Quantitative Analysis of Obese Hypertensive Women and the Health Belief Model

Valerie L Fernandez

AHIMA Approved ICD-10-CM and PCS Trainer, Coding Integrity Manager 346-3E, Patient Revenue Management Organization, 5213 South Alston Ave Durham, NC 27713, Duke Health, USA

*Corresponding author:
Valerie L Fernandez, AHIMA Approved ICD-10-CM and PCS Trainer, Coding Integrity Manager 346-3E, Patient Revenue Management Organization, 5213 South Alston Ave Durham, NC 27713, Duke Health, USA, Office: 919-620-9409; Cell: 862-668-4042, E-mail: Valerie.fernandez@duke.edu

Abstract

This study utilized secondary data to understand weight-loss behaviors in obese adult women with hypertension. There are multifactorial reasons for obesity. This study attempted to clarify why people cannot lose weight and why many often regain weight. The gap in the literature relates to why the concepts such as perception of risk, benefits, and obstacles to action have not been found to cause individuals to achieve weight loss or to maintain weight loss. Secondary data were used from the NHANES dataset, a weighted dataset representative of the U.S. population. The sample used in this study included 411 obese hypertensive women over the age of 18. In all, six years of data from 2009-2014 were derived from the National Health and Nutrition Examination Survey (NHANES) dataset. Perception about the obstacles an individual confronts can be a barrier to successful weight loss. If an individual thinks success cannot be attained, efforts to lose weight will fail. Hierarchical regression analysis was used to assess the variables. The results indicated that only perception of weight acted as a cue to action for losing weight. That is, the perception of weight was the only statistically significant finding of reasons obese hypertensive women initiate weight loss efforts. Recommendations for future research include an investigation of the perception of weight status and body habitus, and to assess what triggers a poor perception of weight and body habitus as a cue to action to lose weight.

Keywords: Obesity, Hypertension, Women, Weight Loss, Perceptions of Barriers, Cues to Action

Introduction
Background of the Problem

Adults suffering from hypertension experience risk factors for cardiovascular disease, renal insufficiency, atherosclerosis, left ventricular hypertrophy, atrial fibrillation, and congestive heart failure. Hypertension is a major risk factor for stroke. The co morbidities associated with hypertension increase medical costs. Proper treatment and ongoing compliance with diet, medication, and exercise can reduce the adverse impact of hypertension [1]. Those individuals with higher systolic blood pressure were at greater risk for complications [1]. Hypertension is diagnosed when the blood pressure reading is 140/90 or higher. A normal blood pressure reading is 120/70. Other factors increasing risks are co morbidities such as high cholesterol, obesity, and diabetes. According to Rapsomaniki et al. (2014) smokers were also at increased risk of complications when diagnosed with hypertension [2]. In 2011-2012, adults who smoked represented 29.1% of the U.S. population [3].

Obesity increases the risk for the development of hypertension, and the link between hypertension and obesity is well documented [4]. It is also known that women suffer disproportionately from obesity [4]. Body mass index (BMI) is commonly used to assess obesity.

Excess body fat and increased adipose tissue and the location of fathavedetermined what health consequences will result [5]. During the aging process, there is a loss of skeletal muscle mass and quality, a phenomenon called sarcopenia. When sarcopenia is associated with obesity; the risk of morbidity and mortality increases. Associated co morbidities result in functional decline and reduced quality of life [6]. Programs focusing on awareness and behavioral changes are prevalent according to Memish et al [7]. Weight loss can be achieved. However, maintaining weight loss is difficult, particularly if individuals revert to a poor diet, reduced activity, and their emotional and psychological issues are not addressed according to Memish et al [7].

