1-1-2012

Development and initial psychometric evaluation of a culturally- sensitive beliefs about personal weight survey

Stephanie Pickett
Wayne State University,

DEVELOPMENT AND INITIAL PSYCHOMETRIC EVALUATION OF A CULTURALLY- SENSITIVE WEIGHT BELIEF SURVEY

by

STEPHANIE PICKETT

DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

2012

MAJOR: NURSING

Approved By:

_____

Advisor Date

_____

_____

_____

_____

DEDICATION

I dedicate my dissertation to the memory of my Granny, Mrs. Alberta Pickett. Even though you have been gone for many years, remembering you encourages me to press on.

ACKNOWLEDGEMENTS

I acknowledge and thank my friends who are going though the doctoral program with me and those who have finished, Wil, Mary, Nicole, Saran and Merry. We have moaned and groaned together and encouraged each other though this process. I also would like to thank the Sigma Theta Tau, Lambda Chapter, Wayne State University College of Nursing and Graduate School Dissertation Research Support for funding my dissertation study.

I acknowledge and thank my family, Momma, Stacy, Elizabeth, Virginia, Ruby, Blanch, other family members, and life-long friends, Jerry, Cora, Valerie and Cheryl, who have encouraged me, prayed for me, sent me money, treated me to dinner and continued with me through this process. I would like to thank the many people at Wayne State and around the city of Detroit who have encouraged me and been family away from home, especially Felicia, Todd, Father Berry and your congregation.

I acknowledge and thank the members of my dissertation committee. I appreciate Dr. Templin meeting with me weekly to discuss and help me make sense of my data. I appreciate the feedback and time I have received from other members of my committee, Dr. Jarosz, Dr. George, and Dr. Firestone. I also thank Dr. Wilson, who participated as a content expert for my dissertation.

I acknowledge and gratefully thank my dissertation chair, Dr. Peters, for your willingness to help me, consistently providing extensive feedback of my work, freely sharing knowledge and experiences with me, and holding me accountable for my work as a doctoral student. I appreciate you and the time that you have given to me and to my work.

Lastly, and most importantly, I want to thank my God, my Heavenly Father, for giving me the desire, strength and grace to complete this process.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Individuals are recognized as being self-regulating meaning they use mental and behavioral processes to enact their self-conceptions, revise their behavior, or alter the environment in order to produce outcomes that are consistent with their self-perceptions and personal goals (Fiske & Taylor, 1991). Therefore, individuals can make contributions toward their own health and well-being through the adoption of health behaviors that are known to reduce morbidity and mortality. Some of these health behaviors may include consuming a low fat diet and engaging in regular physical exercise (Conner & Norman, 2005). In order to receive health benefit one must regularly engage in health behaviors.

Determinants of engaging in health behaviors to improve health are complex and many times unclear. This is the case with weight management behaviors in African American women. Within the United States (US), African American women have the highest prevalence of overweight and obesity of any demographic group in the US. Over 80 % of African American women are either overweight or obese (Flegal, Carroll, Kit, & Ogden, 2012). Although current data suggest that the overall rate of obesity may be slowing, the prevalence of obesity among African American women continues to increase (Flegal et al., 2012; Flegal, Carroll, Ogden, & Curtin, 2010; Wang et al., 2008).

Reasons for the high prevalence of overweight and obesity among African American women, in part, have been attributed to limited engagement in health behaviors necessary to control weight such as dietary habits and limited physical exercise (Jen, Brogan, Washington, Flack, & Artinian, 2007; Roger et al., 2012; Mensah, Mokdad, Ford, Greenlund, & Croft, 2005; Weiss, 2009). Greater than 90% of African American women do not consume the recommended servings of five or more fruits and vegetables per day (Roger et al., 2012). In addition, 57 % of

African American women are sedentary, getting no leisure time physical activity compared to 39% of Caucasian women (Weiss, 2009). Determinants of engaging in health behaviors for weight management in African American women is multifaceted and not completely understood although some of the barriers to engaging in a healthy diet and regular physical activity have been identified.

Qualitative studies with African American women have revealed barriers to engaging in weight management behaviors including beliefs about physical activity, dietary habits, lack of social support, personal aesthetics, time restraints, and limited financial resources (Airhihenbuwa, Kumanyika, Argurs, & Lowe, 1995; Bopp, Wilcox, Laken, & Butler, 2006; Evans, 2009; Kumanyika, 1992; Richer, Wilcox, Greaney, Henderson, & Ainsworth, 2002; Young, Gittelsohn, Charleston, Felix-Aaron, & Appel, 2001). Studies also have revealed ecological barriers for engaging in weight management behaviors including limited environmental resources regarding access to fruits and vegetables, and communities that are not conducive to regular physical activity (James, 2004; Drewnowski, 2010; Drewnowski & Specter, 2004).

Body image studies have shown that many African American women have positive attitudes toward a heavier body size and a tendency toward underestimation of their body weight which may decrease the desire for weight management (Anderson, Eyler, Galuska, Brown, & Brownson, 2002; Befort, Thomas, Daley, Rhode, & Ahluwalia, 2008; Breitkopf, Littleton, & Berenson, 2007; Flynn & Fitzgibbon; 1998; Fitzgibbon, Blackman, & Avellone, 2000; Schwartz & Brownell, 2004).

Statement of the Problem

Engaging in health behavior has been associated with health beliefs. This relationship has received much support in social cognitive theories (Ajzen, 1991; Bandura, 1992; Becker, 1974; Harvey & Lawson, 2009; Leventhal, Nerenz, & Steele, 1984). However, the relationship of beliefs and behavior has had limited attention with regard to weight. Beliefs about obese people and behavior, weight values and behavior and cultural attitudes toward weight have been examined (Allan, Mayo, & Michel, 1993; Anderson, Eyleth, Gauska, & Brown, 2002; Befort et al., 2009; Blixen, et al., 2006; Boyington et al., 2008). Yet, no published study was found that examined the relationship of African American women's beliefs about their own personal weight and weight management behaviors. One reason for this gap in the literature is the lack of an instrument that measures beliefs about personal weight that is culturally-sensitive and has been developed and validated in African American women.

Purpose of the Study

The purpose of this study, therefore, was to develop a culturally-sensitive instrument that measures beliefs about personal weight among African American women and to perform initial psychometric evaluation of the instrument. The specific aim of this study was addressed by developing a relevant pool of items that were examined for cultural sensitivity then developed into a personal weight belief survey and psychometrically evaluated.

The study produced two main outcomes that were consistent with the study purpose. The first outcome was the development of the beliefs about personal weight survey. The second outcome was the analysis of the performance of the new survey by measuring the relationship of beliefs about personal weight, dietary eating patterns, physical activity, and weight. As a result, the relationship of personal weight beliefs and weight management behaviors were examined for

better understanding that may lead to new areas of intervention for weight management that is specific to African American women.

Significance of the Study to Health Care and Society

The significance of this study for healthcare and society is two-fold. By addressing overweight and obesity in African American women, this study addresses a national health research priority and addresses a major public health concern.

A first, this study addresses an area of disparity that has been identified as a research priority by the National Institutes of Health and the African American Collaborative Obesity Research Network (AACORN) (http://www.ninr.nih.gov; Kumanyika et al., 2005). AACORN is an organization of obesity- related investigators with social and cultural experience in the African American community. AACORN extends the National Institutes of Health obesity research agenda to address areas specific to African Americans. Priorities of AACORN, among others, are to better identify and characterize gaps in African Americans' understanding of weight perceptions and beliefs that are inconsistent with current scientific thinking and to identify points of intervention for weight reduction in those with obesity-related comorbidities (Kumanyika et al., 2005). This current study developed a survey to measure beliefs about personal weight of African American women, which uncovered some beliefs that are inconsistent with current scientific thinking.

Secondly, this study addresses a public health concern. Given that obesity related illnesses contribute to approximately 400,000 deaths annually and 139 billion dollars in healthcare cost in the US, investigating factors that are linked to understanding weight management are vital for reducing morbidity, mortality and healthcare cost (Blixen, Singh, & Thacker, 2006; Finkelstein, Trogdon, Cohen, & Dietz, 2009; Finkelstein, Ruhm, & Kosa, 2005;

Schiemen, Pudrovska, & Eccles, 2007). The beliefs about personal weight survey provides a method for assessing the personal weight beliefs of large numbers of African American women; reveals previously unrecognized relationships with variables that may broaden understanding of weight management in African American women; and reveals specific points of intervention in this high-risk group that may be used to develop more successful interventions to improve weight management behaviors leading to weight reduction with subsequent reduction in weight-related disease burden, loss of productivity and healthcare cost.

Significance of the Study to Nursing

This study is significant to nursing because it advances both the practice and the science of the discipline. This study provides knowledge for practice by creating a tool that may be used in the clinical and research areas to gain knowledge related to personal weight beliefs which contributes to the understanding of the belief /behavior relationship concerning weight and weight management behaviors. This study also will build nursing science by validating the new survey using concepts and conceptual relationships derived from a grand nursing theory of self-care, a nursing theoretical framework. In so doing, the nursing conceptual framework is supported.

Organization of Chapters

The remainder of the study is organized using chapters two through six. Chapter two is the literature review that provides the background for the study. Chapter three discusses the conceptual framework used to derive concepts and conceptual relationships, assumptions, propositional statements and specific aims to guide the development and testing of the new instrument. Chapter four discusses the methodology for the development and testing of the survey. Chapters five and six are study results and discussion of findings, respectively**.**

Chapter 2

Review of the Literature

The review of the literature includes five sections. The initial section will discuss weight and obesity measurement, as well as obesity prevalence and development. The second section will discuss the causes and consequences of obesity. The third section will discuss the major determinants of weight-management behaviors including physical activity, and dietary habits, in African American women. The third section will also include a discussion of body image as a risk factor for excess weight in African American women. The fourth section will discuss the development of the concept of beliefs about personal weight and what is currently known about African American women's beliefs about weight. The fifth section of the review of literature will discuss the process of developing the new survey.

Weight and Obesity Measurement

Obesity is defined as an excess of adiposity or body fat (Caballero, 2007; National Task Force on the Prevention and Treatment of Obesity, 2000). Up to the 1970's, weight categories were defined based on body frame standards derived from Metropolitan Life Insurance height and weight tables. Using these height and weight tables, overweight was defined as 20% or more above the midpoint of the weight range for a medium-frame person (Caballero, 2007; Flynn & Fitzgibbon, 1998; Ogden, Yanovski, Carroll, & Flegal, 2007). The ideal body weight based on body frame standards was replaced in the mid 1980's with body mass index (BMI) (Caballero, 2007). According to the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), body mass index (BMI) is a measure of body weight and is calculated by weight in kilograms divided by height in meters squared. Normal weight is a BMI of 18-24.9 kg/m^2; overweight is a BMI of 25- 29.9 kg/m^2; and obese is a BMI of $\geq$ 30 kg/m^2 (Caballero, 2007;

National Task Force on the Prevention and Treatment of Obesity, 2000). Categories of obesity include grade 1 (BMI, 30 < 35), grade 2 (BMI, 35< 40), and grade 3 (BMI $\geq$ 40) (Flegal, Carroll, Ogden, & Curtin, 2010).

The established obesity cutoff points have been questioned for African American women. Recent investigations regarding obesity classification in ethnic populations suggest that the current BMI cutoff point for obesity of 30 kg/m^2 established by the National Institutes of Health may be too high for African American women (Rahman & Berensen, 2010). Based on the World Health Organization's cut point of 35% or greater body fat for obesity, studies have shown that 35% body fat corresponds to at or above a BMI of 28.4 kg/m^2 (Evans et al., 2006), and 28.7 kg/m^2 in African America women (Rahman & Berensen, 2010). These findings suggest that race-specific BMI cutoff points may identify obesity more accurately (Rahman & Berensen, 2010).

A measure of adiposity is waist circumference. The National Heart Lung and Blood Institute's North American Association for the Study of Obesity committee recommends waist girth as a measure of central obesity. Central obesity is defined as a waist circumference of $\geq$ 88 cm (35 inches) for women (Beydoun & Wang, 2009). Data shows that central obesity is a better predictor of chronic disease compared to overall adiposity measured by BMI (Beydoun & Wang, 2009; Despres, 2001). Findings from a study that examined visceral fat using computer tomography on individuals with the same amount of overall body fat showed that individuals with a high accumulation of visceral fat had more severe metabolic disturbances including dyslipidemia, glucose intolerance, hyperinsulimia, and a prothrombotic and inflammatory metabolic risk factor profile including C-reactive protein, cytokines, plasminogen activator inhibitor-1 and fibrinogen (Despres, 2001). Measuring waist circumference is a way to identify

individuals with excess visceral adipose tissue that places them at high risk for metabolic disturbances.

Obesity Prevalence in African American Women

The prevalence of obesity in adults is an escalating public health concern. According to the World Health Organization adult obesity is projected to increase from an estimated 400 million in 2005 to 800 million worldwide by 2015 (Withrow & Alter, 2010). In the US, adult obesity has progressively increased over the past 40 years and is expected to continue increasing over the next 40 years in the general population. The current overall US prevalence of obesity from the National Health and Nutrition Examination Survey (NHANES) 2007-2008, is 33.8% (95% confidence interval [CI], 31.6% - 36.0%) (Flegal, Carroll, Ogden, & Curtin, 2010; Montani, Antic, Yang, & Dulloo, 2002; Wang, Beydoun, Liaug, Caballero, & Kumanyika, 2008). However, the current prevalence of overweight and obesity is highest among African American women. According to the NHANES 2007-2008, the prevalence of overweight and obesity, grade 1, among African American women > 20 years of age is approximately 49.6% compared to 33% of Caucasian women and 43% of Hispanic women. The prevalence of grade 2 obesity (BMI $\geq$ 35 to 39) in African American women is approximately 27.9 % compared to 16.6% of Caucasian women, and 18.9% of Hispanic women. The prevalence of grade 3 obesity (BMI $\geq$ 40) of African American women is approximately 14.2% compared to 6.4% of Caucasian women, and 7.0% in Hispanic women. At each level of obesity, African American women have the highest prevalence compared to Caucasian and Hispanic women in the US (Flegal, Carroll, Ogden, & Curtin, 2010).

Obesity Development

McTigue, Garrett, and Popkin (2002) examined the history of obesity development over 20 years. The study followed a nationally representative sample of 9,179 adult Americans including 1,417 African American women for over 20 years beginning at age 17. The participants were followed to assess their age at the time their BMI reached the obesity category.

The results showed that on average, African American women reached overweight by age 26, Hispanic women at age 28, and Caucasian women at age 35. By age 39, the average BMI for African American women was in the obese category (McTigue et al., 2002). African American women reached obesity 2.1 times faster than Caucasian women. Sixty-six percent of African American women who were normal weight in their early 20's by age 35-37 were obese (McTigue et al., 2002). A logistic regression model for risk of obesity at 35 to 37 years old was developed using baseline BMI, race/ethnicity and sex. African Americans had the highest odds for obesity onset by age 35 to 37 with an odds ratio of 2.3 [CI, 1.9 to 2.8] compared to an odds ratio of 1.6 [CI 1.3 to 1.9] in Caucasian participants (McTigue et al., 2002).

Additionally, women 25-34 years old are twice as likely to gain weight over a ten year period as men. African American women are 40% more likely to have a major weight gain over a ten year period, gaining 15 to 61% more weight than Caucasian women (Kumanyika 1987; Williamson, Kahn, Remington, & Anda, 1990). This data suggest that obesity prevention efforts should focus on young African American women in order to decrease weight gain over time.

Causes of Obesity

Multiple causes of overweight and obesity exist. A brief review of the known causes or factors that influence excess weight are presented. The category of causes for overweight and

obesity are genetic or biological, medical, behavioral environmental, demographic and psychosocial.

Genetic or biological causes. A genetic cause of excess weight is a rare single gene causing deficiency of the hormone leptin which influences body mass. Leptin is a hormone expressed by adipose tissue that regulates energy expenditure (Wilding, 2001). Another genetic cause is the *thrifty* gene. The thrifty gene hypothesis suggests that an evolutionary set of genes promoted the storage of energy during food shortages. As a result, in today's setting of unlimited food supply, these genes promote obesity (Sievo, Wells, & Cizza, 2009). Having parents and/or siblings who are overweight and obese is associated with being obese as well (Davis, Rovi, & Johnson, 2005).

Medical causes. Medical conditions may cause weight gain including Hypothyroidism, Cushing's syndrome, and Polycystic Ovarian Syndrome (PCOS). Hypothyroidism occurs when the thyroid gland under produces thyroid hormone which slows the metabolism causing weight gain (Biondi, 2010). Cushing's syndrome occurs when the adrenal gland over produces cortical or when one takes high levels of prednisone (Kelly, 2009). PCOS is associated with an over production of androgen which causes a characteristic fat pattern of upper body obesity (Pasquali, Gambineri, & Pagotto, 2006). Certain medications also may cause weight gain including certain antidepressants, anti-seizure medication, and corticosteroids (Ben-Menachem, 2007; Pijl & Meinders, 1996; Schwartz, Nihalani, Jinal, Virk, & Jones, 2004).

Behavioral causes. Behaviors that may lead to obesity include infant overfeeding, food choice, physical inactivity, binge eating, sleep deprivation, excessive gestational weight gain, and smoking cessation. Infant overfeeding may lead to increased adipose cells which may contribute to weight control issues later in life (McGee & Hale, 1980). Food choice may lead to

excess weight. Choosing foods that are low cost, energy dense, high in added sugar and fat and consumption of fewer fruits and vegetables are causes of obesity (Drewnowski, 2004). Food choice is affected by income and food environment (Drewnowski, 2004). Individuals of lower social class are likely to consume less healthy foods because healthy foods cost more (Ball, Mishra, & Crawford, 2003; Drewnowski, 2004). The rise in obesity rates in the US in the last twenty years correlate with increased consumption of refined grains, sugars and fats. Competition in the processed food industry has led to increased serving sizes and sharp price differences between processed energy dense verses non-processed less energy dense foods (Dorfman & Wallack, 2007). It is also suggested that fast foods may be an independent factor in rising weight gain due to the energy density and overall caloric count of fast foods (Dorfman & Wallack, 2007). Physical inactivity or being sedentary may lead to excess weight by decreasing the amount of calories burned (Lee, Djousse, Sesso, Wang, & Buring, 2010). Being sedentary is associated with television watching and computer work (Ball et al., 2003). Two percent of obese people have binge eating disorder (BED) (Yanovski, 2003). Binge eating refers to eating large amounts of food over a short period with the feeling of being out of control (Grilo, 2002).

Sleep deprivation is associated with being overweight and obese. Habitual sleep duration of less than seven hours per night is associated with excess weight (Buxton & Marcelli, 2010). Post-partum weight retention is associated with excessive gestational weight gain. While women who remain within the recommended limits of weight gain during pregnancy tend to retain a minimal amount of their gestational weight, minority women are more at risk for excessive post-partum weight retention (Gore, Brown, & West, 2003; Siega-Riz et al., 2009). Smoking cessation is associated with weight gain as nicotine increases the metabolic rate and suppresses

the appetite, while smoking cessation is associated with increased food intake (Ball et al., 2003; Levine, Marcus, & Perkins, 2003).

Environmental causes. Environmental causes of excess weight are disadvantaged communities which include physical environment, food resources, and advertisement. Disadvantaged communities lack resources to support physical activity and healthy diets (Robert & Reither, 2004). Disadvantaged neighborhoods have barriers to physical activity that involves personal safety issues ranging from lack of street lights to insufficient police protection due to high crime (Robert & Reither, 2004). The walkability of a neighborhood leads to lower weight (Brown et al., 2009). Adolescents who reported having convenient physical fitness facilities were 2% less likely to be overweight and 5% less likely to be obese (Nelson & Woods, 2009). Many inner-city neighborhoods are considered disadvantaged. As a result, many inner-city residents are more overweight, less physically active and less healthy overall (Lopez & Hynes, 2006).

Disadvantaged neighborhoods have fewer large supermarkets which decreases the opportunity to purchase healthier foods like fruits and vegetables (Robert & Reither, 2004). Unfortunately, disadvantaged neighborhoods have more than twice the number of fast food restaurants than communities that are not disadvantaged or those with higher socioeconomic status (Reidpath, Burns, Gerrad, Mahoney, & Townsend, 2002). It is noted that with every additional supermarket in a poor neighborhood, consumption of fruits and vegetables increases 32% (Morland, Wing, & Diez-Rouz, 2002; Robert & Reither, 2004).

The advertising industry spends millions of dollars on advertising high-fat, high sugar, and high calorie foods. In addition, celebrities and leading sports stars encourage people to drink

soft drinks and eat fast food. This advertising influences many people to consume unhealthy food (Dorfman & Wallack, 2007).

Demographic causes. The demographic causes of excess weight include socioeconomic status (SES), race, education, age, gender, and marital status. Individuals with low SES are less likely to consume healthy foods (low fat, low salt food) (Ball, Misha, & Crawford, 2003). Education is noted to be negatively associated with BMI (Robert & Reither, 2004). Aging is associated with increasing adiposity and decreasing muscle mass which may slow metabolism causing weight gain (Kuk, Saunders, Davidson, & Ross, 2009). Menopause for women may also be associated with an increase in body fat that is associated with hormonal changes (Lovejoy, 2003). Being married is a risk factor for weight gain for women which appear to be associated with a change in social roles (Ball et al., 2003; Sobal, Rauschenbach, & Frangillo, 2003).

Psychosocial causes. Psychosocial factors may influence weight. Cultural norms may impact one's weight. Some cultures do not stigmatize obesity or encourage weight loss and healthy behaviors leading to weight management (Robert & Reither, 2004). African American women have a more tolerant attitude toward larger bodies as larger body size may be considered a standard of beauty from West African countries where most African Americans have ancestry (Alleyne & LaPoint, 2004). Tolerance for a larger body may decrease the desire to practice behaviors leading to weight reduction for aesthetic reasons (Befort, Thomas, Daley, Rhode, & Ahluwalia, 2008; Flynn & Fitzgibbon, 1998; Robert & Reither, 2004). In one study with low SES African American women, 33% reported family and friends disapprove of their spending time being physically active, and 45% reported never being encouraged to be physically active by their healthcare provider (Felton, Boyd, Bartoces, & Tavakoli, 2002).

Chronic stress also may influence weight. Overeating may be seen as a mechanism to cope with multiple chronic stressors (Lovejoy, 2001). Chronic stressors such as financial stress and stressful life events are predictors of higher BMIs (Robert & Reigher, 2004).

Consequences of Obesity for African American Women

Morbidity. Excess weight places African American women at risk for obesity related illness. Obesity related illnesses include cardiovascular disease (CVD), hypertension (HTN), type 2 diabetes, and certain cancers including endometrial, and post menopausal breast, kidney, and colon. Obesity related illnesses also include sleep apnea-sleep disordered breathing, musculoskeletal disorders, and gallbladder disease (Finkelstein, Rohm, & Kola, 2005; Gore, Brown, & West, 2003; Poirier et al., 2006; Siega-Riz et al., 2009). Because CVD is the principal cause of death among women accounting for 1 in 2.8 deaths in females, the focus of discussion on obesity related comorbidities will center on major CVD risks including coronary artery disease (CAD), dyslipidemia, metabolic syndrome, type 2 diabetes, and hypertension (Lloyd-Jones et al., 2010; Mosca et al., 2004).

The Nurses' Health Study (Manson et al., 1990) examines the relationship between obesity and CVD among women. The Nurses' Health Study collected self-reported weight measurements of 115,195 female registered nurses 30-55 years old over sixteen years. CVD was four times higher in obese women compared to lean women. Seventy percent of coronary events were attributed to obesity in the heaviest groups of women (Rashid, Fuentes, Touchon, & Wehner, 2003). Similarly, the Cancer Prevention Study II (Keil et al., 1993) examined obesity as a risk factor for coronary heart disease (CHD) in over 1 million adults in the United States. This study included among others 9,147 African American females who were healthy, non-smokers at baseline. A 14 year follow-up revealed that African American women had a 20-30%

increased risk of mortality from CHD at a BMI > 35 while the general population of females in the study had a significantly increased risk of death from CVD at BMI > 25. Similarly, Fontaine, Redden, Wang, Westfall, and Allison (2003), who examined years of life lost due to obesity, found a reduction in life expectancy for African American women with a BMI of 37 to 38 kg/m^2 and among African American women with BMIs less than 18.5 kg/m^2. These findings suggest that the risk of mortality occurs at a higher BMI in African American women than Caucasian women.

Adipose tissue. Obesity is an independent risk factor for CVD. Adipose tissue is an active endocrine organ that synthesizes and releases compounds into the bloodstream that may influence cardiovascular homeostasis (Poirier et al., 2006). Of particular importance to CVD, is interleukin-6 (IL-6) which is a pro-inflammatory cytokine that is released from adipose tissue and modulates C-reactive protein (CRP) production in the liver. CRP is a marker for an inflammatory state that may trigger an acute coronary syndrome (Poirier et al., 2006).

Cardiac hemodynamics. Obesity also produces increased cardiac output that is caused in part by increased metabolic demand due to excess body weight. This means for any level of activity the cardiac workload is greater for individuals with excess weight (Poirier et al., 2006). In obesity, increased filling pressures and blood volume of the left ventricle may cause left ventricular chamber dilation. This chamber dilation may lead to increased myocardial mass leading to left ventricular hypertrophy (Poirier et al., 2006). Obesity may also lead to excess fat deposits around key organs that may cause physical compression. This compression may cause secretion of compounds that act locally on surrounding tissue. Excess fat may also accumulate in non-adipose cells leading to cell dysfunction or cell death (Poirier et al., 2006). This fat

accumulation may occur in the heart causing restrictive cardiomyopathy or heart cell lipotoxicity causing cell death (Poirier et al., 2006).

Coronary artery disease. Excess weight is a risk factor for coronary artery disease (CAD). CAD includes deposits of fatty streaks within the intima of large muscular arteries (Poirier et al., 2006). Postmortem examination of individuals 15- 34 years old reveal that BMI is associated with fatty streaks, and fibrous plaques, calcified plaque and ulceration in the right coronary artery and abdominal aorta. The extent of fatty streaks and plague were found to be associated with obesity and abdominal panniculus size which reinforces that central obesity is more important than total fat as a risk factor for CAD. Abdominal panniculus is lower abdominal subcutaneous fat (Poirier et al., 2006). For women, the deposition of central fat after menopause in part may account for the increase in coronary heart disease after menopause. Other studies including Framingham Heart Study (Hubert, Feinleib, & McNamara, 1983) and the Nurses' Health Study (Mason et al., 1990) have supported that obesity is an independent predictor of clinical coronary heart disease (Poirier et al., 2006).

Dyslipidemia. Excess weight is associated with dyslipidemia. Dyslipidemia is defined as an abnormal lipid panel including high total cholesterol, low-density lipoproteins (LDL-cholesterol), triglycerides and low levels of high-density lipoproteins (HDL-cholesterol). Approximately half of women in the US have elevated cholesterol (Weiss, 2009). The CARDIA study showed a relationship between weight and dyslipidemia in African American women (Norman, Bild, Lewis, Liu, & West, 2003). The study sample included 3,325 women and men 18-30 years old in different regions of the US. The participants were followed over a 10 year period with the final sample including 876 African American women. At baseline overweight African American women had an average weight that was 3.4 kg heavier than overweight white

women. African American women had higher LDL-cholesterol and lower HDL-cholesterol compared to Caucasian women. The mean weight increase for African American women over 10 years was 11.8 kg compared to 7.2 kg for Caucasian women ($p < 0.0001$). Also, the data showed the odds of an adverse change in metabolic risk factors including lipids was 3 to 5.1 times greater for African American women who gained more than 10% of their starting weight over 10 years compared to African American women who gained less than 10% (Norman et al., 2003).

Metabolic syndrome. African American women are at increased risk of metabolic syndrome leading to type 2 diabetes mellitus. The metabolic syndrome is characterized by CVD risk factors including abdominal obesity, dysplidemia, elevated blood pressure, insulin resistance, prothrombotic state, and a pro-inflammatory state (Smith et al., 2005). According to the National Cholesterol Education Program Adult Treatment Panel III metabolic syndrome is defined as three of the following for women: waist circumference of > 88 cm or 35 inches, serum triglycerides > 150mg/dL, HDL cholesterol level < 50, blood pressure > 130/85 mmHg, and fasting glucose > 110 mg/dL (Smith et al., 2005). Approximately, 23.7% of the American population have metabolic syndrome with African American women having a 57% higher prevalence than African American men. Metabolic syndrome is a precursor for type 2 diabetes mellitus.

Diabetes mellitus. According to National Health and Nutrition Examination Survey 2003- 2006, 10.4 % of American women $\geq$ 20 years old have diabetes (Lloyd-Jones et al., 2010). African American women have a 1.8 times higher prevalence of diabetes and a mortality rate of 41.6 per 100,000 persons compared to 17.6 per 100,000 persons among Caucasian women. CVD is the leading cause of death for individuals with diabetes (Lloyd-Jones et al., 2010).

Hypertension. Excess weight is a risk factor for hypertension. Hypertension is defined as a systolic blood pressure $\geq$ 140 mmHg and diastolic blood pressure $\geq$ 90 mmHg (Chobanian et al., 2003). Hypertension is six times more frequent in obese individuals than lean individuals. Weight gain of 10 kg is associated with 3.0 mmHg higher systolic and 2.3 mmHg higher diastolic blood pressure (Poirier et al., 2006). Among women, the prevalence of hypertension at a BMI of < 25 kg/m^2 is 15% while the prevalence of hypertension at a BMI of $\geq$ 30 kg/m^2 is 38%. Obesity is linked to hypertension by cardiac output and systemic vascular resistance. Increased oxygen demand from excess adipose tissue requires increased cardiac output, increased blood volume and increased stroke volume (blood pumped with each heart beat). The increased blood flow may be associated with normal or increased peripheral vascular resistance (Poirier et al., 2006).

Age, BMI and education are significant factors for hypertension risk (Roger et al., 2012) Consequently, African Americans are diagnosed with hypertension at younger ages, compared to Caucasians, are less likely to have health insurance and are less likely to have graduated from high school (Hertz, Unger, Cornell, & Saunders, 2005; Roger et al., 2012).

The prevalence of hypertension among African American women in the US is 44% compared to 28 % in Caucasian women. Although the hypertension prevalence is nearly twice as high among African American women compared to Caucasians, trend data show significant improvement in the awareness, treatment and control of hypertension among African Americans as a group overtime between 1988-1994 and 1999-2008 (Egan, Zhao, & Axon, 2010; Lloyd-Jones et al., 2010; Rogers et al., 2012).

Blood pressure is noted to be higher among those with central or abdominal obesity. The relationship of hypertension and visceral or abdominal adiposity was investigated among 1582

adults (Foy et al., 2008). The sample included 58.5% women. Approximately, 18% were African American women. Blood pressure was measured with a mercury manometer using a standardized technique and visceral fat was measured using computer tomography. BMI was calculated using weight/height (kg/m^2). The mean age of the entire sample was 41.1 (13.8) and mean BMI was 28.7 kg/m^2 (*SD* = 6.0). Results showed that visceral adiposity was significantly associated with an increased odds of hypertension for women (OR = 1.98, (1.58, 2.47), $p < 0.001$) compared to men (OR= 1.57, (1.30, 1.89), $p < 0.001$). A similar relationship was revealed with African American women, as visceral adiposity was significantly associated with increased odds of hypertension in African American women compared to Hispanic American women (OR = 3.67, (2.14, 4.70), $p <0.001$). Overall, visceral adiposity was associated with hypertension independent of total body adiposity. The researchers suggest that the relationship between visceral fat and hypertension may be moderated by lifestyle behaviors such as dietary patterns, and physical activity among other variables (Foy et al., 2008).

Mortality. The increased mortality from obesity is mainly due to CVD. A meta-analysis of 26 studies showed BMI $\geq$ 30 was associated with relative risk of mortality from CVD to be 1.48 times higher compared to the normal weight category (Ogden et al., 2007).

Mortality risk from excess weight may be examined using years of life lost. Years of life lost is calculated as the difference between the number of years one would be expected to live if not obese and the number of years expected to live if obese (Fontaine, Redden, Wang, Westfall, & Allison, 2003). Years of life lost were calculated using data from NHANES I, II, III, U.S. Life Table and NHANES Mortality Study among 18-85 year olds. The findings showed that among older African American women, being overweight or moderately obese was generally not associated with years of life lost. However, among younger women with severe levels of obesity

including BMIs of 37 to 38, they had a maximum of 5 years of life lost. Conversely, years of life lost was noted among African American women with BMIs less than 18.5. BMI's at the higher and lower extremes appear to increase years of life lost in African American women (Fontaine et al., 2003). More recent analysis of the relationship between obesity and mortality among African American women also suggest an increased risk of mortality among lower BMI's that may be attributed to illness related weight loss (Boggs, Rosenberg, Cozier, Wise, & Coogan, 2011). However, unlike findings from Fontaine and colleagues (2003), an increased risk of mortality was seen in BMIs at 25 and higher among African American women (Boggs et al., 2011).

Healthcare cost. The rise in body weight has been associated with an increase in medical cost. Medical cost related to obesity accounted for as much as $147 billion dollars per year (Finkelstein, Trogdon, Cohen, & Dietz, 2009; Ogden et al., 2007). Obese adults incur annual medical expenditures that are 42 % higher than a normal weight individual (Finkelstein et al., 2009). Medical cost attributed to obesity in the US is between 5% - 10% of annual health care expenditures (Tsal, Williamson, & Glick, 2011). Medical spending per capita for the obese was $1,429 greater than spending for normal weight people in 2006 (Finkelstein, 2009).

The number of physician office visits from obese adults increased 88% from1988-1994 (Finkelstein et al., 2005). Obese adults have 38% more visits to primary care physicians while moderate to severely obese individuals have 34% to 74% respectively more inpatient hospital days than normal weight individuals (Finkelstein et al., 2005). It is also reported that obese individuals have 1.84 times the annual pharmaceutical dispenses compared to a normal weight individual. Much of these dispenses include medication to treat diabetes and other cardiovascular diseases (Finkelstein et al., 2005).

Employment. Obesity influences type of employment especially in woman. Obese women work in low paying occupations and are many times excluded from managerial positions (Finkelstein et al., 2005). Obese women are 2.5 times more likely to report long term unemployment, make less than their normal weight counterparts, and experience higher rates of poverty. The effect of weight on earnings among women may differ by race. Rate of earnings was noted to differ among obese white women compared to normal weight white women. This difference was not observed among African American women as no difference was noted in earnings among obese African American women compared to normal weight African American women (Finkelstein et al., 2005).

Obesity cost extends to employee absenteeism. Obese individuals are 1.61 to 1.74 times more likely to be absent from work when compared to their lean co-workers. Obesity attributed absenteeism cost employers 2.95 billion dollars in 1998 (Finkelstein et al., 2005).

In summary, there are many consequences of excess weight that affect physical and financial health. Excess weight in African American women increases CVD risk factors including CAD, dyslipidemia, metabolic syndrome, diabetes, type 2 and hypertension. Consequently, CVD is the primary cause of death in women. Obesity increases mortality in some groups. However, mortality directly related to obesity in African American women appears to occur more so with those who are younger and morbidly obese. Excess weight affects health care cost exhibited by increased numbers of primary care visits, longer in-patient hospital stays, and more medications dispensed compared to normal weight individuals. Excess weight also may adversely affect quality of employment for women leading to greater rates of poverty.

This data suggest that weight management behavior is needed to prevent and treat overweight and obesity to reduce cardiovascular disease risk factors, reduce healthcare cost and improve quality of life for African American women.

Determinants of Weight Management Behaviors

The high prevalence of weight gain in African American women may be partially explained by the limited likelihood of weight loss due to physical inactivity, dietary patterns, and a tolerant attitude toward a heavier body (Buxton & Marcelli, 2010; Kumanyika, Morssink, & Agurs, 1992).

Physical activity and weight. Physical activity is defined as any bodily movement that results in energy expenditure. Exercise is a subset of physical activity that is planned, structured and repetitive and has an objective to improve or maintain physical fitness (Caspersen, Powell, & Christenson, 1985). The Center for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) developed guidelines for physical activity for adults 18-65 years old (Haskell et al., 2007). These physical activity guidelines include moderate and vigorous activity. Recommendations include moderate physical intensity aerobic physical activity for a minimum of 30 minutes for five days each week or vigorous intensity activity for at least 20 minutes three days each week. An example of moderate intensity aerobic activity is briskly walking fast enough to accelerate the heart rate. An example of vigorous intensity activity is jogging, which causes a substantial increase in heart rate. The physical activity recommendations also include activity that maintains or increases muscular strength and endurance a minimum of two days each week. An example of strength training includes a progressive weight training program, weight bearing calisthenics, stair climbing, and resistance exercises that use the major muscle groups (Haskell et al., 2007). It is noted that the

CDC/ACSM recommendations may not prevent weight gain in some people. Therefore, the International Association for the Study of Obesity also recommends additional physical activity if weight gain is not prevented after 30 minutes of daily moderate intensity physical activity (Blair, LaMonte & Nichaman, 2004). Based on the National Health Interview Survey, 2010 (NHIS) ~89 % of African American women did not meet the CDC/ACSM physical activity recommendations compared to ~ 81% of Caucasian women (Roger et al., 2012).

Data also reveals that more than half of African American women are sedentary, getting no leisure time physical activity compared to 39% of Caucasian women (Weiss, 2009). According to the CDC, physical inactivity is a risk factor for CVD that is similar to dyslipidemia, hypertension or smoking (Weiss, 2009). The relative risk for CVD for those who are physically inactive is 1.5 to 2.4% (Weiss, 2009).

Determinants of Physical Activity in African American Women

Bopp et al. (2006) examined factors that influenced physical activity in African American women using phone interviews. Participants were randomly selected from membership rosters from 20 African American churches in South Carolina. The sample included 407 women with mean age of 53.53 (*SD* =15.63) and mean BMI 29.53 (*SD* = 6.09). Participants were interviewed by phone about their physical activity and classified into categories of moderate to vigorous physical activity based on physical activity recommendations from the CDC/ACSM that include moderate, vigorous and strength training exercising. Results showed that women who met the moderate physical activity walking recommendations were younger, employed, had fewer chronic health conditions, consumed more servings of fruits and vegetables per day, had a more positive rating of health, and higher physical activity self efficacy. Younger age and greater self-efficacy accounted for 12% of the variance in physical activity. Women who met the

vigorous physical activity recommendations reported positive health rating, currently attempting to lose weight and having a physical activity program at their church. Self-efficacy alone accounted for 11% of the variance in physical activity among the vigorously exercising group. Enjoyment, attempting to lose weight, and age accounted for 23.4% of the variance in strength training. Results from this study indicate that wanting to lose weight, believing that one is able to lose weight and having access to a physical activity program influences engagement in physical activity.

Richter, Wilcox, Greaney, Henderson, and Ainsworth (2002) examined factors that influenced physical activity in African American women using focus groups. The sample included 42 African American women, 19-51 years old, living in the southeastern part of the US. The majority of the participants was single, high school graduates, defined health as good to excellent, was employed and reported participating in moderate physical activities. The focus group revealed that there are categories of enablers and barriers to physical activity among African American women. The enablers were social support and home resources. Barriers were financial, physical environment and working conditions. Social support from friends and family was important for encouragement. Caring for children was seen as some degree of physical activity. Home resources of a backyard was important for playing games, having a place for home exercise equipment, and having a microwave to minimize cooking time to have more time for physical activities. The cost of childcare, cost of joining a fitness center, or lack of transportation to a fitness center was a barrier to physical activity. Physical barriers included weather conditions (hot, cold, raining), lack of sidewalks which limit safety when walking, concern for safety due to living in a high crime neighborhood, and fear of neighborhood dogs. Some women considered their working situations to be enough physical activity so they believed

they had no need for leisure physical activity. The women reported that they believed that engaging in physical activity was linked to motivation rather than cultural beliefs or attitudes.

Young et al., (2001) examined what motivates African American women to engage in regular physical activity using focus groups. The sample included African American women over 40 years of age living in the northeastern part of the US. The sample included 34 participants who reported exercising 30 minutes two times per week. Results revealed that motivators for participating in physical activity were health concerns, building stamina, not being able to wear clothes, and doctor recommendations. Motivators for maintaining physical activity centered on a desire for good health, stamina and stress reduction. Participants were motivated to engage in physical activity to maintain their weight, by encouragement from others and having an exercise partner. Reasons for not exercising were time and health constraints, childcare responsibilities, and not being motivated to exercise. Sedentary participants thought that having an exercise buddy, joining a group, and enjoying the activity would motivate them to become physically active.

Evans (2009) examined exercise beliefs of African American women living in a rural southern town in the US. The sample included 20 African American women 40-60 years of age with at least one risk factor for heart disease. The data was collected by interview. Mean age of participant was 48.9 (SD = 18), the majority were high school graduates, overweight or obese, with mean BMI of 34.2. The participant's belief that exercise may benefit their heart was mixed. Some women believed that exercise was beneficial others believed exercise would damage the heart function. The participants believed that barriers to exercise were having hypertension, painful conditions like arthritis, and fatigue. Other barriers were having multiple responsibilities, lack of motivation, lack of an exercise partner, weather (heat, rain, high humidity), and

neighborhood dogs. Factors believed to encourage physical activity were an exercise partner, encouragement from family and friends, weight loss and weight loss maintenance, a desire to live longer, stress reduction, and improved sleep. Others stated having a health crisis (heart attack or stroke) would encourage them to be physically active. Some thought that they received enough exercise while working so leisure time physical activity was not necessary. Most of these women had similar views about physical activity as women in other parts of the US. However some of their beliefs indicated a lack of knowledge concerning the benefit of physical activity.

Boyington et al., (2008) examined the cultural attitudes and perceptions toward physical activity with a sample of 12 overweight African American adolescents 12-18 years old using focus groups. The adolescents reported that leisure physical activity was not valued in their culture however they preferred group physical activities. Barriers to participating in physical activity were limited time, and access to preferred activities due to weight and blood pressure requirements at school, preferring not to perspire, having hair look unkempt, and living in unsafe neighborhoods prohibited outdoor activities.

