMI=39 +/- 7	Mean wt loss 3.7 +/- 5.1
Martin et al. 2008	137 AA women aged 18-65 years, with a BMI of 25 or greater and classified as low income (<\$16,000 annual income) Attrition rate at 6-months: n=105 (27%)	RCT, 6 month treatment with 18 month follow up, primary care based setting, two clinic sites.	Participants were randomized to a standard care control group or a tailored intervention group. Intervention group received monthly information on weight loss topics	Mean baseline weight 101.95 +/-19.37 BMI 38.85	9-month follow up Control: 0.61 +/- 3.37 Intervention:- 1.52 +/- 3.72 12-month follow up Control:- 0.16 +/- 3.63 Intervention:- 1.38 +/- 3.69 18-month follow up Control: 0.07 +/- 3.75 Intervention:- 0.49 +/- 3.33

Martin et al. 2006	Participants included 144 obese or overweight African-American women recruited from the office of their primary care physician.	RCT, Two treatment arms; Weight loss intervention Usual care	Two clinics with four physicians participating at each site provided a tailored weight loss intervention monthly, 15-min for six months or usual care	Mean BMI Tailored intervention: 38.09(7.52) Usual care: 35.59(7.72)	Weight change (completers) -2.0kg +2.0kg
McNabb et al. 1993	13 AA women, 120% IBW(BMI > 30), NIDDM from a large urban medical center consented to participate, 10 inner-city AA women were randomly selected from the clinic sample for comparison	18-week PATHWAYS program	Intervention: 12 weekly education sessions followed by 6 weekly reinforcement sessions. Usual Care	Intervention: Mean wt =93.5 +/- 12.73; mean BMI = 35.6 +/- 3.4	Intervention: Week 16: Mean wt = 89.41 +/- 12.68; Mean BMI = 34.1 +/- 3.2 1 year: Mean wt = 89.05 +/- 12.45; Mean BMI = 33.9 +/- 3.4 Comparison group: Gained a mean of 3 lbs (1.4 kg)
Murphy & Williams 2013	223 AA women, age 35-65 years with a BMI of 30 or higher	18 month RCT, Project Take HEED (Healthy Eating and Exercise Decisions)	Women were randomized to the usual care group , consisting of self-referral and/or pcp referral to a RD monthly info sessions Experimental group received culturally adapted standard weight-loss	Control BMI: 37.25 Intervention BMI: 38.06	Control BMI: N/A Intervention BMI: 38.16 BMI measurements were inconclusive

				maintenance program, 24 weekly group sessions	
Nicklas et al. 2003	124 overweight and obese (BMI >25), healthy, nonsmoking, postmenopausal women aged 50-73 years Attrition rate n=76	6-month intervention	Participants met weekly in a group with a RD ; Intervention: hypocaloric diet (250-350 kcal/d deficit), low intensity walking 3 days/wk for 30-45 min.	AA women (n=19) 94 +/- 15 BMI= 35 +/- 5	90 +/- 16 33 +/- 5
Parker et al. 2010	A convenience sample of 35 AA women, age 25-64 was recruited from two churches Final sample n=28 Nonspiritual group: n=9 Spiritual: n=19	LIFE Project, a church-based weight-loss intervention, 10-week intervention	Spiritually based curriculum Nonspiritually based curriculum	Mean weight Nonspiritual: 161.62(16.44) BMI: 28.16(2.78) Spiritual: 216.73(9.82) BMI: 37.71	Nonspiritual: 158.76(15.51) BMI: 27.02(2.31) Spiritual: 215.38(10.09) BMI: 36.59(1.77)
Rickel et al. 2011	234 women (AA n=43), age 50-75 years with BMI >30 Current study data is from 224 participants who self-identified as AA or Caucasian (n=181)	RCT, TOURS (Treatment of Obesity in Underserved Rural Settings), included a 6 month lifestyle intervention followed by a 12 month extended care phase, community based setting	All completed 6 month lifestyle intervention for weight management with weekly group sessions Randomization occurred after initial 6 month (phase I) Intervention 12 months 26 bi-weekly sessions Face-to-face counseling, telephone	AA mean weight 99.9 +/- 16.8 BMI 38.1 +/- 6.2	Weight change in AA after 6 month intervention - 6.8 +/- .80 Phase II Control: mean weight change 1.34 +/- 2.04 Intervention: mean weight change 1.9 +/- 1.12

			counseling, or educational control with mail only contact.		
Risica et al. 2013	363 African American women with a BMI of 22 or greater, age 18-70	RCT, Sister Talk, a culturally tailored weight control cable TV program, 12-week program	Participants were randomized to one of four groups; Interactive TV shows with telephone support, interactive television without telephone support, passive t.v. show without telephone support, passive t.v. show with telephone support, and lastly control		BMI change Intervention: -.06(1.94) Control: .03(1.33)
			Follow-up evaluations were 3 months, 8 months, and 12 months		
Simpson et al. 2004	111 Active duty Army and Navy female service members; 56 AA (attrition rate: 46%, n=26)	Retrospective study;The LE ³ AN Program (Healthy lifestyle, low-intensity exercise, reasonable expectations, emotions that are balanced, healthy attitudes, and healthy well-balanced nutrition)	Phase I: one week day long (9.75 hours) Phase II: weekly follow up visits for 12-months	AA Mean weight: 187.92(24.52)	6 month f/u: 177.92(22.44) (Age, education, and race were not significantly correlated to weight loss)

Walcott-McQuigg et al. 2002	23 AA women, 20% above IBW volunteered, 16 completed WL phase, 10 completed WLM age from 22 to 51 years of age (mean = 38, sd = 9.7).	32-week LEAP (Lifestyle enhancement awareness program) A one-group pre-test/post-test design was used to examine factors associated with WL and WLM in African American women.	Individual 60-min dietitian nutritional counseling session and 32 one-hour weight management and stress sessions. 16 weeks WL topics 16 weeks WLM	WL Phase Mean BMI 36.4	BMI 34.50 32.91 + 6.23
Weerts & Amoran 2011	21 AA women were randomly assigned to experimental or control group, BMI 25 or greater 9 participants had complete monthly data (43%)	RCT, Magnolia project, a government-university-industry partnership, 3-month	Monthly 15-min individual health education counseling session and \$40 supermarket gift card was given to all participants Experimental group; instructed to only use the card for produce Control group; received no instruction on gift card use	Baseline mean weights and BMIs not included in study	Mean weight change at 3-months Experimental: -6.05(3.93) Control: 3.68(4.06)