Weight management per Weber, Schiffrin, and White (2014) can be effective in reducing and eliminating hypertension and associated debilitating co morbidities [8]. Dietary guidance to select fruits and vegetables and to limit red meat results in weight loss and is successful in reducing or eliminating hypertension. Reducing salt intake is another lifestyle change that has a positive impact on reducing or eliminating hypertension. Starting or improving an exercise routine is important. Reducing or eliminating smoking and alcohol consumption can protect against cardiovascular incidents. These strategies are difficult to adopt according to Weber, Schiffrin and White (2014), and individuals may need assistance with nutritional services, behavioral modification, and a group initiative where they can interact with others experiencing similar problems. Ethnicity is

a consideration, particularly for African American individuals, as they are often more susceptible to hypertension and should avoid foods that are traditional, but may be counterproductive to weight loss according to Kirby, Liang, Chen, and Wang [8].

Losing weight can be an overwhelming undertaking. The social stigma associated with obesity leads to poor self-image and depression and reduces the likelihood of participating in exercise programs and other social events that would improve the overall psychological wellbeing of an individual attempting to make lifestyle changes. Embarking on a weight-loss program is often best accomplished with professional guidance. There are two strategies for assisting obese patients. The first strategy is to attempt to normalize weight through a variety of behavioral and lifestyle changes. The second strategy according to Tylka et al. (2014) assists the individual in accepting their body [9]. This is accomplished by making positive changes in diet, exercise regimen, and participation in social activities that will reduce the reliance on food for comfort. The ultimate result is an overall sense of wellbeing.

This study focused on the impetus for behavioral change. An individual decides to take action based on several factors. These factors include benefits related to the behavioral change, the potential risk for developing a serious medical condition, and the obstacles that prevent making that change. If an individual perceives a greater risk to overall health, adherence to a proposed regimen of lifestyle change is greater than if the individual thinks there is little cause for concern [10].

Statement of the Problem
According to Landsberg et al. (2012), weight management programs focus on behavior modification [11]. Techniques that are used in these programs include establishing goals, tracking intake, making changes in the environment, self- monitoring, and establishing a support network. Increased exercise and diet modification are routine weight-loss strategies. However, changing the amount of food consumed, increasing physical activity, and coping with the associated metabolic changes in the body can be difficult for individuals attempting to lose weight. Appetite control and perceived hunger or a desire to eat can frustrate individuals who attempt to implement weight-loss behaviors [12]. Ongoing communication with nutritionists and with others who are trying to lose weight can assist in the process [11]. Individuals who attempt to lose weight may encounter psychological, physical, financial, and other obstacles. Weight-loss intervention may be successful per Warner et al. (2013) if opportunities are provided to overcome obstacles and implement long-term behavioral modifications [13]. Obesity and related co morbidities are of great concern to the overall health of an individual. Some of the co morbidities include hyperlipidemia, cardiovascular disease, peripheral vascular disease, and diabetes. Hypertension is a major co-morbidity of obesity. There are often no symptoms of this disease. Without a medical examination, an individual may not know they have hypertension, which can put them at risk for more serious cardiovascular disorders, such as heart attack and stroke. Obesity and hypertension are more prevalent in women, according to Coventry, Fisher, Kenning, Bee, and Bower, as is a sedentary lifestyle [14]. The next section will explore how change is often very difficult for those wishing to control their weight.

Making changes to habits that were formed over a lifetime can be viewed as insurmountable. Obesity has been studied. Hypertension has been studied. Assessing strategies for various ethnic groups has been studied. Studies have been conducted with an ethnically diverse group of obese, hypertensive women that utilized the health belief model (HBM) to determine perceptions, risks, benefits, and cues to action for weight loss. This study evaluated the challenges faced by obese women with hypertension. An assessment of why weight loss cannot be achieved to reduce or eliminate hypertension using concepts that include perceptions of risk, benefits, and obstacles to action elucidates the gap in the literature. The analysis of secondary data from the National Health and Nutrition Examination Survey (NHANES) (Centers for Disease Control and Prevention [CDC], 2014) focused on a cross-section of obese, hypertensive women to determine what cues to action would best assist these individuals in embarking on a weight-loss program [14, 15].