Duncan, Anton, Newton, and Perri (2003) examined self-perception of weight, and physical fitness compared to physiological measures of weight, BMI and aerobic capacity. Thirty-five African Americans and 155 Caucasian women report no structured physical activity. Mean age was 49.6 (*SD* = 8.5), mean BMI for African American women was 30.3 (*SD* = 5.3) and Caucasian women was 27.2 (*SD* = 4.5). Single items from a perception of health questionnaire were used to assess perception of weight, physical shape, and appearance, physical fitness, and eating habits. Physical fitness was empirically assessed by measuring maximal oxygen consumption after a treadmill exercise. Results revealed that weight and BMI were

significantly different between the two groups with both being higher among the African American women. There was no difference between the groups in self–perception of, weight, and physical fitness. However, the African American women's measured physical fitness was significantly lower compared to the Caucasian women (p = 0.002). The results indicate that African American women have subjective perceptions of their weight and physical fitness that are not consistent with physical measurement (Duncan et al., 2003). The results suggest that African American women have positive attitudes toward a heavier body weight and have cultural beliefs that may contribute to a greater prevalence of physical inactivity. According to Duncan et al., (2003), previous data show that African Americans are less likely to believe physical inactivity contributes to cardiovascular disease compared to Caucasians.

In summary, African American women have the highest prevalence of overweight and obesity in the US. Yet, more than half of African American women are sedentary, which increases their risk for weight gain, CVD and other illnesses. Regular moderate to vigorous physical activity is recommended to reduce the risk of weight gain, morbidity and mortality. Data shows that African American women who met the CDC/ACSM recommendations for regular physical activity were younger, employed, had fewer chronic illnesses, consumed a healthier diet, and had higher rating of health and higher self-efficacy for physical activity (Bopp et al., 2006).

The majority of the studies investigating determinants of physical activity in African American females were qualitative studies using focus groups. These studies used small samples ranging from 12- 42 participants and samples were largely middle-aged with ages ranging from 12-60. These studies included samples from various regions of the US, and various SES. Only one study using phone interviews had a relatively large sample size of 407 middle-aged women.

The determinants of physical activity were pretty consistent. Enablers of physical activity were having an exercise partner, encouragement from family, friends and doctor, improved health, stamina, and sleep, weight reduction, and access to resources e.g. back yard, microwave to decrease time spent cooking. Some believed that a health crisis was a good time to begin exercising. Barriers to physical activity were limited resources of money and time, transportation and access to a fitness center, not having an exercise partner, lack of neighborhood safety (crime, neighborhood dogs, and no sidewalks), weather and lack of motivation. Some participants believed that their work gave them sufficient physical activity which is consistent with the sample of adolescents who reported that leisure time physical activity is not valued in African American culture (Boyington et al., 2008).

Only one study examined determinants of physical activity in African American women using quantitative methods (Duncan et al., 2003). The study examined perceptions of weight and physical fitness compared with empirical testing of physical fitness in a sample with 35 African American women. This study used a single question each to examine perception of weight and physical fitness. The study findings were able to show a negative relationship between perception of weight, physical fitness and actual measurement of weight and physical fitness. These findings suggest that beliefs about weight and physical fitness may be a barrier to physical activity (Duncan et al., 2003). This study underscores the need for the development of a culturally sensitive instrument to examine weight beliefs and the relationship of these beliefs to behavior.

Eating Behavior Patterns and Weight

Drewnowski and Specter (2004) examined the relationship between obesity and diet quality. Excess weight has been associated with a diet high in energy-dense foods. The energy-

density of foods is thought to be a function of their water content. Energy dilute foods have high water content such as fruits and vegetables which are considered bulky foods that promote a feeling of fullness or satiety. Foods with high water content allow one to feel full on fewer calories. On the other hand, energy dense foods have low water content and may contain fat, sugar and starch such as potato chips, chocolate, and, doughnuts. These foods are generally cheaper and have a stable shelf life compared to more perishable foods such as meats, fresh fruits and vegetables. In experimental studies energy dense foods have been associated with diminished satiety (Drewnowski, 2010; Drewnowski & Specter, 2004).

Diet quality may be affected by socioeconomic status. Those with higher incomes and higher educational levels tend to have greater dietary variety and higher consumption of fruits and vegetables as consumption of fresh produce is generally associated with higher food cost (Drewnowski & Specter, 2004; Monsivais & Drewnowski, 2009). Those with lower incomes report that price is the deciding factor in making food choices (Hargreaves, Schludt, & Buchowski, 2002). This data suggest that excess weight may be associated with consumption of energy dense inexpensive food.

Determinants of Dietary Habits of African American Women

The American Heart Association (AHA) recommends healthy dietary habits in order to maintain a healthy weight and reduce risk of CVD. Healthy dietary habits include consumption of a diet rich in fruits and vegetables, whole grains, high-fiber, and fish. The AHA recommends that fat intake should be limited by choosing lean meats or vegetables alternatives such as beans, skim or low fat dairy products and limit intake of foods with partially hydrogenated fats. Consumption of beverages or foods with added sugar and salt should be limited (Lichtenstein et al., 2006).

African American women report consuming limited servings of fruits and vegetables. More than 70% of African American women do not consume 5 or more servings of fruits and vegetables per day (Roger et al., 2012).

Jen, Brogan, Washington, Flack, and Artinian (2007) examined the pattern of nutrient intake in a sample of African Americans with hypertension living in an urban mid-western city. The sample included 342 African American participants. More than half of the sample were women, over 40 years of age, and obese. Women in the youngest age group 20-39 reported the highest body weight. Data was collected using three day dietary recall, weight and heights were measured for BMI calculation. The results revealed that body weight was significantly associated with: energy intake ($r = 0.18$, $p < 0.005$), number of servings of fruit ($r = 0.14$, $p < 0.05$), protein intake ($r = 0.17$, $p < 0.01$), total fat intake ($r = 0.21$, $p < 0.001$), percentage of fat intake ($r = 0.14$, $p< 0.05$), saturated fat intake ($r = 0.19$, $p < 0.005$), cholesterol intake ($r = 0.23$, $p < 0.001$) and sodium intake ($r = 0.21$, $p < 0.001$). Education and age were positively associated with vegetable and fruit consumption. The study findings suggest that efforts to improve fruit and vegetable intake and weight reduction should be directed toward women in the younger age groups due to their reported limited fruit and vegetable intake and excess weight.

Airhihenbuwa et al. (1996) examined cultural dietary patterns of African Americans using focus groups. The sample included 53 African Americans, with 32 women living in an urban community. The participants were middle to low income African Americans, ranging from 13-65 year of age. Data from the focus group discussions revealed that the participants believed that their diet is based on traditional foods eaten by parents that have been passed down to the children. These traditional foods are eaten regardless of income. African Americans in higher income categories may chose better cuts of meat but the preparation methods are the

same. Traditional foods noted as "soul food" are fresh meats and vegetables prepared using spices. Meats and vegetables are cooked thoroughly. Participants believed that healthier aspects of their traditions should be preserved such as the social aspects associated with soul food which include eating together as a group, eating pot meals and other healthier dishes such as boiled or steamed vegetables, salads, and baked chicken. The participants recognized that certain aspects of traditional soul food were not healthy such as high-fat, high-salt foods. Others thought that limited amounts of soul food were acceptable. Some thought that modifying the preparation of soul food to limit the amount of fat would be acceptable. The results from this study show that African Americans attach cultural meaning to traditional African American cuisine. Yet, many were open to adapting the food or eating limited amounts for better health.

James (2004) examined how culture impacts the nutritional attitudes, and dietary habits of adult African Americans using focus groups. The participants included a convenience sample of 40 adults with 19 women of varied SES including women on public assistance, professional women and women in graduate/professional schools. The participant ages ranged from 22-58. The participants lived in a lower southeastern region of the US. The results of the focus group revealed that participants believed that traditional African American foods were unhealthy due to the cooking methods used, which include frying, seasoning foods with high fat meats, oils and grease. Traditional African American cuisine is considered high in fat/ cholesterol, sodium, sugar, and low in fiber (James, 2004). Barriers to healthy eating were identified as time restraints due to multiple responsibilities. Additional barriers were friends and relatives not being supportive of dietary changes such as limiting meat with every meal and cost of healthier foods. Beliefs that may be barriers to a healthy diet are fatalistic beliefs that "one has to die from

something," eating healthy means giving up one's cultural heritage; the body can not adjust to a new diet; and consuming starchy foods causes diabetes (James, 2004).

Motivators for eating a healthy diet were weight loss "to look muscular or shapely" but not to be thin. The women stated they would be willing to make dietary changes to positively influence their children. The participants generally believed that there were differences in diet related to age. Younger adults were thought to be more knowledgeable about healthy foods due to a greater emphasis on living a healthy lifestyle during their generation. Older adults were thought to change their diet or eating habits after diagnosed with an illness. Women with higher education, higher incomes and those with chronic illnesses were thought to be most motivated to make changes to their eating habits and health behaviors (James, 2004).

The women believed that traditional African American cuisine is attached to pleasant memories that are to be passed down as a legacy. Eating cultural foods prepared by the older generation is perceived as a sign of respect; serving traditional foods for social events is considered a part of being a good host. Further, the women believed that eating traditional African American cuisine is a way to stay connected to family and friends. Participants believed that the community should have a role in changing eating habits such as promoting healthy foods at church dinners, having local grocery stores provide healthier choices including low fat alternatives (James, 2004). Results from this study are consistent with other studies in that food choice is influenced by many variables including time, cost, food preferences, culture and memories attached to the food, as well as beliefs based on personal philosophies that may not be supported by scientific knowledge.

Hargreaves, Schludt, and Buchowski (2002) used focus groups to examine eating attitudes beliefs and behaviors that contribute to the daily food choices in 40 African American

women living in the south eastern US using focus groups. The study findings were consistent with other studies. Traditional eating patterns included having meat with every meal, and cooking vegetables seasoned with fatty meat. Some women reported substituting high-fat meats with lower fat meats. The women believed that the healthiest meal of the day was considered dinner and snacks were eaten in place of regular meals when busy. Meal patterns may be influenced by appetite, convenience and health concerns. Meals may be skipped if busy or not hungry, on the weekend, or on a daily basis. Food preparation depended on health, taste and convenience. The women were aware of healthy food choices, but barriers to healthy eating were considered to be food cost and preparation time.

As mentioned in other studies, participants in the Hargreaves study (Hargreaves et al., 2002), indicated that social expectations surrounding food influenced food choice. Expectation of what is served at social events to family and friend is influenced by traditions and may hinder attempts to eat healthier foods. However, African American women suggested motivators for healthy eating are improved health and preventing heart disease. Results from this study are consistent with other studies such that dietary patterns are influenced by tradition, taste, preparation time or convenience, cost and health.

Boyington et al. (2008) examined the cultural attitudes and perceptions toward food in a sample of 12 overweight African American adolescent girls, 12-18 years of age using focus groups. The adolescents believed that food taste, texture, appearance and ability to feel full influenced food choice. Family and peers also influenced food choice as their approval and acceptance of food choices promoted cultural and social cohesion.

The link between food choice, cultural, and social cohesion among African Americans has been supported by Peters, Aroian, and Flack, (2006). Peters, Aroian and Flack examined

beliefs about dietary habits for blood pressure control in a sample of hypertensive African Americans using focus groups. Results indicated that African American's have a code of behavior based on shared culture that includes dietary habits. This shared culture is expressed by adhering to traditional standards of food choice and preparation despite health consequences.

In summary, determinants of dietary habits for African American women were discussed using studies that included samples from various regions of the US including urban, rural, southern and mid-western cities. The study participants included various ages and SES levels. The study results show that less than one fourth of African American women consume the recommended amounts of fruits and vegetables per day. However, increased consumption of fruits and vegetables was associated with higher education and older age (Jen et al., 2007). Dietary habits were influenced by culture. African American women believed that eating traditional foods was a way to stay connected to the culture and to family and friends even though traditional food preparation methods were not healthy. Some women reported that they were willing to adapt recipes for healthier alternatives while others believed adapting recipes would be relinquishing their cultural heritage. Other determinants of dietary habits were food cost, preparation time, food taste, family and friend's disapproval, fatalistic beliefs and health preservation.

Obesity and Body Image

The behaviors needed for weight management may be strongly influenced by psychological factors specifically body image and personal weight beliefs. Body image is thought to influence weight management behaviors. Body image is a complex psychosocial construct that includes both attitudinal and perceptual components (Boyington, Johnson, & Carter-Edwards, 2007; Rucker & Cash, 1992). Body image is conceptualized as body size

estimation, evaluation of body attractiveness and emotions associate with body shape and size (Grogan, 1999; Muth & Cash, 1997). In the past, body image has been investigated primarily through eating disorders in Caucasian females. More recently body image has been examined as a risk factor for obesity and as a factor that may influence weight management behaviors in African American women (Dorsey, Eberhardt, & Ogden, 2009; Flynn & Fitzgibbon, 1998; Schwartz & Brownell, 2004). This discussion will focus on factors that influence body image including, age, ethnicity, socioeconomic status (SES) and weight management.

Body Image and Age

Kemper, Sergeant, Drane, Valois, and Hussey (1994) examined adolescents' perception of ideal female body size and social norms regarding female body size. The participants included 190 African American and 247 Caucasian adolescents with a mean age of 14.9 (*SD* = .979). Data were collected using body image questionnaires and height and weight measurements. Findings suggested that African American female adolescents considered the ideal body to be significantly larger than the size selected as ideal by Caucasian females ($p < 0.001$). African American female adolescents were more likely to describe themselves as thinner than other girls their age, categorize body size as smaller than their BMI indicated, felt that others saw them as thin, and wanted them to gain weight. The African American females also thought their body size was satisfactory to significant others, and were unlikely to say they were overweight. These findings suggest that African American adolescent females desire heavier bodies or body parts. According to Kemper et al. (1994), one explanation for this desire is that African American females' desire for a heavier body is actually a desire to be an adult because many adults in their environment are heavy. The results of this study also suggest that African American female adolescents do not appear to have social norms that support a thin body ideal.

These findings are supported in other studies with African American adolescents (Abrams & Stomer, 2002; Wilson, Sergeant, & Dias, 1994).

Harris (1994) examined body image attitudes of college-age African American and Caucasian women. A sample of 212 female participants (68 African Americans, 144 Caucasians) completed several body image questionnaires. The results show that African American women reported more positive attitudes toward their bodies, in particular their height and lower torso than Caucasian participants. This finding is supported by Falconer and Neville (2000) who examined body image attitudes of African American women attending a southern college. A sample of 124 African American female students, whose mean age was 23, completed body image questionnaires. Results showed that African American women with higher BMIs were more likely to report greater satisfaction with their body size than those with lower BMIs (Falconer & Neville, 2000). Other body image studies with college-age African American women have reported that African American women tend to report satisfaction with their bodies and prefer a heavier body ideal (Abrams, Allen, & Gray, 1993; Akan & Grilo 1995; Rucker & Cash, 1992).

Schieman, Tetyana, and Eccles (2007) examined body image attitudes in older African American women. The study was conducted using face-to-face interviews of 1,164 adults $\geq$ 65 years of age selected from Medicare beneficiary files. Participants were asked how they described their present weight and responses were translated into BMI categories. Older African American women were more likely to underestimate their weight by describing themselves as being normal weight when they were actually in the overweight BMI category. The results showed that overweight older African American women were more satisfied with their weight, less likely to feel guilty after overeating, less likely to diet, and more likely to consider

themselves to be attractive. Also, older African American women were less likely to relate health problems to their weight (Schieman et al., 2007). The study findings suggest that African American females of varied ages have positive attitudes toward a heavier ideal body and do not perceive their weight as a health concern.

Body Image and Ethnicity

Fitzgibbon, Blackman, and Avellone (2000) investigated BMI and body image dissatisfaction using a multi-ethnic sample of women. The sample included 60 Caucasian, 205 African American, and 84 Hispanic women. On average the women were in their mid 30's and high school graduates. Mean BMI for Caucasian women was 25.9 (*SD* = 5.9); African American women was 30.4 (*SD* = 8.3); and Hispanic women was 29.2 (*SD* = 7.6). Body image dissatisfaction was defined as the difference between one's current and ideal body image. Body image was measured using a figure rating scale which is a figure of nine female silhouettes of various sizes that are numbered from thin (1) to heavy (9). The participants were asked to choose the silhouette that represented their current body and their ideal body. The difference of the ideal body was taken from the current body image. A linear regression model was constructed to show the relationship between BMI and BD. The findings show that African American women reported body image dissatisfaction at higher BMIs compared to the other groups. African American women showed body image dissatisfaction at a BMI of 29.3 compared to Caucasian women who had body image dissatisfaction at a BMI of 24.6 and Hispanic women who had body image dissatisfaction at a BMI of 28.6. This finding suggests that African American women have a heavier ideal body size. This finding is consistent with other studies that show African American women prefer a heavier body frame. Consequently, the preference for a heavier body frame may put African American women at risk for obesity.

Sanchez-Johnson et al., (2004) examined body image in a sample of Latin-American and African American women in all BMI categories. The sample included 271 African American women and 234 Latin American women, 18 to 67 years of age. The mean age was 31.3 (*SD* = 9.0). On average the African American women had more years of education, and BMIs of both groups were in the obese category. Results from body image questionnaires showed that African American women have less body image dissatisfaction and preferred a larger body than Latin-American women. The study results support the premise that African American women tend to prefer a larger body size.

Breitkopf, Littleton, and Berenson (2007) examined body image perception among a low income multi-ethnic sample of women. The sample included 333 African Americans, 450 European Americans and 434 Latin Americans. The monthly income of the women was under $1,000. The average age of the sample participants was 25 (*SD* = 5.9) average BMI was 27. 2 (*SD* = 6.2). Most of the women completed high school. The women were asked to classify their weight as very under weight, slightly underweight, about the right weight, slightly overweight or very overweight. Weight and height were measured and BMI calculated. The results showed that more normal weight European and Latin American women were more likely to characterize themselves as overweight than African American women χ^2 (2) = 11.2, $p < .005$. African American women who were overweight or obese were less likely than women in the other ethnic groups to characterize themselves as overweight χ^2 (2) = 2.17, $p < .005$; or obese χ^2 (2) = .9, $p > .05$. Nearly all women who were morbidly obese characterized themselves as overweight. The study results appear to support the premise that African American women perceive themselves to be smaller than their measured BMI. The study findings suggest that when compared to other ethnic groups African American women may have a distorted perception of their body weight.

Body Image and Socioeconomic Status

Positive body image toward a larger body has been linked to low socioeconomic status (SES). African American women in the low SES are less likely to describe themselves as overweight or obese. However, higher SES African American women are more likely to describe self as overweight with a similar rate as Caucasian women (Schieman et al., 2007). These findings were supported by Lynch et al. (2006) who examined the relationship of ethnicity, SES and ideal body size in a sample of young African American and Caucasian adult women, 18-30 years of age. Participants were asked to choose current and ideal body size using a figure rating scale of nine silhouette female images ranging from thin to heavy as in the Fitzgibbon et al., (2000) study. Findings suggest that SES is highly correlated with ideal body size. African American women with high SES selected smaller ideal body sizes. Reasons given for high SES individuals preferring smaller bodies may reflect access to health information that encourages weight loss, weight maintenance and healthier lifestyles (Lynch et al., 2006). A seminal review of body image literature by Flynn and Fitzgibbon (1998) examined the relationship of body image and obesity in African American women that showed low SES women were more likely to choose heavier body ideals, tend to be more satisfied with their bodies, and see themselves as thinner than their measured BMI. However, Flynn and Fitzgibbon (1998) contend that some studies did not show any difference in body image attitudes related to SES. More study is needed to characterize the relationship between SES and body image attitudes in African American women (Flynn & Fitzgibbon, 1998).

Body Image and Weight Management

Body image may be associated with whether one chooses to engage in weight management behaviors. Body image studies show that many African American women have

positive body images, have a positive attitude toward heavier bodies and are more likely to perceive their weight to be smaller than the actual weight. These preferences are thought to be a risk factor for excess weight and may impact participation in weight management behaviors (Dorsey, Eberhardt, & Ogden, 2009; Flynn & Fitzgibbon, 1998; Kumanyika, Wilson, & Guilford-Davenport, 1993)

Mack et al. (2004) examined body image and weight management using a large national sample of 98,387 adult women. Findings suggested that although the majority of women perceived an ideal body to be in the normal BMI range, African American women were seven times more likely to report a perceived ideal weight in the obese category than Caucasian women. Caucasian women were more than twice as likely to desire an underweight BMI compared to African American women. However, women who were encouraged to lose weight by their healthcare provider or classified themselves as obese reported that they were trying to lose weight. Other studies have suggested that women who perceive themselves as overweight made attempts to lose weight by dieting, exercising, increasing vegetable intake and portion control (Lemon, Rosal, Zapka, Borg & Andersen, 2009; Sharpe et al., 2001). These findings are consistent with the seminal work of Flynn & Fitzgibbon (1998) who reported that women who perceived themselves to be overweight were more likely to participate in weight management behaviors.

Anderson, Eyleth, Gauska, and Brown (2002) examined the relationship of body size satisfaction and weight management behavior in an ethnically diverse sample of women. The sample included 1760 overweight and obese women, 40 years of age and older with 28% being African American. The data was obtained from a subset of data collected from the U.S. Women's Determinants Study which was conducted using a national telephone survey. The

participants were asked “How do you feel about your body size right now?” and “Are you now trying to lose weight?” The results showed half of the women were overweight (52.8%) and half were obese (47.2%). The majority of the women was 40-59 years of age, were high school graduates, and believed that they were in good health. African American women were 2.14 times more likely to express satisfaction with their body size than Caucasian women. Women who were 40-70 years of age, with higher education and self-rated poor health expressed more body size dissatisfaction compared to older, lower-educated, and self-rated healthier participants. Women who had low body size satisfaction were almost nine fold more likely to be trying to lose weight compared to those who were satisfied with weight (*OR* = 9.25). Women who were obese were more likely to be trying to lose weight compared to those who were overweight (OR = 1.34). The study findings suggest that women who have low body satisfaction and perceive themselves as obese are more likely to attempt weight loss.

In summary, body image studies with African American women showed consistent findings. African American women had less body dissatisfaction, chose a heavier body size as ideal, and perceived body size as smaller than actual BMI. These findings were consistent across a wide age range from adolescents, college age and older African American females. Older women greater than 65 years of age were more likely to feel attractive independent of their body weight, were less likely to diet, and less likely to attribute health problems to their weight when compared to Caucasians (Schieman et al., 2007). African American women of higher SES preferred a smaller body size which may reflect access to health information encouraging weight management (Lynch et al., 2006). While positive attitudes toward a larger body are associated with a lower SES in African American women. This preference for a heavier body may influence perception of excess weight which may influence weight management behaviors

(Flynn & Fitzgibbon, 1998; Kumanyika, Wilson, & Guilford-Davenport, 1993). Studies have shown that women who believed that they were overweight or obese, and/or had body dissatisfaction, were more likely to attempt weight loss (Anderson et al., 2002; Lemon, Rosal, Zapka, Borg & Andersen, 2009; Mack et al., 2004; Sharpe et al., 2001). Therefore, beliefs about ones weight may influence weight management behaviors.

The following section provides the foundation for discussing weight beliefs. This section will discuss the definition of beliefs, belief-knowledge organization, belief-attitude relationship and the belief-behavior relationship.

Belief Definition

Beliefs have been defined and conceptualized in various ways. Beliefs may be defined as the certainty of a proposition being true (Fishbein, 1963; Fishbein & Ajzen 1975; Rokeach, 1968). Belief content may be descriptive, evaluative or prescriptive. Descriptive content may be described as true or false. Evaluative content may be described as good or bad and prescriptive content may determine a course of action to be desirable or undesirable (Rokeach). Beliefs may be based on knowledge about oneself, other persons, places, objects or events and relationships concerning these entities. Beliefs may be acquired through culture and inferred from one's speech or actions. Beliefs have been conceptualized as the underlying cognitive component of attitudes and are considered to be predispositions to action (Fishbein, 1963; Fishbein & Ajzen, 1975; Rokeach, 1968).

Belief-Knowledge Organization

Beliefs about the world are a function of the organization of knowledge that is accessible in memory (Wyer & Albarracin, 1993). Belief-organization theories conceptualize how belief relevant knowledge is retrieved from memory. Belief-organization theories include

independence–trace theories, associated network theories, schema theories and storage bin models. The independent-trace theories assume that information in memory is not organized but stored as experiences in a separate memory trace. When information is needed about a referent, the referent is transformed into a retrieval cue that specifies information being sought. All information that meets the specification is activated are made accessible to memory (Hintzman, 1986).

Associated network theories conceptualize knowledge units in memory as nodes that associate with each other to make pathways. Node pathways are made by thinking about knowledge units (Collins & Loftus, 1975).

Schema theories assume that knowledge is organized in memory schematically. Information is organized and interrelated based on a cluster of features that are spatial, temporal, or logical (Brewer & Nakamur, 1984; Rumelhart, 1985).

Storage bin theories conceptualize knowledge as stored in memory in a particular location as in storage bins. Different types of information are stored in each bin including propositions, schema, visual images, and cluster of traits, behaviors and sequences of temporally related events. When information about a referent is needed, the appropriate bin is located and a top down search for the appropriate knowledge representations are retrieved and copied used them returned to the top of the bin. Knowledge representations at the top of the bin are likely to be used again. This suggests that the initial knowledge received about an object or person may influence interpretation of future information (Wyer & Srull, 1986, 1989).

These four types of theories of knowledge organization conceptualize how knowledge is made accessible in memory. From these conceptualizations four postulates emerge for retrieving belief relevant knowledge from memory including: recency, frequency, strength of association,

and schematic processing. Recency refers to the likelihood of using belief relevant knowledge based on the recency of knowledge acquisition or use in the past. Frequency refers to the likelihood of using belief relevant knowledge based on the frequency of its use in the past. Thirdly, strength of association refers to the likelihood of different units of knowledge being used when they are thought about in relation to each other. Lastly, schematic processing refers to spontaneously adding concrete features to the configuration of general abstract schema (Wyer & Albarracin, 2005). These postulates provide a general framework for accessing relevant knowledge to form beliefs.

Beliefs and Attitudes

Beliefs are conceptualized as determinants of attitudes. Attitudes are defined as a "psychological tendency that is expressed by evaluating a particular entity (attitude object) with some degree of favor or disfavor" (Eagly & Chaiken, 1993, p.1). Attitudes are conceptualized as having three components including affective, cognitive and behavioral. The cognitive component of attitude includes beliefs (Eagly & Chaiken, 1993; Wyler & Albarracin, 2005). The expectancy-value model is a framework for understanding the relationship of beliefs and attitudes (Eagly & Chaiken, 1993). The central premise of the expectancy-value model is that "attitude is a function of one's beliefs when the beliefs are represented as the sum of the expected values of the attributes ascribed to the attitude object" (Eagly & Chaiken, 1993, p.106). The expectancy component is the subjective probability that the attribute characterizes the attitude object. The value component is the assessment of the attribute (Eagly & Chaiken). The original formulation of expectancy–value model developed from the work of Peak (1955), Rosenberg (1953), and Carlson (1953), focused only on the attributes of goals or values. This original work on the expectancy-value model was extended by Fishbein. Fishbein (1963, 1967)

proposed that attitudes are a function of beliefs such that the beliefs about the characteristics of the attitude object form attitudes toward the object. Accordingly, attitudes follow spontaneously from beliefs that are accessible in memory as information is acquired about the attitude object's attributes. These beliefs and attitudes guide behavior (Ajzen & Fishbein, 2000).

Theoretical Relationship of Beliefs and Behavior

The relationship of beliefs and behavior has been purported in social cognitive theories. The theory of planned behavior hypothesizes that intention to perform behavior is influenced by beliefs about the behavior in question (Ajzen, 1991). The social cognitive theory hypothesizes that behavior is influenced by one's belief in their capabilities to perform a specific action required to attain a desired outcome (Bandura, 1997). The health belief model and the self-regulatory model purport that believing that an illness is a health threat influences health behavior (Becker, 1974; Leventhal, Meyer, & Nerenz, 1980). These belief-behavior models have not been used to examine the relationship of beliefs about personal weight and weight management behaviors in African American women.

Weight Beliefs and African American Women

Beliefs about weight in general have been examined in African American women. Qualitative studies were found that addressed (1) weight beliefs held by obese African American women, (2) African American women's beliefs about obesity, and (3) African American women's cultural attitudes toward weight.

Befort, Thomas, Daley, Rhonde and Ahluwalia (2006) examined weight beliefs in obese African American women using focus groups. The participants' mean age was 46.6, +/- 10.9 years of age, the majority had some years of college (mean years of education was 12.7, +/- 1.4), and approximately 72% were divorced or single. The mean BMI was 40.3 kg/m^2. The

participants responded to questions that asked about their beliefs about body size and attractiveness. The majority of the participants reported that the main cause of their weight was their eating behaviors. The participants believed that being attractive was independent of weight and believed that attractiveness was associated with self-esteem and feeling beautiful as a person. Concerning health and weight, the participants believed that health did not depend on weight as there are small and large people who are unhealthy. The participants also believed current weight charts were unrealistic and did not reflect the natural body size of African American women. Although the participants reported that they accepted their body size, they acknowledged that many were self-conscious about their bodies and avoided focusing on their weight. The participants did report a desire to lose weight for health purposes and believed that their culture influenced their ability to practice behaviors leading to weight management.

Blixen, Singh, and Thacker (2006) examined differences in beliefs about obesity and weight reduction using focus groups. The sample included African American and Caucasian women with BMIs $\geq$ 30 kg/m^2. Both African American and Caucasian women believed the word "obesity" was a medical term that physicians used to describe excess weight when excess weight becomes a threat to one's health. Whereas, overweight is thought of as a layman's term that is used to describe self when one has excess weight (Blixen et al., 2006). Both groups viewed obesity as a disease that they had little control over. Obesity was defined as being very heavy and having a weight- related illness. Both groups viewed themselves as "overweight" despite their BMI classification indicating obesity. Both groups desired to be thin and saw thinness as more attractive than an overweight or obese body (Blixen et al., 2006). However, African American women were more likely than Caucasian women to feel that they were

attractive to the opposite sex as African American women felt that African American men preferred a larger body frame (Blixen et al., 2006).

Allan, Mayo, and Michel (1993) examined weight values and relationship to weight loss behaviors in African American women using intensive interviews. The sample included 31 African American women 18-55 years old. The majority of the women were high school graduates or higher (96.8%) all were employed, married (41.9%) and obese (45.2%). The results revealed on average, African American women did not associate their weight with their health status. However, they associated their health with consumption of a high-fat, high-salt diet. The women defined a "healthy weight" as 10-15 pounds overweight. This healthy weight was associated with stamina, strength and shapeliness. Further, the data suggest that African American women's appearance in clothes was more important than a thin body. These findings suggest that dietary changes are more likely associated with health concern than weight (Allan et al., 1993).

Boyington et al. (2008) examined the cultural attitudes toward weight in a sample of African American adolescent girls 12-18 years of age using focus groups. The adolescents believed that satisfaction with their own weight and feeling comfortable was more important than actual size. The adolescents had no desire to be skinny and believed as one grows older it was customary to gain weight.

In summary beliefs concerning obesity and cultural attitudes toward weight in African American women were examined. These studies used focus groups and interview. The studies revealed that *obese* women prefer to be described as overweight as overweight is seen as a lay term while obese is seen as a medical term meaning disease. African American women did not associate their weight with health, but associated their eating habits with their health. This

finding suggests that dietary changes are more likely to be made for health reasons than for weight management. Adolescents believed that feeling comfortable with ones weight is more important than one's actual size.

Overall, the determinants of weight management behaviors have been discussed including barriers and enablers of physical activity, dietary patterns, sleep duration, body image and beliefs concerning obesity in African American women. Missing from the literature is an examination and measurement of beliefs about one's own personal weight and the relationship of these beliefs to weight management behaviors. One reason for this gap is the lack of a culturally- sensitive instrument to measure beliefs about personal weight. This study will fill this gap in the literature by developing a questionnaire to measure beliefs about personal weight in African American women.

Instrument Development

This section of the literature review discusses the steps necessary for developing an instrument that would measure beliefs about personal weight. Empirical indicators are measurement tools that provide scores that are interpreted as a measurement of a concept of interest (DeVillis, 2003). Developing an empirical indicator is the process of producing a measure of a concept of interest that may include knowledge, skill, ability, interest, attitudes, beliefs or other characteristics by developing items (questions) and combining these items to form an instrument (Standardized for Educational and Psychological Testing [SEPT], 1999). General steps for instrument development include: a) defining the concept of interest; b) specifying characteristics of the instrument; c) developing instrument items, pilot testing and revising the items; and d) assembling the items into one instrument and evaluating the

psychometric properties of the instrument (SEPT). The following is a review of instrument development steps.

Defining the Concept of Interest

Defining the concept of interest is the initial step for instrument development (SEPT, 1999). The concept of interest may be defined theoretically/conceptually and operationally. A theoretical/conceptual definition defines a concept using precise clear terms that elucidate the concept dimensions. Theoretical/conceptual definitions may be derived from common usage, existing theory, and literature synthesis or by observation (Waltz, Strickland, & Lenz, 2010). An operational definition defines a concept in terms of how the concept will be measured. Generally, the operational definition is specific to a study or activity and lacks the breath of the theoretical/conceptual definition (Waltz et al., 2010). The concept of interest for this study is *beliefs about personal weight.* Its development and conceptualization are discussed in Chapter 3 within the conceptual framework from which it was derived.

Specifying Instrument Characteristics

Steps toward developing a new instrument include establishing the instrument characteristics. Instrument characteristics include (a) identifying the measurement framework of the instrument (b) defining item response formatting, (c) identifying scoring procedures (d) identifying characteristics of the intended respondents e.g. race, gender, and (e) identifying the procedure to administer the measure (SEPT, 1999).

Measurement framework. The two basic measurement frameworks for instrument design include norm-referenced and criterion-referenced measures. When the instrument is norm-referenced, items are designed to distinguish between varying degrees of the concept being measured and individual scores are compared to the scores of other respondents. Criterion-

referenced instrument items are designed to convey a level of competence that an individual has for the concept or domain being measured. The scores are compared to a certain criterion and not to other respondents' scores (SEPT, 1999; Waltz et al., 2010).

Item response formatting. There are two basic types of instrument item response formats including selection-type items and supply-type items. Selection-type items allow the respondent to choose answers from the options provided. Examples of selection-type items are multiple choices, true-false, matching, and scaled responses. Scaled responses are used to provide a gradation of the concept of interest. A widely used scaling response is the likert-type scale. Typically, respondents are asked to indicate the degree to which they agree or disagree with a declarative statement (Polit & Beck, 2008; SEPT, 1999; Waltz et al., 2010). Instrument items also may be supply-type items where the respondent is asked to supply a response without predetermined options. Examples of supply-type items are short answer or essay.

Scoring procedures. Scoring procedures are another characteristic that guides instrument development. Scoring procedures are used to obtain raw scores for a measure. Simple scoring procedures are preferable over elaborate weighing schemes because both methods have been empirically proven to yield similar results for total and subscale scores for a measure (Waltz et al., 2010). An example of simple scoring is summative scoring. The process of summative scoring includes assigning a score to each item according to a conceptual plan, than summing the scores for a total score (Waltz et al., 2010). Summative scoring may be used with norm-referenced measures that have selection-type response items. Instruments with supply-type response items are scored more subjectively using a scoring rubric which specifies criteria for evaluating responses. Scoring for supply-type response items require more judgment

from the researcher to score the items as compared to the selection-response items (SEPT, 1999; Waltz et al., 2010).

Respondent characteristics. Other concerns for instrument development include consideration of characteristics of the intended respondent population. Characteristics to consider include the range of expected educational or skill levels, their familiarity with the instrument response formatting, and the primary language used (SEPT, 1999). Respondents may have a broad range of educational or skill levels, therefore it is recommended that items with long sentences and words with more than three syllables be avoided due to varied literacy levels (Polit & Beck, 2008). Readability may be established using the Microsoft Word, word processing feature that provides a readability statistic of single words and sentences. This method provides a Flesch-Kincaid grade reading level. Generally, scales are developed at the 6th to 7th grade levels as many high school graduates do not have reading levels above a 12 year old (Streiner & Norman, 2008).

Instrument administration. The directions for instrument administration should specify the nature of the instrument, nature of responses expected, and general time to complete the measure. The goal of the directions is to standardize the way the instrument is administered in order to assume all respondents are presented with the same information (Waltz et al., 2010).

Item Development and Review

The third step in the development of an instrument is item development and review. The concept definition and instrument characteristics guide the development of a pool of items. The concept definition and items may be derived and developed from the scientific literature and/or from obtaining a cultural perspective from a representative sample of the target group (Creswell, 2007; Waltz et al., 2010). Instrument items may be developed to be culturally sensitive to a

particular group. This process includes developing item content using words, phrases and expressions that are familiar to the cultural group of interest (Resnicow, Soler, Braithwaite, Ahluwalia, & Butler, 2000). Using culturally appropriate language may help the target group to better understand and identify with the items (Guidry, Fagan, & Walker, 1998).

Obtaining the cultural perspective for item development/revision/adaption may be accomplished using personal interviews or focus groups (Creswell, 2007; Willgerodt, 2003). The personal interviews may be semi-structured or unstructured. Semi-structured interviews are a qualitative method of obtaining data from participants using a set of predetermined questions that are developed by the researcher. This method allows the participants' to share their views about the concept in their own words (Creswell, 2007). The unstructured interviews are a qualitative method of data collection that is more conversational between researcher and participant. This method may be used when the researcher has little information about the concept of interest to formulate predetermined questions (Creswell, 2007). Interviews may be face-to-face, by telephone or over the internet (Polit & Beck, 2008).

Another method to obtain the cultural perspective for item development/revision/adaption is focus groups (Polit & Beck, 2008). Focus groups are groups of four or more participants who assemble for a discussion centered on the concept of interest. The discussion is led by a moderator who poses a set of predetermined questions. Focus groups are an efficient method of obtaining views of many people at one time. However, members may be uncomfortable expressing views in a group setting (Polit & Beck, 2008).

The pool of items is developed, and evaluated for content validity using feedback from content experts and a small sample of the target population (Creswell, 2007; Waltz et al., 2010). Typically, the items are evaluated for adequate sampling of concept domain; content

appropriateness referring to content being culturally appropriate for target population; and clarity referring to wording being clear and unambiguous (Lynn, 1986; Polit & Beck, 2008; SEPT, 1999). The final items are compiled into one instrument. The final step toward developing a new instrument is psychometric evaluation.

Psychometric Evaluation

Psychometric evaluation provides evidence for instrument reliability and validity. This step of instrument development will discuss the process of validating an instrument using statistical techniques that assess reliability and validity. This discussion will use the terms instrument, and empirical indicator as equivalent concepts that are defined as measurement tools that provide scores that are interpreted as a measurement of the concept of interest (DeVillis, 2003).

Data Cleaning. Before analyzing the data for reliability and validity the accuracy of the data must be confirmed though data cleaning. Data cleaning involves evaluating the data for accuracy, identifying and evaluating missing data and determining if the score distributions meet the statistical assumptions required for the analysis used to support evidence of reliability and validity (e.g., normality) (Tabachnick & Fidell, 2007). Data accuracy is evaluated at the item level. Missing data is evaluated for randomness or non-randomness (Tabachnick & Fidell, 2007). Missing random data pattern refers to values that are haphazardly missing throughout the data set (Munro, 2005). Missing non-random data pattern refers to values missing in a methodical, nonrandom way throughout the data set (Munro, 2005). Missing data that is non-random is more serious than randomly missing data because non-random data may affect the dependent variables which affect the study outcome (Tabachnick & Fidell, 2007). The IBM SPSS statistical program has a feature for examination and analysis of missing data. The

program may be directed to identify items with 5-10% or more of the data missing. The missing data is assessed for randomness or non-randomness using a *t* test. Data is divided using a grouping variable with two levels. The two levels are 1 = cases with missing values on the variable and 0 = cases with no missing values on the variable. A *t*-test is performed between the two levels on the dependent variable. If there are no significant differences on the dependant variable denoted by a non-significant *t*-test than the missing data are random and may not affect the outcome (Munro, 2005; Tabachnick & Fidell, 2007). If there are differences between the two groups denoted by a significant *t*-test then the missing data may affect the outcome (dependent variable). To confirm non-randomness, the Separate variance *t*-tests may be performed between the variable with missing items and the other variables. A significant *t*-test indicates non-randomness (Tabachnick & Fidell, 2007).

There are three basic approaches to handling missing data which are pairwise deletion, listwise deletion and missing data estimation (Nunnally & Bernstein, 1994). Pairwise deletion refers to deleting a missing observation and the associated correlational item data. Listwise deletion refers to deleting cases with missing data and only analyzing cases with complete data. Listwise deletion is the default procedure in major statistical programs (Munro, 2005; Nunnally & Bernstein, 1994). Also cases with missing data may be deleted using percentage cut-offs. A predetermined percentage cut-off of 5% or 10% is typically used which is based on theoretical or empirical reasoning (Munro, 2005). Another method of dealing with missing data is estimating missing data by making imputations of missing data based on known values of other variables or cases in the sample (Munro, 2005; Tabachnick & Fidell, 2007).

The method of handling missing data depends on whether the missing data is random or non-random. If the missing data appears random, deletion of the variable may be considered

because randomly missing data is unlikely to affect the outcome data. If the missing data appears non-random a method to preserve all data should be chosen because non-randomly missing data may affect the outcome data. The methods most recommended are correlation matrix or multiple imputations which are accomplished with particular computer programs (Tabachnick & Fidell, 2007).

Statistical assumptions. After the data is cleaned and missing data assessed, descriptive statistics are used to determine if the item score distributions meets the statistical assumptions for reliability and validity analysis. Statistical assumptions for reliability and validity analyses are the assumptions of normality, linearity and homoscedasticity (Munro, 2005). Normality refers to mean item scores having a distribution that approximates the normal curve. Linearity refers to mean item scores having a linear relationship and homoscedasticity refers to the variance or standard deviation of the mean item scores being equal (Munro, 2005; Tabachnick & Fidell, 2007).