Purpose of the Study
The purpose of this study was to assess the relationships between perceived barriers to weight loss and adherence to weight-loss behaviors in obese adult women with hypertension. Additionally, the purpose of the study was to assess the relationship between perceived threats to health and adherence to weight-loss behaviors in obese adult women with hypertension. Understanding what types of frustrations or perceived barriers individuals encounter enables life coaches and weight-management strategists to develop ways to assist individuals in achieving their weight-loss goals which can also result in reducing the complications of diabetes [16]. Psychosocial behaviors are habits that are difficult to change [17]. An individual must be motivated to succeed in this effort, and assistance is needed in overcoming the perceived barriers [3, 18, 19]. The health concerns of obese women are pervasive and include both medical and psychological aspects [20]. Heart disease is the primary cause of death for women and is one of many health concerns experienced by women [5].

However, many women do not realize the cardiovascular risks associated with obesity and hypertension [21]. Convincing women that preventing heart disease is an important consideration for their overall health, wellness, and longevity is a difficult task. This too requires a change in behavior and attitude, as well as understanding the consequences of a poor diet and a sedentary lifestyle [22]. Determining what can be done to overcome perceived threats to health and educating women about risk factors is important. Identifying those perceived threats and addressing them could assist caregivers and healthcare providers in developing tools to reduce behaviors associated with increased risk of heart disease [23]. Furthermore, there is minimal research to date that has considered this relationship using a weighted nationally representative dataset that examined these behaviors in the U.S. population. Changing behavior can be frustrating, particularly when perception, barriers, and long-term adherence to change make the task more difficult.

HBM explains individuals' adherence to health behavior. HBM relates the perceived threat of health problems to changes (or the lack thereof) in behaviors. HBM has been applied to a variety of diseases and associated health behaviors [24]. HBM focuses on perceived benefits of health behaviors and the perceived barriers to implementing positive health behaviors. Self-efficacy is the belief in the ability to reach goals. Cues to behavioral changes are what thoughts or conditions result in action. These cues could be body image or a physician's advice. This would result in taking steps to improve the overall health condition such as embarking on a weight-

loss program or increasing physical activity [24]. The perspective of HBM and weight-loss behaviors in obese adult women with hypertension was utilized in this study [24, 25]. There was a focus on the independent variables of perceived threats and perceived barriers to successful weight loss. This included body image, overall health, and psychosocial factors. Chest pain was also included as a perceived threat, as obese women with hypertension are at greater risk for heart disease and adverse cardiovascular events such as heart attack and stroke [5]. Furthermore, HBM has demonstrated explanatory power when applied to empirical data. Although research exists applying HBM to individuals with hypertension, there are few studies that have analyzed the relationship between perceived barriers, perceived threat, and adherence to weight-loss behaviors [26].

Definition of Terms
Pertinent terms in this study include hypertension and obesity. HBM has many associated terms such as perceived threat, perceived benefit, barriers, self-efficacy, and cues to action [24].

Hypertension: According to Brook et al., hypertension occurs when the pressure of the blood in the arteries is elevated [27]. Blood pressure is measured using the diastolic and systolic readings. Systolic pressure, the upper reading of blood pressure, measures the constriction of the left ventricle. Diastolic pressure, the lower reading of blood pressure, measures the left ventricle when relaxed. Hypertension is present when there is a consistent measurement of 140/90 or higher.

Obesity: Obesity is defined as being 20% above the ideal weight and having a Body Mass Index (BMI) of 30 or greater [28].
Body Mass Index (BMI): Per Romero-Corral et al. (2008), BMI is a weight-to-weight ratio, calculated by dividing one's weight in kilograms by the square of one's height in meters, and is used as an indicator of normal weight, obesity and an assessment of whether an individual is underweight [29].

Health belief model (HBM): HBM assesses perceived threats, perceived benefits, barriers, and self-efficacy in determining whether an individual will be compliant with a program of proposed medical treatment [24].

Perceived threat: A perceived threat is the belief that a serious health condition may occur [24].

Perceived benefit: A perceived benefit is something that will alleviate the threat of developing a serious medical condition [24].

Barriers: Barriers are obstacles that prevent taking a positive step to avoid or minimize the effects of a serious health condition [24]. Self-efficacy: Self-efficacy is the belief that a goal can be achieved [24].

Cues to action: Cues to action are things that motivate an individual to take positive steps to improve their health [24].

Research Design
Secondary data were used in a quantitative methodology and a cross-sectional design. The NHANES dataset (CDC, 2014), which is representative of the U.S. population from 2009 to 2014, was used for this study [30]. Several years of data from the NHANES database were used to reach the 411 participants used in this study.

Results from 2009-2014 were used. The target population of this study, derived from the NHANES dataset, was obese women over the age of 18 who were told that they have high blood pressure by a medical professional. All individuals under the age of 18 and without a hypertension diagnosis were excluded from this study. All women without a diagnosis of hypertension and women with BMI less than 30 were excluded from the study. Data were analyzed at the 95% confidence level (α = .05) using SAS software (2013). Hierarchical regression analysis was used to analyze the research questions. Control variables were entered into each model. Independent variables were then entered into the model, and the effects of the independent variables were assessed for statistical significance.

A primary reason for using secondary de-identified data was the protection of privacy for individuals who participated in the initial research. The NHANES database offered a large number of subjects over several years. The population in the research was representative of individuals across the United States. The data warehousing, according to W. Raghupathi and Raghupathi (2014), enabled easy access to information [31]. The access to the data was inexpensive. The secondary data provided an efficient research effort. Using a recognized source of data reinforced outcomes that ultimately may benefit clinicians in their weight-management program development [32].

Assumptions and Limitations
Assumptions
There were several assumptions for this study. First, it was assumed that there is a relationship between an individual's perceived weight, health conditions, and adherence to weight-loss behaviors. Second, it was assumed that overcoming any barriers preventing weight loss would enable adherence to a program of weight management. Third, it was assumed that knowledge about a serious health condition and its impact would motivate an individual to take action to reduce those effects by implementing a weight-loss strategy. There were many perspectives reinforcing these assumptions.

From an ontological perspective (the nature of reality or the view of the world), individuals want to gain acceptance within their peer group. The ontological assumptions respond to questions that include "What is there that can be known?" and "What is the nature of reality?" People have their thoughts and interpretations of their experiences. The ontological assumption focuses on feelings and inner thoughts [33]. One obstacle to assimilation is body image. Obesity rates are increasing as sedentary lifestyles increase. There are challenges related to nutrition, physical activity, weight, and BMI. Individuals with a poor body image often demonstrate restrictive eating habits that include skipping meals or concentrating on one food type or eliminating certain foods [34].

From an axiological perspective (the role of values or the issue of objectivity or subjectivity), the notion of what is right and good or beautiful denotes whether or not an individual is accepted by their peers. The measure of an individual's happiness or satisfaction with life or overall wellbeing is an important indicator in developing relationships within the peer group [35]. A poor personal perception can adversely impact interpersonal relationships.

Poor body image may adversely influence an individual's sense of well-being and can have far-reaching negative outcomes. It is important to focus on personal strengths, learning coping

mechanisms, or developing the ability to assess a circumstance to determine how to make changes. Recognizing that immediate gratification is not attainable is an important step to developing the ability to set long-term goals. An individual can then identify the steps necessary to realize those objectives. Self-worth can be assessed objectively, but more often is a perception of the individual based on reactions and experiences within their peer group at work, in the community, or in the home. Positive reinforcement is necessary to assist an individual in attaining weight-reduction goals, increasing physical activity, and developing a healthy lifestyle that includes improved nutrition [36].

The epistemological approach focuses on questioning, and the ability to be creative about how to improve or change the current circumstance. Research involves identifying a question and seeking the answers to either prove or disprove a hypothesis. Testing, using a multitude of methodologies stimulates the brain. In assessing what is the optimal way to acquire knowledge, a relaxed environment is far more conducive to learning and the acquisition of knowledge Thana tense, anxiety-ridden one. Identifying the best time to acquire new information for optimal retention is also important [37]. For example, physical activity is far better left to the end of the day when reaction time and eye-hand coordination are sharpest. Developing the brain via diet and stimulation is important, but genetics is the main determinant of intelligence and the ability to acquire and retain and implement new knowledge [38].