To determine if score distributions meet assumptions, measures of frequency, central tendency and variance are explored using IBM SPSS. The statistical output is reviewed to determine if all values are in the expected range and means and standard deviations plausible (Tabachnick & Fidell, 2007). The score distributions also may be evaluated graphically. Normality may be assessed by skewness and kurtosis. Skewness refers to symmetry of a distribution. Kurtosis refers to peakedness of a distribution. For skewness, absolute values greater than 3.0 indicate extreme skewness (Chou & Bentler, 1995). For kurtosis absolute values higher than 10 suggest significant kurtosis while values higher than 20 are extreme (Kline, 2005). Normality may also be determined by histogram. Histograms are graphs of the distribution of scores depicted as bars. The distribution is compared to the normal distribution

where 95% of the score distribution falls within 2 standard deviations from the mean. Linearity refers to a straight line relationship between scores which makes it possible to correlate scores (Tabachnick & Fidell, 2007). Linearity may be determined by a bivarate scatter plot by plotting the mean item scores for a straight–line relationship. Homoscedasticity refers to the variance of the variable scores being equal which supports the assumption of normality. Homoscedasticity is assessed by examining a scatter plot of variable scores for a linear relationship where the score distribution is roughly the same width with a concentration of score at the middle (Munro, 2005; Tabachnick & Fidell, 2007).

Scores will be assessed for outliers. Outliers are cases with an extreme value on one or more variables that distort data analysis (Tabachnick & Fidell, 2007). Reasons for outliers include incorrect data entry, unspecified missing value such that the computer program reads a missing data indicator as a real data point, or an outlier may not be a member of the population that was intended to be sampled. Outliers may be identified by graphical methods of histograms, box plots, and scatter plots among others by identifying observations that fall far away from the mean or from other observations. Outliers may be dealt with in several ways. The data may be analyzed with and without the outliers. If the results are similar the outliers may be ignored. The outlier may also be deleted if the outliers are on one variable and that variable is highly correlated with others or not critical to the analysis. If the outlier is retained because it is determined to be a member of the intended population, the outlier may be transformed by changing the outlier score to a raw score 1 unit larger than the next most extreme score (Munro, 2005; Tabachnick & Fidell, 2007).

If the scores do not meet the assumptions the scores may be transformed. Methods of transforming data to meet the assumptions of normality, linearity, and homoscedasticity include

taking the square root of the scores, using log of the scores or using the inverse of the scores Tabachnick & Fidell, 2007).

After the data is cleaned and meets the assumptions, all items are correlated and reviewed for inflated or deflated correlations. Inflated correlations may occur if items are correlated with composite scores that contain the items. Deflated correlations may occur if the range of responses for a variable or item is narrow due to sampling restrictions (Tabachnick & Fidell, 2007). After the data is cleaned and assumptions are met, the reliability and validity of the instrument may be examined.

Reliability

Reliability is concerned with dependability, consistency, accuracy and comparability of an instrument (Kerlinger & Lee, 2000; Zeller & Carmines, 1980). Reliability of a measure means the measure yields consistently repeatable measurements. The reliability of a measure is expressed as a form of a correlation coefficient with a range from 0.00 to 1.00. A correlation coefficient of 0.00 indicates no reliability; a correlation coefficient of 1.00 indicates perfect reliability. A reliability score of .70 is acceptable for newly developed scales (Kerlinger & Lee, 2000). Strategies for determining the reliability of a measure are stability, equivalence and homogeneity (Kerlinger & Lee, 2000; Zeller & Carmines, 1980).

Reliability of an instrument may be determined based on the questionnaire framework. Reliability for normed-referenced instruments usually includes test-retest, and/or equivalence and internal consistency evaluation. Reliability for a criterion-referenced instrument is concerned with consistency of classifying a phenomenon. Scores from criterion-referenced instruments are less variable compared to scores form a norm-referenced instrument. For this reason, reliability for criterion-referenced measures may use non-parametric procedures. Non-

parametric procedures are used for data that do not conform to normality. However, if the scores from a criterion-referenced measure are reported as percentages and indicate variability then test-retest, and/or equivalence and internal consistency can be used to assess reliability (Waltz et al., 2010).

Stability. Stability of a measure refers to the consistency of scores when measured more than one time with the same sample (Kerlinger & Lee, 2000; Zeller & Carmines, 1980). A typical method to evaluate stability is the test-retest reliability correlation. Test-retest reliability refers to correlating the same measure at different times using the same sample (Kerlinger & Lee, 2000; Zeller & Carmines, 1980). The assumption for test-retest reliability correlation is that the concept being measured has not changed between measurement intervals (Burns & Grove, 2001). There are several limitations with test-retest reliability. Obtaining two measures from the same sample at different times may be expensive and impractical. Moreover, a test-re-test correlation may be difficult to interpret. For example, a low-test retest correlation may not mean low reliability but may indicate that the theoretical concept has changed even though the assumption is that the concept has not changed. This situation may be particularly true if a large amount of time has elapsed between measurements. Inflated reliability scores may be the result of short time elapses between measurements. Another limitation of test-retest reliability is reactivity. Reactivity refers to the actual affect of measuring a phenomenon may change subsequent measurements by sensitizing the sample to the concept being measured (Zeller & Carmines, 1980). In summary, test-retest reliability correlation is a common method to measure stability.

Equivalence. Another strategy for measuring reliability is equivalence. Equivalence of a measure is used when it is possible to generate two forms of a measure. The two forms of a

measure must have parallel form before they are correlated which means they meet the following criteria: (a) the instrument has been constructed using the same objectives and procedures (b) both instruments have equal means (c) both instruments have equal correlations with a third variable and (d) equal standard deviations. If these criteria are met the instrument is considered parallel. To assess parallel form reliability, the two instruments are administered to one representative sample at the same time. The scores for the two measures are correlated. Equivalence is achieved if the reliability coefficient is > .80 and the measures may be used inter-changeably (Waltz et al., 2010).

Homogeneity/internal consistency. Homogeneity is another strategy for measuring reliability. Homogeneity or internal consistency of an instrument refers to the extent that items on an instrument are tapping into different aspects of the same concept (Cronbach, 1951; Streiner & Norman, 2008). Internal consistency measurement values range from 0.00 to 1.00, with 0.00 being no correlation and 1.00 being perfect correlation between items (Cronbach, 1951). Perfect correlation may indicate that each item on the empirical indicator is measuring the exact same thing which is not desirable. Ideally, each item should be related yet contain some unique value concerning the attribute being measured. Coefficient reliabilities of .80 to .90 indicate a more discriminating measure of the attribute and may indicate the entire measure is measuring a single attribute (Streiner & Norman, 2008; Waltz et al., 2010).

Methods to determine internal consistency are item-total correlation, split-half reliability, and Cronbach's alpha. Item-total scale correlation refers to correlating individual items of a scale with the composite scale scores. Correlation of the item-to-total instrument score should be above 0.20 (Waltz et al., 2010). According to Kline (1986), items that correlate to the total composite scale below 0.20 should be discarded.

Split-half reliability is a method of reliability that refers to dividing an instrument in half and correlating the scores from the two halves. Several methods may be used to divide the instrument. The instrument may be divided by even-odd items, or by randomly separating the items into two groups. If the halves are highly correlated the instrument has internal consistency. A limitation of the split-half method is that each split may lead to different reliability correlations despite the measurement being from the sample. Also, this method may underestimate the true reliability as reliability is influenced by the number of items on an instrument (Kerlinger & Lee, 2000; Nunnally, 1978; Streiner & Norman, 2008; Zeller & Carmines, 1980).

Cronbach's alpha is a common measure of internal consistency that is a single measure for a data set (Waltz et al., 2010). Cronbach's alpha is equal in value to the mean of the distribution of all possible split-half coefficients associated with a data set (Cronbach, 1951). Cronbach's alpha represents the average correlation among items within an instrument. It is recommended that Cronbach's alpha be the first measure of reliability obtained on a measure as it sets the upper limit of reliability. Therefore, all other reliability methods would be expected to result in lower reliability (Nunnally, 1978). Alphas of 0.70-0.90 are considered acceptable (Cronbach, 1951).

Current understanding of reliability, according to Cronbach and Shavelson (2004), is that Cronbach's alpha coefficient is a small part of the information needed to support the reliability of a measure. Cronbach and Shavelson (2004) believe the standard error or measurement error which refers to the uncertainty associated with each measure is an important part of determining the reliability of a measure. Within an observed score there is a true score and an error score. The true score indicates the degree to which the score measures the intended concept and error score indicates the part of the observed score due to error. The error score or measurement error

may be random or systematic. Random error impacts the error score by making the true score less precise which decreases the reliability of a measure. On the other hand, systematic errors impact the true score, which decreases the validity of a measure (Waltz et al., 2010). Therefore, the operational definition of reliability of an instrument is the proportion of true variability to the total observed variability in a particular sample. A reliability of .90 mean 90 % of the variability in the observed scores represents true individual differences and 10% measurement error (Polit & Beck, 2008). As a result of measurement error, reliability is sample specific and should be calculated with each new sample (Polit & Beck, 2008).

Sources of measurement error may be internal or external to the individual. Internal sources of measurement error include respondent's level of interest, motivation, attention, and inconsistent application of ability. External sources of measurement error include distraction in the external environment where the instrument is administered, item content, clarity of items, item formatting, and scoring differences. Measurement error reduces the confidence that can be placed in any single measurement which impacts the usefulness of a measure (Polit & Beck, 2008; SEPT, 1999; Waltz et al., 2010).

In summary, reliability of an empirical indicator refers to the consistency or stability of the scores produced by the measure. Methods used to determine reliability include test-retest reliability referring to the extent that a measure yields consistent results using the same sample on repeated measure. Another method of reliability is equivalence which refers to developing two forms of a measure from the same concept and correlating them. The third method used to determine reliability is internal consistency which refers to the degree to which the items of an instrument measure the same concept. Internal consistency may be measured using correlation of item-to-total scale scores, split–halves, and Cronbach's alpha. Cronbach's alpha coefficient is

measured using a range of 0.00 to 1.00. Alpha coefficients of 0.70-0.90 are considered acceptable. Reliability is sample specific and is a function of the true score and measurement error. Measurement error may be random or systematic affecting the reliability and validity of a measure.

Validity

Validity refers to the appropriateness, meaningfulness, and usefulness of the conclusions made from empirical indicator scores (Kerlinger & Lee, 2000; Zeller & Carmines, 1980). Validity is the degree to which an empirical indicator measures the concept it is intended to measure (Zeller & Carmines, 1980). Evidence of validity may be supported in three basic ways including content, criterion, and construct (Zeller & Carmines, 1980).

Content validity. Content validity refers to the extent to which a set of items from an empirical indicator tap the relevant universe of content about the domain of interest (Zeller & Carmines, 1980). Content validity is established by defining a universe of items from the domain of interest and systematically sampling within this universe to establish an empirical indicator (Cronbach & Meehl, 1955). Content validity answers the question: to what extent do the items on the scale adequately sample the intended universe of content? The universe of content is framed by the theoretical rationale surrounding the concept of interest and its conceptual definition. The theory and conceptual definition generate the operational definition of the concept of interest. This definition guides the sampling of items from the universe of content (Gable & Wolf, 1993). After the items are generated and compiled, each item and the entire measure as a whole is judged using certain specifications set by the researcher.

Content experts are chosen to evaluate the content validity of items. These experts may have clinical expertise, theoretical or conceptual expertise, conducted research and published in

refereed journals on the concept of interest (Davis & Grant, 1997). A minimum of five content experts are recommended to control for chance agreement. Three experts may be used in content areas where there are small numbers of experts available (Lynn, 1986). The content experts are asked to assess item content for adequacy of measuring dimensions of the concept of interest, clarity of item construction and wording and comprehensiveness of entire instrument to assess the content domain (Davis & Grant, 1997; Lynn, 1986).

Evaluations may be quantified using agreement indices such as Cohen's *Kappa*. Cohen's *Kappa* coefficient ranges from 0 (low agreement) to 1 (perfect agreement). Values of *Kappa* < 0.40 are considered poor agreement; *Kappa* 0.45 to 0.75 is considered fair to good. *Kappa's* above 0.75 reflects strong agreement. Items with poor agreement may be removed (Kerlinger & Lee, 2000; Zeller & Camines, 1980).

Content validity also may be quantified using an index of content validity (CVI). The CVI uses a 4-point ordinal rating scale where 1 = an irrelevant item to 4 = an extremely relevant item. The experts will be asked to rate each item from 1 – 4. An item and total instrument is considered content valid with a rating of 3 or 4 (Lynn, 1986). The experts are also asked to identify areas that have been omitted from the instrument. Items that do not achieve the required minimum agreement index should be removed or revised (Lynn, 1986).

To support content validity from a cultural-sensitivity perspective, the instrument items are reviewed by a representative sample from the cultural group. The cultural group may provide a form of content validity known as face validity. Face validity refers to an inspection of the items by laymen for items being relevant to the cultural group (Polit & Beck, 2008; Tran & Aroian, 2000; Waltz et al., 2010).

Criterion-related validity. Criterion-related validity refers to the correlation between a measure and some criterion variable of interest. Criterion related validity can be divided into two types, predictive and concurrent validity. If the correlation is high the measure is considered valid for that criterion (Zeller & Carmines, 1980). Predictive validity refers to correlating a measure to a criterion that occurs in the future (Zeller & Carmines, 1980). For example a college entrance exam score is correlated with actual college performance noted by college grade point average (Zeller & Carmines, 1980). The measure is the entrance exam score; the criterion is the college grade point average. If the correlation is high between the college entrance exam score and college performance measured as college grade point average then the entrance exam is a valid measure of college performance. Concurrent validity refers to correlating a measure to a criterion that exists in the present. For example a verbal report of voting behavior is correlated with the criterion of actually voting in an election. High correlation indicates a verbal report of voting behavior is a valid measure of actual voting. A limitation of criterion validity in the social sciences is that few measures in social sciences have clear criterion variables for comparison. Therefore criterion–related validity may be difficult to establish with social science concepts (Zeller & Carmines, 1980).

Construct validity. Construct validity answers the question: Does this empirical indicator measure the intended concept? According to the classic work of Cronbach and Meehl (1955), construct validity refers to the belief that an empirical indicator reflects a particular concept of interest and scores from the empirical indicator have interpretations that are based on theoretical definitions and variable relationships. Confirmation of score interpretation supports the validity of the empirical indicator. Evidence of construct validity may be supported by using

correlation, factor analysis, and/or convergent and discriminant analysis (Polit & Beck, 2008; Gable & Wolf, 1993).

Correlation. Correlation is a common statistical technique used to examine construct validity of an instrument. Correlation may be used to describe the relationship between instrument item scores or instrument scores and external variables according to strength of the relationship and direction of the relationship (Munro, 2005; Waltz et al., 2010). Correlations are measured as correlation coefficients. The Pearson product moment correlation coefficient (*r*) is the usual method of quantifying the relationship. The strength of a relationship may be noted by the magnitude of the coefficient from -1.00 to +1.00. The direction of the relationship is noted by the negative or positive sign of the coefficient. A + 1.00 indicates a perfect positive relationship, 0.00 indicates no relationship, and -1.00 indicates a perfect negative relationship. The *p* value is associated with the probability of the correlation between the items occurring by chance. The *p* value ranges from 0.00 to 1.00. A *p* value of < .05 that is associated with the correlation indicates the correlation has 5% or less chance of occurring randomly (Munro, 2005).

Correlation is used for instrument item analysis (Polit & Beck, 2008). Instrument items may be positively or negatively correlated with each other. Negatively correlated items may not perform well during construct validity analysis therefore the item should be recoded unless the negative association is intended. Acceptable inter-item correlations within the same subscale range from .30 to .70. Correlations under .30 may reflect little connection with the underlying subscale dimension concept, while correlations above .70 may reflect item redundancy (Ferketich, 1991). These cut points may vary depending on number of items in the scale (DeVellis, 2003). Individual items may also be correlated with the total instrument score. The

recommendations for item- to-scale correlations may vary from .20 or .30, if less the item may be eliminated (Kenny, 1986; Polit & Beck, 2008).

Factor analysis. Evidence of construct validity may be supported by factor analysis. Factor analysis is a statistical technique for analyzing instrument item scores. The item scores are correlated with each other and organized into subsets that are independent of one another. These subsets are defined as factors (Tabachnick & Fidell, 2007). The factors are assumed to identify conceptual dimensions of the instrument (Munro, 2005; Tabachnick & Fidell, 2007). The factors represent a latent variable which is a larger unobserved construct that is considered to be the underlying cause of the factor (Floyd & Widman, 1995; Musil, Jones, & Warner, 1998). The two basic types of factor analysis are exploratory and confirmatory (Munro, 2005; Tabachnick & Fidell, 2007).

Exploratory factor analysis. Exploratory factor analysis is another method to establish construct validity. It describes and summarizes data from an instrument by grouping items with similar correlations. The correlation between the item and the factor is referred to as a factor loading. The researcher then hypothesizes about the underlying processes that may have caused the item correlations as exploratory factor analysis assumes no *a priori* hypotheses about how items fit together (Kline, 1979; Polit & Beck, 2008)..For better interpretation of item correlations, factor loadings may be rotated to load predominately on one factor (Munro, 2005). Factor loadings also may be squared to obtain the proportion of variance that the item and factor have in common. The amount of variance accounted for by one factor is referred to as an eiganvalue. Typically, eiganvalues of one or greater are important for interpretation of the subset of items that are purported to define the factor (Munro, 2005). Exploratory factor analysis

allows the data to drive the identification of the instrument dimensions (Babyak & Green, 2010; Polit & Beck, 2008).

A number of factors are considered in producing appropriate item groupings using factor analysis. These include sample variability, marker items, and multicollinearity (Munro, 2005; Tabachnick & Fidell, 2007). The sample chosen should be able to produce variability in scores to show moderate to high correlations so that factors may emerge in the analysis (Tabachnick & Fidell, 2007). Identifying marker items is important for factor analysis. Marker items refer to items that show high correlations with a single factor regardless of the factor loading rotation. In so doing, the item defines the factor. High factor loadings with high marker items do not require a large sample for factors to emerge. Multicollinearity is another consideration in factor analysis. Multicollinearity refers to high item correlations (> 0.90) which is indicated when a factor's eiganvalue approaches zero which means the items in the factor provide for minimal variance in the factor (Munro, 2005; Tabachnick & Fidell, 2007).

Exploratory factor analysis is also used to summarize large amounts of data by reducing a larger set of items into a smaller set. This data reduction is performed by choosing the items that represent the most variance in a factor (Tabachnick & Fidell, 2007).

Confirmatory factor analysis. Unlike exploratory factor analysis, confirmatory factor analysis refers to *a priori* grouping of items into a factor model that represents the underlying dimensions of an instrument. The hypothesized model is then examined for fit with empirical data (Floyd & Widaman, 1995; Munro, 2005). More specifically, confirmatory factor analysis uses structural equation modeling (SEM) techniques that test a hypothesized factor model that represents a theory. SEM combines confirmatory factor analysis with path analysis. Path analysis is an application of regression analysis where path coefficients and regression

coefficients represent the relationship between factors and relationship between factors and items (Floyd & Widaman, 1995; Youngblut, 1994). The graphic program that is a part of the SEM program displays both the structural and measurement model as a schematic drawing. The process of SEM includes model specification, parameter estimation, model fit and model modification (Hoyle, 1995; Munro, 2005; Tabachnick & Fidell, 2007; Youngblut, 1994).

SEM schematic drawing. The SEM schematic drawing includes ellipses, squares, and arrows. The latent variables or factors are represented by ellipses (circles), the empirical indicator items or observed variables are represented by squares (Youngblut, 1994). The SEM schematic contains arrows that show relationships. Factors and empirical indicator items are linked by a single headed arrow directed from the factor toward the items. Arrows connecting the measurement error term to the empirical indicator item point toward the empirical indicator item. A two headed arrow indicates covariances or correlations between two factors **(**Youngblut, 1994).

SEM Process

Model specification. Model specification makes explicit the components of the hypothesized factor model including items, factors, parameters, and parameter estimation. The items are questions from the empirical indicator representing observed data. The factors are the dimensions of the instrument representing the latent variables. Parameters indicate the nature of the relationship between factors or factors and items (Hoyle, 1995). Parameters may be path coefficients, variances, covariances, and error terms. Parameters may be fixed or free. The fixed parameters are assigned either a "1" or "0". Fixed parameters that are assigned "1" indicate that a measurement scale is assigned. Fixed parameters that are assigned "0" represent the absence of a path between factors or items and factors (Tabachnick & Fidell, 2007). Free parameters are

estimated by the data (Hoyle, 1995; Norris, 2001). The pattern of free and fixed parameters is compared to the observed data pattern of variances and covariances (Hoyle, 1995). The correspondence of the specified model to the observed data may be described in three ways:(a) a just-identified model refers to each free parameter corresponding to one value in the observed data; (b) an over- identified model refers to the free parameters corresponding to more than one value in the observed data; and (c) an under-identified model refers to values from the observed data being unable to provide values for all of the free parameters. Therefore parameters in an under- identified model cannot be estimated (Hoyle, 1995).

Parameter estimation. The next step in model specification is to provide estimates for free parameters. Free parameter estimates include coefficients, variances, covariances, and measurement error (Chou & Bentler, 1995; Munro 2005). The maximum likelihood estimation (ML) is commonly used with SEM (Hoyle, 1995). Assumptions of ML are that (a) the sample is large (asymptotic), (b) observed variables are normally distributed, (c) the hypothesized model is valid, and (d) the scale of the observed variables is continuous (Byrne, 2001). The estimative procedure is achieved by an iterative computational cycle starting with either values set by the computer program or the researcher (Chou & Bentler, 1995). In summary, model specification includes developing the factor model with items and factors, specifying the free and fixed parameters and estimating the free parameters using maximum likelihood estimation.

Assessment of Model Fit

Degrees of freedom. Degrees of freedom (df) are important for model fit assessment. Degrees of freedom refer to the freedom of scores values to vary given what is known about the other scores in the model (Munro, 2005, p.417). Degrees of freedom are determined by the unadjusted degrees of freedom minus the number of parameters to be estimated in the model.

The unadjusted degrees of freedom is equal to the number of distinct variances and covariances in the model to be tested or P* [(p + 1)/2], where p equals the number of manifest or observed variables. The model df = (P* [(p +1)/2])-k, where k is the number of parameters to be analyzed in SEM (Munro, 2005, p. 417-418). The degrees of freedom help to identify the model as just-identified, over-identified or under-identified to indicate if there is sufficient data to fit with the model parameters (Munro, 2005). When there are more than 0 degrees of freedom the model is over identified (Weston & Gore, 2006).

Overall model fit. Evaluation of whether the observed data fit the hypothesized model is examined using multiple goodness of fit test (Hu & Bentler, 1995). The parameters are estimated and simultaneously tested for adequacy of fit to the data using model fit indexes. Three basic categories of overall model fit indexes exist including absolute, relative and adjusted (Maruyama, 1998). Absolute indexes are concerned with the residual or unexplained variance after model fitting (Maruyama, 1998). Absolute indices directly assess the hypothesized model fit. Examples of absolute indexes include the chi-square test, χ^2/df ratio and goodness of fit index (GFI). All SEM programs produce a model fit chi-square test where the observed data is compared to the hypothesized model. The goal is for the chi-square to be nonsignificant, meaning there is no difference between the observed data and hypothesized model. Limitations of chi-square test are the statistic does not provide information about the degree of model fit along a continuum and the statistic is influenced by sample size and violations of normality assumptions (Maruyama, 1998; Norris, 2001). The $\chi 2/df$ is similar to chi square, a fit of <3.0 is considered acceptable but a < 2.0 is desirable, however, there is no definite consensus ((Kline, 1998; Norris, 2001). GFI refers to the variance accounted for in the entire model. GFI range

from 0-1 with .90 or greater indicating a good fit. GFI is not reported consistently (Hu & Bentler 1995; Norris, 2001).

The second category of fit indexes is relative indexes. The relative indexes are concerned with how well one model fits the observed data compared with an established baseline worst fit model (null model) or another model. The hypothesized model fits with observed data along a continuum from worst fit to perfect fit (Maruyama, 1998). Models may be compared if they are nested. Models are nested when one model has the same free parameters as a second model and one model has additional free parameters that are not shared (Maruyama, 1998). Comparative fit index (CFI) and normed fit index (NFI) are examples of a relative index. CFI and NFI are incremental fit indices meaning they measure the proportionate improvement in fit by comparing the target model with a nested worst fit baseline model (Hu & Bentler, 1995). CFI and NFI range from 0-1 with 0.95 or greater indicating a good fit (Byrne, 2001; Norris; Tabachnick & Fidell, 2007). Another relative fit index is Tucker-Lewis Index (TLI) and Non-normed fit index (NNFI) compares alternative models rather than comparing one model with the null model and is less sensitive to sample size. However, TLI is not bound to values from 0-1 making the index difficult to interpret compared to NFI (Maruyama, 1998). Incremental fit index (IFI) is another relative fit index.

The third basic category of fit indexes is adjusted model fit. The adjusted model fit is concerned with assessing the parsimony of a model. Parsimony refers to models that approximate the just-identified model while having degrees of freedom (Maruyama, 1998). Root mean square error approximation (RMSEA) may be used to compare non-nested models. RMSEA estimates the lack of fit in a model by measuring the discrepancy per degree of freedom which makes the index sensitive to the number of estimated parameters (Byrne, 2001;

Maruyama, 1998; Tabachnick & Fidell, 2007). The RMSEA fit index of <.05 indicates a good fitting model. A fit index between .05 - .08 is acceptable, mediocre fit is .08-.10 (Byrne, 2001; Maruyama, 1998; Tabachnick & Fidell, 2007). The use of confidence intervals (CI) with RMSEA has been suggested to determine the degree of accuracy of the RMSEA with wide CI indicating little accuracy and narrow CI indicating more precise accuracy of model discrepancy (Byrne, 2001). RMSEA may be affected by small sample size by overly rejecting true models.

There is a lack of consensus for the best overall measure of model fit. It is recommended that multiple measures be used and reported to minimize Type 1 (rejecting null when null is correct) and Type 2 errors (accepting a null when null is wrong) (Bollen, 1990; Hu & Bentler, 1999). The CFI and RMSEA are most frequently reported (Tabachnick & Fidell, 2007). It is also recommend that chi-square test, degrees of freedom, significance level, an index that describes the overall proportion of explained variance (GFI, CFI); and an index that adjust the proportion of explained variance for model complexity (NNFI, AGFI, RMSEA) be reported (Kline, 1998).

Model mis-specification. After the parameters have been estimated, the parameters are evaluated for mis-specification. The parameters are evaluated for a) magnitude of coefficient estimates, b) appropriateness of the standard error and c) statistical significance of the parameter estimates (Byrne, 2001). .Evaluating the magnitude of the coefficient estimates include assessing for appropriate integer sign and magnitude of coefficient estimates that is consistent with underlying theory. Correlations greater than 1.0, and negative variances or covariances indicate the model is mis-specified or that the input data matrix is insufficient. Secondly, parameters are evaluated for appropriate standard error. If a standard error approached zero the test statistic for its related parameter cannot be defined. Standard errors that are large indicate

parameters that cannot be determined. No definitive criterion has been established for small or large standard error (Byrne, 2001).

Thirdly, the parameters are evaluated for statistical significance. Critical ratio is the statistic that tests if the parameter estimate is different from zero meaning if the parameter estimate fits the hypothesized model. The critical ratio is calculated by the parameter estimate divided by its standard error (Byrne, 2001). The critical ratio, based on a significance level of 0.05 should be > $\pm$1.96 for the null hypothesis to be rejected. Nonsignificant parameters are considered unimportant to the model and may be deleted. However, nonsignificant parameters may indicate that the sample size is too small (Byrne, 2001).

The size of the covariance residuals is assessed for mis-specification. The model may be mis-specified if the covariance residual do not center around zero as zero residual indicates a perfectly fit model (Tabachnick & Fidell, 2007). The SEM program provides an evaluation or diagnostics of the covariance residuals or amount of error connected to variables. Two types of residuals can be examined unstandardized or standardized (Raykov, 2006). Examining standardized residual is recommended if raw data across variables has different units of measurement. The standardized residual represents an estimate of the number of standard deviations from a zero residual model (perfectly fitting model). A standardized residual close to or above + 3 indicates that the model under explains the relationship between two variables (Raykov, 2006). Conversely, a standardized residual close to or below -3 indicates that the model over explains the relationship between two variables (Raykov, 2006). Another source says standardized residual values > 2.58 are considered large and indicate the model is misspecified (Byrne, 2001). Based on the residual information, model paths or covariances may

be removed or added to improve model fit (Raykov, 2006). The model modification indexes may also be examined for recommendations for better model fit (Tabachnick & Fidell, 2007).

Model modification. If the fit indices indicate that the hypothesized model does not fit the data, the model may be modified for better fit. The SEM computer printout provides recommended model modifications to improve model fit. The model modification test include chi-square difference test, Larange multiplier test (LM) and Wald tests (Hoyle, 1995; Maruyama, 1998; Tabachnick & Fidell, 2007). The chi-square difference test requires estimation of two models. This test asks if uncorrelated independent variables are allowed to correlate would this improve the model fit. The LM test requires estimation of one model. This test ask if one of the current fixed parameters were free to be estimated would this improve the model fit or what parameters should be added to improve the fit? Significance is desired with the LM test between the old model and the newly estimated model. The Wald test ask what parameters should be deleted from the model, or are there any estimated parameter that can be fixed to 1 or are there parameters that are not needed? Non-significance is desired when using the Wald test because only parameters that has little significance to the model should be removed (Hoyle, 1995; Maruyama, 1998; Tabachnick & Fidell, 2007).

It is generally recommended that parameters be added before any are deleted. So the LM test is suggested before the Wald test. Parameters should be added or deleted one at a time. Each time the model is adjusted it is retested using the model- fit indexes. However, model respecification should only be done with theoretical justification.

Construct validity may also be supported by convergent and discriminant evidence. Convergent evidence refers to the ability of the new instrument to show correlation with an existing instrument that measures a similar concept. Also convergent validity is supported when

the new self-report measure performs similarly using a different method of data collection, such as by observation. Achieving high correlation (> .70) between the new measure and the existing instrument and the new measure and a different method of collecting similar data is considered evidence of convergent validity. Whereas, discriminant evidence refers to the ability of a measure to differentiate the concept from a neutral or opposing concept by showing limited correlation such as a correlation below (> .30) (Campbell & Fiske, 1959; Kerlinger & Lee, 2000; Waltz et al., 2010). Convergent and discriminant evidence may be achieved using the multitrait-multimethod matrix method (MTMM) (Campbell & Fiske, 1959). The process is to correlate more than one data collection method of the same concept and correlate instruments that measure neutral or opposing attributes. High correlations between the different data collection methods of the same concept and low correlation between same method and neutral or opposing concepts would support convergent validity and discriminant validity respectively (Campbell & Fiske, 1959; Kerlinger & Lee, 2000).

In summary, gathering evidence of validity for a new instrument refers to determining if the instrument measures the intended concept. The three basic types of evidence to support validity include content, criterion and construct validity. Content validity refers to the degree to which the items on the measure are a representative sampling of the concept domain. Criterion validity including concurrent and predictive evidence refers to using the new measure to predict an objective criterion behavior that is external to the new measure. Lastly, construct validity refers to examining the internal structure of the instrument and the performance of the instrument in relation to other variables to determine if the instrument is measuring the intended concept. Evidence of construct validity of an instrument is supported with a pattern of consistent findings involving different researchers, different samples, and diverse variables (Polit & Beck, 2008).

Conclusion

This chapter has reviewed the scientific literature in five key areas. First, the discussions focused on the prevalence and development of obesity as well as methods to measure and classify obesity (e.g., weight, BMI, waist circumference). It then addressed the causes and consequences of obesity. The next section focused specifically on African American women and their engagement in the behaviors necessary for weight control (e.g., their diet and physical activity). Then there was discussion that focused on body image, and other beliefs about weight that are held by African American women which may affect their weight management behaviors. At that point a gap in the literature was identified in that there is limited literature addressing what African American women believe about their own personal weight, and that there is no existing instrument available to measure these weight beliefs that may affect weight management behaviors. Thus the final section of this chapter presented literature that describes the steps needed to develop an instrument to measure beliefs about personal weight, including steps to ensure the reliability and validity of a new instrument.

The following chapter addresses the conceptual framework that has guided the development of the concept of beliefs about personal weight and shows the theoretical linkages between this belief and weight management behaviors and actual weight.

Chapter 3

Conceptual Framework

Nursing Knowledge Development

The primary purpose of nursing inquiry is to advance nursing knowledge for practice. The boundaries for nursing inquiry are largely guided by nursing's disciplinary perspective. Disciplinary perspectives are based on values that characterize the nature of concepts of interest and provide a framework to perceive, comprehend and interpret phenomena (Meleis, 1997). According to Donaldson and Crowley (1978), nursing's disciplinary perspective views phenomena from the perspective of healthy functioning of individuals in interaction with their environments. This perspective provides the context for nursing knowledge development.

The framework for nursing knowledge development flows from abstract to concrete concepts. This framework includes metaparadigm concepts, worldviews, conceptual models, theories and empirical indicators. Metaparadigm concepts are abstract concepts that define the phenomena of central interest to a discipline and describe the relationships among these concepts (Fawcett, 2005). The generally accepted metaparadigm concepts of nursing are human being, health, environment, and nursing (Fawcett, 2005). Human being is defined as individual, families, communities or groups that are participants in nursing. Health is defined as the human process of living and dying recognizing that human beings are in continuous relationship with their environment. Environment is defined as the human being's significant others, physical surroundings, settings where nursing occurs including private home to health care facilities. Environment also includes cultural, social, political and economic conditions at local, regional, national, and worldwide levels. Nursing is defined as the actions taken by nurses on behalf of or in conjunction with human beings and the outcomes of these actions (Fawcett, 2005).

Nursing knowledge development is guided by philosophical claims about the nature of human beings and human being environment-relationships (Fawcett, 1993). These philosophical claims are worldviews that inform our definition of the nature of reality (ontology) and how knowledge about reality is acquired (epistemology) (Fawcett, 2005; Rogers, 2005; Rawnsley, 1998). According to Fawcett (2005), world views include: reactive world view, reciprocal interaction world view and simultaneous action world view. The reactive world view, regards human beings as the sum of parts including bio-psycho-social parts. Human beings are reactionary, responding to stimuli as it chronologically occurs and knowledge is acquired through observable phenomena. Reactive worldview is an example of positivism where there is one objective reality that can be empirically measured (Jacox, Suppe, Campbell, & Stashinko, 1999; Rogers, 2005). The reciprocal interaction world view regards human beings as holistic with parts being acknowledged within the context of the whole person. Reality is context dependent, and human beings and their environment interact in reciprocal fashion. Knowledge is gained through both subjective and objective means. Reciprocal interaction worldview is an example of postpositivism where there is an appreciation for the impact of one's environment on behavior and objective and subjective knowledge are important to understand phenomena (Jacox et al., 1999; Rogers, 2005). Lastly, the simultaneous action world view regards human beings as being more than the sum of their parts and is recognized by patterns of behavior. This world view regards human beings as being in rhythmical interaction with their environment and gaining knowledge through personal knowing and pattern recognition (Fawcett, 2005). The simultaneous action worldview is an example of postmodernism where a single objective reality does not exist. Instead, multiple truths and realities are accepted as knowledge (Rogers, 2005).

Moving from abstract to concrete, theories have a narrower scope and have more concrete concepts and concept relationships that can be measured using empirical indicators. Empirical indicators represent and measure theoretical concepts. Empirical indicators may be instruments, experimental conditions or procedures (Fawcett, 2005).

In summary, disciplinary perspectives provide a framework to characterize phenomena of interest. The disciplinary perspective of nursing focuses on healthy functioning of human beings, which provides the context for the development of nursing knowledge. The process for nursing knowledge development flows from broad abstract concepts to specific measureable concepts, from metaparadigm concepts, worldviews, conceptual models, and theories to empirical indicators.

Phenomenon of Interest: Beliefs about Personal Weight

A large body of evidence details that obesity is a major health threat for African American women. A review of the literature identified a gap in knowledge related to the measurement of African American women's beliefs about their own personal weight and the effect of those beliefs on weight management behaviors. This section of the conceptual framework discusses the development of a new concept: *beliefs about personal weight.* The next section discusses how that concept is incorporated within Orem's (2001) theory of self-care in order to examine the relationship of beliefs to health-related self-care behaviors.

Development of the Concept: Beliefs about Personal Weight

Concepts are mental constructions that summarize observations and experiences that appear to be related (Walker & Avant; 2005; Fawcett, 1993). Defining concepts promotes the ongoing process of being able to better operationalize the concepts in empirical testing (Gast et al., 1989).

The concept of beliefs about personal weight was developed using concept synthesis. Concept synthesis refers to bringing concepts together that are not theoretically connected to form a new concept (Walker & Avant, 2005). Developing the definition of weight beliefs began with a definition of the concept of beliefs. Beliefs are defined as convictions (Trueblood, 1939) about a belief object. Beliefs about a belief object are made explicit or accessible through inquiry about the characteristics, causal attributions and consequences regarding the belief object (Fishbein, 1963; Fishbein & Ajzen, 2000; Leicester, 2008). The concept of beliefs was then combined with the concept of personal weight, defined as current body weight. These two concepts formed a "summative unit" as defined by Dubin's schema to create a new concept of "beliefs about personal weight". Dubin's schema (1978) is a method of defining a phenomenon by its properties, meaning the attributes of the phenomenon, and then using the properties as measurement characteristics. Thus, the definition of *beliefs about personal weight is defined as a multidimensional concept consisting of the convictions regarding the descriptive characteristics, causal attributions, and consequences of one's personal weight.* Beliefs about the descriptive characteristics of one's personal weight are how one describes one's own weight (e.g. skinny, heavy, nice size). Beliefs about causes of personal weight are beliefs about the source of one's personal weight (e.g., heredity, lack of exercise, eating habits). Beliefs about the consequences of one's personal weight are the beliefs about the outcome of one's personal weight (e.g. no consequence, chronic illness, decreased mobility). The beliefs about personal weight are conceptualized as a single concept with three dimensions. These dimensions will be used to develop an instrument regarding beliefs about personal weight for the purpose of measuring the relationship of beliefs about personal weight and weight management behaviors.

The concept, *beliefs about personal weight*, is further theorized as a foundational disposition affecting one's motivation and self-care behaviors. Incorporating this concept within the theory of self-care provides a theoretical framework for examining the effect of beliefs on weight management behaviors as well as on actual measured body weight.

The Theory of Self-Care

The theory of self-care (TSC; Orem, 2001) provides the conceptual framework for developing the beliefs about personal weight survey. The worldview of self-care deficit nursing theory is moderate realism. Within a moderate realism perspective the world exist independent of thought which means there is an empirical reality that can be known. Human beings are unitary beings that interact with their environment and knowledge is acquired using objective and subjective means (Orem, 2001).

The self-care deficit nursing theory (SCDNT) consists of three constituent theories: theory of self care, theory of self care deficit, and theory of nursing systems. Theory of self-care is the foundational theory of the self-care deficit nursing theory where self-care is defined as learned deliberate action that individuals initiate and perform on their own behalf to maintain life, health and well-being (Orem, 2001). Self-care deficit theory examines the relationship between the need for self-care or self-care demand and the ability to meet the need. When the need for self-care is greater than the ability to meet the need a deficit occurs (Orem, 2001). The theory of nursing systems establishes the content of nursing practice. The content of nursing practice is nursing agency which connects the patient's therapeutic self-care demand and self-care agency when the patient does not have the agency to meet his own self-care demand (Orem, 2001).

The constituent theory of self-care (TSC; Orem, 2001) will be used to derive concepts and concept relationships to develop and test the beliefs about personal weight survey. TSC has five key concepts including, basic conditioning factors, therapeutic self-care demand, self-care agency, self-care and health. The following are definitions of the TSC concepts and the derived concepts that will be used to develop and validate the new survey. Figure 1 depicts the relationship of these concepts and is presented after the narrative discussion of the concepts.

Basic conditioning factors. Basic conditioning factors are parameters that describe the individual, including internal and external "factors that affect individual's ability to engage in self-care or affect the kind and amount of self-care required" (Orem, 2001). Basic conditioning factors are age, gender, developmental state; individual and family factors referring to socio-cultural orientation, and family systems. Basic conditioning factors also include health state, health care system factors, pattern of living, environmental factors, resource availability and adequacy (Orem, 2001).

Weight contextual factors. Weight contextual factors is a more concrete concept derived from basic conditioning factors.. Weight contextual factors are internal and external factors that influence the ability to engage in weight management. Definitions for weight contextual factors are: *gender* referring to sex, male or female*; age* referring to chronological age in years; *health state* referring to the presence or diagnosis of medical conditions (e.g. hypertension, diabetes mellitus, cardiovascular disease); *socio-cultural orientation* referring to ethnicity; *ethnicity* referring to race (e.g., African American, Caucasian); s*ocioeconomic status* referring to education*;* and *pattern of living* referring to the practice of behaviors such as smoking or ethanol use.

Therapeutic self-care demand. Therapeutic self-care demand is the sum of all self-care needs and actions that are required for health and well-being. These self-care needs are specific to the individual and include universal requisites, developmental requisites and health deviation requisites. Universal requisites include air, water, food, elimination, balance between activity, rest, balance between solitude and social interaction, prevention of hazards, and promotion of normalcy. Developmental requisites include three sets of self-care needs that are met at different stages of the life cycle. Provision of conditions that promote development may include self-care needs as an infant, when subjected to a disaster, or serious illness. Self-care needs during these times may include food, water, and safe, stable and appropriately stimulating environments. The second set of developmental requisites is engagement in self-development which include, among other things, introspection and reflection in order to develop insights and perceptions about self and others, and act with responsibility in life situations. The third developmental requisite is interferences with development which include among other things conditions leading to deprivation such as situations of loss, poor health, and educational deprivation. The third requisite is health deviation requisites which are self-care needs of those with a disability, injury or medical diagnosis that include seeking medical care when needed, attention to pathologically conditions, following medical recommendations and adapting self-concept to a particular state of health (Orem, 2001).

The developmental requisite of insights and perceptions of self regarding personal weight is the requisite of concern in this proposal.