From a methodological perspective, the researcher makes assumptions. It is important to determine the best approach to conduct the study. Identifying any cause and effect relationship assists in the process. Objectivity is integral to finalizing an assessment. The data analysis must be conducted, and analysis must be completed before generalizations can be made. The results of the testing must be valid, and the process must be able to be repeated by other researchers [39]. These perspectives offer insight for conducting research, which for the obese woman can be evaluated using a basic measure of the body mass index (BMI).

Assessing food intake and the type of foods eaten by an individual, along with the amount of physical activity, is a direct determinant of whether an individual has a BMI that is appropriate for age and body type. Further, BMI is a good indicator of whether an individual has a positive image about their physical attributes, barring any eating disorders such as bulimia or anorexia that might cause an individual to have a negative body image [29]. A healthy lifestyle that includes good nutrition and regular physical activity can prevent many chronic disorders, such as hypertension, diabetes, and hyperlipidemia, which are prevalent in the obese [12]. Obesity and the associated co morbidities result in increased utilization of healthcare services. Promoting a healthy lifestyle can thereby reduce healthcare expenditures. Intervention at an early age, even before adolescence, enables development of behaviors that become lifelong habits [19].

Limitations
There were several limitations to this study. First, the study was cross-sectional, so causality was not established. Second, the study relied on the perceptions of the participants. Finally, all variables impacting the outcome behaviors analyzed in this study were not accounted for in the study design.

Are view of weight-loss behaviors such as food substitution for foods with lower caloric content, reduction of fat intake, increased exercise, skipping meals, and reduction or elimination of junk food was conducted. The weight-loss behaviors were the dependent variables in the current study.

Perceived benefits refer to an individual's belief in the efficacy of a recommended treatment. For example, an individual may believe that age-appropriate colonoscopies can prevent mortality or morbidity from colon cancer [24]. If an individual thinks they cannot achieve a specific goal or objective, the likelihood of success is reduced. Perceived barriers such as self-reported physical, psychological, and emotional limitations were assessed. Perceived barriers also include difficulty in preparing meals. The perceived barriers were independent variables.

The perceived threat is a combination of the perceived susceptibility and perceived severity. Perceived susceptibility refers to beliefs held by an individual that if preventative action is taken, health disorders and associated co morbidities can be avoided. For example, an individual may believe that getting a flu vaccine will protect against the flu. Perceived severity refers to beliefs held by an individual that there is an adverse impact on health if healthy behaviors are not adopted. For example, an individual with heart disease may believe that a heart attack may occur if there is noncompliance with recommended treatment for heart disease [24]. In the current study, perceived threat was the perception of weight, general health condition, and the presence of chest pain. These variables highlighted an individual's feelings, thoughts, and perceptions. The study used the participants 'perceptions as responses, and some participants may have reported information that was thought to be expected. However, self-reporting was easily implemented for large samples such as the NHANES database.

Design Limitations
There was no access to the questionnaires or other documents associated with the NHANES dataset. Several years of data from 2009-2014 were obtained from NHANES to reach the total of 411 used in this research. Only sections from the NHANES database that were specific to this research were retrieved.

Delimitations
The focus of this research was obese, hypertensive women over the age of 18. Any individual who was under 18 and was not obese or suffering from hypertension were excluded. Women with hypertension who did not suffer from obesity were not selected for this study. Males were excluded from the study. Only a consideration of barriers to weight loss was included in this study. The research questions selected from the NHANES database were those that focused on perceived barriers, threats, and cues to action related to weight-loss initiatives. All of the questions available in the NHANES study were not utilized. Only the questions specific to women with obesity and hypertension were selected for this study.

Organization of the Remainder of the Study
A literature review was conducted to survey existing research information about obesity and hypertension. Preventing complications related to these co morbidities was highlighted, with weight loss as the primary objective. The success and failure of weight-loss strategies were delineated. Specifically, a review of women and the impact of obesity on lifestyle and psychosocial

disorders were conducted. Several related studies were noted, including WISEWOMAN, as well as examinations of the Be Fit Be Well program conducted by researchers such as Bennett et al. and Ritzwoller, Glasgow, Sukhanova, Bennett, Warner, and Greaney [18, 40-42]. Ethnic variations related to obesity and body image offered insight into why cultural differences play a role in obesity.