Self-care agency. Self-care agency is the central component of the TSC. Self-care agency is a multidimensional concept that is defined as the ability to engage in self-care. Components of self-care agency include human foundational dispositions and capabilities, power

components and self-care operations. Human foundational dispositions are defined as dispositions that determine one's concern for health, affects goals sought, expresses conditions that affect one's willingness to accept self as a self-care agent, determines lasting habits, and provides motivation to engage in self-care behavior (Orem, 2001). Power components are defined as enabling traits for self-care behavior. Motivation, defined as goal orientation, is power component. Lastly, self-care operations are defined as operational traits that allow one to prepare to engage in self-care. Self-care operations include the estimative operation of knowledge, transitional operation of judging and deciding, and productive operations that include preparation to engage in self-care (Orem, 2001). Estimative operations focus on gaining empirical knowledge of self and environment in order to answer the question "what should be" concerning one's health and well-being (Orem, 2001). Estimative operations involve consideration of expected benefits and consequences of any regulatory actions taken or not taken and discernment of the possible results of change or maintenance of some condition or state. Decisions about the course of action regarding self-care are motivated by values or beliefs concerning social, cultural, economic and health related factors (Nursing and Development Conference Group [NDCG], 1979). These factors influence the decision for or against self-care. Productive operations focus on preparation of self, materials, and environment to perform the regulatory actions for self-care that were decided during estimative operations. Productive operations also provide ongoing evaluation of self-care to determine adequacy of self-care performance and results regarding some condition or state (NDCG, 1979; Orem, 2001). In total, self-care agency is the comprehensive ability to take action to maintain health and well-being (Orem, 2001). Self-care agency is evaluated in terms of the relationship of the self-care need and ability to meet the need.

Weight management agency. Weight management agency is derived from self-care agency, defined as the ability to engage in weight management behaviors. Weight management agency is a multidimensional concept that conceptualizes weight beliefs and body image as human foundational dispositions and capabilities. Motivation to engage in weight management behavior is conceptualized as a power component; and knowledge of weight management behaviors is conceptualized as the estimative self-care operation. As human foundational dispositions, beliefs about personal weight and body image, determine a person's concern over weight related to health, affect goals sought, expresses conditions that affect one's willingness to accept self as being responsible for weight management behavior, and affects lasting habits related to weight management. The power component of motivation is conceptualized as the power to set goals and engage in weight management behavior. The estimative operation of knowledge is conceptualized as knowledge of weight management behaviors. Motivation and knowledge will not be addressed in this study.

Beliefs about personal weight are defined as a multidimensional concept consisting of the convictions regarding the descriptive characteristics, causal attributions, and consequences of one's personal weight. Beliefs about the descriptive characteristics of one's personal weight is how one describes their weight e.g. skinny, heavy, nice size; beliefs about causal attributions of personal weight is beliefs about the source of personal weight e.g. heredity, lack of exercise, eating habits; beliefs about consequences of personal weight is beliefs about the outcome of personal weight e.g. no consequence, chronic illness, decreased mobility.

Body image refers to an assessment of one's body that includes both attitudinal and perceptual components (Rucker & Cash, 1992).

Self-care. Self-care is defined as the practices of activities that mature persons initiate and perform own their own behalf to maintain health and well being through meeting known requisites. Orem asserts that self-care actions are deliberate, and performed continuously over time in the process of daily living. Self-care actions are learned within a socio-cultural context. Orem further asserts that persons have the potential for self-care through knowledge and motivation (Orem, 2001).

Weight management behaviors. Self-care is substructed to weight management behaviors including regular physical activity (work, sporting, leisure time), and eating behaviors (eating patterns),

Health. Health is defined as a state of structural or functional wholeness or integrity. Deviation from normal structure or functioning is referred to as absence of wholeness or integrity. Health also includes psychological, interpersonal and social aspects of living. The meaning of health changes as views about one's human and biological characteristics change (Orem, 2001, p.182).

Weight control. Health within this study is conceptualized as weight control as evidenced by actual body weight and BMI and adiposity being within normal limits.

Relational Statements

The relational statements are propositional statements that show how the concepts of TSC are connected. The relational statements of TSC include:

1. Basic conditioning factors are associated with self-care agency.
2. The influence of basic conditioning factors on self-care behaviors is mediated by self-care agency.

3. Components of self-care agency (foundational dispositions, power components, and self-care operations) influence self-care behaviors.
4. Self-care behaviors influence health and well-being.
5. The influence of self-care agency on health and well-being is mediated by self-care behaviors.

Assumptions

Philosophical assumptions are statements that are accepted as true and provide the context for conceptualizing and operationalizing concepts (Polit & Beck, 2008). The explicit assumptions regarding the concepts and concept relationships used to conceptualize and test the measure of beliefs about personal weight are:

1. Human beings are unitary beings who function as whole persons.
2. Human beings' personal view about their weight is central to weight management.
3. Human beings require continuous input to self to maintain their weight.
4. Weight management agency (ability to engage in weight management behavior) is exercised through care of self by identifying the need and being motivated to maintain a healthy weight.
5. Weight management agency (ability to engage in weight management behavior) is exercised through care of self by having the knowledge and resources, judging and deciding and ability to take action to practice weight management behaviors. This assumption will not be addressed in this study.
6. Weight management behaviors (physical activity, eating behaviors) are deliberate voluntary behaviors that are learned.

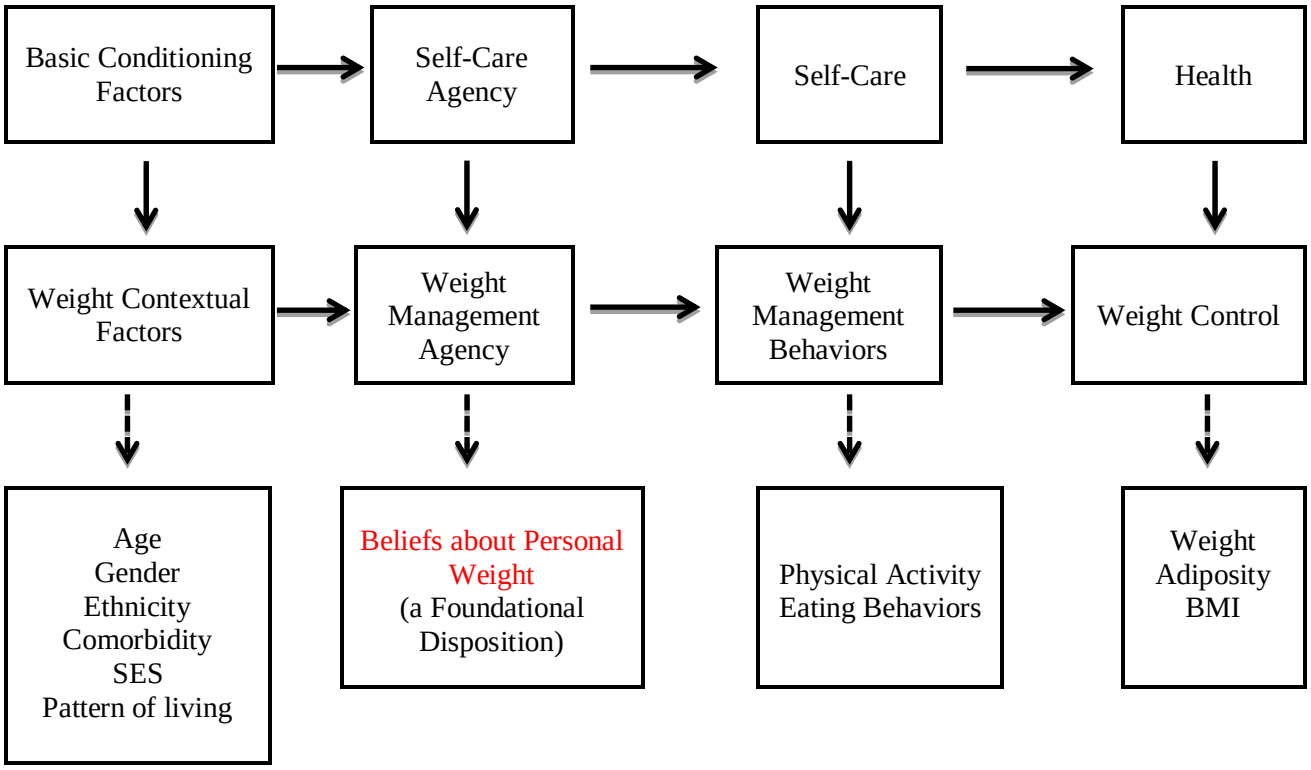
7. Maturing human beings are viewed as being responsible for caring for self and maintaining their own weight.
8. Weight control is a state of health.

Propositional Statements

Propositional statements are statements using concepts and conceptual relationships derived from the TSC:

1. Weight contextual factors are associated with weight control agency.
2. Influence of weight contextual factors on weight management behaviors are mediated by weight management agency.
3. Components of weight management agency (weight beliefs, body image, motivation to engage in weight management behaviors and knowledge of weight management behaviors) influence weight management behavior.
4. Weight management behaviors have the potential to positively influence health.

Figure 1. *Beliefs about Personal Weight* Derived from Concepts within the Theory of Self-Care



Conclusion

Chapter three discussed the conceptual framework used to derive the concept of personal weight beliefs and to situate that concept within a broader conceptual framework. This chapter specified the concepts, conceptual relationships, assumptions, propositional statements and specific aims that were used to guide the development and testing of an instrument to measure this new concept.

Chapter 4

Methodology

The purpose of this study was to develop and perform initial psychometric evaluation on the Beliefs about Personal Weight Survey (BPW). The specific aim of this study was to develop and test a culturally-sensitive survey that measure beliefs about personal weight by (a) developing a relevant item-pool, (b) analyzing cultural sensitivity of the measure, and (c) performing initial psychometric evaluation of the survey to determine initial reliability and establish beginning evidence of the instrument's validity based on content, internal structure, and its relationship to other variables.

The BPW was developed as a culturally-sensitive, norm-referenced instrument to measure beliefs about personal weight in African American women. In this chapter the method for developing the new instrument is discussed. The BPW was developed in three phases. The initial phase included item-pool development and cultural-sensitivity analysis. The second phase included content validation, face validity and pretesting. Lastly, the third phase included initial psychometric evaluation of the instrument to establish beginning evidence of reliability and validity.

Evidence Based on Content

Phase 1: Item-Pool Development and Cultural-Sensitivity Analysis

Item-pool development. The initial instrument-item pool development was guided by theoretical and empirical considerations. Theoretical items were developed by the dimensions of the beliefs about personal weight. Items also were developed from the literature on African American women's weight including general weight beliefs, weight values, cultural values, body image and existing health belief questionnaires (Allan, Mayo, & Michel, 1995; Allison, Basile,

& Yuker, 1991; Befort et al., 2006; Blixen, Singh, & Thacker, 2006). The item content was developed for a norm-referenced, likert-type measure which means items were designed to measure magnitude of beliefs regarding personal weight (Waltz et al., 2010). A sufficient number of questions were generated under each weight belief dimension, producing a pool of potential items. Readability of the initial items was assessed using the Microsoft Word, word processing feature that provides a readability statistic for single words and sentences. A reading level of < 7^{th} grade is desired (Streiner & Norman, 2003).

Cultural-sensitivity analysis. The next step in phase one of item development was cultural-sensitivity analysis of the item-pool using a sample of African American women. The sample size depended on data saturation and quality of the data collected (Sandelowski, 1995; Davis & Harris, 1989). Inclusion criteria included (a) self-report African American woman; (b) 18-40 years of age; (c) able to speak and understand English; (d) pre-menopausal; (e) not pregnant or breast feeding; (f) willing to commit to an interview for data collection. Exclusion criteria included (a) cognitive impairment, as noted by results from the animal naming test. Inability to name 10 animals in one minute is associated with cognitive impairment as noted by MacNeill and Lichtenberg Decision Tree for cognitive impairment (MacNeill & Lichtenberg, 2000); (b) self-report medical diagnoses of diseases known to cause weight gain (Hypothyroidism, Cushing's syndrome, Polycystic Ovarian Syndrome) and (c) currently taking medications known to cause weight gain (steroids, anti-seizure medication, anti-psychotic medication). Beliefs about personal weight may be different in those with weight gain from illness or illness treatment. Participants were recruited from a university campus, community, social and religious organizations using flyers, and the university pipeline system.

Sample characteristics Phase 1. A non-probability sample of 14 African American women between 18-40 years old, were recruited over one month, from April, 2011 to May, 2011. Participants self-reported their level of education, height, and weight. BMI was calculated from height and weight data. Table 1 presents characteristics of Phase 1 participants. Overall, the sample was well educated. All of the participants reported being high school graduates. Over half reported highest level of education as some college 57%. (n = 8) while twenty-one percent reported their highest level of education as college graduate. Fourteen percent reported having a graduate level degree. Participants had a range of BMIs from approximately 19 – 50. Approximately, one-third of the sample were at a normal BMI 35%, (n = 5), 14 % (n= 2) were overweight while 50 % (n= 7) had BMIs > 30. All of the participants were able to name at least ten animals in one minute indicating cognitive ability to participate in the study.

Table 1

Phase 1: Sample Characteristics (*N* =14*)*

Level of Education		*Mode* = Some College
< High school		0
High school graduate		14.3% (n =2)
Some College		57.1% (n = 8)
College Graduate		21.4% (n = 3)
Graduate/ Professional School		7.1% (n = 1)
BMI	Range = 18.75 – 49.64	*M* = 31.5 (*SD*= *8.5*)
Normal Weight	(18 < 24.9)	35% (n =5)
Overweight	(25 < 29.9)	14% (n = 2)
Obesity grade 1	(30 < 34.9)	14% (n = 2)
Obesity grade 2	(35 < 39.9)	29% (n = 4)
Obesity grade 3	(≥ 40)	7% (n =1)

Procedure for Phase 1. The thinking aloud method by Kucan and Beck (1997) was used to analyze and revise the item pool for cultural sensitivity. The thinking aloud method is a process of expressing one's thoughts as one reads a text aloud as a way of overtly making known one's processing of the information to determine comprehension of the text (Kucan & Beck, 1997). Each participant was asked to read each item aloud followed by articulating their thoughts about what the items meant, to them and suggest alternate wording that may be more culturally appropriate. Participants also were asked to choose five items from each subscale that were most important to assess personal weight beliefs among African American women. The thinking aloud information was tape recorded and transcribed verbatim.

Data collection. The study was reviewed by Wayne State University's Institutional Review Board (IRB). The review process included providing verbal information and a written information sheet explaining the study. Participation in the study was considered consent. No identifying information was collected. Data collection included, completing a demographic form, and completing the cultural sensitivity analysis of the item pool. The data collection interview lasted up to 60 minutes. Participants received a $25.00 gift card to CVS drugstore for their time and effort. The item-pool form used for the thinking aloud process and transcriptions were numbered with the same number, placed in a folder and were stored in a locked cabinet. Tape recordings were electronically transferred and stored in a password protected electronic folder. The folder will be deleted at the end of the study.

Data analysis. Transcripts were reviewed for: explanations of what items meant, unintended meanings, ambiguous, and misleading words, items believed to be most important within each subscale and additional item content. The transcripts were reviewed for revisions to the item pool to improve cultural-sensitivity

Phase 2: Content Validation

Expert content validation. The item pool was reviewed for content validity by six experts that included experts in obesity, body image, attitude formation, obesity-related comorbidities, instrument development and African American women's health. Content validity was examined using item relevance and clarity. Content validity was quantified using an index of content validity (CVI) (Lynn, 1986). The CVI uses a 4-point ordinal rating scale where 1 = irrelevant item; 2 = somewhat relevant, needs revision 3= quite relevant, needs minor revision and 4 = highly relevant and succinct (Lynn, 1986; Polit & Beck, 2006). Clarity was assessed by choosing clear (C) or not clear (NC) for each item. The experts were asked to rate each item from 1 – 4. The CVI for an individual item is the proportion of experts rating the item as a 3 or 4. An item was considered content valid with a rating of 3 or 4 by at least five out of six of the experts. A CVI of .83-1.00 is desired for each item and entire scale (Grant & Davis, 1997; Lynn, 1986). The content validity rating for the entire scale was calculated by the proportion of total items judged content valid. The content experts also were asked to assess overall comprehensiveness of the instrument by providing overall comments and recommendations (Davis & Grant, 1997; Lynn, 1986).

Face validity and pretesting. After expert content validity evaluation and item pool revisions, the items were examined for face validity and pretesting. A non probability sample of 10 African American women, meeting inclusion and exclusion criteria were recruited from August, 2011 to September, 2011. The participants received an information sheet about the study. No identifying data was collected and the participants received a $20.00 gift card to CVS for their time and effort.

Sample characteristics Phase 2. Table 2 presents characteristics of Phase 2 participants. The sample was well educated, with 60% (*n* = 6) reporting some college and 30% (*n*= 3) reporting being a college graduate or professional. BMIs were calculated using self-report weight and height. The participant's had an average BMI in the overweight category.

Table 2

Phase 2: Sample Characteristics (*N*= 10)

Years of Education	*Mode* = Some College		
< High school		0%	
High school graduate		10%	(*n* =1)
Some College		60%	(*n* = 6)
College Graduate/ Professional		30%	(*n* = 3)
BMI	Range =19-34 *M* = 28 (*SD* = 5.4)		
Underweight	(< 18)	0%	
Normal Weight	(18 < 24.9)	30%	(*n* =3)
Overweight	(25 < 29.9)	10%	(*n* = 1)
Obesity grade 1	(30 < 34.9)	60%	(*n* = 6)
Obesity grade 2	(35 < 39.9)	0 %	
Obesity grade 3	(≥ 40)	0 %	

Procedure Phase 2. There were two procedures done in Phase 2: those to assess face validity, and procedures for pretesting. For face validity participants were asked to review the item pool for items that addressed beliefs African American women may hold about their weight by responding to the question: Do you think these statements address beliefs African American women hold about their weight? Participants were asked to respond yes, no, or not sure to each item in the item pool.

Data analysis for face validity. Items declared not culturally sensitive by 80% of the sample (receiving a no, or not sure) may be removed from the item pool. However, the items may be retained if there is a theoretical reason, such as, items that are scientifically known to a cause or be a consequence of weight.

Procedure for pretesting. For pretesting, the item pool was arranged into a survey entitled Beliefs about Personal Weight Survey (BPW) with five point likert-type responses, from strongly disagree to strongly agree. Pre-testing the instrument was necessary to uncover problems with administration, identify missing data, and perform preliminary analysis (Tran & Aroian, 2000; Waltz et al., 2010). Missing data may mean the item is asking for information that is too personal, threatening, or not applicable (Waltz et al., 2010).

Data analysis for pretesting. Item frequencies were used to determine if the score distributions were appropriate and varied for each item.

Phase 3: Psychometric Evaluation

After the BPW was pre-tested, the instrument underwent initial psychometric evaluation. The psychometric evaluation included determination of the BPW score distributions meeting statistical assumptions and examination of the reliability and validity of the survey. Evidence of reliability was estimated by internal consistency analysis using Cronbach's alpha and test-retest reliability using paired-*t*–test. Evidence of internal structure was evaluated by exploratory factor analysis using principal component analysis, correlation, and evidence based on relationships to other variables using regression.

Design

Phase 3 of the study used quantitative, cross-sectional, descriptive, correlational design.

Sample and Setting

The sample was a non-probability sample. Inclusion criteria included (a) self report African American woman; (b) 18-40 years of age; (c) able to speak and understand English; (d) pre-menopausal; (e) not pregnant or breast feeding. Exclusion criteria included (a) obvious cognitive impairment (b) self-report medical diagnoses of diseases known to cause weight gain (Hypothyroidism, Cushing's syndrome, Polycystic Ovarian Syndrome) and (c) currently taking medications known to cause weight gain (steroids, anti-seizure medication, anti-psychotic medication). All data collection was done in a room provided by the management of the recruitment sites.

Sample Justification

Men and other ethnic groups were excluded from this study. African American women were chosen because of the nationally recognized high prevalence of obesity in this group and the low rates of African American women engaging in weight management behaviors such as physical activity. The pre-menopausal age range was chosen to limit confounders of weight changes associated with menopause and increased risk of illness with advancing age. Pregnancy and breast feeding women were excluded due to weight instability during pregnancy and breast feeding. Participants with medical conditions or currently taking medications that are known to influence weight are excluded to control for a potential bias in weight beliefs due to the medical condition or medication.

Participant Recruitment and Incentive

Recruitment began following approval from Wayne State University Institutional Review Board (IRB). A representative sample of African American women living in a large metropolitan city was recruited using word of mouth, informational flyers and university internet

advertising. Participants were recruited from academic, social, medical and community sites. As a participant incentive, and to thank participants for their time and effort, participants received a $20.00 gift card to CVS drugstore after the data collection session was completed.

Sample Size

The sample size for instrument validation may be determined by (a) the number of items on the instrument, (b) type of analysis planned (c) effect size, (d) desired power, and (e) alpha level. A sample size of 150 participants was used because it was sufficient to complete psychometric evaluation of PCA and regression analysis (Tabachnick & Fidell, 2007). Six percent of this sample (n =10) were recruited for test-retest reliability.

Phase 3 Sample Characteristics

Table 3 presents sample characteristics. A non-probability sample of 150 African American women participated in this phase of the study. The participants were recruited from multiple community sites including: college campus, elementary school, clinic waiting room, church, and a women's association in Metropolitan Detroit. The recruiting sites were chosen to obtain a representative sample of African American women meeting study criteria. On average the participants were younger than 30 years of age (M = 28.4; SD 7.69), well educated with more than half of the participants having some college or graduate professional degree (n = 104). A third of the sample reported an annual income greater than $25,000 ($n$ = 50). Approximately half of the participants were single (n = 77), 18% (n = 28) were married. More than half of the participants were obese, BMI $\geq$ 30 (n = 79) with central obesity (waist circumference > 35 inches) (n = 83).

The majority of participants (66%, n = 99) reported sleeping less than seven hours per night. Most of the participants denied smoking or drinking alcohol. Eighteen percent of the

participants (*n* = 27) reported smoking with half of smokers reported smoking six cigarettes per day. Thirty-nine percent (*n* = 28) reported drinking alcohol with an intake of 1.68 drinks per day. A small number of participants reported having a diagnosis of hypertension (*n* = 18) or diabetes (*n* = 8). Most of the participants reported having delivered at least one child 60% (*n* =91). The participants perceived their weight on average to be normal as a child and overweight as an adult. More than 80% (*n* = 132) of the participants reported no history of participating in commercial weight loss program.

Table 3

Phase 3 Sample Characteristics (N = 150)

Age	Range: 18-40 years *M* = 28.39 (*SD* = 7.69)		
Years of Education (*n* =146)	Range: 9-22 years *M* = 13.78 (*SD* = 2.04)		
< High school		8.7%	(*n* = 13)
High school graduate		19.3%	(*n* = 29)
Some College		48.7%	(*n* = 73)
College Graduate/ Professional		20.7%	(*n* = 31)
Missing		.03%	(*n* = 4)
Relationship Status			
Single	51.3% (*n* = 77)		
Single, in committed relationship	21% (*n* = 32)		
Married	18.7% (*n* = 28)		
Widowed	.7% (*n* = 1)		
Divorced	4% (*n* = 6)		
Separated	4% (*n* = 6)		
Annual Household Income	*Mode* = $25, 000 – $49, 999		
< $15,000	52.6% (*n* = 79)		
15, 000 – 24,999	11.3 % (*n* = 17)		
25,000 -49,000	19.3% (*n* = 29)		
> $50, 000	14% (*n* = 21)		
Missing	2.7% (*n* = 4)		
Weight	Range: 93 pounds – 322 pounds *M* = 183.70 (*SD* = 47.61)		

Table 3 (cont'd)

BMI	Range: 16 – 52 *M* = 31.5 (*SD*= 7.82)		
Underweight	(< 18)	.7%	(*n* = 1)
Normal Weight	(18 < 25)	23%	(*n* = 34)
Overweight	(25 < 30)	24%	(*n* = 36)
Obesity grade 1	(30 < 35)	22%	(*n* = 33)
Obesity grade 2	(35 < 40)	16%	(*n* = 24)
Obesity grade 3	(≥ 40)	15%	(*n* =22)
Waist Circumference	Range: 24.50-57.00 inches *M* = 37.1 inches (*SD*= 6.72)		
< 30 inches	19% (*n* = 29)		
30 inches - 35 inches	25% (*n* = 38)		
> 35 inches	55% (*n* = 83)		
Body Image Perception	Range: 1(BMI~18) - 8(BMI ~ 32) *M* = 4.8 (BMI ~ 26)		
Sleep Pattern			
Less than 7 hours per night	66% (*n* = 99)		
7 to 8 hours per night	30% (*n* = 45)		
Greater than 8 hours per night	2.7% (*n*= 4)		
Tobacco Use			
No	82% (*n* = 123)		
Yes	18% (*n* = 27)		
Number of cigarettes per day	*M* = 6		
Alcohol Use			
No	59.7% (*n*= 121)		
Yes	39.6% (*n* = 28)		
Missing	.7% (*n*= 1)		
Number of drinks per week	*M* = 1.68		
Medical Diagnosis			
Hypertension			
No	85.3%	(*n*= 128)	
Yes	12%	(*n* = 18)	
Missing	2.7%	(*n* = 4)	
Diabetes			
No	94.7%	(*n* =142)	
Yes	5.3%	(*n*= 8)	

Table 3 (cont'd)

Number of Pregnancies Delivered		
None	38.7%	(*n*= 58)
< 4	50.0%	(*n* = 75)
≥ 4	10.6%	(*n* = 16)
Missing	.7%	(*n* = 1)
Weight History		
Weight as a child (6-14 years old)	*Mode* = normal weight	
Underweight	8%	(*n* = 12)
Normal weight	74.7%	(*n* = 112)
Overweight	24%	(*n*= 16)
Not Known	1.3%	(*n* = 2)
Weight as an adult (≥ 18 years old)	*Mode* = overweight	
Underweight	4.7%	(*n* = 7)
Normal weight	43.3%	(*n* =65)
Overweight	45.3 %	(*n* = 68)
Very Overweight	3.4%	(*n* = 5)
Not Known	2.7%	(*n* = 4)
Missing	.7%	(*n* = 1)
History of participation in commercial weight loss program		
No	89.2%	(*n* = 132)
Yes	10.8%	(*n* = 16)
Missing	1.3%	(*n* = 2)

Data Collection Measures

Study Variables

The study variables derived from TSC, were used to measure the performance of the BPW. The study variables included weight contextual factors, weight management agency, weight management behaviors and health**.** Weight contextual factors were measured using a researcher-created demographic form. Weight management agency is a multidimensional concept that includes foundational dispositions that were conceptualized as beliefs about personal weight, measured using the BPW. Body image was also conceptualized as a foundational disposition and was measured with Pulver's Figure rating scale (Pulvers et al.,

2004). Weight management behaviors were conceptualized as eating behavior patterns and physical activity. Weight management behaviors were measured using Eating Behavior Pattern Questionnaire (Schlundt, Hargraves, & Buchowski, 2003) and Baecke Activity Questionnaire (Baecke, Burema, & Frijters, 1982). Health was conceptualized as weight and adiposity, measured by body mass index and waist circumference respectively.

Concepts Substructed from the SCT

SCT Concepts*	**Substructed Theoretical Concepts**	**Substructed Empirical Concepts**	**Empirical Concepts Measured**
Basic Conditioning Factors	Weight Contextual Factors	Age Gender Ethnicity Comorbidity SES Pattern of living	Demographic data sheet
Self-Care Agency	Weight Management Agency Human Foundational Disposition	 Beliefs about Personal Weight Body Image	 Beliefs about Personal Weight Survey Pulver's Figure Rating Scale
Self-Care	Weight Management Behavior	Physical Activity Eating Behaviors	Baecke's Activity Questionnaire Eating Behavior Pattern Questionnaire
Health	Weight Control	Weight Adiposity	Weight in pounds Body Mass Index Waist Circumference

*Theory of Self-Care (Orem, 2001)

Weight Contextual Factors

Weight contextual factors were measured using a researcher- developed demographic form that described the characteristics of the sample that were conceptually thought to influence beliefs about personal weight. The form captured age, socioeconomic status (years of formal education salary range), health state (medical diagnoses), pattern of living (daily intake of ethanol and tobacco), weight history and history of participation in a commercial weight loss program (e.g., Weight Watcher, Jenny Craig).

Weight Management Agency

The concept of weight management agency focused on foundational dispositions related to weight. These are beliefs about personal weight and body image

Beliefs about personal weight. Beliefs about personal weight were measured using the newly developed BPW. The BPW is a self-report likert-type, culturally-sensitive norm-referenced instrument that is conceptualized as a foundational disposition. It was anticipated that the questionnaire would have three dimensions that are consistent with the definition of beliefs about personal weight, including: descriptors, causes, consequences.

Body image. Body image perception was measured using a culturally-sensitive figure rating scale, Pulvers' Figure Rating Scale (PFRS; Pulvers et al., 2004). PFRS consist of nine female silhouette drawings and nine male silhouette drawings. The female silhouette drawings will be used for this study. The nine figures were arranged in order of body size from smallest (A) to the largest (I). The body sizes increase incrementally from an estimated BMI of 16 to 40. Each figure is associated with a BMI classification range. Pulvers' scale was modeled after Stunkard's figure rating scale which is a well-validated body size perception scale. PFRS is designed to measure the accuracy of one's own body size and weight classification. The

participants are asked to choose the figure that matches their body size. Actual BMI measures are correlated with figure selection. Content validity of the scale was supported with 97% of medical practitioners being able to sort figures into the appropriate ascending order. Correlation of the appropriated silhouette figure with weight classifications range was high (r = .91) (Pulvers et al., 2004). Convergent validity was supported using a community sample of African American females by correlating an observer body size perception and the participant's ratings of their own body size perception and weight classification. Correlations ranged from 0.59 - 0.83. Concurrent validity using PFRS and BMI was 0.82. PFRS was positively correlated with two other well-validated figure rating scales Williamson's figure rating scale (r = 0.92) and Stunkard's figure rating scale (r = 0.90) (Pulvers et al., 2004).

Weight Management Behaviors

Weight management behaviors were conceptualized as dietary patterns (eating behavior patterns), and regular physical activity (work, sporting, leisure time).

Eating behavior patterns. Dietary patterns regarding behaviors related to food intake were measured using the Eating Behavior Pattern Questionnaire (EBPQ; Schludt, Hargreaves, & Buchowski, 2003). EBPQ is a multidimensional instrument that was developed to measure eating behavior patterns in African American woman. The EBPQ is a 51 item, self-administered survey using a 5-point likert-type scale with responses ranging from "1" strongly disagree to "5" strongly agree. EBPQ measures six dimensions including (a) low-fat eating, (b) emotional eating, (c) snacking on sweets, (d) cultural/lifestyle behaviors (e) haphazard planning, and (f) meal skipping. Questions examine health and unhealthy behaviors such as "I use low-fat food products" and "I like to eat vegetables seasoned with fatty meat." The instrument was initially validated using 278 adult African American women. Subscale Cronbach alpha's range from

0.70-0.88. Construct validity of EBPQ was supported by each subscale being correlated with total energy and total fat intake (r = 0.23 to 0.53). The instrument also demonstrated ability to predict micro and macro nutrient intake (r = 0.22 to 0.58).

Physical activity. Physical activity was measured using Baecke's Activity Questionnaire (BAQ; Baecke, Burema, & Frijters, 1982). The BAQ measures habitual physical activity using three dimensions including physical activity at work, sporting activity, and leisure time activity. The questionnaire is a 16 item self-report, 5-point likert-type scale. Responses range from "1" seldom to "5" very often. Scoring of the questionnaire included averaging subscale scores then adding the subscale scores for a total physical activity score. Higher scores indicate greater physical activity. Reliability of the subscales using test-retest reliability ranged from r = .74 to.90, measured with an interval of three months (Baecke et al., 1982). The performance of the questionnaire was examined within a multiple regression model predicting lean body mass. Lean body mass was chosen as an outcome because of the accepted relationship between lean body mass and physical activity. The BAQ along with body height and body fat accounted for 46 % of the variance in lean body mass. The questionnaire was normed using a Dutch population of male and female adults (Baecke et al., 1982). The BAQ has been used with culturally-diverse female samples including African American women. Reliability with female samples has ranged from 0.74 to 0.92. The use of the BAQ to assess a general measure of physical activity has been supported over more detailed instruments due to its simplicity.

Weight Control

Health was conceptualized as weight control as evidenced by actual body weight. BMI, and adiposity being within normal limits Weight and height were measured and then used to calculate BMI.

BMI. Body mass index was measured by calculating weight and height. Weight was measured with the participants wearing light clothing and standing facing forward on a standard calibrated scale that measures 0 to 400 pounds. Height was measured using a portable stadiometer Seca 217. Weight was measured to the nearest 0.5 pound and height was measured to the nearest 0.5 inch. BMI was calculated using the following equation: BMI= [Weight (pounds)/Height (inches) ^{2} x 703] (Pi-Sunyer et al., 1998).

Adiposity. Adiposity was determined by measuring waist circumference.

Data Collection Procedure

Participants were given both verbal information and a written information sheet about the study. Participation in the study was considered consent. Participants were asked to complete the packet of questionnaires then have their height, weight and waist circumference measured. Information was recorded on the demographic sheet. Participants could obtain a copy of their physiologic measures by request.

Institutional Review Board

The proposal was submitted to the Institutional Review Board (IRB) at Wayne State University prior to recruiting participants. The initial study participants received verbal information and a written information sheet about the study. Participation in the study assumed consent. The last 50 participants received a consent form with an invitation to take the BPW a second time for test-retest reliability. Participants had the right to refuse to respond to a question, or withdraw from the study at any time. Participants were asked to answer questions regarding their demographics, body image perception, weight beliefs, eating behavior patterns and regular physical activity. Privacy was maintained while obtaining weight and waist

circumference measurements by obtaining measurements in an area away from other participants.

A minimal psychological and physical risk existed. It was possible that answering questions may cause some negative emotion as weight beliefs may be attached to memories and traditions. However, no participant voiced negative emotions regarding the study.

Completed questionnaire packets including demographic sheets and questionnaires were labeled numerically and stored in a locked cabinet. An electronic database was created for all study data. The database is password protected and stored in an electronic folder indefinitely. Completed questionnaires will be destroyed within five years and data dissemination will occur in aggregate form only.

Data Analysis

IBM SPSS (v.20) software program was used for data analysis. Data was coded, entered into a personal computer, verified, cleaned and a codebook prepared (Polit & Beck, 2008). After data was entered into the computer, the data was assessed for accuracy by assessing for missing values using frequency of the items and missing data analysis.

Data Cleaning

For the BPW, since subscales, subscale means and individual scores were not yet established, therefore, items with less than five percent of the values missing, item means were used to calculate missing values. Items with greater than five percent of the values missing, missing values were imputed using data from items identified from principal component analysis (PCA). PCA for each of the three BPW domains was performed and the items that loaded on the same factor as the item with missing responses were used in a regression equation to impute the

missing values. Item loadings equal to or greater than .3, using the factor pattern matrix, were used for the regression equation.

For established scales (EBPQ, BAQ, PFRQ) missing values were estimated using individual based item means. The missing values were calculated after certain items were reverse-coded as indicated using questionnaire scoring instructions. Scale scores were calculated by adding the items on each scale and dividing by the number of valid items on each scale.

Data Cleaning Results

The total amount of missing scale item responses was minimal and appeared random. BPW had only two items with 5% or more of the item responses missing. EBPQ and PFRS had no item with 5% or more of the item responses missing. BAQ had multiple item responses missing. The item responses were mainly missing in the work activity and sporting activity subscales largely because participants reported being unemployed and not playing a sport. Valid item responses were used to calculate the mean of the subscales for BAQ. The subscale means were used to calculate a total activity score for each participant.

Evidence of Internal Structure

Principal Component Analysis

Beliefs about personal weight survey analysis. The analysis of BPW was a process that involved evaluation of items using exploratory factor analysis. Exploratory factor analysis using principal component analysis (PCA) was used to determine dimensionality of the 3 domains (descriptors, causes, consequences) and for data reduction. PCA was used because it was not known if the items were from the same conceptual domain. PCA was performed for each domain separately. First, to determine what items within each domain (descriptors, causes, and consequences) to group together, a PCA with oblimin rotations of all components with

eiganvalues > 1 was performed in each domain separately. Items with standard loadings of .3 or greater on each retained component were identified. Because items can load on a component because of method variance rather than semantic or conceptual similarity, only items that appeared relevant (face valid) were retained. Eiganvalues > 1 and scree plots also were used as criteria to examine component solutions. Secondly, the principal components within each domain were identified as composites. These composites were named according to the interpretation of the set of items. Also, the results of PCA correlations were used to provide direction for reverse coding of certain items. The composites developed from PCA were used in the reliability, correlation, confirmatory factor and regression analyses.

Reliability of Composites

Internal consistency. Cronbach's alpha was used to examine the internal consistency of the composite scores. A Cronbach's alpha of $\geq .70$ was desired (Waltz et al., 2010).

Stability. The paired-t-test was used to determine the stability of the responses of the composite scores. The survey was administered twice to a small sample of participants, under similar conditions, two weeks apart. A non-significant *t*-test is desired among the two sets of scores to support score stability. Also, a correlation between the two sets of scores, with moderate to high correlations, is desired to support score stability (Waltz et al., 2010).

Correlations of Composites

Bivarate correlation using Pearson product moment coefficient (*r*) was used to examine construct validity of BPW. The composite relationships within the three domains were correlated. Moderate to high correlations support construct validity (Waltz et al., 2010).

Confirmatory Factor Analysis

Confirmatory factor analysis was used to examine the internal structure of the BPW. SEM was used to determine how well the 16 individual weight belief composites tap the underlying domains (descriptors, causes, characteristics) of weight beliefs and was used to determine the fit of the hypothesized factor model with the sample data. SEM was employed using Amos v20. Six different types of model fit measures were used to evaluate the hypothesized model; chi –square (χ^2); chi-square divided by degrees of freedom (CMIN/*df*); Tuck-Lewis index (TLI); Comparative fit index (CFI); root mean square error of approximation (RMSEA); and Akaike's Information Criterion (AIC). In addition to evaluating overall model fit, standardized residuals and parameter estimates were examined for appropriate ranges.

Evidence Based on Relationships of Other Variables

Correlation of Composites and Weight Management Behavior and Outcomes

Bivarate correlations were used to examine the relationship between the composite scores, eating behavior patterns (EBPQ), total physical activity (BAQ), weight (BMI) and adiposity (waist circumference). Criterion validity is supported with correlations ($r > .50$) (Campbell & Fiske, 1959; Kerlinger & Lee, 2000; Waltz et al., 2010).

Regression Analysis

Stepwise regression analysis was used to examine evidence of criterion validity of BPW. Criterion validity refers to using the new measure to predict an objective criterion behavior that is external to the new measure. Each weight management behavior and outcome (EBPQ, BAQ, and BMI) was regressed on the composites within each domain. The weight management behavior and outcomes also were regressed the composites as a block (entering all composites

together). Criterion validity is supported when composites in each domain, significantly predict weight management behaviors and outcomes.

Confounders

Efforts to detect true relationships between variables include locating and controlling confounding variables. Possible confounders that may influence the relationship of beliefs about personal weight and weight management behaviors are SES. SES is measured as education, and yearly income. The confounders were statistically examined by determining if there was a difference in the BPW results by education and income.

Conclusion

This chapter discussed the three phases used to develop the new BPW instrument. Initial phases included: item-pool development, cultural-sensitivity analysis, content validation, face validity, and pretesting. The final phase included procedures to collect the data needed to establish beginning evidence of reliability and validity of the instrument.

Chapter 5

Results

The Beliefs about Personal Weight Survey is a measure that is intended to operationalize the foundational disposition component of the theoretical concept of weight management agency. Weight management agency is a multidimensional concept derived from self-care agency within the TSC (Orem, 2001). As a human foundational disposition, beliefs about personal weight determine a person's concern over weight related to health, affect goals sought, express conditions that affect one's willingness to accept self as being responsible for weight management behavior, and affects lasting habits related to weight management leading to actual weight control.

The process of developing the BPW survey included item development, cultural-sensitivity analysis, and psychometric evaluation. The results of this process is presented using evidence of content validity, evidence of internal structure and evidence based on relationships to other variables (AERA, 1999).

Evidence Based on Content

Item Development and Cultural-Sensitivity Analysis

In phase I of this study, the initial items for the BPW were developed using the beliefs about personal weight definition and existing literature on general weight beliefs, weight values, cultural values related to body image among African American women, and existing health belief questionnaires. Beliefs about personal weight is defined as a multidimensional concept consisting of the convictions regarding the descriptive characteristics, causal attributions and consequences of one's personal weight. Three sets of items were developed that corresponded to the three personal weight belief domains. A sufficient number of questions (16-42 items) were

generated under each weight belief domain, producing a pool of 81 potential items. Item wording was general enough to be answered by all people in the sample population. The initial item pool had a Flesch Kincaid reading level of 12.5.

After item development, 14 African American women, meeting inclusion criteria, were recruited to evaluate the pool of items for cultural-sensitivity using the thinking aloud method (Table 4). Overall the participants reported that the majority of the items for beliefs about the descriptors, causes, and consequences of personal weight were culturally appropriate.

One participant believed *Skinny/bony* had a negative connotation. *Thin* was suggested as a better *descript*or. However, 36% of the sample chose skinny/bony as important to be included as a descriptor on the survey. Items chosen by more than half of the participants as most important to describe personal weight were *overweight* (64%), and *healthy* (64%). Items infrequently chosen as important items to be included to describe personal weight included: *big boned* (7%); *fine* (7%); *too big* (7%); and *normal for women of my social circle* (14%).

Items chosen as most important for beliefs about the *causes* of personal weight were my *emotional state* (64%) and *stress or worry* (50%). Items infrequently chosen as important causes of personal weight were items related to food including: *dieting* (14%); *eating fast foods regularly* (14%); *not eating healthy foods due to cost* (7%); *eating fresh fruits* (7%); *foods I choose to eat* (7%) ; *eating soul food* (7%); *eating a healthy diet* (7%); *skipping meals regularly* (7%); and *snacking between meals* (7%). Items not chosen as important causes of personal weight included: *germ or virus, being naturally big boned, never being told to lose weight by medical provider, exercise I get a work, stopping smoking, continuing to smoke, not getting enough sleep, no time to prepare food, eating fresh fruits and vegetables, eating low fat foods,*

eating meat with every meal, eating lots of sweets, and desire to clean plate at every meal. Birth-control pills were suggested as an additional cause of personal weight by one participant.

The item chosen as most important *consequence* of personal weight by more than half of the participants were being at risk for serious *health problems* (71%). Items infrequently chosen as important consequences of personal weight were *kidney disease* (7%); *shortness of breath* (7%); *difficulty with activities such as housework* (7%), *exercising* (7%), and *difficulty sleeping* (7%).