The background and statement of the problem have been provided. The purpose of the study and the research questions have been highlighted based on obese hypertensive women and weight-loss behaviors, along with barriers to weight loss. The definitions of terms offered abettor understanding of various concepts. Next, the results will be presented and discussed, with tables highlighting aspects of the study. Detailed documentation of the methodology used in this research will provide clarity about the focus of this research. Research questions, hypothesis, and variables were provided. The target population and sample of 411 subjects over the age of 18 was documented. Data analysis, hypothesis testing, the validity of the instrument, and ethical considerations were also included.

Next, the results were discussed with tables highlighting key variables such as age, educational level, income, marital status, and race. Lastly, a summary of the results with implications and recommendations was provided. The limitations of the research were reported. Implications for clinical practitioners who develop weight loss strategies were given. Recommendations for future research include the perception of weight status and body habitus.

Methodology
Purpose of the Study
The primary purpose of this study was to consider weight-loss behaviors and barriers to weight loss in obese hypertensive women using a dataset representative of the U.S. population. Minimal information was found relating to the specific focus of this research, which was to use the perspective of HBM and weight-loss behaviors among obese women with hypertension. In this study, an attempt was made to fill the gap in knowledge by examining weight-loss behaviors in obese women with hypertension in relation to social cognitive theory and stimulus-response theory, along with HBM as a lens through which the research was conducted. The NHANES dataset, a weighted dataset representative of the U.S. population, was used. Specifically, the barriers to losing weight and what caused an individual to decide to lose weight were the primary focus. The NHANES dataset was publicly available, and no cost was associated with downloading the information. Results from the NHANES dataset from 2009-2014 were used in this study [30].

Research Questions and Hypotheses
Research Question R1- What is the relationship between individuals' perception of weight, along with their health condition (perceived threat) and adherence to weight-loss behaviors including: (a) reduction in food intake, (b) food substitution for foods with lower caloric content, (c) reduction of fat intake, (d) increased exercise, (e) skipping meals, and (f) reduction or elimination of the consumption of junk food?

Null Hypothesis H0- There is no relationship between an individual's perception of weight along with their health condition and adherence to weight-loss behaviors.

Alternate Hypothesis H1- There is a relationship between an individuals' perception of weight along with their health condition and adherence to weight-loss behaviors.

Research Question R2- What is the relationship between experience of pain or chest discomfort that limits exercise and reduces the ability to participate in activities of daily living (perceived threat) and adherence to weight-loss behaviors listed above?

Null Hypothesis H0- There is no relationship between the experience of pain or chest discomfort that limits exercise and reduces the ability to participate in activities of daily living and adherence to weight-loss behaviors.

Alternate Hypothesis H1- There is a relationship between the experience of pain or chest discomfort that limits exercise and reduces the ability to participate in activities of daily living and adherence to weight-loss behaviors.

Research Question R3- What is the relationship between physical, psychological, and emotional limitations (perceived barriers) and adherence to weight-loss behaviors listed above?

Null Hypothesis H0- There is no relationship between physical, psychological, and emotional limitations and adherence to weight-loss behaviors.

Alternate Hypothesis H1- There is a relationship between physical, psychological, and emotional limitations and adherence to weight-loss behaviors.

Research Question R4- What is the relationship between difficulty walking (perceived barriers) and adherence to weight-loss behaviors listed above?

Null Hypothesis H0- There is no relationship between difficulty walking and adherence to weight-loss behaviors.

Alternate Hypothesis H1- There is a relationship between difficulty walking and adherence to weight-loss behaviors.

Research Question R5- What is the relationship between difficulty preparing meals and adherence to weight-loss behaviors listed above?

Null Hypothesis H0- There is no relationship between difficulty preparing meals and adherence to weight-loss behaviors.