Items that were chosen as important items to be included on the survey by 20% or more of the sample were submitted for expert content validity evaluation. From the initial 81 items, a total of 33 items remained after cultural sensitivity analysis. The participants endorsed 10 descriptor items, 12 cause, items and 11 consequence items. Some items that were not chosen as important by participants remained in the item pool because the items are known to be a cause or consequence of weight e.g., *eating fast foods regularly, snacking between meals, shortness of breath,* and *difficulty sleeping.* After cultural sensitivity analysis, these items were submitted for expert content validation.

Table 4

Cultural Sensitivity Analysis

Weight Descriptors

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**	**P11**	**P12**	**P13**	**P14**
1. Nice size 43%	*	Curvy	Not too heavy *				* hot	*		*		*	Thick, healthy	Healthy
2. On the heavy side 14%	Could slim down more		Round *						*				neg	
3. Skinny/ Bony 36%		* petite				*	Too thin	*			* No curves		* Skinny Neg-thin	
4. Big bone 7%					Remove									* Meat on bones
5. Fine 7%	Nice size	attractive									* ok			
6. Over weight 64%	*	*	*			*	*	*		*			*	*
7. Too big 7%		obese					*						neg	
8. Muscular 7%	Well-toned	toned	toned					*						
9. Healthy 64%		*		*		*	*	*	*			*	*	*
10. Normal 42%		average	*	*		*				*	* average	* Good happy		
11. Just right for my age 29%		*		*	Remove		Remove		*					*
12. Just right for my height 36%		*				*	Nice size		*				*	*
13. Attractive 43%	*	Fine/ desirable Same as sexy		*					*			* good looking	*	*
14. Sexy 29%	*		*	*								*		
15. Normal for women		Vague								*	*			

in my social circle 14%														
16. Attractive to my significant other 29%	*				Remove		*			*	*			

* items chosen as important items to be included in instrument by participants

Beliefs about causes of personal weight

	PI	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14
							No data most important items							
1. Heredity – my bloodline 36%			*			*					*		*	*
2. A germ or virus														
3. My age 7%	*													
4. My health condition or medication 28%	*	*		*		*								
5. My metabolism 14%						*								*
6. Being naturally big boned 7%														*
7. Never being told to lose weight by my medical provider														
8. My emotional state e.g. Feeling down, lonely, anxious, empty 64%	*				*	*		*	*	*		*		*
9. Not caring about how much I weigh 7%									*					
10. My significant other encouraging me									*					

to maintain my current weight 7%														
11. Stress or worry 50%	*		*					*	*		*	*		
12. No support from family or friends to lose weight 28%				*				*	*				*	
13. Not exercising on a regularly basis 35%	*	*			*	*								
14. Being physically active 28%	*	*											*	*
15. The exercise I get at work														
16. Weight left over from pregnancy 35%	*		*					*		*		*		
17. Stopping smoking														
18. Continuing to smoke														
19. Not getting enough sleep														
20. No money for gym membership 14%											*		*	
21. Not eating healthy food because of cost 7%								*						
22. Having to buy groceries in stores that do not have fresh fruits and vegetables 21%	*			*							*			
23. No time to prepare healthy food														
24. Knowing how to maintain a healthy weight 28%	*		*		*								*	
25. I don't know the cause of my weight 14%			*	*										
26. Not enjoying eating foods that are healthy	*				*									

21%														
27. Eating fresh fruits most days 7%	*													
28. Eating fresh vegetables most days														
29. Eating foods low in fat														
30. The amount of food I eat 14%	*									*				
31. The foods I choose to eat 7%	*													
32. Eating fast foods regularly 14%		*								*				
33. Eating meat with every meal														
34. Dieting 14%	*											*		
35. Eating soul food (traditional foods) on a regular basis 7%	*													
36. The way I cook/prepare my food 21%					*					*	*			
37. Eating lots of sweets														
38. My desire to clean my plate at every meal														
39. Being addicted to food 7%												*		
40. Eating a healthy diet 7%		*												
41. Skipping meals on a regular basis 7%				*										
42. Snacking between meals 7%	*													
Suggestions Taking Birth Control Pills	BC													

* items chosen as important items to be included in instrument by participants

Table 4 (cont'd)

Beliefs about consequences of personal weight

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P 11	P12	P13	P14
							No data for 5 most important items							
1. Kidney Disease 7%	*													
2. Shortness of breath 7%	*													
3. High blood pressure 29%	*	*							*				*	
4. Diabetes 29%	*	*		*					*					
5. Tiredness 21%	*			*						*				
6. Being at risk for serious health problems 71%	*		*		*	*		*		*	*	*	*	*
7. Me increasing my chances of being in good health 35%	*		*		*						*	*		
8. Me decreasing my chances of chronic illness (diabetes, high blood pressure) 35 %	*		*		*							*		*
9. Me being at risk for an early death 50%		*	*			*			*	*	*			*
10. Difficulty doing housework 7%					Difficulty with daily activities							*		
11. Difficulty exercising 7%				*										
12. Difficulty sleeping 7%									*					
13. Difficulty walking														
14. A limited social life 29%		*	*			*				*				
15. An active social life 14%								*					*	
16. Me being depressed 42%			*	*	*	*		*						*

17. Me being anxious 7%				*										
18. Me feeling afraid for my health 14 %								*				*		
19. Me feeling good about myself 42%			*		*	*		*			*		*	
20. Me being attractive to others that I care about 7%		*												
21. Difficulty finding stylish clothes 14%									*	*				
22. Being dissatisfied with how I look in my clothes 29%								*			*		*	*
23. Me looking good 14%	*											*		
suggestion														

* items chosen as important items to be included in instrument by participants

Expert Content Validity

A content validity packet was emailed to six content experts in June, 2011. The content experts included an expert in obesity, body image, attitude formation, obesity-related comorbidities, instrument development and African American women's health. The packet included the list of items to be assessed and detailed instructions (Appendix B). The content experts initially evaluated the 33 items endorsed from cultural sensitivity analysis. The experts also made suggestions for 29 additional items which were compiled and resubmitted for content expert review. Overall, the content experts reviewed 62 items of which 54 items were judged content valid, achieving a CVI $\geq$ .83 on the content validity scale. Content experts also made recommendations to simplify item wording to add clarity to items. The CVI for the entire item pool was .87 (Table 5). One item, *difficulty sleeping,* did not achieve expert content validity but

was retained due to knowledge of the relationship of weight and sleep. The item: *me being at risk for an early death* was removed although it achieved content validity due to suggestions from content experts and due to content redundancy. The 54 items remaining following expert content validity evaluation were used in Phase II to assess face validity from the perspective of African American women, and pretesting of the items with a representative sample.

Table 5

Phase 2: Content Validity Index Calculations

Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	CVI
DESCRIPTORS							
1. Nice size	*2/nc Grammar issue*	*2/nc*	*3/nc vague*	*3*	*4nc fine*	*4/c*	*.66*
2. ^^Skinny	4/c	4/c	4/c *Too skinny*	4	4c *Too skinny*	4/c	1.00
3. Overweight	4/c	4/c	4/c	4	4c	4/c	1.00
4. Healthy	3/c	3/c	4/c	4	4c	3/c	1.00
5. Normal	4/c	4/c	3/c *Not normal*	4	4c	4/c	1.00
6. Just right for my age	3/c	3/	3/c	4	4c	4/c	1.00
7. Just right for my height	3/c	4/c	4/c	4	4c	4/c	1.00
8. Attractive	3/c	2/nc	3/c	3	4c	4/c	.83
9. Sexy	*3/c*	*2/nc*	*2/c*	*4*	*4c*	*4/c*	*.66*
10. Attractive to significant other	3/c	4/c	4/c	3 *redundant to # 8*	4c	4/c	1.00
11.Very Overweight	4/c	2/c	4/c	4	4/c	4/c	.83
12. Heavy	4/c	4/c	3/c	4	4/c	4/c	1.00
13.Chunky	4/c	4/c	2/nc	4	4/c	4/c	.83
14. Well Proportioned	4/c	3/c	3/nc	4	4/c	4/c	1.00
15. Too Skinny	4/c	3/c	4/c	4	4/c	4/c	1.00
16. Athletic	4/c	3/c	3/c	4	1/nc	4/c	.83
17.Unimportant	*4/c*	*2/c*	*2/nc*	*4 Not sure it fits with subscale*	*1/c Item out of place Not a problem*	*4/c*	*.33*
18.Unattractive	4/c *Too high for my health*	2/c	4/c	4	4/c	4/c	.83

Table 5 (cont'd)

Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	CVI
CAUSES							
1. ^^Heredity – my bloodline	3/c	4/c *My parents*	4/c	4/c	4c *Heredity*	2/c *Heredity may not be understood Change to runs in my family*	.83
2. ^^ My health condition or medication	3/c	4/c	3/c	4/c	4c *My health Medication I am taking*	4/c	1.00
3. My emotional state e.g. Feeling down, lonely, anxious, empty	3/c	3/c	4/c	4/c	4/c *My emotional state*	4/c	1.00
4. Stress or worry	3/c	3/c	4/c	4/c	4/c	4/c	1.00
5. No support from family or friends to lose weight	*2/c*	*2/c*	*3/c*	*3/nc Change to Family pressure*	*2/nc Family & friends encourage overeating*	*3/c*	*.50*
6. ^^ Not exercising on a regularly basis	3/c	4/c	4/c	4/c	4/c *Not exercising enough*	4/c	1.00
7. ^^ Being physically active	1/c *Does this refer to sedentary lifestyle*	4/c	4/c	4/c	3c	4/c	.83
8. Weight left over from pregnancy	3/c	4/c	4/c	3/c *need N/A option*	4c	4/c	1.00
9. ^^Knowing how to maintain a healthy weight	3/nc	4/c	3/c *Add lifestyle*	4/c	2nc	4/c	.83

Table 5 (cont'd)

Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	CVI
CAUSES (cont'd)							
10. ^^ Not enjoying eating foods that are healthy	2/c *? Eating high calorie foods*	4/nc *Not liking to eat foods that are healthy*	3/c	3/nc *Healthy foods Do not equate with weight*	4/c *Eating the wrong foods*	4/c	.83
11. The way I cook/prepare my food	3/c *I enjoy eating traditional southern food*	4/nc *I like to cook traditional Southern food*	4/c	4/c	4/c	4/c	1.00
12. Taking Birth Control Pills	*2/c*	*4/c*	*2?*	*3/c Need N/A option*	*4/c*	*4/c*	*.66*
13. My parents	4/c	2/c	4/c	3nc	4/nc *to vague*	4/c	.83
14. My family	4/c	2/c	4/c	3nc	4/nc *To vague*	4/c	.83
15. ^^Cooking traditional southern food	4/c	3/c	4/c	3 *Remove southern*	1/c *Seems biased, acceptable to certain Black women*	4/c	.83
16. My metabolism	4/c	4/c	4/c	4	4/c	3/c	1.00
17. Not getting enough sleep	*4/c*	*4/c*	*2/nc*	*4*	*2/c*	*3/c*	*.66*
18. Smoking	*4/c*	*3/c*	*2/c*	*4*	*2/c*	*4/c*	*.66*
19. Snacking between meals	4/c	3/c	4/c	4	4/c	4/c	1.00
20. ^^Overeating	4/c	3/c	4/c	4nc *Change to: Eating too much*	4/c	4/c	1.00

Table 5 (cont'd)

Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	CVI
CAUSES (cont'd)							
21. Eating fast foods regularly for example (3 or more times per week)	4/c	4/c	4/c	4	3/c	4/c	1.00
22. Dieting	2-3/c	4/c	3/c *Not dieting*	4	4/c	4/c	.83
23. Eating fresh fruits and vegetables daily	4/c	4/c	3/c *Do resp. know that these are good?*	4	4/c	4/c	1.00
24. ^^Eating foods high in fat or sugar	4/c	3/c	4/c	4 *Divide into fat & sugar*	4/c	4/c	1.00
25. ^^Having to buy groceries in stores that do not have fresh fruits and vegetables	4/c	4/c	3/nc *Do resp. know that these are good?*	4 *Change groceries to food*	3/c *Regional and SES biased Not eating fresh fruits and vegetables daily*	4/c	1.00
26. The high cost of fruits & vegetables	4/c	4/c *Do you want a category of other , and fill in their own response*	3/nc *Do resp. know that these are good?*	4	4/c	4/c	1.00

Table 5 (cont'd)

Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	CVI
CONSEQUENCES							
1. High blood pressure	4/c	4c *High blood*	4/c	4/c	4c	4/c	1.00
2. Diabetes	4/c	4c	4/c	4/c	4c	4/c	1.00
3. Tiredness	4/c	2/nc	3/c	3/c	4c	3/c	.83
4. Being at risk for serious health problems	4/c	4c	4/c	4/c	4c	4/c	1.00
5. ^^Me increasing my chances of being in good health	4/nc *Remove me*	?2nc	3/c	4/c	3nc *Remove me*	3/c decreasing	.83
6. ^^Me decreasing my chances of chronic illness (diabetes, high blood pressure)	4/nc *Remove me* *Same as item 5*	4c	4/c	4/c *Response may bias 1 and 2 Remove e.g. Increasing chance of illness*	4nc Remove me	4/c	1.00
7. Me being at risk for an early death	4 *Remove me* *My being at risk…..*	4c	3/c	4/c	4nc *Remove me*	4/c	1.00
8. A limited social life	4/nc	2/c	3/nc	4/c	4c	4/c	.83
9. Me being depressed	4 *Same as item 7*	3/c	4/c	4/c	4c *Remove me*	4/c	1.00
10. Me feeling good about myself	4 *Same as item 7*	4/c	3/c	3/c	4nc *Remove me*	4/c	1.00
11. Being dissatisfied with how I look in my clothes	1 *Does not fit in this section*	4/c	4/c	4/c	4c	4/c	.83

Table 5 (cont'd)

Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	CVI
CONSEQUENCES (cont'd)							
12. Not getting the job opportunities I want	3/c	3/c	4/c	4	4/c	4/c	1.00
13. Not finding a suitable mate	3/c	2/c	4/c	4	4/c	4/c	.83
14.People thinking that I am lazy	4/c	4/c	4/c	4	4/c	4/c	1.00
15. Difficulty sleeping	*4/c*	*2/c*	*2/nc*	*4*	*4/c*	*3/c*	*.66*
16. Difficulty finding stylish clothes	4/c	4/c	4/c	4	4/c	4/c	1.00
17. Kidney Disease	4/c	4/c	4/c	4	3/c	2/nc *Doesn't fit*	.83
18. Breathing Problems	4/c	4/c *Poor Health Being the target of jokes*	4/c	4	4/c	4/c	1.00
						Total scale CVI	.87

Notes: Expertise of Reviewers: 1 = Obesity; 2 = Attitude Formation; 3 = Obesity-related Comorbidities; 5 = Instrument Development; 6 = African American Women's Health.

C = Clear; N/C = Not Clear

^^ = wording changed using content expert suggestions

Italicized Items = items removed prior to face validity and pretesting analysis

Face Validity

For further refinement of the item pool, face validity was assessed by participants, (N = 10) responding to the question *Do you think these statements address beliefs African American women hold about their weight?* Overall, most of the items within each domain were considered beliefs African American women may hold about their weight. A few of the items in each domain were assessed as inconsistent with beliefs about descriptors, causes and consequences of African American women's personal weight. Items considered inconsistent with personal weight beliefs of African American women, receiving a *no* or *not sure* from 80% of the participants for the descriptor domain were: *too thin* (100%) *athletic* (90%), *too skinny* (80%); and *very overweight* (80%);for the cause domain, *dieting* (80%); and for the consequence domain, *decreasing chance of illness* (90%), *not getting job opportunities (80%)*, and *difficulty sleeping* (80%).

Twelve items were added near the end of the data collection period that were stated in the opposite direction of some of the existing items. This was done to better ensure participants were actually reading items and not responding randomly. These items included descriptor *(too thin*), causes (*eating wrong foods, eating right foods, not over eating, eating too much, eating foods low in fat, my family, my family traditions, sleeping too much, active social life*) consequences (*satisfied with how I look in clothes, finding a suitable mate*). These items were not assessed by all 10 participants in Face Validity assessment (Table 6). *Too thin* was removed from the item list due to face validity results. *Thin* was added for pretesting. The other items identified as having limited face validity remained in item pool for further evaluation.

Table 6

Face Validity Analysis Results

Items by Domain	**Yes %**	**No %**	**Not sure %**
DESCRIPTORS:			
1.Overweight	60	40	
2.Healthy	60	40	
3.Normal	80	20	
4.Just right for age	50	30	20
5.Just right for height	30	50	20
6.Attractive	70	20	10
7.Very Overweight	20	70	10
8.Heavy	70	30	
9.Chunky	80	20	
10.Well Proportioned	60	30	10
11.Too Skinny	20	60	20
11a.Too Thin*		20	
12. Athletic	10	80	10
13.Unattractive	50	50	
14.Attractive to significant other	70	10	20

* items given to 2 participants

Table 6 (cont'd)

Items by Domain	**Yes %**	**No %**	**Not sure %**
CAUSES			
1.Heredity	90	10	
2.My Health	60	30	10
3.Medication	40	60	
4.Emotional State	30	50	20
5.Stress/Worry	50	30	20
6.Not exercising enough	70	20	10
7.Wt left from pregnancy	90	10	
8.Knowing how to have healthy wt	30	50	20
9.Eating wrong foods^	60	20	
9a.Eating right foods*	10	10	
10.Way food cooked	80	20	
11.My metabolism	80	20	
12.Snacking b/t meals	80	20	
13.Eating too much	80	10	10
13a.Not overeating*	10	10	
14.Eating fast foods	50	30	20
15.Dieting	20	70	10
16.Eating fresh fruits/vegetables	30	70	
17.Eating foods high in fat^	60	20	
17a.Eating foods low in fat*	10	10	

Table 6 (cont'd)

Items by Domain	Yes %	No %	Not sure %
CAUSES (cont'd)			
18.Eating foods high in sugar	70	30	
19.Buy foods in stores w/o fruit/vegetables	50	30	20
20.High cost of fruit/vegetables	50	30	20
21.My family*	50	10	20
21a.My family traditions*	20		
22.My parents	70	10	20
23.Not getting enough sleep	40	40	20
23a.Sleeping too much*	10	10	
24.My mood*	20		
* Items given to 2 participants ^ Items given to 8 participants			
CONSEQUENCES			
1. High blood pressure	40	40	20
2. Diabetes mellitus	40	40	20
3. Tiredness	40	40	20
4. Risk of serious health problem	50	40	10
5. Increasing chances of good health	40	60	
6. Decreasing chance of illness	10	70	20
7. Limited social life	30	40	10
7a. Active social life*	10	10	

Table 6 (cont'd)

Items by Domain	Yes %	No %	Not sure %
CONSEQUENCES (cont'd)			
8. Being depressed	60	40	
9. Feeling good about myself	80	20	
10. Dissatisfied how look in clothes^	60	20	
10a. Satisfied w/ how I look in clothes*	20		
11. Not getting job opportunities	20	60	20
12. Not finding suitable mate^	40	40	
12a Finding a suitable mate*	10	10	
13. People thinking I am lazy	40	50	10
14. Difficulty finding stylish clothes	60	40	
15. Kidney Disease	30	60	10
16. Breathing problems	30	50	20
17. Difficulty Sleeping	20	60	20

*items given to 2 participants
^ items given to 8 participants

Pretesting

As the final step in determining evidence based on content, the preliminary draft of the Beliefs about Personal Weight Survey (BPW) survey was pretested by the same sample of African American women who participated in Phase 2, Face Validity aspect of the study. Participants completed the survey in approximately five minutes. Participants did not report difficulty with question clarity and formatting. Item frequencies exhibited plausible minimum and maximum values. The standard deviations of all items were plausible, within three standard

deviations from the mean indicating good score dispersion (Table 7). After review of the pretesting results, one item was added to the cause domain, *regular physical exercise* as an opposite to *not exercising enough.* Results of the BPW survey contained 65 items with 15 descriptors, 30 causes, and 20 consequences. The Flesch Kincaid reading level was 8.5.

Table 7

Pretesting Results (*N*= 10)

	Over wt	Healthy	Normal	Just rt for age	Just rt for ht	Attractive	Very Overwt	Heavy
Mean	3.2	3.7	3.30	2.7	2.7	3.60	1.60	2.10
SD	1.39	.48	.94	.94	1.15	.96	1.26	1.45
Range	1-5	3-4	1-4	1-4	1-4	2-5	1-5	1-5

	Chunky	Well proportioned	Too Skinny	*Thin	Athletic	Unattractive	Attractive to Significant other
Mean	2.40	3.30	1.60	1.00	2.50	2.30	3.90
SD	1.50	.82	1.34	.00	1.43	1.15	.99
Range	1-5	2-4	1-5	1-1	1-5	1-4	2-5

	Heredity	My Health	Medication	My emotional health	Stress or worry	Heredity	My Health
Mean	3.40	3.10	1.20	2.60	2.7	3.40	3.10
SD	1.26	.87	.63	1.34	1.63	1.26	.87
Range	1-5	2-4	1-3	1-4	1-5	1-5	2-4

	Medication	My emotional health	Stress or worry	Not exercising enough	Wt left from pregnancy	Knowing how to have healthy wt	^Eating wrong foods
Mean	1.20	2.60	2.7	3.60	1.80	3.30	4.00
SD	.63	1.34	1.63	1.23	1.39	.94	1.30
Range	1-3	1-4	1-5	1-5	1-5	1-4	2-5

	*Eating right foods	Way food cooked	My metabolism	Snacking b/t meals	*Eating right foods	Way food cooked	My Metabolism
Mean	3.50	3.10	3.60	3.90	3.50	3.10	3.60
SD	.71	1.19	1.26	.99	.71	1.19	1.26
Range	3-4	1-5	1-5	2-3	3-4	1-5	1-5

	Eating fast foods	Dieting	Eating Fresh Fruits/veg	Eating foods high in fat	*Eating food low in fat	^Eating foods high in sugar	Buy foods in stores w/o fresh fruits/veg
Mean	3.10	2.50	2.80	3.37	3.50	3.10	2.80
SD	1.52	1.08	1.22	1.30	.71	1.20	1.22
Range	1-5	1-4	1-4	1-5	3-4	1-5	1-4

	High cost of fruits/veg	^My family	*My family traditions	My parents	Not getting Enough sleep	*Sleeping too much
Mean	2.90	3.20	4.00	2.90	3.20	1.00
SD	1.59	1.16	1.41	1.52	1.22	.00
Range	1-5	2-5	3-5	1-5	1-5	1-1

	*My mood	HBP	Diabetes	Risk for serious health problems	Increasing chances of good health	Decreasing chance of illness
Mean	2.50	1.90	2.10	2.50	3.40	3.00
SD	2.12	1.19	1.19	1.08	.69	.94
Range	1-4	1-4	1-4	1-4	3-5	2-5

	^A limited social life	*An active social life	Being depressed	Feeling good about myself	^Dissatisfied with how look In clothes	Being depressed
Mean	1.87	4.50	2.40	3.50	2.87	2.40
SD	1.12	.71	1.64	1.17	1.72	1.64
Range	1-4	4-5	1-5	1-5	1-5	1-5

	*Satisfied with how I look In clothes	Not getting job opportunities	^Not finding suitable mate	*Finding a suitable mate	People thinking I am lazy
Mean	3.50	1.50	2.37	2.00	2.00
SD	.71	.85	1.68	1.41	1.05
Range	3-4	1-3	1-5	1-3	1-4

	Difficulty Finding Stylish clothes	Kidney Disease	Breathing Problems	Difficulty sleeping
Mean	3.00	1.70	1.70	2.00
SD	1.63	1.05	1.05	1.15
Range	1-5	1-4	1-4	1-4

* items given to 2 participants
^ items given to 8 participants

Evidence of Internal Structure

BPW Descriptive Data

Evidence for internal structure will be determined by principal component analysis, internal consistency reliability, test-retest reliability and Pearson product moment correlations**.** Prior to conducting Principal Component Analysis (PCA), the BPW was evaluated to assess individual items and ensure that score distributions met the statistical assumptions required to perform further psychometric evaluation.

Overall, the items on the BPW performed well. Mean scores ranged from 1 to 4.3 on a 5-point likert scale (1 = strongly disagree to 5 = strongly agree). Most of the standard deviations were 1 or greater which indicates good dispersion around the mean. A small number of items in each domain did not perform well, having standard deviations below 1, indicating a limited dispersion around the mean. These included: in the descriptor domain: *healthy, thin;* in the cause domain: *health, medication, eating right foods, not overeating, eating foods lowing in fat*. *sleeping to much*; and in the consequence domain: *increasing chance of good health, active social life, satisfied with how I look in my clothes.* Skewness and kurtosis were normal for the majority of the item scores indicating a normal distribution. Items with extreme skewness, having absolute values greater than 3.0 (Chou & Bentler, 1995), in the descriptor domain were: *attractive* (5.2), *very overweight* (6.1), *too skinny* (12.8), *thin* (11), *unattractive* (7.9), attractive

to my significant other (6.2). Skewed cause domain items were: *medications* (5.3), *not exercising enough* (-4.3), *eating wrong foods* (-5.5), *eating too much* (-9.1), *dieting* (4.2), eating *high fat foods* (4.5), *eating foods high in sugar* (-5.3), and *sleeping too much* (5.1). Skewed consequence domain items were: *not getting the job I want* (3.8), *not finding suitable mate* (5.5), *people thinking I am lazy* (4.5), and *kidney disease* (4.4). Items with significant kurtosis, having absolute values greater than 10 (Kline, 2005), in the descriptor domain were*: too skinny* (15.0), and *thin* (10.8). Nineteen items were significantly skewed and two items were significantly kurtosed. Item skewness and kurtosis is expected when the measure is performing well.

In examining the participant's response to personal weigh beliefs, the mode was used for better interpretation. The participants in this sample most frequently believed that their weight was normal (*Mode* = 4). The participants did not believe their weight was very overweight (*Mode* =1.6) or overweight (*Mode* = 2.8). The participants most frequently believed the cause of their weight was not exercising enough (*Mode* =5) and eating too much (*Mode* = 5). Other frequently chosen beliefs about the causes of personal weight were heredity (*Mode* = 4), health (*Mode* = 4) stress and worry (*Mode* = 4) knowing how to maintain a healthy weight (*Mode* = 4), not getting enough sleep (*Mode* = 4) and other causes related to food choice. The participants most frequently believed the consequences of their weight were mostly positive. The participants believed that the consequences of their personal weight were feeling good about self (*Mode* = 4); being satisfied with how they look in clothes (*Mode* = 4); having an active social life (*Mode* =4) and tiredness (*Mode* = 4). The participants did not believe that a consequence of their weight was hypertension (*Mode* =1), diabetes (*Mode* = 1), or being at risk for serious health problems (*Mode* = 1).

BPW Principal Component Analysis

Table 8 presents the BPW principal component factor analysis which was done with oblimin rotation. Principal component factor analysis was performed on each BPW domain (descriptors, causes, and consequences). Eiganvalues greater than one and scree plots were used to determine the number of factors to retain.

For the descriptor domain of the BPW, four principal components were retained and were examined using oblimin rotation. The four factors explained 68.4% of the variance in how the study sample described their personal weight. These factors include: overweight, skinny, attractive, and normal weight. Using the pattern matrix, the results show that the study participants believed that the primary descriptors for their personal weight were overweight descriptors (*heavy, very overweight, chunky, overweight*). These descriptors accounted for nearly half of the explained variance while skinny descriptors, which included *too skinny, thin* and *athletic,* accounted for 15% of the explained variance. Athletic was moved to the fourth component because it is more conceptually related. The third component of the descriptor domain of the BPW accounted for 9% of the explained variance and included attractive descriptors including *attractive to significant other, unattractive, attractive, and well-proportioned*. *Unattractive* was negatively correlated with the other items on this factor, therefore *unattractive* was reversed coded in future analysis. The fourth component of the descriptor domain of the BPW, was normal weight descriptors including *normal, healthy, just right for age, just right for height and athletic,* and accounted for 6% of the variance.

For the cause domain of the BPW, the principal component analysis extracted eight principal components that were examined using oblimin rotation. These components explained 62% of the variance in participant's beliefs about the causes of their personal weight. Using

pattern matrix, the study participants believed that the primary causes of their personal weight were: unhealthy eating behaviors, healthy eating behaviors, stress factors, family culture and heredity, food economics, health related factors, food preparation and amount, and physical activity. *Unhealthy eating behaviors, accounting for 21% of the variance,* included *not exercising enough, eating wrong foods, eating high fat foods, eating too much, eating foods high in sugar, snacking between meals, and eating fast foods 3x/wk. Heredity* was statistically included on this component but was moved to a more conceptually-related component. *Not exercising enough* was removed due to redundancy. The second component of the cause domain of the BPW, *healthy eating behaviors*, accounted for 13% of the explained variance included *eating foods low in fat, knowing how to maintain healthy* weight, *eating right foods, eating fresh fruits and vegetables daily, regular exercise, and weight left from pregnancy*. *Weight left from pregnancy* was removed due to limited conceptual relevance. *Regular exercise* was moved to a separate component for conceptual fit. The third component of the cause domain of the BPW, stress factors, accounted for 8% of the explained variance and included *stress and worry, emotional state, not getting enough sleep, and my mood*. The fourth component of the causal domain of the BPW, family culture, accounted for 6% of the explained variance included *my parents, my family, my family traditions, and not over eating. Not over eating* was placed with the second component due to conceptual fit. The fifth component of the cause domain of the BPW, food economics, accounted for 5% of the explained variance included *buying foods with no vegetables and fruits and high cost of fruits and vegetables*. The sixth component of the cause domain of the BPW, health related factors, accounted for 5% of the explained variance included *health* and *medication.* The seventh component of the cause domain of the BPW, energy level, accounted for 4% of the explained variance included *sleeping too much and my*

metabolism. This component was removed from analysis due to redundancy and limited conceptual relevance. The eighth component of the causal domain of the BPW, food preparation/amount, accounted for 4% of the explained variance included *the way I cook/prepare my food and dieting*.

For the consequence domain of the BPW, the principal component analysis extracted four principal components that were examined using oblimin rotation, explained 64% of the variance in participant beliefs about the consequences of their personal weight. The study sample believed that the primary consequences of their personal weight were: health problems, good health, social problems, and emotional problems. The health problems factor included items that addressed specific health conditions including *diabetes, high blood pressure, being at risk for serious health problem, tiredness, kidney disease* and *people thinking that I am lazy*. These consequences of personal weight accounted for over half of the explained variance. *People thinking that I am lazy* was moved to the third component due to better conceptual fit. The second component of the consequence domain of the BPW, good health, accounted for 12% of the explained variance and included; *increase chances of good health, decrease chances of serious illness and feeling good about myself*. The third component of the consequence domain of the BPW, negative social consequences, accounted for 6% of the explained variance and included *not finding a suitable mate, not getting the job opportunities I want, limited social life, and people thinking that I am lazy*. The fourth component of the consequence domain of the BPW, negative emotional consequences, accounted for 5% of the explained variance included *being dissatisfied with how I look in my clothes, being depressed,* and *difficulty finding stylish clothes. Difficulty finding stylish clothes* was removed due to redundancy.

Lastly, items that loaded on the fifth component of the consequence domain of the BPW, were removed from analysis because items did not load uniquely. These items included *finding a suitable mate, being satisfied with look in clothes* and an *active social life.*

From the PCA, 16 principal components were extracted. These components were used to form composites (e.g. subscales) representing each domain of the BPW. Thus, the final BPW is comprised of three domains, 16 composites and 57 items (Table 8). Based on the PCA loadings, item redundancy and conceptual fit, eight items were omitted from the item list.

Table 8

Principal component analysis of the Beliefs of Personal Weight Survey (eiganvalues >1.0)

Domain	**Composite (Component)**	**Items**
DESCRIPTORS		
	1. Overweight Descriptors	1. Heavy 2. Very overweight 3. Chunky 4. Overweight
	2. Skinny Descriptors	5. Too skinny 6. Thin
	3. Attractive Descriptors	7. Attractive to significant others 8. Unattractive (reverse code) 9. Attractive 10. Well-proportioned
	4. Normal/acceptable Weight Descriptors	11. Normal 12. Healthy 13. Just right for my age 14. Just right for my height 15. Athletic
CAUSES		
	1. Unhealthy Eating	16. Eating wrong foods 17. Eating high fat foods 18. Eating too much 19. Eating foods high in sugar 20. Snacking between meals 21. Eating fast foods 3x/week
	2. Healthy Eating	22. Eating foods low in fat 23. Knowing how to maintain healthy weight 24. Eating right foods 25. Eating fresh fruits, vegetables daily 26. Not over eating

Table 8 (cont'd)

Domain	Composite (Component)	Items
	3. Stress Factors	27. Stress and worry 28. Emotional state 29. Not getting enough sleep 30. My mood
	4. Family Culture and Heredity	31. My parents 32. My family 33. My family traditions 34. Heredity
	5. Food Economics	35. Buying foods with no vegetables and fruits 36. High cost of fruits and vegetables
	6. Health Related Factors	37. Health 38. Medication
	7. Food Preparation/Amount	39. Way I cook/prepare my food 40. Dieting
	8. Physical Activity	41. Regular Exercise
CONSEQUENCES		
	1. Health Problems	42. Diabetes 43. High blood pressure 44. Being at risk for serious health problems 45. Tiredness 46. Kidney disease 47. Breathing problems 48. Difficulty sleeping
	2. Good Health	49. Increase chances of good health 50. Decreases chances of serious illness 51. Feeling good about myself
	3. Social Consequences	52. Not finding a suitable mate 53. Not getting the job opportunities that I want 54. Limited social life 55. People thinking I'm lazy
	4. Emotional Consequences	56. Being dissatisfied with how I look in my clothes 57. Being depressed
	5. Removed as items did not load uniquely	
Totals: 3 Domains	16 Composites	57 Items

Reliability of Composites

Internal consistency reliability. Internal consistency of the composite scores were determined by Cronbach's alpha. The majority of the composites achieved alphas ranging from .68 to .90 indicating adequate internal consistency. Only two of the composites had Cronbach's alpha under .68: *health related factor* causes (.38) and *food preparation and amount causes* (.54). Low alphas may be a reflection of the small number of items in these composites, as each had only two items, or may reflect low item to item correlations within the composite. Physical activity composite has one item therefore no alpha was calculated (Table 9).

Test-retest reliability. The stability of the composite scores was determined by test-retest reliability using paired *t*-test. The BPW was administered to 10 participants twice, under similar conditions, two weeks apart. The majority of the paired t-test showed the composite score pairs were nonsignificant, indicating score stability over a two week time interval. Only one composite pair was significant, *skinny descriptors* $t_{(9)} = -3.21$, $p = .01$ which indicates a significant difference in the responses. Concerning the paired- *t* test, significant composite pair score was not adjusted for multiple comparisons however, if the correlation was adjusted using Bonferroni correction, the critical value would not be significant. Of the 16 composites, 11 composite pair scores were significantly correlated with a magnitude of correlations ranging from .38 to .90 (Table 9). Five composites had non-significant correlations: *healthy eating behavior causes* ($r = .16$, $p = .66$), *regular physical activity* ($r = .38$, $p = .28$), *food preparation and amount causes* ($r = -.33$, $p = .35$), *good health* ($r = .38$, $p = .27$) and *social consequences* ($r = .45$, $p = .19$).

Table 9

Internal Consistency and Stability Reliability of Personal Weight Belief Composites within Three Domains

Domains	Composites	Cronbach's Alpha *N* =150	Paired Sample Correlations *n* =10	Scale Mean (SD) (Rating Scale 1-5)
Descriptor Composites (4)	Overweight	.88	.79 (*p* = .01)	2.38 (1.26)
	Skinny	.90	.68 (*p* = .03)	1.45 (.93)
	Attractive	.68	.82 (*p* = .004)	3.89 (.85)
	Normal/Acceptable Weight	.81	.90 (*p* = .001)	2.97 (1.02)
Cause Composites (8)	Unhealthy Eating Behavior	.80	.83 (*p* = .003)	3.50 (.94)
	Healthy Eating Behavior	.73	.16 (*p* =.66)	2.66 (.94)
	Physical Activity [a]	*	.39 (*p* = .28)	2.70 (1.40)
	Stress Factor	.80	.68 (*p* =.03)	3.25 (1.15)
	Family Culture and Heredity	.76	.77 (*p* =.01)	2.98 (1.08)
	Food Economic	.68	.76 (*p* =.01)	2.54 (1.21)
	Health Related Factor	.38	.69 (*p* =.03)	2.58 (1.01)
	Food Preparation/Amount	.54	-.33 (*p* =.35)	2.79 (1.01)
Consequence Composites (4)	Health Problems	.90	.84 (*p* = .002)	2.68 (1.22)
	Good Health	.68	.38 (*p* = .27)	2.88 (1.06)
	Negative Social	.78	.45 (*p* =.19)	2.09 (1.04)
	Negative Emotional	.76	.69 (*p* = .03)	2.83 (1.29)

[a] Physical Activity only had one item

Correlations of Composites

Pearson product moment correlations were used to examine the composite relationships for construct evidence. The results suggest that each domain had significant composite relationships within and across each of the three domains with correlations $\geq$ .30. Table 10 presents the results of the composite correlations by the three domains.

Within the descriptor domain four of six correlations had moderate to moderately strong and significant correlations with each other. The correlations were in the expected direction, e.g., the composite of overweight descriptors was negatively correlated with the composite of normal weight descriptors (r = -.66, p < .01). The composite of skinny descriptors was not significantly correlated with other descriptor composites.

Within the cause domain, 20 of the 27 correlations had weak to moderately strong and significant correlations with each other. The correlations were in the expected direction, e.g., . the composite of healthy eating behaviors was positively correlated with the composite of physical activity (r = .48, p = < .01).

Within the consequence domain four of the six correlations had weak to moderately strong and significant correlations with each other. The correlations were in the expected direction .e.g., the composite of health problems was positively correlated with the composite of negative emotional consequences (r = .66, p < .01).

Across domains, the descriptor domain had weak to moderately strong but significant correlations with 14 of the 32 cause domain correlations. The correlations were in the expected direction e.g. the composite of overweight descriptors were positively correlated with the composite of unhealthy eating behaviors (r = .45, p <.01). The descriptor domain had weak to moderately strong and significant correlations with 12 of the 16 consequence domain

correlations. The correlations were in the expected direction the composite overweight descriptors was positively correlated with the composite health problems(r = .51, p < .01). The cause domain had weak to moderately strong, but significant correlations with 18 of the 24 consequence domain correlations. The correlations were in the expected direction, .stress factor causes was positively correlated with the composite negative emotional consequences (r = .54, p < .01).

Overall, the composites within domains performed well, with the majority having significant and moderately strong correlations among composites. In addition, there were significant correlations among composites across domains. This finding suggests that while each domain taps a unique aspect of personal weight beliefs, the composites may share an underlying construct. *Skinny descriptors, physical activity causes, food economic causes, health related factor causes, food preparation and amount, and good health consequences* did not produce correlations equal to or greater than $r \geq .30$ within domains and across domains which indicates that these composites may have limited connection with the underlying construct.

Table 10

Correlation of Personal Weight Belief Composites within and across Three Domains

	1. Overweight Descriptors	2. Skinny Descriptors	3. Attractive Descriptors	4. Normal Weight Descriptors	5. Unhealthy Eating Behavior Causes	6. Healthy Eating Behavior Causes	7. Physical Activity Causes	8. Stress Factors Causes	9. Family Culture and Heredity Causes	10. Food Economic Causes	11. Health Related Factor Causes	12. Food Preparation/ Amount Causes	13. Health Problem Consequences	14. Good Health Consequences	15. Negative Social Consequences	16 Negative Emotional Consequences
1.Overweight Descriptors	1	**-.35****	**-.27****	**-.66****	**.45****	**-.31****	**-.17***	**.24***	.02	.11	.10	**.17***	**.51****	**-.16***	**.42****	**.47****
2.Skinny Descriptors		1	**-.**15	**.**16	**-.24****	.16	.06	.09	**.17***	-.08	-.15	-.14	-.30	.09	-07	.02
3.Attractive Descriptors			1	**.39****	**-14**	**.30****	**.17***	-.14	.01	-.01	.04	-.01	**-.28****	**.28****	**-.22****	**-.27****
4.Normal Weight Descriptors				1	**-.44****	**.42****	**.33****	**-.31****	-.04	-.03	.05	-.10	**-.55****	**.26****	**-.39****	**-.51****
5.Unhealthy Eating Behavior Causes					1	**-.28****	**-.25****	**.33***	**.16***	**.27****	.03	**.32****	**.44****	-.06	**.30****	**.38****
6.Healthy Eating Behavior Causes						1	**.48****	-.03	**.16***	.02	**.21***	**.21****	**-.19***	**.40****	-.13	**-.22****
7.Physical Activity Causes							1	**-.17***	.10	.07	.05	**.23****	**-.29***	**.29****	**-.21****	**-.21***
8.Stress Factors Causes								1	**.41****	**.26****	**.35****	.14	**.53****	-.02	**.45****	**.54****
9.Family Culture and Heredity Causes									1	**.27****	**.22****	**.23****	**.17***	.16	**.22****	**.30****
10. Food Economic Causes										1	**.17***	**.16***	.16	-.01	**.16***	**.20***
11.Health Related Factor Causes											1	.07	**.19***	.09	.13	.10
12.Food Preparation/ Amount Causes												1	**.22****	**.20***	**.20***	.15
13.Health Problem Consequences													1	**-.19***	**.64****	**.66****
14.Good Health Consequences														1	-.07	-.14
15. Negative Social Consequences															1	**.59****
16.Negative Emotional Consequences																1

*p <.05 **p <.01(2tailed)

Confirmatory Factory Analysis

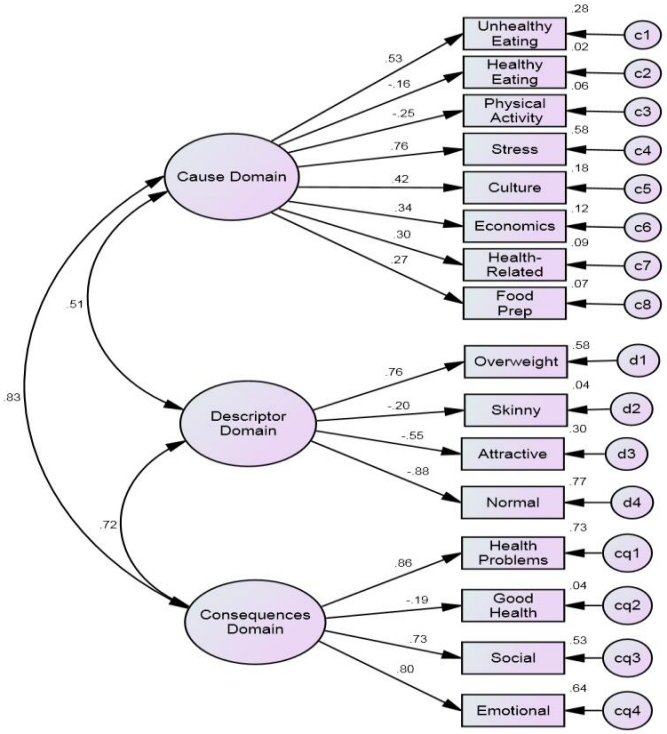
Evaluation of the CFA output assessed the degree to which the sample data fit or was consistent with the theoretical model. A three factor CFA was fit to the 16 composites of the BPW (Fig. 2, Model A). The initial fit of this model was not an acceptable fit (Table 11). Five composites with correlations less than .30 were removed from the model (*Healthy eating, physical activity, food preparation and amount causes, skinny descriptors, good health consequences*). The three-factor CFA with these five items omitted achieved a marginal fit (Table 11). To achieve a more acceptable fit, modification indices suggested a *correlation of unhealthy eating behaviors* and *overweight descriptors.* This correlation is not consistent with the hypothesized model. However, theoretically, these composites may be related as participants may believe their personal weight is *overweight* and believe the cause is related to unhealthy eating behaviors. Therefore, the error terms of the composites, *unhealthy eating behaviors* and *overweight descriptors* were correlated to achieve a better fit (Table 11). The standardized factor loadings ranged from .34(*food economic causes*) to -.88(*normal weight descriptors*). All parameters were statistically significant at $p < .05$ and the square multiple correlation for the composites ranged from .12 (*food economic* causes) to .77 (*normal weight descriptors;* Fig.2, Model C).