Alternate Hypothesis H1- There is a relationship between difficulty preparing meals and adherence to weight-loss behaviors.

Research Design
For this study, secondary data analysis from the NHANES dataset, which used a quantitative cross-sectional design, was assessed. The NHANES data set is representative of the U.S. population [15]. This study was approved by the Capella University Institutional Review Board (IRB). This study used secondary data, and there was no contact with the participants. There was also no access to participant demographic information other than general information about race, ethnicity, income, and age.

Study Variables
The dependent variables were:
- WHD080A Ate less to lose weight
- WHD080B Switched to foods with lower calories
- WHD080C Ate less fat to lose weight
- WHD080D Exercised to lose weight
- WHD080E Skipped meals
- WHD080F Ate less junk food or fast food

The independent variables were:
- WHQ030 How do you consider your weight? (Perceived threat)
- PFQ059 Physical, mental, emotional limitations (perceived barriers)
- PFQ061G Preparing meals difficulty (perceived barriers)
- PFQ061 Walking for a quarter mile difficulty (perceived barriers)
- HSD010 General health condition (perceived threat)
- CDQ001 SP ever had pain or discomfort in chest (perceived threat)

The control variables were:
- Age
- Education
- Socioeconomic Status
- Race/Ethnicity
- Marital Status

The analysis was performed using the following steps:
- Step 1: Enter control variables: Age, Education, Socioeconomic Status, Race, Ethnicity, and Marital Status.
- Step 2: Enter first independent variable into the model WHQ030 How do you consider your weight? (Perceived severity)
- Step 3: Remove WHQ030 How do you consider your weight? (Perceived severity). Enter PFQ059 Physical, mental, emotional limitations (perceived barriers).
- Step 4: Remove PFQ059 Physical, mental, emotional limitations (perceived barriers).
  Enter PFQ061 Walking for a quarter mile difficulty (perceived barriers).
- Step 5: Remove PFQ061 Walking for a quarter mile difficulty (perceived barriers).
  Enter HSD010 General Health condition (perceived severity).
- Step 6: Remove HSD010 General Health condition (perceived severity).

Construct: Health Behaviors
HBM construct health behaviors were referenced as weight-loss behaviors, which included self-reported reduction in food intake, food substitution for foods with lower caloric content, reduction of fat intake, increased exercise, skipping meals, and reduction or elimination of the consumption of junk food. The weight-loss behaviors were the dependent variables in the current study. These variables assessed what the participant did to lose weight (e.g., eating less, switching to foods with fewer calories, eating less fat, exercising, skipping meals, and eating less junk food).

Construct: Perceived Barriers
Perceived benefits refer to an individual's belief in the efficacy of a recommended treatment or prevention measure. HBM perceived barriers that included self-report physical, psychological, and emotional limitations were reviewed. Perceived barriers also included preparing meals with difficulty, experiencing difficulty in walking for a quarter of a mile (approximately two to three blocks), and experiencing any physical, mental or emotional limitations. The perceived barriers were the independent variables.

Construct: Perceived Severity
Perceived severity refers to beliefs held by an individual that has an adverse impact on health if health behaviors are not adopted. In the current study, perceived severity was operational zed as the perception of one's weight, general health condition, and the presence of chest pain.

Conducting a study of obese hypertensive women using HBM as a lens through which to view the study was important, as obesity continues to increase due to the sedentary lifestyle of many individuals. Obesity leads to other chronic debilitating co morbidities such as diabetes, hypercholesterolemia, and heart disease. This results in a decreased quality of life. This can also lead to a reduced lifespan with multiple medical interventions that increase the overall cost of healthcare. Weight management through behavior modification has been a focus of many programs.

Cues to action using HBM as a lens through which to conduct the study were assessed. This was an assessment of adherence to health behaviors. Hypotheses tested included the elements of perception of weight, health condition, experiencing chest pain with activity, physical and emotional limitations of initiating weight loss, inability to walk short distances of one to two blocks, and difficulty preparing meals. Based on the results of this study, the only circumstance that resulted in a cue to action was the perception of weight.