Table 11

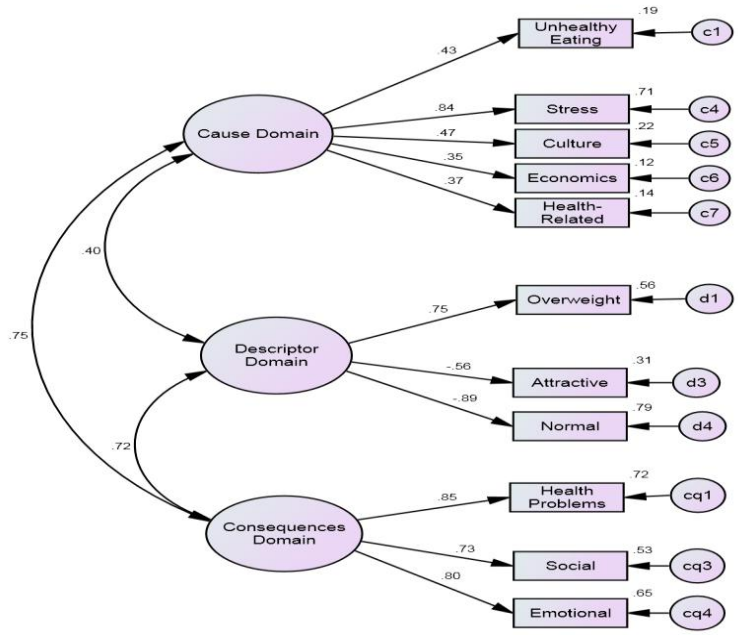
Fit Indices for Beliefs about Personal Weight Survey CFA

Indices	**Desired Fit Criteria**	**Model A**	**Model B**	**Model C Final**
X^2 *df* (*p* value)	$p<.05$	300.16 101($p < .03$)	76.25 41($p <.01$)	69.5 40 ($p<.003$)
CMIN/DF	< 2.0	2.81	1.86	1.74
TLI	> 0.95	.70	0.91	.93
CFI	> 0.95	.75	0.93	.95
RMSEA (90% CI)	<.08 (not wide)	.110 (.09-.13)	.076 (.05-.10)	.070 (.04-.98)
AIC	smaller	353.05	126.25	121.51

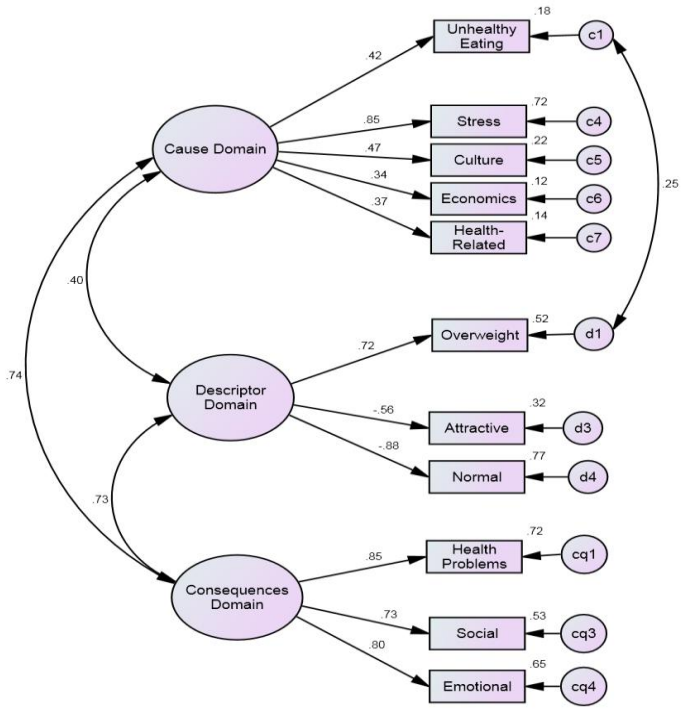
Figure 2: *Beliefs about Personal Weight CFA*



Model A. Structural equation model results for the BPW with three-factors and 16 composites



Model B. Structural equation model results for the BPW with three-factors and 11 composites



Model C Structural equation model results for the BPW with three-factors, 11 composites and error term correlation

Evidence Based on Relationship to Other Variables

In order to establish evidence of criterion validity, the BPW was correlated with behaviors and outcomes relevant to weight control. The behaviors and outcomes include: eating behavior patterns measured by the EBPQ, total regular physical activity measured by BAQ and weight as measured by BMI and waist circumference. The outcomes were also regressed on BPW composites. The overall performance of each measure is reviewed first, and then the correlation and regression results are discussed.

EBPQ. The Eating Behavior Pattern Questionnaire (Schlundt, Hargraves, & Buchowski, 2003) measured six dimensions including (a) low-fat eating, (b) snacking on sweets, (c) cultural/lifestyle behaviors (d) haphazard planning, and (e) meal skipping, (f) emotional eating. EBPQ was a self administered survey using a 5 point likert-type scale with responses ranging from "1" strongly disagree to "5" strongly agree. Using the *mode* for better interpretation, most frequently the participants reported not eating a low fat diet (*Mode* = 2.43), most frequently reported neutral or not applicable for snacking on sweets (*Mode* =3.00), practicing cultural lifestyle behaviors (*Mode* = 3.00), meal skipping (*Mode* = 3.50), and emotional eating (*Mode* =3.40). Participants reported more frequently not practicing haphazard meal planning (*Mode* = 2.89). The Cronbach's alpha for this study sample ranged from .46 to .87 across the six dimensions.

BAQ. The Baecke Activity Questionnaire (Baecke, Burema, & Frijters, 1982) measured habitual physical activity using three dimensions including physical activity at work, sporting activity, and leisure time activity. The questionnaire was a 16 item self-report, 5-point likert-type scale. Responses ranged from "1"never to "5" always. Scoring of the questionnaire included averaging subscale scores then adding the subscale scores for a total physical activity

score. Higher scores indicate greater physical activity. The total physical activity score was used in this study. The participants reported on average seldom participating in physical activity (*M*= 2.63, *SD* = .52). The Cronbach's alpha for this study sample was .52.

BMI. Body mass index was calculated using weight and height measurements. BMI was calculated using the following equation: BMI= [Weight (pounds)/Height (inches) ^{2} x 703] (Pi-Sunyer et al., 1998). The actual weight range of this sample was 93 pounds to 322 pounds (*M* = 183. 70, *SD*= 47.61). The average BMI was in the obese category (*M* = 31.5, *SD*= 7.82) with a range of 16 to 52.

Waist circumference. Waist circumference was used to measure central adiposity and was measured to the nearest 0.5 inches using a cloth tape measure. On average the participant's waist circumference was greater than 35 inches (*M* = 37.09, *SD* = 6.72) with a range of 24.50 to 57.00 inches.

Correlation of Composites, Weight Management Behaviors, and Outcomes

Criterion evidence was examined by correlating the composites with established scales EPBQ, BAQ, weight and waist circumference (Table 12). Moderately strong to strong bivariate correlations would support criterion evidence. Within the descriptor domain 15 of the 36 correlations between descriptor composites and outcome variables (i.e., eating behavior patterns, total physical activity, BMI and waist circumference) were significant ranging from (r = .19 to .71, $p \leq .05$). All of the descriptor composites were significantly correlated with activity, BMI and waist circumference in the expected direction. The overweight, attractive, and normal weight descriptors were also significantly correlated with emotional eating in the expected direction. There was a weak nonsignificant correlation between skinny descriptors and emotional eating.

Within the cause domain, 28 of the 72 correlations between cause composites and outcome variables (i.e., eating behavior patterns, total physical activity, BMI and waist circumference) were significant ranging from r = .16 to .47, $p \leq .05$. *Unhealthy eating behavior* causes were significantly correlated with all of the eating behavior patterns, total physical activity and weight, in the expected direction. *Healthy eating behavior causes* significantly correlated with specific eating behaviors (low fat diet, haphazard meal planning, and emotional eating), total physical activity and BMI in the expected direction. Most of the other cause composites had significant correlations with at least one eating behavior pattern, total physical activity or weight in the expected direction. *Food economic causes* was not significantly correlated with any of the eating behavior patterns, total physical activity or BMI.

Within the consequence domain, 14 of the 36 correlations between *consequence composites* and outcome variables (i.e., eating behavior patterns, total physical activity, BMI, and waist circumference) were significant ranging from r = .19 to .41, $p \leq .05$, in the expected direction. All of the consequence composites were significantly correlated with at least one of the eating behavior patterns. The *health problem composite* was significantly correlated with eating behavior patterns, total physical activity, weight, and waist circumference in the expected direction.

The BPW composites performed well. Each domain had at least one composite that significantly correlated with an established subscale, measuring eating behavior patterns, or total physical activity, as well as being significantly correlated with BMI and waist circumference. The correlations were in the expected direction.

To provide further evidence of validity based on other variables, body image perception was correlated with the descriptor composites to examine convergent validity. Body image perception significantly correlated moderately strong with overweight descriptors (r =.70, p= .001) and also was significantly correlated with normal weight descriptors (r = -57, p = .001). Body image perceptions were significantly weakly correlated with skinny descriptors (r= -.38, p = .001) and attractive descriptors (r = -.29, p = .001).

Table 12

Correlation of Personal Weight Belief Composites with Weight Management Behaviors and Weight Outcomes

Weight Belief Composites	**EBPQ**						**BAQ**	**Weight**	**Adiposity**
	Low fat Diet	Snack on Sweets	Cultural L/S Behavior	Haphazard Meal Planning	Meal Skip	Emotional Eating	Total Physical Activity	BMI	Waist Circumference
Overweight Descriptors	-.02	.10	.02	.13	-.09	**.27****	**-.31****	**.71****	**.69****
Skinny Descriptors	.01	.10	.04	.01	-.40	-.05	**.19***	**-.35****	**-.26****
Attractive Descriptors	.02	-.08	-.04	-03	.01	**-.28****	**.22****	**-.25****	**-.32****
Normal/ Acceptable Weight Descriptors	.13	-.06	-.04	-.08	.11	**-.35****	**.29****	**-.53****	**-.53****
Unhealthy Eating Behavior Causes	**-.31****	**.27****	**.19****	**.37****	**.17***	**.47****	**-.25****	**.39****	**.40****
Healthy Eating Behavior Causes	**.33****	-.13	-.03	**-.30****	.02	**-.31****	**.29****	**-.20***	**-.18***
Physical Activity Causes	**.27****	.03	-.07	**-.18***	.03	**-.20***	**.24****	.11	**-.17***
Stress Factor Causes	-.02	.12	.05	.03	.05	**.41****	.06	**.17***	**.19***

Table 12 (cont'd)

Weight Belief Composites	**EBPQ**						**BAQ**	**Weight**	**Adiposity**
	Low fat Diet	Snack on Sweets	Cultural L/S Behavior	Haphazard Meal Planning	Meal Skip	Emotional Eating	Total Physical Activity	BMI	Waist Circumference
Food Economic Causes	-.08	.09	-.02	.13	.11	.03	-.03	.06	.04
Health Related Factor Causes	.09	.12	.13	-.09	**.16***	.05	**.17***	.02	-.06
Food Preparation/ Amount Causes	.03	.08	-.03	.01	.13	.06	-.06	**.25****	**.18***
Health Problem Consequences	-13	**.21***	**.21***	.04	-.07	**.34****	**-.21***	**.41****	**,41****
Good Health Consequences	.06	.04	-.05	.03	**.25****	-.08	.14	-.05	-.07
Social Consequences	.01	.14	.14	.11	-.06	**.31****	-.09	**.34****	**.36****
Emotional Consequences	-.12	**.19***	.13	.12	-.05	**.36****	-.12	**.30****	**,31****
Range	1.21 - 4.36	1.00-5.00	1.00-4.57	1.22-4.89	1.00 - 5.00	1.10-5.00	1.13-4.21	16-52	24.50-57.00
Mean(SD)	2.7 (.62)	3.0 (.91)	3.0 (.68)	2.8 (.72)	3.2 (.77)	3.1 (.94)	2.6 (.52)	30.86 (7.67)	37.09 (6.72)
Alpha	.79	.81	.63	.75	.46	.87	.52	_____	_____

*p < .05,** p< .001

Regression Analysis

Stepwise regression analysis was also used to examine criterion evidence of the BPW. Criterion evidence is supported when the BPW composites significantly predict weight

management outcomes. Each outcome (EBPQ, BAQ, and BMI) was regressed on the sets of composites within each domain. A total of 24 regression analyses were performed including eight outcomes times three domains. Due to the high correlation of BMI and waist circumference (r = .85, p = < .001) and the fact that the composites correlated similarly with both weight outcomes, the regression analyses were done only with BMI. Table 13 shows the composites that contributed significantly to the variance in one or more outcomes.

All of the eating behavior patterns, regular physical activity and weight were significantly predicted by weight belief composites. The descriptor composite, *normal weight*, was a significant predictor that explains 12% of the variance in emotional eating. No other eating behavior pattern was significantly predicted by descriptors. The descriptor composite, *overweight*, was a significant predictor explaining 9% of the variance in physical activity. The o*verweight composite* is also a significant predictor explaining 51% of the variance in BMI.

The cause composite, *health related factors* and *unhealthy eating behaviors* significantly predicted meal skipping explaining 5% of the variance in meal skipping. The cause composite, *healthy eating behaviors* and *unhealthy eating behaviors* were predictors explaining 16% of the variance in low fat diet, 18% of the variance in meal planning, and 11% of the variance in physical activity. Also, these same cause composites (*healthy eating behaviors, unhealthy eating behaviors)* and *stress factors* were significant predictors explaining 34% of the variance in emotional eating. The cause composite, *unhealthy eating behaviors*, was a predictor explaining 7% of the variance in snacking on sweets and 15% of BMI.

The consequence composite, *health problems*, was a significant predictor explaining 4% of variance in cultural lifestyle eating behavior, 4% of the variance in physical activity and 17% of the variance in BMI. The consequence composite, *good health*, was a significant predictor

explaining 6% of the variance in meal skipping and the *negative emotional consequences* was a predictor explaining 13% of the variance in emotional eating.

Overall, the descriptor composites accounted for 9 to 51% of the variance in the outcomes. The cause composites accounted for 4 to 34% of the variance in the outcomes and the consequence composites accounted for 4 to 17% of the variance in the outcomes (Table 13).

Table 13

Summary Results of 24 Stepwise Regression Analysis Weight Belief Composites – Criterion Related Validity of Composites

Significant weight belief domains & composites	EBPQ Subscales												BAQ		Weight	
	Low Fat		Snacking on Sweets		Cultural Lifestyle		Haphazard Meal Planning		Meal Skipping		Emotional Eating		Total Physical Activity		BMI	
	β	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**
Descriptors																
Normal weight											**-.35****					
Overweight													**-.31****		**.71****	
Final Model												**.12**		**.09**		**.51**
Causes																
Health Related									**.16**							
Healthy Eating Behaviors	**.27****						**-.21****				**-.21****		**.24***			
Unhealthy Eating Behaviors	**-.24***		**.27***		**.19**		**.31****		**.16**		**.31****		**-.18***		**.39****	
Stress Factors											**.30****					
Final Model		**.16**		**.07**		**.04**		**.18**		**.05**		**.34**		**.11**		**.15**
Consequences																
Health Problems					**.20***								**-.20***		**.41****	
Good Health									**.25***							
Negative Emotional											**.37****					
Final Model						**.04**				**.06**		**.13**		**.04**		**.17**

*p < .05 - **p <.001

In order to determine the predictive validity of the weight belief composites across domains, each outcome was also regressed on all 16 of the weight belief composites, which were entered as a block, in the regression analysis (Table 14). Weight management behaviors and outcomes were predicted by nine of the weight belief composites. Twenty-one percent of the variance in low fat eating behavior was accounted for by the composites: *overweight descriptors*,

healthy eating behavior causes and *unhealthy eating behavior* causes. Ten percent of the variance in snacking on sweets was accounted for by the composites: *skinny descriptors* and *unhealthy eating behavior* causes. Four percent of the variance in cultural lifestyle eating behaviors was accounted for by the composites: *health problem consequences*. Nineteen percent of the variance in haphazard meal planning was accounted for by the composites: *normal weight* descriptors, *healthy eating behavior* causes, *unhealthy eating behavior* causes. Ten percent of the variance in meal skipping was accounted for by the composites: *unhealthy eating behavior* causes and *good health* consequences. Thirty-four percent of the variance in emotional eating was accounted for by the composites: *healthy eating behavior* causes, *unhealthy eating behavior* causes, and *stress factor* causes. Fourteen percent of the variance in total activity was accounted for by the composites: *overweight* descriptors, and *healthy eating behavior* causes. Lastly, 53% of the variance in BMI was accounted for by the composites: *overweight* descriptors and *food preparation and amount*. Overall, the weight belief composites account for significant amounts of variance in weight management behaviors and outcomes.

Table 14

Summary Results of Eight Block Regression Analyses Weight Belief Composites

Significant Weight Belief Domains & Composites	**EBPQ Subscales**												**BAQ**		**Weight**	
	Low Fat		**Snacking on Sweets**		**Cultural Lifestyle**		**Meal Planning**		**Meal Skipping**		**Emotional Eating**		**Total Activity**		**BMI**	
	β	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**	**β**	**R^2**
Overweight Descriptors	**.23***												**-.24***		**.69****	
Skinny Descriptors			**.17***													
Normal Weight Descriptors							**.21****									
Healthy Eating Behavior Causes	**.31****						**-.28****				**-.21***		**.22***			
Unhealthy Eating Behavior Causes	**-.33****		**.32****				**.38****		**.18***		**.32****					
Stress Factor Causes											**.30****					
Food Prep/ amount causes															**.14***	
Health Problems Consequences					**.20***											
Good Health consequences									**.26***							
Final Model		**.21**		**.10**		**.04**		**.19**		**.10**		**.34**		**.14**		**.53**

*p < .05 -** p <.001

Conclusion

The BPW was developed based on theoretical and empirical considerations. Eighty one items were developed and subjected to cultural-sensitivity analysis. Fifty-four items achieved expert content validity, face validity, and pretesting. A final scale with 65 items (54 content valid and 11 items generally worded in the opposite direction) comprised the final scale. PCA reduced the items to 16 composites within three domains, retaining 57 items. Evidence for

content, internal structure and relationship with other variables support the validity of the BPW composites.

A discussion of the results, implications, and conclusion of this study are presented next in the final chapter.

Chapter 6

Discussion

The final chapter will discuss key findings in this study in relationship with other studies and in relationship with theories of health beliefs and behaviors. The discussion will also include study limitations, implications for practice, future research, theory, and final conclusions about the study.

The specific aim of this study was to develop a culturally-sensitive instrument that measures beliefs about personal weight among African American women and to perform initial psychometric evaluation of the instrument. Results of the initial psychometric evaluation demonstrates that the BPW composites performed well with evidence of reliability and content, construct and criterion validity within and across the descriptor, cause, and consequence domains. The BPW composites also exhibited predictive ability for weight management behaviors (i.e., eating behaviors, physical activity) and actual weight.

Unexpected results of this study reveal that this sample did not believe that a consequence of their weight was physical illness, such as hypertension or diabetes even though the sample believed the cause of their weight was *not exercising enough* and *eating too much*. Instead, the participants believed the consequences of their personal weight were mostly positive, such as *feeling good about self* and *being satisfied with how they look in their clothes.*

Key results show that African American women may have misperceptions of their actual weight. The participants believed their weight was normal even though their actual BMI was in the obese category and their body image perception was in the overweight BMI category.

Emotional eating emerged as an important eating behavior pattern that was associated with many of the weight belief composites and actual weight. Describing weight as overweight,

believing cause of weight is unhealthy eating behaviors and stress factors were associated with emotional eating. Another key finding in this study was that emotional eating was partially predicted by believing cause of personal weight was unhealthy eating behaviors, and stress factors.

The next section will discuss these findings in terms of the beliefs about the descriptors, causes and consequences of personal weight in relationship to other studies in the literature

Beliefs about Personal Weight Descriptors and BMI

The results of this study suggest a disconnect between personal weight descriptors and actual BMI. The study results suggest that perhaps "*normal weight*" may not be consistent with a normal BMI but may mean *normal* compared to others in the social environment, while the actual weight may be in the overweight or obese BMI category. This point is further supported with the results from the body image perception data from this sample. The body image perception results showed that the participants, on average, chose a body image that reflected an overweight BMI which was less than the average BMI for this sample. So the participant's perception of their body weight was not consistent with their measured body weight. Also, overweight descriptors accounted for more of the variance in weight descriptors. The actual BMI was in the obese BMI category. Similar findings have been noted by Heiland and Nadler (2009) who examined self-perception of weight status over time. Comparing NHANES data from 1988 -1994 to 1999-2004, the study found a decline in young women classifying personal weight as overweight despite the increased prevalence of overweight and obesity in the general population.

Similar findings were noted by Hendley et al. (2011) who examined weight perceptions and actual BMI. The participants were asked to describe their weight as underweight, just right,

overweight or obese. The participants self reported their height and weight and had their actual height and weight measured. The BMI calculated from self-report and actual weight measures were consistent among African American women, yet their weight description was not consistent with their actual weight measures. In fact, African American women were less likely to describe their weight as obese despite their actual BMI being in the obese category.

One explanation for the growing misperception of body weight may be explained by a generational shift in social norms related to body weight such that, larger weights are accepted as *normal* (Heiland & Nadler, 2009). This explanation may be supported given the normality of larger body sizes. Larger body sizes may be encouraged by the recalibration of women's dress sizes, as a size 12, 40 years ago, is a size 6 today. This dress size change, in part, may be attributed to increased height and also may contribute to misperceptions about body weight (Heiland & Nadler, 2009).

Another possible explanation for African American women's misperception of their personal body weight may be due to cultural differences in what constitutes excess body weight and body weight satisfaction (Hendley et al., 2011). Misperception of body weight has been found in other studies (Dorsey, Eberhardt, & Ogden, 2009; Howard, Hugo, Taylor, & Wilson, 2008; Rand & Resnick, 2000).

Beliefs about Causes of Personal Weight and Emotional Eating

Believing the cause of weight to be unhealthy eating behaviors and stress factors appears to be associated with emotional eating. Believing the cause of weight to be unhealthy eating behaviors and stress factors was predictive of emotional eating. Emotional eating refers to eating for reasons other than hunger such as stress, loneliness, boredom (Urquhart & Mihalynuk, 2011). Emotional eating has been associated with obesity largely because of increased consumption of

energy dense foods, such as cake, ice cream, chips and soda (Nguyen-Michel, Unger, Spruit-Metz, 2007). Also, stress is linked to a greater drive to eat as physiologically, stress produces cortisol and people with high cortisol levels report eating more high fat, high sugar foods (Groesz et al., 2012; Newman, O'Connor, & Conner, 2007; Sims et al., 2008).

Obesity has been associated with life stress in African American women (Wilson-McQuigg, 1995). Examination of perceived stress and eating behavior among a sample of African Americans revealed greater perceived stress was associated with unhealthy eating behaviors including: emotional eating, haphazard meal planning, and snacking on sweets, particularly among overweight and obese individuals (Dallman, 2009; Sims et al., 2008). Controlling emotional eating has been noted as one of the psychosocial factors associated with weight loss in African American women (Walcott-McQuigg et al., 2002). Also, stress reduction using relaxation training in an Italian population revealed a reduction in emotional eating and subsequent weight reduction (Manzoni et al., 2009). This data suggest that interventions for weight management in African American women may benefit from addressing emotional eating and stress reduction**.**

Beliefs about Consequences of Personal Weight

The participants believed that the consequences of their personal weight were not negative such as having specific *health problems;* but positive, such as, *being satisfied with how they look in clothes* and *having an active social life*. These findings suggest that the participants believed the results of their personal weight to be positive even though their average BMI was in the obese category. This apparent disconnect of actual weight and positive consequences of personal weight may be explained by the participants believing their weight to be *normal*. This finding may suggest that how one describes their weight may be associated with beliefs about the

consequences of their weight which may affect behavior. Also, given that the sample was young and healthy, health problems from excess weight was not a reality therefore the sample's current weight has limited negative consequences.

Predictive Ability of Weight Belief Composites for Eating Behavior Patterns and BMI

The weight belief composites that show the most predictive ability for eating behavior patterns, total activity and weight include: *overweight* descriptors, *healthy eating behavior* causes, *unhealthy eating behavior* causes and *stress factor* causes. These composites accounted for significant variance in low fat eating patterns, emotional eating patterns, and BMI.

The study results show that believing self to be overweight and believing personal weight is caused by healthy eating behaviors and not unhealthy eating behaviors was partially predictive of low-fat eating patterns. This finding does not appear intuitive. However, one explanation for this finding is that some participants who characterize themselves as overweight may be actually obese as more than half of the women in this study were obese, therefore these women may be actively attempting to lose weight by eating healthy foods and avoiding unhealthy eating behaviors. This finding is supported by the view that African American women who perceive themselves to be obese are more likely to attempt weight loss (Anderson, Elyeth, Gauska, & Brown, 2002). Believing that unhealthy eating behaviors and stress factors were the cause of personal weight was partially predictive of emotional eating. This key finding is consistent with other studies (Dallman, 2009; Groesz et al., 2012; Newman, O'Connor, & Conner, 2007; Sims et al., 2008).

Study Results within Theoretical Frameworks

This section will consider the study results within the TSC (Orem, 2001) and social cognitive frameworks including the theory of planned behavior (TPB; Ajzen 1991, 2001), and the heath belief model (HBM; Becker, 1974, Bandura, 1977).

Weight Beliefs within the TSC

Overall, the results of this study provide support for conceptual relationships derived from TSC. Positive relationships were found for the self-care agency concept of foundational dispositions (beliefs about personal weight) self-care behaviors (weight management behaviors) and health outcomes (weight) which are consistent with TSC. Results that were inconsistent with the TSC show that different aspects of foundational dispositions (weight belief composites) differentially predict self-care behaviors (weight management behaviors). This finding is an important theoretical finding that requires more investigation in the future which includes deconstructing the weight belief composites to determine which items have more predictive ability for weight management behaviors.

Although much of the study findings provide support for TSC, alternate explanations for the conceptual relationships may exist. One alternate explanation may be a bidirectional relationship between SCA (weight management agency) and SC (weight management behavior) and a bidirectional relationship between SC (weight management behavior) and Health (actual weight). A bidirectional relationship suggests that beliefs about personal weight may influence weight management behaviors, and actual weight. In the same way, actual weight and weight management behaviors may influence beliefs about personal weight. A bidirectional causal pathway within the SCDNT framework has been suggested in another study using self-care behaviors for blood pressure control and actual blood pressure (Peters & Templin, 2008). A

longitudinal study is needed to determine if a bidirectional relationship exist among personal weight beliefs, weight management behaviors and actual weight.

Weight Beliefs within Social Cognitive Theories

Social cognitive frameworks emphasize the relationship of cognitions in the regulation of behavior (Conner & Norman, 1996). The theory of planned behavior (TPB; Ajzen 1991, 2001) (provides a framework to explain and predict human behavior. The TPB purports that *beliefs* about the behavior of interest (weight management behaviors), beliefs about the acceptance of the behavior by significant others, and beliefs about having opportunity and resources necessary to perform the behavior influences intention to engage in a behavior of interest (weight management behaviors). The relational concepts within the TPB do not fit with the weight beliefs, weight management, and actual weight relationships as noted in this study. The TPB does not consider beliefs about the initial condition (personal weight) but considers beliefs about the health behavior (engaging in weight management). Also, the direction of the conceptual propositions within the TPB supports a unidirectional relationship which suggests beliefs influences intention and behavior. The causal pathway of the conceptual propositions from this study, weight beliefs, weight management behaviors, and actual weight are not as clear and warrant further investigation.

Another social cognitive theory that will be discussed is the health belief model (HBM; Becker, 1974; Bandura, 1977). The HBM examines the likelihood of one engaging in health behaviors by assessing ones perception of the following: one's susceptibility to a particular condition or health threat, severity of the health threat, benefit of engaging in health behaviors, barriers to engaging in health behaviors, cues to action which are conditions that motivate one to take action and self-efficacy, which is believing one has the ability to successfully engage in

health behaviors (weight management) (Bandura, 1977; Becker et al., 1978; Rosenstock, Strecher, & Becker, 1998). The HBM asserts that the primary motive for persons to engage in health behaviors is their belief that the condition of interest (weight) is a health threat. Considering results from this study, African American women did not consider their weight to have negative health consequences even though their weight was in the obese BMI category. This finding suggest that the participants in this study did not perceive their weight to be a health threat; therefore, would be less likely to engage in health behaviors necessary to change their weight. The results from this study were not consistent with the premise of the HBM.

In summary, the results of this study provide support for the TSC. The results of this study are not consistent with the TPB or the HBM.

Study Limitations

This study has limitations that should be considered when reviewing the study results. These limitations may be considered as threats to internal and external validity of the study. Factors that may be threats to internal validity concern study design, data collection method, instrumentation and participant selection. Factors that may be a threat to external validity include sampling method.

Study Design

The study design was a cross-sectional correlational design which limits the ability to show causal relationships. Theoretically, the study concepts derived from TSC, purports that personal weight beliefs influence weight management behavior and actual weight. Empirically, due to the nature of cross-sectional, correlational designs, the reverse may be valid as weight and weight management behaviors may influence personal weight beliefs. However, the actual data may suggest a bidirectional relationship between beliefs, behavior, and health and health,

behavior and beliefs. A longitudinal study is needed to better clarify the direction of personal weight beliefs, weight management behaviors and weight.

Measurement

Personal weight belief data was collected using self-report methods as this data may not be obtained in other ways. The data was collected using the same process with every participant. However, self-report inherently has weaknesses as participants may provide socially acceptable responses and participants may have difficulty recalling information from the past (Kimberlin & Winterstein, 2008; Polit & Beck, 2008). Yet, self-report methods have been consistently used to examine cognitive concepts and behavior in research as well as relied upon in clinical practice (Osterberg & Blaschke, 2005). In order to limit socially desirable responses in this study, the participants were told that there were no right or wrong responses and provisions were made to provide as much respondent anonymity as possible. In future research objective methods for assessing eating behaviors and physical activity will be considered.

Instrumentation

A limitation of the BPW is a high reading level. The analysis of the initial item list for the BPW survey had a Flesch Kincaid reading level of 12.5. The final item list that underwent psychometric evaluation had a Flesch Kincaid reading level of 8.5. This reading level is slightly higher than the recommended 7th grade reading level (Streiner & Norman, 2003). Given that the sample's mean educational level was some college, this sample did not report difficulty reading or understanding the survey content. However, it is possible that participants with limited education may have a problem with wording as reading level is based on word and sentence length (Crossley, Allen, & McNamara, 2011; Kincaid, Fishburne, Rogers, & Chissom, 1975).

More revision is needed to reduce the reading level to 7th grade. Also, the instrument may be read to participants with low literacy.

Another limitation within the BPW cause domain is the physical activity composite only having one item. Because of this single item, internal consistency reliability for the physical activity composite could not be determined. Therefore assessment of beliefs about personal weight causes related to physical activity is limited. More items need to be added to the physical activity composite.

Another limitation of this study was low internal consistencies on several subscales on EBPQ and BAQ. Meal skipping within the EBPQ, achieved an alpha of .46, which may indicate a significant amount of measurement error. This finding may account for meal skippings' limited associations with the weight belief composites. Other studies found that used the EBPQ, did not report meal skipping subscale alphas (Groner et al., 2009; Stetson et al., 2006).

The BAQ has been used in multicultural samples however; the instrument did not perform well with this sample. The Cronbach's alphas for the BAQ subscales were low. Working, sporting, and leisure subscales along with the total activity scores had alphas ranging from .52-.57. Reasons for the low alphas may be due to missing data on the work and sporting activity subscales due to participants not being employed or not playing a sport. The low alphas may also be due to different formatting for each subscale which may cause errors or item skipping. Similar findings have been noted in another study using a multicultural sample (Sternfeld, Ainsworth, & Quesenberry, 1999). These results suggest that BAQ may not be culturally relevant in African American samples or user friendly. More assessment is needed to evaluate the relationship of personal weight beliefs and physical activity in African American women using a more appropriate physical activity instrument.

Selection

Interval validity of this study may be affected by sample selection. This study sample was a non-probability, sample of young African American women. While non –probability sampling is an efficient sampling method, the sampling method may introduce selection bias. Selection bias causes observed measurements or results to differ from their true values because of systematic, but unintended, "errors," (Kukull & Ganguli, 2012). The error may be introduced by participants who meet inclusion criteria but also have other traits are characteristics that are unknown and unconnected to the study but may influence or be related to the variables in the study (Kerlinger & Lee, 2000; Polit & Beck, 2008). On the other hand, selection bias may be limited by the fact that the sample was a community sample with clear boundaries that were established and adhered to using inclusion and exclusion criteria. These boundaries enhance the internal and external validity of this study (Kukull & Ganguli, 2012). Ultimately, the results of this study need to be replicated in other samples to show support for the internal and external validity of this study's findings.

External validity

External validity refers to generalizability of the study results. Because the sample was not randomly selected, it is difficult to determine whether the sample is representative of young African American women in the general population. Therefore, the findings from this study may be generalized to premenopausal African American women living in an urban city. Replication of this study is needed to determine if personal weight beliefs and relationships between personal weight beliefs and weight management behaviors hold in other samples of premenopausal African American women.

Confounders

Confounding variables are variables that may influence both the predictor and outcome variables that, may threaten the results of a study. The potential confounding variable for this study was SES measured as annual income and highest level of education completed. The data does not support a significant difference in beliefs about personal weight by SES. This finding is not consistent with past studies as African American women with high SES appear to prefer smaller bodies similar to Caucasian women (Schieman et al., 2007; Lynch et al., 2006). African American women in lower SES have been noted to prefer a heavier body ideal (Flynn & Fitzgibbon, 1998). These findings may indicate different beliefs about personal weight possibly related to SES. More research is needed to determine the relationship of SES to weight beliefs in African American women.

Strengths of the Study

Despite the limitations of this study, important knowledge can be gained from this study that include knowledge about the BPW instrument, implications for theory development, implications for clinical practice and future research.

Beliefs about Personal Weight Survey

The Beliefs about Personal Weight Survey is the first instrument developed to measure beliefs about personal weight known to this author. The instrument was developed as a culturally-sensitive tool to assess personal weight beliefs of African American women of all BMI categories. The results of the initial psychometric analysis of the new instrument supports the validity and reliability of the instrument and supports a model of personal weight beliefs that include descriptors, causal attributions and consequences of personal weight that may be used to examine belief, behavior and outcome relationships.

Implications for Theory

Results from this study have important theoretical implications. Results of the psychometric analysis support the multidimensional concept of *beliefs about personal weight*. Conceptualized as a foundational disposition, beliefs about personal weight had relationship with weight management behaviors and weight control outcomes. However, the relationship varied based on the beliefs about personal weight composites. Weight management behaviors were also associated with the health outcome of weight as measured by BMI. The study results also indicated that the participant's perception of their weight was inconsistent with their BMI indicating an error in estimative operation. Estimative operation, defined as knowledge of self and environment, is important for judging and deciding to perform deliberate self-care action. Estimative operation also is a component of weight management agency (Orem, 2001). More research is needed to examine the differential ability of foundational dispositions to predict eating behavior patterns, physical activity and BMI. Also, considering the estimative operation's definition of knowledge of self, the data may suggest that *beliefs about personal weight* may be better conceptualized as an estimative operation in future studies as this conceptualization may be more useful for interventions geared toward changing misperceptions of weight.

The discussion of personal weight beliefs has been conceptualized and discussed primarily within an individual or personal frame of reference. Considering that beliefs may be formed by cultural and social associations, beliefs about personal weight may be considered within a sociocultural orientation. The TSC considers sociocultural orientation to be a conditioning factor that influences self-care agency. The sociocultural orientation includes family, community and other personal associations (Orem, 2001). From Orem's self-care perspective, agency includes decisions about the course of action for self-care. The TSC does

not specifically speak to limited resources, such as is found in many urban settings, that may impact one's ability to make decisions leading to better health. But, the TSC provides a framework that concedes that self-care decisions are motivated by values or beliefs concerning social, cultural, economic and health related factors (Nursing and Development Conference Group [NDCG], 1979). These factors influence the decision for or against self-care. More research is needed to examine how agency is reconciled within the parameters of limited resources.

Implications for Clinical Practice

Results from this study have important clinical practice implications. Implications for clinical practice suggest that healthcare providers should focus more on stress reduction in order to reduce or prevent emotional eating rather than focusing on other eating behaviors. Emotional eating is generally thought to be a maladaptive response to stress that may lead to excess calorie intake and weight gain. However, emotional eating considered within an ethnic context may suggest a more positive association to food and in fact may help to reduce stress. The traditional cuisine of many African Americans is "soul food" which may be characterized as high fat, high-salt foods. Eating soul food is also associated with sharing a meal with family and friends i.e. Sunday dinners and holiday dinners. In these cases, people are surrounded by friends and family that are usually a support system that may in fact help to reduce stress but may also increase intake of high fat, high salt foods. More research is needed to examine emotional eating from an ethnic perspective in African American women. However, from a clinical perspective, healthcare providers should inquire about behaviors used to deal with stress, specifically eating behaviors associated with stress and stress reduction and emotions associated with such behaviors in African American women.

Clinical implications from this study also suggest that some African American women who consider themselves as having a *normal* weight may, in fact, be overweight or obese. This perception of *normal* weight may be suggestive of a sociocultural *normal* where most women in one's environment are of similar size indicating what is normal for one's environment/world. As a result, these women may be at high risk for weight related chronic illnesses yet, less likely to engage in weight management behaviors because of their socioculturally set *normal* weight. Data from this study suggest that healthcare providers should inquire about how their patients characterize their personal weight using body image perceptions to explore misperceptions of personal weight and provide information about the relationship of body size and risk of illness. Additionally, healthcare providers may examine the beliefs about causes and consequences of personal weight with their African American female patients in order to gain information that may lead to points of intervention for weight management.

Implications for Future Research

Results from this study have important future research implications. More research is needed in order to reduce the BPW reading level to 7^{th} grade. A longitudinal study is indicated to determine whether beliefs influence behavior or behavior influences beliefs about personal weight. More research is needed to refine the BPW by adding more items within the physical activity composite, and returning certain items such as *weight left from pregnancy* to the cause domain. Also, more research is needed to evaluate the predictive ability of beliefs about personal weight using another physical activity instrument given the low alphas in the BAQ. Another important research implication is to deconstruct the composites and determine which items within each composite have the most predictive ability for weight management behaviors and actual weight.

The study also needs to be replicated with a probability sampling of African American women to determine if belief/behavior relationships hold in order to generalize results to the general population of African American women. The study also needs to be replicated in other groups (i.e., African American men, Hispanic men and women) to determine similarities/ differences that may lead to weight management interventions for these groups.

Perhaps the most important research implication from the study results is that the data suggest that developing an intervention that includes stress management strategies with an emphasis on reducing emotional eating may be beneficial for weight control among young African American women. More research is needed to examine emotional eating in this population.

Overall, the instrument development, theory, clinical and research implications of this study will advance knowledge of beliefs about personal weight for nursing practice. This knowledge may serve to improve interventions for weight management among African American women.

Conclusion

Over 80% of African American women are overweight or obese in part, due to limited engagement in a dietary habits and physical activity that is necessary to control weight. Although many studies have examined beliefs about dietary habits and physical activity among African American women, few studies have examined beliefs about personal weight and its relationship to weight management behaviors and actual weight. This gap in the literature was possibly due to the lack of any measure of beliefs about personal weight.

The concept of beliefs about personal weight was defined as a multidimensional concept consisting of the convictions regarding the descriptive characteristics, causal attributions, and

consequences of one's personal weight. The concepts and conceptual relationships were derived from the SCT (Orem, 2001). The BPW was developed to operationalize human foundational dispositions as a component of weight management agency in order to evaluate the relationship of personal weight beliefs, weight management behaviors and actual weight.

Using a sample of 174 African American women, the BPW was developed in three phases: phase one included item development and culturally sensitivity analysis; phase two included expert content evaluation, face validity evaluation and pretesting; and phase three included initial psychometric evaluation using evidence of content, internal structure and relationships based on other variables.

The preliminary evaluation of the BPW shows that the survey is easy to administer and has an eighth grade reading level. The initial psychometric evaluation of the BPW survey demonstrated composites that performed well. Most of the beliefs about personal weight composites are reliable and valid and appear promising. While validity evidence from confirmatory factor analysis nine composites (*overweight descriptors, skinny descriptors, normal weight descriptors, healthy eating behavior causes, unhealthy eating behavior causes, food preparation and amount causes, health problem consequences and good health consequences)* predict eight weight management behaviors and outcomes (low fat eating, snacking on sweets, cultural lifestyle, haphazard meal planning, meal skipping, emotional eating, total activity and BMI) further work is needed to determine which items within the composites are most useful for predicting weight management behaviors and outcomes. Also, future research is suggested to overcome the limitations of the current study that include refining the BPW to a 7^{th} grade reading level, adding additional items to the physical activity composite to improve internal consistency reliability. To improve criterion validity a more appropriate physical activity questionnaire is

needed to possibly improve weight belief composite relationships with physical activity. A longitudinal study is needed to better evaluate a possible bidirectional relationship between beliefs about personal weight and weight management behaviors. Additionally, the BPW needs to be tested in other samples, African American and other cultures. While the BPW must undergo refinement to be useful clinically and in research, the current study findings provide important information concerning the relationship of personal weight beliefs and weight management behavior. Believing personal weight is caused by stress factors is associated with emotional eating and BMI is an important finding that has been supported in other studies. These findings suggest that weight management interventions for African American women should include stress reduction and emotional eating.

APPENDIX A

DEVELOPMENT OF CULTURALLY-SENSITIVE BELIEFS ABOUT PERSONAL WEIGHT QUESTIONNAIRE

Phase I: Analysis for Cultural Sensitivity

Purpose: The purpose of this study is to develop a questionnaire to measure beliefs about personal weight of African American women. Information from this study will be used to develop a questionnaire that healthcare providers may use in the future to advise African American women about their weight management beliefs and behaviors.

In order to develop a questionnaire that is culturally sensitive to African American women we need to know what African American women believe about their weight including:

1. How do African American women describe their current weight?
2. What do African American women believe are the causes of their current weight?
3. What do African American women believe are the consequences of their current weight?

Directions: You are being asked to **read** the beginning statement and each possible response **aloud** and talk about what each response **means** to **you and suggest** how you would say the response using your **own words**. You are also asked to choose possible responses that are most important to include on the questionnaire.

The statement and possible responses may be read to you if requested.

You may talk about and add other beginning statements and responses to examine beliefs African American women have about their personal weight.

I believe my current weight is:

Possible Responses	Changes/Notes
17. Nice weight	
18. On the heavy side	
19. Skinny/Bony	
20. Big boned	
21. Fine	
22. Overweight	
23. Too big	
24. Muscular	
25. Healthy	
26. Normal	
27. Just right for my age	
28. Just right for my height	
29. Attractive	

30. Sexy	
31. Normal for women in my social circle	
32. Attractive to my significant other	

I believe my current weight is due to:

Possible Responses	Changes/Notes
43. Heredity-My bloodline	
44. A germ or virus	
45. My age	
46. My health condition or medication	
47. My metabolism	
48. Being naturally big boned	
49. Never being told to lose weight by my medical provider	
50. My emotional state (e.g. Feeling down, lonely, anxious, empty)	
51. Not caring about how much I weigh	
52. My significant other encouraging me to maintain my current weight	
53. Stress or worry	
54. Not having support from family or friends to lose weight	
55. Not exercising on a regularly basis	
56. Being physically active	
57. The exercise I get at work	
58. Weight left over from pregnancy	
59. Stopping smoking	
60. Continuing to smoke	
61. Not getting enough sleep	
62. No money for gym membership	

I believe my current weight is due to:

Possible Responses	Changes/Notes
63. Not eating healthy food because of cost	
64. Having to buy groceries in stores that do not have fresh fruits and vegetables	
65. Not having time to prepare healthy food	

66. Knowing how to maintain a healthy weight	
67. I don't know the cause of my weight	
68. Not enjoying eating foods that are healthy	
69. Eating fresh fruits most days	
70. Eating fresh vegetables most days	
71. Eating foods low in fat	
72. The amount of food I eat	
73. The foods I choose to eat	
74. Eating fast foods regularly	
75. Eating meat with every meal	
76. Dieting	
77. Eating soul food (traditional foods) on a regular basis	
78. The way I cook/prepare my food	
79. Eating lots of sweets	
80. My desire to clean my plate at every meal	
81. Being addicted to food	
82. Eating a healthy diet	
83. Skipping meals on a regular basis	
84. Snacking between meals	

I believe my current weight has led to OR will lead to:

Possible Responses	Changes/notes
24. Kidney Disease	
25. Shortness of breath	
26. High blood pressure	
27. Diabetes	
28. Tiredness	
29. Being at risk for serious health problems	
30. Me increasing my chances of being in good health	
31. Me decreasing my chances of chronic illness (diabetes, high blood pressure)	
32. Me being at risk for an early death	
33. Difficulty doing housework	
34. Difficulty exercising	
35. Difficulty sleeping	
36. Difficulty walking	
37. A limited social life	
38. An active social life	

39. Me being depressed	
40. Me being anxious	
41. Me feeling afraid for my health	
42. Me feeling good about myself	
43. Me being attractive to others that I care about	
44. Difficulty finding stylish clothes	
45. Being dissatisfied with how I look in my clothes	
46. Me looking good	

Phase I

Self-report weight _____

Self-report Height_____

Education Completed: – Less than High School_____ High School Graduate_____

Some College____ College Graduate_____ Graduate/Professional School_____

APPENDIX B

EXPERT CONTENT VALIDITY EVALUATION

Name _____
Content Expert_____

Content Validity Evaluation

Content validity answers the question: to what extent do the items on the scale adequately sample the intended universe of content? The universe of content is framed by the theoretical rationale surrounding the concept of interest and its conceptual definition. In order to evaluate content validity, content experts are asked to assess item content for adequacy of measuring dimensions of the concept of interest, clarity of item wording and comprehensiveness of the entire instrument (Davis & Grant, 1997; Lynn, 1986).

The concept of interest is *beliefs about personal weight* defined as a multidimensional concept consisting of the convictions regarding the descriptive characteristics, causal attributions, and consequences of one's personal weight.

The items that will be evaluated have been developed to assess beliefs African American women (18-40 years of age) may hold about their current weight based on the definition of *beliefs about personal weight*. These items will be developed into a norm-referenced, 5-point likert type response instrument. A norm-referenced instrument is designed to distinguish between varying degrees of the concept being measured.

The items listed were selected from a larger item list by 21 -71% of a convenience sample of 14 African American women. The convenience sample viewed the items listed as culturally sensitive items that should be included on a questionnaire assessing beliefs about characteristics, causes and consequences of one's personal weight in African American women.

Instructions:

You are being asked to evaluate the content validity of items by assessing relevance and clarity of each item, as well as overall comprehensiveness.

Item relevance will be assessed using the following scale: 1= an irrelevant item;
2= somewhat relevant; 3= quite relevant; 4= highly relevant.

Clarity will be assessed by choosing clear (C) or not clear (NC).
Any additional items may be added.
Overall comprehensiveness of the instrument will be assessed by providing overall comments and recommendations.

Content Validity Index (CVI)

Your responses will be used to calculate a CVI for individual items and for the entire instrument. CVI for each item is determined by the proportion of experts who rate an item as 3 or 4. Items that achieve a rating of 3 or 4 are content valid (Grant & Davis, 1997; Lynn, 1986; Polit & Beck, 2006). CVI for the entire instrument is the proportion of total items judged

content valid (Grant & Davis, 1997; Lynn, 1986). A CVI of .83-1.00 is desired for each item and entire scale.

Descriptive characteristics of one's personal weight (I believe my weight is)

List of items	Content Validity Item Relevance 1= irrelevant item 2=somewhat relevant 3= quite relevant 4= highly relevant	Content Validity Item Clarity Clear (C) Not Clear (NC)	Comments/ Recommendations/ Revisions
1. Nice size			
2. Skinny			
3. Overweight			
4. Healthy			
5. Normal			
6. Just right for my age			
7. Just right for my height			
8. Attractive			
9. Sexy			
10. Attractive to my significant other			

Additional Items

Causal attributions of one's personal weight (I believe my current weight is due to)

List of items	Content Validity Item Relevance 1= irrelevant item 2=somewhat relevant 3= quite relevant 4= highly relevant	Content Validity Item Clarity Clear (C) Not Clear (NC)	Comments/ Recommendations/ Revisions
1. Heredity – my bloodline			
2. My health condition or medication			
3. My emotional state e.g. Feeling down, lonely, anxious, empty			
4. Stress or worry			

5. No support from family or friends to lose weight			
6. Not exercising on a regularly basis			
7. Being physically active			
8. Weight left over from pregnancy			
9. Knowing how to maintain a healthy			
10. Not enjoying eating foods that are healthy			
11. The way I cook/prepare my food			
12. Taking Birth Control Pills			

Additional Items

Consequences of one's personal weight (I believe my current weight has led to or will lead to)

List of items	Content Validity Item Relevance 1= irrelevant item 2=somewhat relevant 3= quite relevant 4= highly relevant	Content Validity Item Clarity Clear (C) Not Clear (NC)	Comments/ Recommendations/ Revisions
1. High blood pressure			
2. Diabetes			
3. Tiredness			
4. Being at risk for serious health problems			
5. Me increasing my chances of being in good health			
6. Me decreasing my chances of chronic illness (diabetes, high blood pressure)			
7. Me being at risk for an early death			

8. A limited social life			
9. Me being depressed			
10. Me feeling good about myself			
11. Being dissatisfied with how I look in my clothes			

Additional Items:

Overall assessment of instrument comprehensiveness:
Comments:

Recommendations:

APPENDIX C

DEVELOPMENT OF CULTURALLY-SENSITIVE BELIEFS ABOUT PERSONAL WEIGHT QUESTIONNAIRE

Phase III: Psychometric Evaluation

INSTRUCTIONS: I am interested in what you believe about your weight. Below is a list of statements that are possible responses to what you may believe about the description, causes and consequences of your current weight. Please show how much you agree or disagree with each statement by circling the appropriate number. There is no right or wrong answer.

Description of my personal weight- ***I believe my weight is:***

Possible Responses	**Strongly Disagree**	**Somewhat Disagree**	**Neither agree Nor disagree**	**Somewhat Agree**	**Strongly Agree**
1. Overweight	1	2	3	4	5
2. Healthy	1	2	3	4	5
3. Normal	1	2	3	4	5
4. Just right for my age	1	2	3	4	5
5. Just right for my height	1	2	3	4	5
6. Attractive	1	2	3	4	5
7. Very Overweight	1	2	3	4	5
8. Heavy	1	2	3	4	5
9. Chunky	1	2	3	4	5
10. Well Proportioned	1	2	3	4	5
11. Too Skinny	1	2	3	4	5
11a. Thin	1	2	3	4	5
12. Athletic	1	2	3	4	5
13. Unattractive	1	2	3	4	5
14. Attractive to my significant other	1	2	3	4	5

Causes of my personal weight -*I believe my current weight is due to:*

Possible Responses	**Strongly Disagree**	**Somewhat Disagree**	**Neither agree Nor disagree**	**Somewhat Agree**	**Strongly Agree**
1. Heredity (Runs in my family)	1	2	3	4	5
2. My health	1	2	3	4	5
3. Medication	1	2	3	4	5
4. My emotional state	1	2	3	4	5

5. Stress or worry	1	2	3	4	5
6. Regular exercise	1	2	3	4	5
6a. Not exercising enough	1	2	3	4	5
7. Weight left over from pregnancy	1	2	3	4	5
8. Knowing how to maintain a healthy weight lifestyle	1	2	3	4	5
9. Eating the wrong foods	1	2	3	4	5
9a. Eating the right foods	1	2	3	4	5
10. The way I cook/prepare my food	1	2	3	4	5
11. My metabolism	1	2	3	4	5
12. Snacking between meals	1	2	3	4	5
13. Eating too much	1	2	3	4	5
13a. Not overeating	1	2	3	4	5
14. Eating fast foods regularly (3 or more times per week)	1	2	3	4	5
15. Dieting	1	2	3	4	5

Causes of my personal weight- ***I believe my current weight is due to*** **cont'd:**

Possible Responses	**Strongly Disagree**	**Somewhat Disagree**	**Neither agree Nor disagree**	**Somewhat Agree**	**Strongly Agree**
16. Eating fresh fruits and vegetables daily	1	2	3	4	5
17.Eating foods high in fat	1	2	3	4	5
17a. Eating foods low in fat	1	2	3	4	5
18 .Eating foods high in sugar	1	2	3	4	5
19. Having to buy food in stores that do not have fresh fruits and vegetables	1	2	3	4	5
20. The high cost of fruits and vegetables	1	2	3	4	5
21 My family	1	2	3	4	5
21a. My family traditions	1	2	3	4	5
22. My parents	1	2	3	4	5
23. Not getting enough sleep	1	2	3	4	5
23a. Sleeping too much	1	2	3	4	5

24. My mood	1	2	3	4	5

Consequences of my personal weight - ***I believe my current weight has led to or will lead to:***

Possible Responses	**Strongly Disagree**	**Somewhat Disagree**	**Neither agree Nor disagree**	**Somewhat Agree**	**Strongly Agree**
1. High blood pressure (High Blood)	1	2	3	4	5
2. Diabetes (Sugar)	1	2	3	4	5
3.Tiredness	1	2	3	4	5
4. Being at risk for serious health problems	1	2	3	4	5
5. Increasing my chances of being in good health	1	2	3	4	5
6. Decreasing my chances of serious illness	1	2	3	4	5
7. A limited social life	1	2	3	4	5
7a. An active social life	1	2	3	4	5
8. Being depressed	1	2	3	4	5
9. Feeling good about myself	1	2	3	4	5
10. Being dissatisfied with how I look in my clothes	1	2	3	4	5
10a. Being satisfied with how I look in my clothes	1	2	3	4	5
11. Not getting the job opportunities I want	1	2	3	4	5
12. Not finding a suitable mate	1	2	3	4	5
12a.Finding a suitable mate	1	2	3	4	5
13. People thinking that I am lazy	1	2	3	4	5
14. Difficulty finding stylish clothes	1	2	3	4	5
15. Kidney Disease	1	2	3	4	5
16. Breathing Problems	1	2	3	4	5
17. Difficulty sleeping	1	2	3	4	5

APPENDIX D

DATA COLLECTION FORMS

Demographic Data Form

1. **Sex:** Female _____
2. **Age:** _____
3. **Birthdate:** _____
4. **Race:** African American _____
5. **Marital Status:**

    1. Single, never married
    2. Single, in committed relationship
    3. Married
    4. Widowed
    5. Divorced
    6. Separated

6. **Education: Highest year in school completed:** 1 2 3 4 5 6 7 8 9 10 11 12;
   College 1 2 3 4 5 6 7 8 9 10;
Other_____

7. **Occupation:**

_____

8. **Work Status:**
    1. Full-time
    2. Part-time
    3. Unemployed (temporary or lay off)
    4. Unemployed (student)
    5. Permanently disabled
    6. Retired
    7. Other _____

9. **Annual household income range:**
    1. Less than $1000
    2. $1000 – $5000
    3. $5000 – $9999
    4. $10,000 - $14,999
    5. $15,000 - $24,999
    6. $25,000 - $49,999
    7. $50,000 or more

10. Medical diagnosis:

1. Hypertension
    1. No _____
    2. Yes _____
2. Diabetes
    1. No _____
    2. Yes _____
3. Other
    1. No_____
    2. Yes _____

If yes what other condition:

_____
_____
_____

11. Type of medications currently taking:

1. Birth Control Pills:
    1. No _____
    2. Yes _____

If yes name of medication:

_____
_____
_____

2. Blood Pressure
    1. No _____
    2. Yes _____

If yes name of medication:

_____
_____
_____

3. Blood Sugar
    1. No _____
    2. Yes _____

If yes name of medication:

_____
_____
_____

4. Other_____
    1. No _____
    2. Yes _____

If yes name of medication:

_____

---

12. Tobacco use:

1. No _____
2. Yes_____
3. On average, number of cigarettes per day_____
4. Do you use another type of tobacco other than cigarettes?

1. No_____
2. Yes_____
   If yes what do you use _____
   How often do you use it _____

13. Alcohol use:

1. No_____
2. Yes_____
3. On average, number of drinks per week_____

Sleep Pattern:

14. Think about your sleep over the past month. On most nights during a typical week, how many hours did you sleep?

1. Less than 7 hours per night _____
2. 7 to 8 hours per night _____
3. Greater than 8 hours per night _____

Weight Information:

15. Weight history: On average, as an adult your weight has been:

1. underweight _____
2. normal weight_____
3. overweight_____
4. very overweight _____
5. not known _____

16. Pregnancy:

1. Number of children delivered? _____
2. On average, how much weight did you gain with each pregnancy? _____
3. After delivery how many times did you return to your pre-pregnancy weight? _____

17. Weight loss:

Have you ever participated in a commercial weight loss program (Weight Watchers, Jenny Craig, etc?)

1. No_____
2. Yes_____
3. If yes
   a) Are you currently on a weight loss program?
      1. No
         a. If no how many years ago were you on one?
         _____
      2. Yes
         a. If yes, which program are you on?
         _____

   b) How many times have you been on a commercial weight loss program in your life?
   _____

Family History: What is the general weight of your biological mother and father during their middle-age years?

18. Mother's average weight at middle age is/was:

1. underweight_____
2. normal weight_____
3. overweight_____
4. very overweight _____
5. not known_____

19. Father's average weight at middle age is/was:

1. underweight_____
2. normal weight_____
3. overweight_____
4. very overweight _____
5. not known_____

Below is information to be obtained by data collector:

1. Waist Circumference_____
2. Weight measured _____
3. Height measured _____
4. BMI_____

Blood Pressure

1. Systolic 1 _____
2. Diastolic 1 _____
3. Systolic 2 _____
4. Diastolic 2 _____
5. Average Systolic _____
6. Average Diastolic _____

Eating Behavior Pattern Questionnaire

INSTRUCTIONS: Below are statements about eating behavior patterns. You are being asked to consider your own eating habits and show how much you agree or disagree with each statement by circling the number that fits. There are no right or wrong answers.

	Strongly Disagree	**Disagree**	**Neutral or Not Applicable**	**Agree**	**Strongly Agree**
1. I reduce fat in recipes by substituting ingredients and cutting portions.	1	2	3	4	5
2. I am very conscious of how much fat is in the food I eat.	1	2	3	4	5
3. I use low-fat food products.	1	2	3	4	5
4. I choose healthy foods to prevent heart disease	1	2	3	4	5
5. I count fat grams.	1	2	3	4	5
6. I carefully watch the portion sizes of my foods.	1	2	3	4	5
7. When choosing fast food, I pick a place that offers healthy foods.	1	2	3	4	5

8. Fish and poultry are the only meats I eat.	1	2	3	4	5
9. I like to eat vegetables seasoned with fatty meat.	1	2	3	4	5
10. I eat meatless meals from time to time because I think that is healthier for me.	1	2	3	4	5
	Strongly Disagree	**Disagree**	**Neutral or Not Applicable**	**Agree**	**Strongly Agree**
11. I try to limit my intake of red meat (beef and pork).	1	2	3	4	5
12. I buy snacks from vending machines.	1	2	3	4	5
13. I take a shopping list to the store.	1	2	3	4	5
14. Instead of planning meals, I choose what is available and what I feel like eating.	1	2	3	4	5
15. I eat when I am upset.	1	2	3	4	5

16. When I am in a bad mood, I eat whatever I feel like eating.	1	2	3	4	5
17. I eat for comfort.	1	2	3	4	5
18. My emotions affect what and how much I eat.	1	2	3	4	5
19. If I am bored, I will snack more.	1	2	3	4	5
20. I sometimes snack even when I am not hungry.	1	2	3	4	5
21. I am a snacker.	1	2	3	4	5
22. I snack more at night.	1	2	3	4	5
23. When I buy snack foods, I eat until I have finished the whole package.	1	2	3	4	5
24. When I am upset, I tend to stop eating.	1	2	3	4	5
	Strongly Disagree	**Disagree**	**Neutral or Not Applicable**	**Agree**	**Strongly Agree**
25. Sometimes I eat dessert more than	1	2	3	4	5

once a day.					
26. I usually keep cookies in the house.	1	2	3	4	5
27. I have a sweet tooth.	1	2	3	4	5
28. I eat cookies, candy bars, or ice cream in place of dinner.	1	2	3	4	5
29. I snack two to three times every day.	1	2	3	4	5
30. To me, cookies are an ideal snack food.	1	2	3	4	5
31. On Sunday, I eat a large meal with my family.	1	2	3	4	5
32. I buy meat every time I go to the grocery store.	1	2	3	4	5
33. I associate success with food.	1	2	3	4	5
34. I have a serving of meat at every meal.	1	2	3	4	5

35. I take time to plan meals for the coming week.	1	2	3	4	5
36. A complete meal includes a meat, a starch, a vegetable, and bread.	1	2	3	4	5
37. I eat at church socials.	1	2	3	4	5
38. I would rather buy takeout food and bring it home than cook.	1	2	3	4	5
	Strongly Disagree	**Disagree**	**Neutral or Not Applicable**	**Agree**	**Strongly Agree**
39. I eat out because it is more convenient than eating at home.	1	2	3	4	5
40. I stop for a fast food breakfast on the way to work.	1	2	3	4	5
41. When I don't plan meals, I eat fast food.	1	2	3	4	5
42. I have at least three to four servings of vegetables per	1	2	3	4	5

day.					
43. My eating habits are very routine.	1	2	3	4	5
44. I eat at a fast food restaurant at least three times a week.	1	2	3	4	5
45. I hate to cook.	1	2	3	4	5
46. I never know what I am going to eat for supper when I get up in the morning.	1	2	3	4	5
47. If I eat a larger than usual lunch, I will skip supper.	1	2	3	4	5
48. If I eat a larger than usual lunch, I will replace supper with a snack.	1	2	3	4	5
49. I rarely eat breakfast.	1	2	3	4	5
50. If I am busy, I will eat a snack instead of lunch.	1	2	3	4	5

Baecke Activity Questionnaire

INSTRUCTIONS: You are being asked to consider your own physical activity at work, when playing a sport, during leisure time and answer the questions below. Circle the number that fits with your answer. There are no right or wrong answers.

Work Activity

	Low level activity (clerical, sales)		**Medium level activity (Factory work, housekeeping)**		**High level activity (Construction work)**
1. What is your main occupation?	1		3		5
	Never	**Seldom**	**Sometimes**	**Often**	**Always**
2. At work I sit	1	2	3	4	5
3. At work I stand	1	2	3	4	5
4. At work I walk	1	2	3	4	5
5. At work I lift heavy loads	1	2	3	4	5

	Very often	**Often**	**Sometimes**	**Seldom**	**Never**
6. After working I am tired	5	4	3	2	1
7. At work I sweat	5	4	3	2	1
	Much heavier	**Heavier**	**As heavy**	**Lighter**	**Much lighter**
8. In comparison with others of my own age, I think my work is physically	5	4	3	2	1

Sporting Activity
9. Do you play a sport? Yes/no

		Low Intensity sport (billiards, sailing, bowling, golf)		**Med Intensity sport (cycling, dancing, badminton ,swimming, tennis)**		**High Intensity sport (boxing, basketball, football, rowing)**
a. Which intensity level sport do you play most frequently?	**Intensity**	1		3		5
		< 1 hours	**1-2 hours**	**2-3 hours**	**3-4 hours**	**> 4 hours**

b. How many hours per week?	**Time**	1	2	3	4	5
		< 1 month	**1-3 months/year**	**4-6 months/ year**	**7-9 months/ year**	**> 9 months/ year**
c. How many months a year?	**Proportion**	1	2	3	4	5

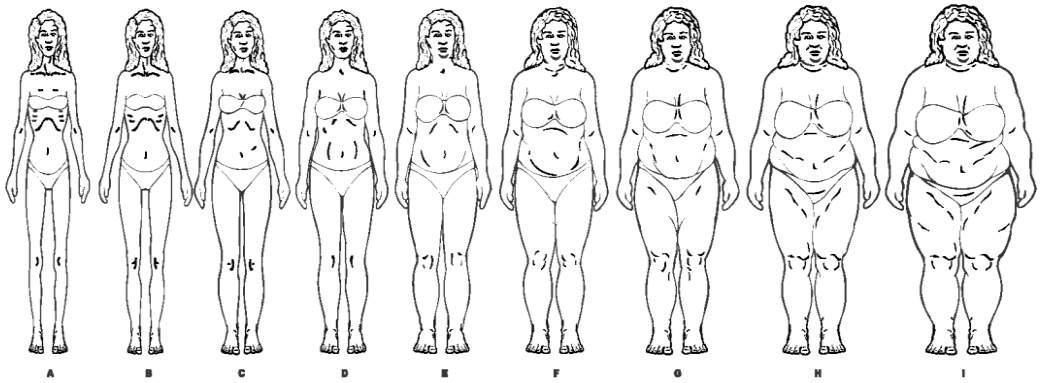
Leisure Activity

	Much more	**More**	**The same**	**Less**	**Much less**
10. In comparison with others of my own age I think my physical activity during leisure time is	5	4	3	2	1
	Very often	**Often**	**Sometimes**	**Seldom**	**Never**
11. During leisure time I sweat	5	4	3	2	1
	Never	**Seldom**	**Sometimes**	**Often**	**Very often**
12. During leisure time I play a sport	1	2	3	4	5
13. During	1	2	3	4	5

leisure time I watch television					
14. During leisure time I walk	1	2	3	4	5
15. During leisure time I cycle	1	2	3	4	5
	< 5 minutes	**5-15 minutes**	**15-30 minutes**	**30-45 minutes**	**> 45 minutes**
16. How many minutes do you walk and/or cycle per day to and from work, school and shopping	1	2	3	4	5

Pulver's Figure Rating Scale

INSTRUCTIONS: You are being asked to examine the figures below and select the figure that most closely resembles your body image. Circle the letter that fits with your perception of your body image. There is no right or wrong answer.



APPENDIX E

INFORMATION SHEETS AND CONSENT FORM

Research Information Sheet

Title of Study: Development and Initial Psychometric Evaluation of Culturally-Sensitive Beliefs about Personal Weight Questionnaire (Phase I)

Principal Investigator (PI): Stephanie Pickett, MSN, RN
Doctoral Student
Wayne State University
College of Nursing
Advisor: Rosalind Peters, PhD, RN
(313) 577-0342

Funding Source: None

Purpose
You are being asked to be in a research study. Information from this study will help to develop a culturally-sensitive questionnaire to measure personal weight beliefs. The study sample includes African American women, 18 to 40 years of age. The study will be conducted at Wayne State University, and community sites including churches, and private homes. The total number of participants to be enrolled is approximately 14-25 or until no new information is revealed.

Study Procedures
If you agree to take part in this study, you will be asked to participate in one interview that includes reviewing a list of statements on personal weight beliefs of African American women. Specifically you will be asked to: read the statements aloud (or listen while the researcher reads the statements aloud), provide your thoughts on what the statements mean, and provide suggestions to change or adapt existing statements to be more culturally sensitive for African American women. The one time meeting will take about 45 to 60 minutes to complete. The interview will be audio-recorded, but your name will not be recorded, and will not be associated with any data collected.

Benefits
The possible benefit to you for taking part in this research study is increased awareness of your beliefs about your weight. Also, you are providing information to develop a questionnaire that may be used to advise African American women about their weight management beliefs and behaviors.

Risks
There is a minimal risk of experiencing anxiety or sadness related to beliefs about personal weight.

Study Costs
Participation in this study will be at no cost to you.

Compensation
You will receive a $25.00 gift card to CVS drugstores at the completion of the interview.

Confidentiality
No information that identifies you personally will be asked or used in this study. When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity. The information reported will be compiled in group form only.

Voluntary Participation/Withdrawal
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You are free to withdraw from participation in this study at any time. You also have the right not to answer specific questions. Your decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

Questions
If you have any questions about this study now or in the future, you may contact Stephanie Pickett at picketts@wayne.edu. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation
By completing the interview you are agreeing to participate in this study.

Research Information Sheet

Title of Study: **Development and Initial Psychometric Evaluation of Culturally-Sensitive Beliefs about Personal Weight Questionnaire (Phase II)**

Principal Investigator (PI): Stephanie Pickett, MSN, RN
Doctoral Student
Wayne State University
College of Nursing
Advisor: Rosalind Peters, PhD, RN
(313) 577-0342

Funding Source: None

Purpose
You are being asked to be in a research study. Information from this study will help to develop a culturally-sensitive weight beliefs questionnaire. The sample includes African American women 18 to 40 years of age. The study will be conducted at Wayne State University, and community sites including churches, community centers, and private homes. The total number of participants to be enrolled is 10 participants.

Study Procedures
If you agree to take part in this study, you will be asked to review a list of statements on personal weight beliefs and decide if the statements address beliefs African American women may hold about their weight. You then will be asked to complete a *Beliefs about Personal Weight Questionnaire* and report your weight, height and highest educational level achieved. The one time meeting will take less than one hour to complete.

Benefits
The possible benefit to you for taking part in this research study is increased awareness of your beliefs about your weight. Also, you are providing information to develop a questionnaire that may be used to advise African American women about their weight management beliefs and behaviors.

Risks
There is a minimal risk of experiencing anxiety or sadness related to beliefs about personal weight.

Study Costs
Participation in this study will be at no cost to you.

Compensation
You will receive a $20.00 gift card to CVS drugstores after data collection.

Confidentiality
No information that identifies you personally will be asked or used in this study. When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity. The information reported will be compiled in group form only.

Voluntary Participation/Withdrawal
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You are free to withdraw from participation in this study at any time. You also have the right not to answer specific questions. Your decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

Questions
If you have any questions about this study now or in the future, you may contact Stephanie Pickett at picketts@wayne.edu. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation
By completing data collection you are agreeing to participate in this study.

Research Information Sheet

Title of Study: **Development and Initial Psychometric Evaluation of Culturally-Sensitive Beliefs about Personal Weight Questionnaire (Phase III)**

Principal Investigator (PI): Stephanie Pickett, MSN, RN
Doctoral Student
Wayne State University
College of Nursing
Advisor: Rosalind Peters, PhD, RN
(313) 577-0342

Funding Source: None

Purpose
You are being asked to be in a research study. Information from this study will help to develop a culturally-sensitive weight beliefs questionnaire. The sample includes African American women 18 to 40 years of age. The study will be conducted at Wayne State University, and community sites including churches, community centers, and private homes. The total number of participants to be enrolled is 150 participants.

Study Procedures
If you agree to take part in this study you will be asked to complete three questionnaires regarding your beliefs about your personal weight, your physical activity, and your eating behavior. You also will be asked to complete a demographic form and have your weight, height, waist circumference and blood pressure measured. The one time meeting will take less than one hour to complete.

Benefits
The possible benefit to you for taking part in this research study is increased awareness of your beliefs about your weight. Also, you are providing information to develop a questionnaire that may be used to advise African American women about their weight management beliefs and behaviors.

Risks
There is a minimal risk of experiencing anxiety or sadness related to beliefs about personal weight.

Study Costs
Participation in this study will be at no cost to you.

Compensation
You will receive a $20.00 gift card to CVS drugstores for your time and effort.

Confidentiality
No information that identifies you personally will be asked or used in this study. When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity. The information reported will be compiled in group form only.

Voluntary Participation/Withdrawal
Taking part in this study is voluntary. You have the right to choose not to take part in this study. You are free to withdraw from participation in this study at any time. You also have the right not to answer specific questions. Your decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

Questions
If you have any questions about this study now or in the future, you may contact Stephanie Pickett at picketts@wayne.edu. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation
By completing data collection you are agreeing to participate in this study.

BEHAVIORAL RESEARCH INFORMED CONSENT

Title of Study: Development and Initial Psychometric Evaluation of Culturally-Sensitive Beliefs about Personal Weight Questionnaire (Phase III)

Principal Investigator (PI): Stephanie Pickett, MSN, RN
Doctoral Student
Wayne State University
College of Nursing
919- 619-0310

Funding Source: Sigma Theta Tau Lambda Chapter

When we say "you" in this consent form, we mean you "we" means the researchers and other staff.

Purpose
You are being asked to be in a research study about belief about personal weight. The sample includes African American women 18 to 40 years of age. The study will be conducted at Wayne State University, and community sites including churches, and community centers. The estimated number of study participants to be enrolled at Wayne State University is about 40 as well as about 110 study participants throughout churches and community sites.

Please read this form and ask any questions you may have before agreeing to be in the study.

The purpose of this research study is to develop a culturally-sensitive questionnaire that measures beliefs that African American women hold about their personal weight. .

Study Procedure
If you agree to take part in this research study, you will be asked to complete four questionnaires regarding your beliefs about your personal weight, your physical activity, your eating behavior and your body image. You also will be asked to complete a demographic form (age, birthdate, marital status, occupation, etc) and have your weight, height, waist circumference and blood pressure measured. The one time meeting will take less than one hour to complete. Participants have the option of not answering some of the questions and still remain in the study.

No information that identifies you personally will be used in this study. When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity. The information reported will be compiled in group form only.

Benefits

As a participant in this research study, there may be no direct benefit for you; however, information from this study may benefit other people now or in the future.

Risks

By taking part in this study, you may experience the following risks: Minimal risk of experiencing feelings of sadness or anxiety related to beliefs about personal weight.

There may also be risks involved from taking part in this study that are not known to researchers at this time.

Study Costs

Participation in this study will be of no cost to you.

Compensation

For taking part in this research study, you will receive a $20.00 gift card to CVS drugstores for your time and effort.

Confidentiality

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. You will be identified in the research records by a code name or number. Information that identifies you personally will not be released without your written permission. However, the study sponsor, the Institutional Review Board (IRB) at Wayne State University, or federal agencies with appropriate regulatory oversight [e.g., Food and Drug Administration (FDA), Office for Human Research Protections (OHRP), Office of Civil Rights (OCR), etc.) may review your records.

When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity.

Voluntary Participation/Withdrawal

Taking part in this study is voluntary. You have the right to choose not to take part in this study. If you decide to take part in the study you can later change your mind and withdraw from the study.] You are free to only answer questions that you want to answer. You are free to withdraw from participation in this study at any time. Your decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

The PI may stop your participation in this study without your consent. The PI will make the decision and let you know if it is not possible for you to continue. The decision that is made is to protect your health and safety, or because you did not follow the instructions to take part in the study

Questions

If you have any questions about this study now or in the future, you may contact Stephanie Pickett or one of doctoral research team members at the following phone number (313)-577-

0342. If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Consent to Participate in a Research Study

To voluntarily agree to take part in this study, you must sign on the line below. If you choose to take part in this study you may withdraw at any time. You are not giving up any of your legal rights by signing this form. Your signature below indicates that you have read, or had read to you, this entire consent form, including the risks and benefits, and have had all of your questions answered. You will be given a copy of this consent form.

_____	_____
Signature of participant / Legally authorized representative *	Date
_____	_____
Printed name of participant / Legally authorized representative *	Time
_____	_____
Signature of witness**	Date
_____	_____
Printed of witness**	Time
_____	_____
Signature of person obtaining consent	Date
_____	_____
Printed name of person obtaining consent	Time

*

**Use when participant has had this consent form read to them (i.e., illiterate, legally blind, translated into foreign language).

Consent for return visit

May I contact you in the future to take the Beliefs about Personal Weight Questionnaire a second time in order to compare your results from the first and second administrations to determine the consistency of the questionnaire results. The first 15 participants who agree to be contacted will be selected to retake the Beliefs about Personal Weight Questionnaire.

☐ Yes, You may contact me to retake the Beliefs about Personal Weight Questionnaire

Name _____

Contact information: Email _____ Phone _____

☐ Thank you, but I do not wish to be contacted.

APPENDIX F

HUMAN INVESTIGATION COMMITTEE

WAYNE STATE UNIVERSITY

HUMAN INVESTIGATION COMMITTEE
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://hic.wayne.edu

Full AAHRPP Accreditation

NOTICE OF EXPEDITED APPROVAL

To: Stephanie Pickett
Family, Comm Mental Health
5557 Cass, 100 Cohn Bldg

From: Dr. Scott Millis K. Tosso, PhD for
Chairperson, Behavioral Institutional Review Board (B3)

Date: March 30, 2011

RE: HIC #: 029011B3E
Protocol Title: Development and Initial Psychometric Evaluation of a Culturally-Sensitive Beliefs about Personal Weight Questionnaire
Funding Source:
Protocol #: 1102009448

Expiration Date: March 29, 2012

Risk Level / Category: Research not involving greater than minimal risk

---

The above-referenced protocol and items listed below (if applicable) were **APPROVED** following *Expedited Review* Category (#7)* by the Chairperson/designee *for* the Wayne State University Institutional Review Board (B3) for the period of 03/30/2011 through 03/29/2012. This approval does not replace any departmental or other approvals that may be required.

- Protocol Summary Form (revised and received in the IRB office 3-24-11).
- Recruitment scripts received (for Phase I, II, and III) to be posted on WSU pipeline, University campus, and community.
- Flyer received (for Phase I, II, and III)- to be posted at WSU campus.
- Research Information Sheet - Phase I (dated 3-21-11)
- Research Information Sheet - Phase II (dated 3-21-11).
- Research Information Sheet - Phase III (dated 3-21-11).
- Receipt of a research protocol

° Federal regulations require that all research be reviewed at least annually. You *may* receive a *"Continuation Renewal Reminder"* approximately two months prior to the expiration date; however, it is the Principal Investigator's responsibility to obtain review and continued approval ***before*** the expiration date. Data collected during a period of lapsed approval is unapproved research and can ***never*** be reported or published as research data.

° All changes or amendments to the above-referenced protocol require review and approval by the HIC **BEFORE** implementation.

° Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the HIC Policy (http://www.hic.wayne.edu/hicpol.html).

NOTE:

1. Upon notification of an impending regulatory site visit, hold notification, and/or external audit the HIC office must be contacted immediately.
2. Forms should be downloaded from the HIC website at ***each*** use.

*Based on the Expedited Review List, revised November 1998

WAYNE STATE UNIVERSITY

HUMAN INVESTIGATION COMMITTEE
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://hic.wayne.edu

NOTICE OF EXPEDITED AMENDMENT APPROVAL

To: Stephanie Pickett
Family, Comm Mental Health
5557 Cass, 100 Cohn Bldg

From: Dr. Scott Millis S. Millis /BS
Chairperson, Behavioral Institutional Review Board (B3)

Date: April 12, 2011

RE: HIC #: 029011B3E
Protocol Title: Development and Initial Psychometric Evaluation of a Culturally-Sensitive Beliefs about Personal Weight Questionnaire
Funding Source: Sponsor: SIGMA THETA TAU INTERNATIONAL, INCORPORATED
Protocol #: 1102009448

Expiration Date: March 29, 2012

Risk Level / Category: Research not involving greater than minimal risk

---

The above-referenced protocol amendment, as itemized below, was reviewed by the Chairperson/designee of the Wayne State University Institutional Review Board (B3) and is APPROVED effective immediately.

- Protocol Revisions: Addition of the instrument "Pulver's Figure Rating Scale" to assess body image in Phase III of the study.
- Phase I, Phase II, and Phase III Flyers and Pipeline Advertisements - Modified to reflect change in compensation.
- Phase I Information Sheet (revised 4/11/11) - Revised to reflect change in compensation from a $10.00 CVS gift card to a $25.00 CVS gift card and inclusion of "body image" in the Study Procedures section.
- Phase II and Phase III Information Sheets (both revised 4/11/11) - Revised to reflect change in compensation from a $10.00 CVS gift card to a $20.00 CVS gift card and inclusion of "body image" in the Study Procedures section.
- Other: Addition of funding from Sigma Theta Tau, Lambda Chapter.

WAYNE STATE UNIVERSITY

IRB Administration Office
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://irb.wayne.edu

NOTICE OF EXPEDITED AMENDMENT APPROVAL

To: Stephanie Pickett
Family, Comm Mental Health
5557 Cass, 100 Cohn Bldg

From: Dr. Scott Millis S. Millis, PhD /as
Chairperson, Behavioral Institutional Review Board (B3)

Date: October 19, 2011

RE: IRB #: 029011B3E

Protocol Title: Development and Initial Psychometric Evaluation of a Culturally-Sensitive Beliefs about Personal Weight Questionnaire

Funding Source: Sponsor: SIGMA THETA TAU INTERNATIONAL, INCORPORATED

Protocol #: 1102009448

Expiration Date: March 29, 2012

Risk Level / Category: Research not involving greater than minimal risk

---

The above-referenced protocol amendment, as itemized below, was reviewed by the Chairperson/designee of the Wayne State University Institutional Review Board (B3) and is APPROVED effective immediately.

- Flyer – Flyer updated to remove statement that no identifying data will be collected and to remove compensation amount. Flyer will be posted at WSU and community sites.
- Protocol – Changes to study design and data collection methods and/or instruments which include the use of a consent form instead of an information sheet, ten percent (n=15) of participants will have a repeat visit, and participants will be asked to provide contact information if they agree to be contacted to take the questionnaire a second time (contact information will be used to schedule a return visit). These changes do not affect risk to participants. The changes do affect confidentiality as name and contact information will be collected. The contact information will only be used for scheduling patients to return a second time to retake the Beliefs about Personal Weight Questionnaire. The contact information will be on a separate sheet of paper, detached from the consent form, will be stored in a locked drawer at the PI's home, and will be destroyed after the participants' questionnaire numbers for the first and second administrations have been matched.
- Consent Form (revision dated 10/14/2011) – Current Information Sheet is being revised into a Behavioral Research Informed Consent (Phase III) in order to collect contact information for follow-up intervention.
- Consent Form (dated 10/14/2011) – Addition of Behavioral Research Informed Consent (Phase III retesting) to be provided to participants returning for the second testing.
- Other - Other changes include the addition of a $10 gift card to CVS for the retesting visit and the addition of Plymouth Education Center as a recruitment site (letter of support dated 10/13/2011).

WAYNE STATE UNIVERSITY

IRB Administration Office
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://irb.wayne.edu

NOTICE OF EXPEDITED AMENDMENT APPROVAL

To: Stephanie Pickett
Family, Comm Mental Health
5557 Cass, 100 Cohn Bldg

From: Dr. Scott Millis
Chairperson, Behavioral Institutional Review Board (B3)

Date: November 18, 2011

RE:

IRB #:	029011B3E
Protocol Title:	Development and Initial Psychometric Evaluation of a Culturally-Sensitive Beliefs about Personal Weight Questionnaire
Funding Source:	Sponsor: SIGMA THETA TAU INTERNATIONAL, INCORPORATED
Protocol #:	1102009448
Expiration Date:	March 29, 2012
Risk Level / Category:	Research not involving greater than minimal risk

The above-referenced protocol amendment, as itemized below, was reviewed by the Chairperson/designee of the Wayne State University Institutional Review Board (B3) and is APPROVED effective immediately.

- Protocol - Other changes which includes the addition of YWCA (letter of support dated 11/11/2011) and Children's Hospital of MI General Pediatric Clinic (letter of support dated 11/01/2011) as study sites.

REFERENCES

Abrams, K. K., Allen, L., & Gray, J. J. (1993). Disordered eating attitudes and behaviors psychological adjustment, and ethnic identity: A comparison of black and white female college students. *International Journal Eating Disorders, 14*, 49-57.

Abrams, L. S., & Stormer, C. C. (2002). Sociocultural variation in the body image perceptions of urban adolescent females. *Journal of Youth and Adolescence, 31*(6), 443-450.

Airhihenbuwa, C. O., Kumaniyika, S., Agurs, T. D., Lowe, A., Saunders, D., & Morssink, C.B. (1996). Cultural aspects of African American eating patterns. *Ethnicity and Health, 1*(3), 245-260.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Ajzen, I., & Fishbein, M. (2000). Attitudes and the attitude behavior relation: Reasoned and Automatic Processes. *European Review of Social Psychology, 11*, 1046-3283.

Akan, G. E., & Grilo, C. M. (1995). Sociocultural influences on eating attitudes and behaviors, body image, and psychological functioning: A comparison of African American, Asian-American and Caucasian college women. *International Journal Eating Disorders, 18,* 181-187.

Allan, J. D., Mayo, K., & Michel, Y. (1993). Body size values of white and black women. *Research in Nursing and Health, 16*(5), 323-333.

Alleyne, S. I., & LaPoint, V. (2004). Obesity among Black adolescent girls: Genetic, psychological and cultural factors. *Journal of Black Psychology, 30*, 344-365.

Allison, D. B., Basile, V. C., & Yuker, H. E. (1991). The measurement of attitudes toward and beliefs about obese persons. *International Journal of Eating Disorders, 10*(5), 599-607.

American Educational Research Association, American Psychological Association, National Council on Measurement in Education. (1999). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.

Anderson, L. A., Eyler, A. A., Galuska, D. A., Brown, D. R., & Brownson, R. C. (2002). Relationship of satisfaction with body size and trying to lose weight in a national survey of overweight and obese women aged 40 and older, United States. *Preventive Medicine, 35*, 390-396.

Babyak, M. A., & Green, S. B. (2010). Confirmatory Factor Analysis: An introductory for psychosomatic medicine researchers. *Psychosomatic Medicine, 72*, 587-597.

Baecke, J. A., Burema, J., & Frijters, E. R. (1982). A short questionnaire for the measurement of habitual physical activity in epidemiological studies. *American Journal of Clinical Nutrition 36*, 936-942.

Ball, K., Mishra., G. D., & Crawford, D. (2003). Social factors and obesity: An investigation of the role of health behaviors. *International Journal of Obesity, 27*, 394-403.

Bandura, A. (1997). *Self-Efficacy: The exercise of control*. New York: Freeman.

Bandura, A. (1977). Self-Efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.

Becker, M. H. (1974). The health belief model and personal health behavior. *Health Education Monograph, 2*, 324-508.

Befort, C. A., Thomas, J. L., Daley, C.M., Rhode, P. C., & Ahluwalia, J. S. (2008). Perceptions and beliefs about body size, weight and weight loss among obese African American women: A qualitative inquiry. *Health Education and Behavior, 35*(3), 410-426.

Ben-Menachem, E. (2007). Weight issues for people with epilepsy-A review. *Epilepsia, 48*(S9), 42-45.

Biondi, B. (2010). Thyroid and obesity: An intriguing relationship. *The Journal of Clinical Endocrinology and metabolism, 95*(8), 3614-3617.

Blair, S. N., LaMonte, M. J., & Nichaman, M. Z. (2004). The evolution of physical activity recommendations: How much is enough? *American Journal of Clinical Nutrition, 79*(5), 913S-920S.

Blixen, C. E., Singh, A., & Thacker, H. (2006). Values and beliefs about obesity and weight reduction among African American and Caucasian women. *Journal of Transcultural Nursing 17*(3), 290-297.

Boggs, D. A., Rosenberg, L., Cozier, Y.C., Wise, L. A., & Coogan, P. F. (2011).General and abdominal obesity and risk of death among black women. *New England Journal of Medicine, 365*(10), 901-908.

Bollen, K. A. (1990). Overall fit in covariance structure models: Two types of sample size effects. *Psychological Bulletin, 107*(2), 256-259.

Bopp, M., Wilcox, S., Laken, M., Butler, K., Carter, R. E., McClorin, L., . . . Yancy, A. (2006). Factors Associated with physical activity among African American men and women. *American Journal of Preventive Medicine, 30*(4), 340-346.

Boyington, J. E., Carter-Edwards., Piehl, M., Hutson, J., Langdon, D., & McManus, S. (2008). Cultural attitudes toward weight, diet, and physical activity among overweight African American girls. *Preventing Chronic Disease Public Health Research, Practice, and Policy, 5*(2), 1-9.

Breitkopf, C. R., Littleton, H., & Berenson, A. (2007). Body image: A study in a tri-ethnic sample of low income women. *Sex Roles, 56*, 373-380.

Brewer, W. H., & Nakamura, G. V. (1984). The nature and functions of schema. In R. S. Wyer, & T. K. Srull (Ed.), *Handbook of social cognition* (Vol. 1, pp. 119-160). Hillsdale, NJ: Lawrence Erlbaum Associates Publishers.

Brown, B. B., Yamada, I., Smith, K. R., Zick, C. D., Kowaleski-Jones, L., & Fan, J. X. (2009). Mixed land use and walkability: Variations in land use measures and relationships with BMI, overweight and obesity. *Health & Place, 15*(4), 1130-1141.

Burke, M. A., Heiland, F., & Nadler, C. (2009). Has overweight become the new normal? Evidence of a generational shift in body weight norms. *Journal of Economic Literature Classification, J11*, Z13.

Burns, N. B., & Grove, S. K. (2001). *The practice of nursing research conduct, critique, & utilization.* Philadelphia: W. B. Saunders Company.

Buxton, O. M., & Marcelli, E. (2010). Short and long sleep is positively associated with obesity, diabetes, hypertension, and cardiovascular disease among adults in the United States. *Social Science & Medicine, 71*, 1027-1036.

Byrne, B. M. (2001). *Structural equation modeling with AMOS* Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Caballero, B. (2007). The global epidemic of obesity: An overview. *Epidemiologic Reviews, 29*, 1-5.

Campbell, D. T., & Fiske, D. W. (1959). Covergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*(2), 81-105.

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports, 100*, 126-130.

Chobanian, A. V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo, J. L., …Roccella, E. J. (2003). The Seventh Report of the Joint National Committee on Prevention Detection, Evaluation, and Treatment of High Blood Pressure. *JAMA, 289*, 2560-2572.

Chou, C. P., & Bentler, P. M. (1995). Estimates and tests in structural equation modeling. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 37-55). Thousand Oaks: Sage.

Collins, A. M., & Loftus, E. F. (1975). A spreading activation theory of semantic processing. *Psychological Review, 82*, 407-428.

Conner, M., & Norman, P. (2005). The role of social cognition in health behaviors. In M. Conner, & Norman, P. (Ed.), *Predicting Health Behavior*. New York: Open University Press.

Creswell, J. W. (2007). *Qualitative Inquiry and Research Design: Choosing among five approaches* (2nd ed.). Thousand Oaks, California: Sage Publications, Inc.

Cronbach, L. J. (1951). Coefficients alpha and the internal structure of tests. *Psychometrika, 16*, 297-334.

Cronbach, L. J., & Shavelson, R. J. (2004). My current thoughts on coefficient alpha and successor procedures. *Educational and Psychological Measurement, 64*(3), 391-418.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*(4), 281-302.

Dallman, M. F. (2009). Stress-induced obesity and the emotional nervous system. *Trends in Endocrinology and Metabolism, 21*(3), 159-165.

Davis, E. M., Rovi, S., & Johnson, M. S. (2005). Mental health family function and obesity in African American women. *Journal of the National Medical Association, 97*(4), 478-482.

Despres, J. P. (2001). Health consequences of visceral obesity. *Annals Medicine, 33*, 534-541.

DeVellis, R. F. (2003). *Scale development theory and application* (2nd ed.). London: Sage Publications.

Donaldson, S. K., & Crowley, D. M. (1978). The discipline of nursing. *Nursing Outlook 26*(2), 113-120.

Dorfman, L., & Wallack, L. (2007). Moving nutrition upstream: The case for reframing obesity. *Journal of Nutrition Educational Behavior, Suppl*, S45-S50.

Dorsey, R. R., Eberhardt, M. S., & Ogden, C. L. (2009). Racial/ethnic differences in weight perception. *Obesity, 17*, 790-795.

Drewnoski, A. (2010). The cost of US foods as related to their nutritive value. *American Journal of Clinical Nutrition, 92,* 1181-1188.

Drewnowski, A., & Specter, S. E. (2004). Poverty and obesity, the role of energy density and energy costs. *American Journal of Clinical Nutrition, 79,* 6-16.

Dubin, R. (1978). *Theory Building* (revised ed.). New York: The Free Press.

Duncan, G. E., Anton, S. D., Newton, R. L., & Perri, M. G. (2003). Comparison of perceived health to physiological measures of health in Black and White. *Preventive Medicine, 36*, 624-628.

Eagly, A. H., & Chaiken, S. (1993). *The Psychology of Attitudes*. Orlando, Florida: Harcourt Brace Jovanovich, Inc.

Egan, B. M., Zhao, Y., & Axon, N. (2010). US trends in prevalence, awareness, treatment, and control of hypertension, 1988-2008. *JAMA, 303*(20), 2043-2050.

Evans, E. M., Rowe, D. A., Racette, S. B., Ross, K. M., & AcAuley, E. (2006). Is the current BMI obesity classification appropriate for black and white premenopausal women? *International Journal of Obesity*, 30, 837-843.

Evans, L. K. (2009). Rural black women's thoughts about exercise. *Applied Nursing Research,* 1-7.

Falconer, J. W., & Neville, H. A. (2000). African American college women's body image. *Psychology of Women Quarterly, 24*, 236-243.

Fawcett, J. (1993). From a plethora of paradigms to parsimony in worldviews. *Nursing Science Quarterly, 6*(2), 56-58.

Fawcett, J. (2005). *Contemporary nursing knowledge analysis and evaluation of nursing models and theories* (2nd ed.). Philadelphia, PA: Davis Company.

Felton, G. M., Boyd, M.D., Bartoces, M. G., & Tavakoli, A. S. (2002). Physical activity in young African American women. *Health Care for Women International, 23*, 905-918.

Ferketich, S. (1991). Focus on psychometrics: Aspects of item analysis. *Research in Nursing and Health, 14*(2), 165-168.

Finkelstein, E. A., Ruhm, C. J., & Kosa, K. M. (2005). Economic causes and consequences of obesity. *Annual Review of Public Health, 26,* 239-257.

Finkelstein, E. A., Trogdon, J. G., Cohen, J. W., & Dietz, W. (2009). Annual medical spending attributable to obesity: Payer and service–specific estimates. *Health Affairs, 25*(5), w822-w831.

Fishbein, M. (1963). An investigation of the relationships between beliefs and an object and the attitude toward that object. *Human Relations, 16*, 233 -239.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Fiske, S. T., & Taylor, S. E. (1991). *Social Cognition* (2nd ed.). New York: McGraw-Hill.

Fitzgibbon, M. L., Blackman, L. R., & Avellone, M. E. (2000). A relationship between body image discrepancy and body mass index across ethnicity groups. *Obesity Research, 8*(8), 582-589.

Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among US adults 1999-2008. *JAMA, 303*(3), 235-241.

Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment, 7*(3), 286-299.

Flynn, K. J., & Fitzgibbon, M. (1998). Body images and obesity risk among black females: A review of the literature. *Annals of Behavioral Medicine, 20*(1), 13-24.

Fontaine, K. R., Redden, D. T., Wang, C., Westfall, A. O., & Allison, D. B. (2003). Years of life lost due to obesity. *JAMA, 289*(2), 187-193.

Foy, C. G., Hsu, F., Haffner, S. M., Norris, J. M., Rotter, J. I., Henkin, L. F., … Wagenknecht, L. E. (2008). Visceral fat and prevalence of hypertension among African Americans and Hispanic Americans: Findings from the IRAS family study. *American Journal of Hypertension, 21*(8), 910-916.

Gable, R. K., & Wolf, M. B. (1993). *Instrument development in the affective domain: Measuring attitude and values in corporate and school setting* (2nd ed.). Boston, MA: Kluwer Academic Publishers.

Gore, S. A. Brown, D. M., & West, D. S. (2003). The role of postpartum weight retention in obesity among women: A review of the evidence. *Annals of Behavioral Medicine, 26*(2),149-159.

Grant, J. S., & Davis, L. L. (1997). Selection and use of content experts for instrument development. *Research in Nursing and Health, 20*, 269-274.

Groesz, L. M., Mccoy, S., Carl, J., Saslow, L., Stewart, J., Adler, N., … Epel, E. (2012). What is eating you? Stress and the drive to eat. *Appetite, 58*, 717-721.

Grogan, S. (1999). Body *image: Understanding body dissatisfaction in men, women, and children.* New York: Routledge.

Groner, J. A., Skybo, T., Murray-Johnson, L., Schwinan, P., Eneli, I., Sternstein, A., Klein, E., & French, Gina. (2009). Anticipatory guidance for prevention of childhood obesity: Design of the MOMS project. *Clinical Pediatrics, 48,* 483-

Guidry, J. J., Fagan, P., & Walker, V. (1998). Cultural sensitivity and readability of breast and prostate printed cancer education materials targeting African Americans. *Journal of National Medical Association 90*, 165-169.

Hargreaves, M. K., Schlundt, D. G., & Buchowski, M. S. (2002). Contextual factors influencing the eating behaviors of African American women: A focus group investigation. *Ethnicity and Health, 7*(3), 133-147.

Harris, S. M. (1994). Racial differences in predictors of college women's body image attitudes. *Women & Health, 21*, 89-104.

Harvey, J. N., & Lawson, V. L. (2009). The importance of health belief models in determining self-care behaviors in diabetes. *Diabetic Medicine, 26*, 5-13.

Haskell, W. L., Lee, I. M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., … Bauman, A. (2007). Physical activity and public health: Update recommendation for adults form the American College of Sports Medicine: American Heart Association. *Circulation, 116*(9), 1081-1093.

Hendley, Y., Zhao, L., Coverson, D. L., DinDzietham, R., Morris, A., Quyyumi, A. A., … Vaccarino, V. (2011). Differences in weight perception among black and whites. *Journal of Women's Health, 20*(12), 1805-1811.

Hertz, R. P., Unger, A. N., Cornell, J. A., & Saunders, E. (2005). Racial disparities in hypertension prevalence, awareness, and management. *Archives of Internal Medicine, 165*, 2098-2104.

Hintzman, D. L. (1986). "Schema abstraction" in a multiple trace model. *Psychological Review, 93*, 411-428.

Howard, N. J., Hugo, G. J., Taylor, A. W., & Wilson, D. H. (2008). Our perception of weight: Socioeconomic and sociocultural expectations. *Obesity Research and Clinical Practice, 2*, 125-131.

Hoyle, R. H. (Ed.). (1995). *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: Sage.

Hu, L. T., & Bentler, P. M. (1995). Evaluating model fit In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: Sage.

Hubert, H. B., Feinleib, M., McNamara, P. M., & Castelli, W. P. (1983). Obesity as an independent risk factor for cardiovascular disease: A 26-year follow-up of participants in the Framingham Heart Study. *Circulation, 67*, 968-977.

Hutchinson, S., & Wilson, H. S. (1992). Validity threats in scheduled semi-structured research interviews. *Nurse Research, 41*(2), 117-119.

Jacox, A., Suppe, F., Campbell, J., & Stashinko, E. (1999). Diversity in philosophical approaches. In A. S. Hinshaw, S. L Feetham, & J. L. Shaver (Ed.), *Handbook of Clinical Nursing Research.* Thousand Oaks, CA: Sage.

James, D. C. (2004). Factors influencing food choices, dietary intake, and nutrition-related attitudes among African Americans: Application of a culturally sensitive model. *Ethnicity and Health, 9*(6), 349-367.

James, C. S., Pobee, J. W., Oxidine, D., Brown, L., & Joshi, G. (2012). Using the Health Belief Model to develop culturally appropriate weight –management materials for African American women. *Journal of the Academy of Nutrition and Dietetics*, *112*, 664-670.

Jen, K., Brogan, K., Washington, O. G., Flack, J. M., & Artinian, N. T. (2007). Poor nutrient intake and high obese rate in an urban African American population with hypertension. *Journal of the American College of Nutrition 26*(1), 57-65.

Keil, J. E., Sutherland, S. E., Knapp, R. G., Lackland, D. T., Gazes, P.C., & Tyroler, H.A. (1993). Mortality rates and risk factors for coronary disease in black as compared to white men and women. *New England Journal of Medicine, 329*, 73-78.

Kelly, W. (2009). Cushing's syndrome: A review of diagnosis and treatments. *Sudan Medical Journal*, *45*, 1-7.

Kemper, K. A., Sargent, R. G., Drane, J. W., Valois, R. F., & Hussey, J. R. (1994). Black and White females' perception of ideal body size and social norms. *Obesity Research, 2*(2), 117-126.

Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioral research* (4th ed.). United States: Thomson Learning, Inc.

Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health System Pharmacy*, *65*, 2276-2277.

Kincaid, J. P., Fishburne, R. P., Rogers, R. L., & Chissom, B. S. (1975). Derivation of new readability formulas (automated readability index, fog count. and Flesch reading ease formula) for Navy enlisted personnel. *Navy Training Command Research Branch Report,* 8-75.

Kline, P. (1986). *A handbook of test construction: Introduction to psychometric design*. New York: Methuen & Co. Ltd.

Kline, R. B. (1998). *Principals and practice of structural equation modeling*. New York: Guildford Press.

Kline, R.B. (2005). *Principals and practice of structural equation modeling* (2nd ed.). New York: Guilford Press.

Kruger, J., Yore, M.M., Solera, M., & Moeti, R. (2007). Prevalence of fruits and vegetable consumption and physical activity by race/ethnicity-United States, 2005. *Morbidity and Mortality Weekly Report, 56*(13), 301-304.

Kucan, L., & Beck, I. L. (1997). Thinking aloud and reading comprehension research: Inquiry, instruction, and social interaction. *Review of Educational Research, 67*(3), 271-299.

Kuk, J. L., Saunders, T. J., Davidson, L. E., & Ross, R. (2009). Age-related changes in total and regional fat distribution. *Ageing Research Reviews, 8*(4), 339-348.

Kukull, W. A., & Ganguli, M. (2012). *Generalizability: The trees, the forest, and the low-hanging fruit*. *Neurology, 78*, 1886- 1891.

Kumanyika, S. K. (1987). Obesity in Black women. *Epidemiologic Reviews, 9*, 31-50.

Kumanyika, S. K., Morssink, C., & Agurs, T. (1992). Models for dietary and weight change in African American women: Identifying cultural components. *Ethnicity and Disease, 2*(2), 166-175.

Kumanyika, S. K., Wilson, J. F., & Guilford-Davenport, M. (1993). Weight related attitudes and behaviors of black women. *Journal of the American Dietetic Association, 93*(7), 416-426.

Kumanyika, S. K., Gary, T. L., Lancaster, K. J., Samuel-Hodge, C. D., Banks-Wallace, J., Beech, B. M., … Whitt-Glover, M. C. (2005). Achieving healthy weight in African American communities: Research perspective and priorities. *Obesity Research, 13*(12), 2037-2047.

Lee, I., Djousse, L., Sesso, H. D., Wang, L., & Buring, J. (2010). Physical activity and weight gain prevention. *JAMA, 303*(12), 1173-1179.

Leicester, J. (2008). The nature and purpose of belief. *Journal of Mind and Behavior, 29*(3), 217-238.

Lemon, Rosal, Sapka, Borg, & Andersen. (2009). Contributions of weight perceptions to weight loss attempts: Differences by body mass index and gender. *Body Image, 6*, 90-96.

Levine, M. D., Marcus, D., & Perkins, K. A. (2003). Women, weight, and smoking: A cognitive behavioral approach to women's concerns about weight gain following smoking cessation. *Cognitive and Behavioral Practice, 10*, 105-111.

Lichtenstein, A. H., Appel, L. J., Brands, M., Carnethon, M., Daniels, S., Franch, H. A., . . . Wylie-Rosett, J. (2006). Diet and lifestyle recommendations revision 2006: A scientific

statement from the American Heart Association Nutrition Committee. *Circulation, 114,* 82-96.

Lloyd-Jones, D., Adams, R. J., Brown, T. M., Carnethon, M., Dai, S., Simone, G. D., …Wylie-Rosett, J. (2010). Heart disease and stroke statistics 2010 update: A report from the American Heart Association. *Circulation, 121*, e46-e215.

Lopez, R. P., & Hynes, H. P. (2006). Obesity, physical activity and the urban environment: Public health research needs. *Environmental Health: A Global Access Science Source, 5*(25), 1-10.

Lovejoy, J. C. (2001). Disturbances in the social body: Differences in body image and eating problems among African American and White women. *Gender and Society, 15*(2), 239-261.

Lovejoy, J. C. (2003). The menopause and obesity. *Primary Care Clinical Office Practice, 30,* 317-325.

Lynch, E. B., Liu, K., Kiefe, C. I., & Greenland, P. (2006). Cardiovascular disease risk factor knowledge in young adults and 10 year change in risk factors: The coronary artery risk development in young adults (CARDIA) study. *American Journal of Epidemiology, 164,* 1171-1179.

Lynn. (1986). Determination and quantification of content validity. *Nursing Research, 35*(6), 382-385.

Mack, K. A., Anderson, L., Galuska, D., & Ahluwalia, I. (2004). Health and socio- demographic factors associated with body weight and weight objectives for women: 2000 behavioral risk factors surveillance system. *Journal of Women's Health, 13*(9), 1019-1032.

MacNeill, A. E., & Lichtenberg, P. A. (2000). The MacNeill-Lichtenberg Decision Tree: A unique method of triaging mental health problems in older medical rehabilitation patients. *Archives of Physical Medical Rehabilitation, 81*, 618-622.

Manson, J. E., Colditz, G. A., Stampfer, M. J., Willett, W. C., Rosner, B., Monson, R. R., … Hennekens, C. H. (1990). A prospective study of obesity and risk of coronary heart disease in women. *New England Journal of Medicine, 322*, 882-889.

Manzoni, G. M., Pagnini, F., Gorini, A., Preziosa, A.,Castelnuovo, G., Molinari, E., & Riva, G. (2009). Can relaxation training reduce emotional eating in women with obesity? An exploratory study with 3 months of follow-up. *Journal of the American Dietetic Association, 109*, 1427-1432.

Maruyama, G. (1998). *Basics of Structural Equation Modeling*. CA: Sage Publication, Inc.

McGee, M., & Hale, H. (1980). Social factors and obesity among black women. *Free Inquiry in Creative Sociology, 8*(1), 83-87.

McTigue, K. M., Garrett, J. M., & Popkin, B. M. (2002). The natural history of the development of obesity in a cohort of young U.S. adults between 1981 and 1998. *Annals of Internal Medicine, 136*(12), 857-864.

Meleis, A. I. (Ed.). (1997). *Nursing perspective* (3rd ed.). Philadelphia: J. B. Lippincott.

Mensah, G. A., Mokdad, A. H., Ford, E. S., Greenlund, K. J., & Croft, J. B. (2005). State of disparities in cardiovascular health in the United States. *Circulation, 111*(10), 1233-1241.

Monsivais, P., & Drewnowski, A. (2009). Lower-energy density diets are associated monetary costs per kilocalorie and are consumed by women of higher socioeconomic status. *Journal of the American Dietetic Association, 109*(5), 814-822.

Montani, J. P., Antic, V., Yang, Z., & Dulloo, A. (2002). Pathways from obesity to hypertension: From the perspective of a vicious triangle. *International Journal of Obesity Related Metabolism Disorders, 26,* S28-S38.

Moore, S. E., Harris, C., & Wimberly, Y. (2010). Perception of weight and threat to health. *Journal of the National Medical Association, 102*(2), 119 -124.

Morland, A. V., Wang, S., & Diez-Roux, A. (2002). The contextual effect of the local food environment on residents' diets: The atherosclerosis risk in communities study. *American Journal of Public Health 92*(11), 1761-1767.

Mosca, L., Appel, L. J., Benjamin, E. J., Berra, K., Chandra-Strobos, N., Fabunmi, R. P., … Williams, C. (2004). Evidence-Based guidelines for cardiovascular disease prevention in women. *Circulation, 109,* 672-693.

Munro, B. H. (2005). *Statistical methods for health care research* (5th ed.). Philadelphia: Lippincott Williams & Wilkins.

Musil, C. M., Jones, S. L., & Warner, C. D. (1998). Structural equation modeling and its relationship to multiple regression and factor analysis. *Research in Nursing and Health, 21*, 271-281.

Muth, L. J., & Cash, T. F. (1997). Body-image attitudes: What differences does gender make? *Journal of Applied Social Psychology, 27*(16), 1438-1452.

National Task Force on the Prevention and Treatment. (2000). Overweight, obesity, and health risk. *Archives of Internal Medicine, 160,* 898-904.

Norman, J. E., Bild, D., Lewis, C. E., Liu, K., & West, D. S. (2003). The impact of weight change on cardiovascular disease risk factors in young black and white adults: the CARDIA study. *International Journal of Obesity 27*, 369-376.

Norris, A. E. (2005). Structural Equation Modeling. In B. H. Munro (Ed.), *Statistical methods for healthcare research* (5th ed.). Philadelphia: Lippincott Williams & Wilkins.

Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). New York: McGraw-Hill

Nunnally, J. C., & Bernstein, I. H. (1994). *Construction of conventional tests, psychometric theory* (3rd ed.). New York: McGraw-Hill.

Nguyen, S. T., Unger, J. B., & Spruijt-Metz, D. (2007). Dietary correlated of emotional eating in adolescence. *Appetite, 49*, 494-499.

Ogden, C. L., Yanovski, S., Carroll, M. D., & Flegal, K. M. (2007). The epidemiology of obesity. *Gastroenterology 132*(6), 2087-2102.

Osterberg, K., & Blaschke, T. (2005). Adherence to medication. *The New England Journal of Medicine, 353*, 487-497

Orem. (2001). *Nursing: Concepts of practice*. St. Louis Missouri: Mosby, Inc.

Pasquali, R., Gambineri, A., & Pagotto, U. (2006). The impact of obesity on reproduction in women with polycystic ovary syndrome. *International Journal of Obstetrics & Gynecology 113*(10), 1148-1159.

Peak, H. (1955). Attitude and motivation. In M. R. Jones (Ed.), *Nebraska Symposium on Motivation* (Vol. 3, pp. 149-188). Lincoln: University of Nebraska Press.

Peters, R. M., Aroian, K. J., & Flack, J. M. (2006). American culture and hypertension prevention. *Western Journal of Nursing Research, 28*(7), 831-854.

Peters, R. M., & Templin, T. N. (2008). Measuring blood pressure knowledge and self-care behaviors of American Americans. *Research in Nursing and Health, 31*, 543-552.

Pi-Sunyer, F. X., Becker, S.M, Bouchard, C., Carleton, R. A., Colditz, G. A., Dietz, W. H., … Wilson, G. T. (1998). *National Heart Lung and Blood Institute Obesity Education*

Initiative Expert Panel on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. Retrieved September 30, 2010. from http://www.ncbi.nlm.nih.gov/guidelines/obesity/prctgdc._.pdf.

Poirier, P., Giles, T. D., Bray. G. A., Hong, Y., Stern, J. S., Pi Sunyer, F. X., … Eckel, R. H. (2006). Obesity and cardiovascular disease: Pathophysiology evaluation, effect of weight loss: An update of the 1997 American Heart Association Scientific Statement on obesity and heart disease from the obesity committee of the council on nutrition, physical activity, and metabolism. *Circulation, 113*, 898-918.

Polit, D. E., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing and Health, 29,* 489-497.

Polit, D. E., & Beck, C. T. (2008). *Nursing Research: Generating and Assessing Evidence for Nursing Practice* (8th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Pulvers, K. M., Lee, R. E., Kaur, H., Mayo, M.S., Fitzgibbon, M. L., Jeffries, S.K.,…Ahluwalia, J. S. (2004). Development of a culturally relevant body image instrument among urban African Americans. *Obesity Research, 12*(10), 1641 -1651.

Rahman, M., & Berenson, A. (2010). Accuracy of current body mass index obesity classification for White, Black, and Hispanic reproductive-age women. *American College of Obstetricians and Gynecologists, 115*(5), 982-988.

Rand, C. S., & Resnick, J. L. (2000). The "Good Enough" body size as judged by people of varying age and weight. *Obesity Research, 8*(4), 309-

Rashid, M. N., Fuentes, F., Touchon, R. C., & Wehner, P. S. (2003). Obesity and the risk for cardiovascular disease. *Preventive Cardiology, Winter*, 42-47.

Rawnsley, M. M. (1998). Ontology, epistemology, and methodology: A clarification. *Nursing Science Quarterly, 11*(1), 2-4.

Raykov, T., & Marcoulides, G. A. (2000). *A First Course in Structural Equation* Modeling. Mahweh, New Jersey: Lawrence Erlbaum Associates, Inc.

Reicks, M., Randall, J. L., & Haynes, B. J. (1994). Factors affecting consumption of fruits and vegetables by low-income families. *Journal of the American Dietetic Association, 94*(11), 1309-1311.

Reidpath, D., Burns, C., Gerrard, J., Mahoney, M., & Townsend, M. (2002). An ecological study of the relationship between social and environmental determinants. *Health & Place, 8*, 141-145.

Resnicow, K., Soler, R., Braithwaite, R. L., Ahluwalia, J. S., & Butler, J. (2000). Cultural sensitivity in substance use prevention. *Journal of Community Psychology 28*(3), 271-290.

Richter, D. L., Wilcox, S., Greaney, M. L., Henderson, K. A., & Ainsworth, B. E. (2002). Environmental, policy, and cultural factors related to physical activity in African American women. *Women & Health, 36*(2), 89-107.

Robert, S. A., & Reither, E. N. (2004). A multilevel analysis of race community disadvantage and body mass index among adults in the US. *Social Science & Medicine, 59*, 2421-2434.

Rogers, B. L. (2005). *Developing nursing knowledge: Philosophical traditions and influences.* Philadelphia: Lippincott Williams & Wilkins.

Roger, V. L., Go, S. A., Lloyd-Jones, D. M., Benjamin, E.J., Berry, J. D. Borden, W. B…Turner, M. B.(2012). Heart disease and stroke statistics- 2012 update. A report from the American Heart Association. *Circulation, 125,* e2-e220.

Rokeach, M. (1968). *Beliefs, Attitudes, and Values: A Theory of Organization and Change*. San Francisco, California: Jossey-Bass, Inc.

Rosenberg, M. J. (1953). The experimental investigation of a value-theory of attitude structure (Doctoral dissertation, University of Michigan). *Dissertation Abstracts International, 13,* 899.

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly, 15*(2), 175-183.

Rucker, C. E., & Cash, T. F. (1992). Body images, body-size perceptions, and eating behaviors among African American and White college women. *International Journal Eating Disorders, 12,* 291-299.

Rumelhart, D. E. (1984). Schemata and the cognitive system. In R. S. Wyer, & T. K. Srull (Ed.), *Handbook of social cognition* (Vol. 1, pp. 161-188). Hillsdale, NJ: Lawrence Erlbaum Associates

Sanchez-Johnsen, L. A., Fitzgibbon, M.L., Martinovich, Z., Stolley, M. R., Dyer, A. R., & Horn, L. V. (2004). Ethnic differences in correlates of obesity between Latin-American and Black women. *Obesity Research, 12*(4), 652-660.

Sandelowski, M. (1995). Sample size in qualitative research. *Research in Nursing and Health, 18,* 179-183.

Schieman, S., Purovska, T., & Eccles, R. (2007). Perceptions of body weight among older adults: Analysis of the intersection of gender, race, and socioeconomic status. *Journal of Gerontology, 62B*(6), S415-S423.

Schlundt, D. G., Hargraves, M. K., & Buchowski, M. S. (2003). The eating behavior patterns questionnaire predicts dietary fat intake in African American women. *Journal of the American Dietetic Association, 103*(3), 338-346.

Schwartz, M. B., & Brownell, K. D. (2004). Obesity and body image. *Body Image, 1*, 43-56.

Schwartz, T. L., Nihalani, N., Jindal, S., Virk, S., & Jones, N. (2004). Psychiatric medication-induced obesity: A review. *Obesity Reviews, 5*(2), 115-121.

Siega-Riz, A. M., Viswanathan, M., Moos, M., Deierlein, A., Mumford, S., Knaack, J.,... Lohr, K. N. (2009). A systematic review of outcomes of maternal weight gain according to the Institute of Medicine recommendations: Birth weight, fetal growth and postpartum weight retention. *American Journal of Obstetrics and Gynecology, 201*(339), e1-14.

Siervo, M., Wells, J. C., & Cizza, G. (2009). The contribution of psychosocial stress to the obesity epidemic: An evolutionary approach. *Hormone Metabolism Research, 41*(4), 261-270.

Sims, R., Gordon, S., Garcia, W., Clark, E., Monye, D., Callender, C., & Campbell, A. (2008). Perceived stress and eating behaviors in a community-based sample of African Americans. *Eating Behaviors, 9*, 137-142.

Smith, S. C., Clark, L. T., Cooper, R. S., Daniels, S. R., Kumanyika, S. K., Ofili, E.,… Tiukinhoy, S. D. (2005). Discovering the full spectrum of cardiovascular disease; Minority health summit 2003: Report of the obesity, metabolic syndrome, and hypertension writing group. *Circulation, 111*, e134-e139.

Sobal, J., Rauschenbach, B., & Frongillo, E. (2003). Marital status changes and body weight changes: A US longitudinal analysis. *Social Science & Medicine, 56*(7), 1543-1555.

Sobal, J., & Stunkard, A. J. (1989). Socioeconomic status and obesity: A review of the literature. *Psychological Bulletin, 105*(2), 260-275.

Sternfeld, B., Ainsworth, B. E., & Quesenberry, C. P. (1999). Physical activity patterns in diverse populations of women. *Preventive Medicine, 28,* 313-323.

Streiner, D. L., & Norman, G. R. (2008). Health *measurement scales: A practical guide to their development and use* (4th ed.). New York Oxford University Press.

Tabachnick, B. G., & Fidell, L. S. (Ed.). (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson Education, Inc.

Tsal, A. G., Williamson, D. F., & Glick, H. H. (2010). Direct medical cost of overweight and obesity in the USA: a quantitative systematic review. *Obesity Reviews*, *12*, 50-81.

The Nursing Development Conference Group. (1979). Concept Formalization in Nursing: Process and Product (2nd ed.). Boston: Little, Brown and Company.

Tran, T. V., & Aroian, K. J. (2000). Developing cross-cultural research instruments. *Journal of Social Work Research and Evaluation, 1*(1), 35-41.

Trueblood, C. K. (1939). Beliefs and Personality. *Journal of Abnormal and Social Psychology, 34*(2), 200-224.

Urquhart, C. S., & Mihalynuk, T. V. (2011). Disordered Eating in women: Implications for the obesity pandemic, *Canadian Journal of Dietetic's Practice and Research, 72*(1), e115-e125.

Walcott-McQuigg, J. A., Chen, S. P., Davis, K., Stevenson, E., Choi, A., & Wangsrikhun, S. (2002). Weight loss and weight loss maintenance in African-American women. *Journal of the National Medical Association*, *94*(8), 687-694.

Walker, K. L., & Avant, K. C. (2005). *Strategies for theory construction in nursing* (4th ed.). Upper Saddle River, New Jersey Pearson Education, Inc.

Waltz, C. F., Strickland, O. L., & Lenz, E. R. (2010). *Measurement in nursing and health research* (4th ed.). New York: Springer Publishing Company, LLC.

Wang, Y., Beydoun, M. A., Liang, L., Caballero, B., & Kumanyika, S. K. (2008). Will all Americans become overweight or obese? Estimating the progression and cost of the US obesity epidemic. *Obesity, 16*(10), 2323-2330.

Weiss, A. M. (2009). Cardiovascular disease in women. *Primary Care 36*(1), 73-102.

Weston, R., & Gore, P. A. (2006). A brief guide to structural equation modeling. *The Counseling Psychologist, 34*, 719.

Wilcox, S., Richter D. L., Henderson, K. A., Greaney, M. L., & Ainsworth, B. E. (2002). Perceptions of physical activity and personal barriers and enablers in African American women. *Ethnicity and Disease, 12*(3), 353-362.

Wilding, J. P. (2001). Causes of obesity. *Practical Diabetes International 18*(8), 288-291.

Willgerodt, M. A. (2003). Using focus groups to develop culturally relevant instruments. *Western Journal of Nursing Research, 25*, 798 - 814.

Williamson, D. F., Kahn, H. S., Remington, P. I., & Anda, R. F. (1990). The 10 year incidence of overweight and major weight gain in US adults. *Archives of Internal Medicine, 150*, 665-672.

Wilson, D. B., Sargent, R., & Dias, J. (1994). Racial differences in selection of ideal body size by adolescent females. *Obesity Research, 2*(1), 38-43.

Withrow, D., & Alter, D. A. (2010). The economic burden of obesity worldwide: A systemic review of the direct cost of obesity. *Obesity Review,* 1-11.

Wyer, R. S., & Srull, T. K. (1989). *Memory and cognition in its social context* Hillsdale, NJ: Lawrence Erlbaum Associates.

Wyler, R. S., & Albarracin, D. (2005). Belief formation, organization, and change: Cognitive and motivational influences. In D. Albarracin, B. T. Johnson, & M. P. Zanna (Ed.), *The Handbook of Attitudes*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Yanovski, S. Z. (2003). Binge eating disorder and obesity in 2003: Could treating an eating disorder have a positive effect on the obesity epidemic? *International Journal Eating Disorders, 34*, S117-S120.

Young, D. R., Gittelsohn, J., Charleston, J., Felix-Aaron, K., & Appel, L. J. (2001). Motivations for exercise and weight loss among African American women: Focus group results and contribution toward program development. *Ethnicity and Health, 6*(3/4), 227-245.

Youngblut, J. M. (1994). A consumer's guide to causal modeling: Part 1. *Journal of Pediatric Nursing, 9,* 168-271.

Zeller, R. A., & Carmines, E. G. (1980). *Measurement in the social sciences*. London: Cambridge University Press.

ABSTRACT

DEVELOPMENT AND INITIAL PSYCHOMETRIC EVALUATION OF A CULTURALLY-SENSITIVE WEIGHT BELIEF SURVEY

by

STEPHANIE PICKETT

December 2012

Advisor: Dr. Rosalind Peters

Major: Nursing

Degree: Doctor of Philosophy

The purpose of this study was to develop and perform initial psychometric evaluation of an instrument that measures beliefs about personal weight in young African American women. Beliefs about personal weight were defined as a multidimensional concept consisting of the convictions regarding the descriptive characteristics, causal attributions, and consequences of one's personal weight. The theory of self-care (Orem, 2001) was used to conceptualize concepts and conceptual relationships.

The Beliefs about Personal Weight Survey (BPW) was developed using three phases: phase one included item development and culturally sensitivity analysis; phase two included expert content validation, face validity and pretesting; and phase three included initial psychometric evaluation to establish beginning evidence of reliability and validity.

The BPW was developed as a culturally–sensitive, norm-referenced survey with five-point likert responses with three domains, 16 composites from principal component analysis and 57 items. The BPW was evaluated in a non probability sample of 150 community-dwelling African American women. Results of the initial psychometric evaluation demonstrates that the

BPW composites performed well with evidence of reliability and content, construct and criterion validity within and across the descriptor, cause, and consequence domains. The BPW composites also exhibited predictive ability for weight management behaviors (i.e., eating behaviors, physical activity) and actual weight.

Key findings from this study indicate that African American women‘s beliefs about the descriptors, causes and consequences of their personal weight is associated with weight management behaviors and actual weight. These findings have important implications for clinical practice, research and theory development.

AUTOBIOGRAPHICAL STATEMENT

Curriculum Vita **Last Update 8/12**
Stephanie Pickett, MSN, APRN-BC

RESIDENCE: 1474 Finwick Drive
Pfafftown, North Carolina 27040

SCHOOL: 5200 Anthony Wayne Drive
Detroit, Michigan 48202
Phone (919) 619-0310
dt9456@wayne.edu

EDUCATION:

Institution	**Degree**	**Date**
Wayne State University College of Nursing	PhD student	2007-2012 expected completion
Duke University School of Nursing	MSN	1998-2000
Medical University of South Carolina School of Nursing	BSN	1983-1986

PROFESSIONAL LICENSURE AND CERTIFICATION:

Category	**Organization**	**Date**
Adult Nurse Practitioner	American Nurses Credentialing Center	2010-2015
Adult Nurse Practitioner	American Academy of Nurse Practitioners	2001-2011
Registered Nurse	North Carolina Board of Nursing	1986-2014
Registered Nurse	Michigan Board of Nursing	2008-2013
Basic Life Support	American Heart Association	2011-2013

HONORS/AWARDS:

Rumble Fellowship	2009-2010; 2010-2011
Golden Key International Honor Society induction	2008
Who's Who among Students in American Universities and Colleges induction	2000
Sigma Theta Tau Nursing Honor Society induction	1999

SCHOLARLY ACTIVITIES AND RESEARCH:

$2,000 grant received from Sigma Theta Tau Lambda Chapter entitled: "Development and Initial Psychometric Evaluation of the *Beliefs about Personal Weight Questionnaire*
Principal Investigator 2011

$2,000 grant received from Sigma Theta Tau Lambda Chapter entitled: "Self-Care and Blood Pressure control in African Americans"
Co-Principal Investigator 2008