Target Population and Sample
Population
The target population of this study was obese women over the age of 18 who were told that they had high blood pressure from a medical professional. All individuals under the age of 18 and without a hypertension diagnosis were excluded from this study. All women without a diagnosis of hypertension, as well as women with BMI less than 30, were also excluded from the study. Obese hypertensive women are susceptible to cardiovascular disorders as well as kidney disease. Type 2 diabetes is also prevalent in obese hypertensive women, particularly around menopause per Demarco et al. [21]. Heart disease is the primary reason for mortality in women [43]. For individuals with hypertension, only 53% have their condition appropriately controlled. Cardiovascular disease accounts for 31.9% of all deaths, or one in every three deaths. The cost of caring for those with cardiovascular disease is approximately $315 billion according to Go et al [43].

Sample
The NHANES is a nationally representative multistage survey. The NHANES does not use simple random sampling. Sampling takes place in four steps. First, PSUs (primary sampling units), counties, or in a few cases adjacent counties, were selected. During the second stage of selection, segments, census blocks within the county, or combinations of census blocks within the county were selected. Then, households within each segment were randomly selected. Finally, individuals from each household were selected to respond to the survey. Individuals of adult age also received a medical exam. In the 2011-2012 NHANES survey, 6,888 individuals were surveyed, and 5,000 individuals received a medical examination [15].

The sample size for the present research consisted of 411 obese hypertensive women. This sample was derived from several NHANES surveys that spanned 2009 through 2014 [15, 30].

Power Analysis
A power analysis revealed that at least 395 participants were necessary. The power analysis was conducted using G*Power, version 3.1. At least 395 participants were needed to achieve a power of .80 with 95% confidence ($\alpha = .05$) and small effect size for hierarchical multiple regression analysis.

Procedures
Participant Selection
Based on the secondary data available in the NHANES database, the participants included women over the age of 18 who were obese and suffered from hypertension.

Protection of Participants
There was no identifying information available in the NHANES database. All participants were voluntary. The study used secondary data, which further protected the participants 'identity as there was no direct contact with participants.

Data Collection
The NHANES dataset was used to investigate all of the variables. The NHANES dataset is a weighted dataset representative of the U.S. population, accessed via the following link http://wwwn.cdc.gov/Nchs/Nhanes/2011-2012/DIQ_G.htm. The dataset for 2011-2012 was first published in September 2013. Several years of the NHANES dataset was used which included survey results from 2009-2014 [15, 30]. This study used a quantitative cross sectional design using secondary data. Each of the NHANES surveys was downloaded. Only obese hypertensive women over the age of 18 were used for this research. Hypertension was defined as a blood pressure of 140/90 or higher. Obesity was defined as a BMI >30. The independent, dependent, and control variables were extracted from the NHANES survey questions based on the focus on weight-loss barriers and what action was taken to lose weight. Demographics, including socioeconomic level and education level, were utilized as control variables.

Data Analysis
Hypothesis testing: Data were analyzed at the 95% confidence level ($\alpha = .05$) using Statistical Analysis Software [44]. Hierarchical regression analysis was used to analyze the research questions. Control variables were entered into each model. Individual independent variables were then entered into the model, and their effects were assessed for statistical significance. Each independent variable was analyzed separately using all control variables. This was performed to assess the impact of each independent variable.

Instruments
The United States National Health and Nutrition Examination Survey (NHANES) for 2009 2014was the instrument used for this study [15, 30].

Validity
The results of the NHANES survey can be generalized to the population across the nation. It is a multi-stage cross-sectional survey. The NHANES is unique in that it is administered in two phases, consisting of an interview and a physical examination. The interview portion of the NHANES, administered at the individual's home, included demographic, socioeconomic, nutrition, and health-related questions. The self-reported data can result in overestimates as compared to measured data. Under-reporting of energy intake is common and is typically greater for those with a higher BMI. Many of the NHANES questionnaires are based on previously tested questions from other surveys; therefore, recall bias and misreporting is limited. The NHANES findings are the basis for national standards such as measurements for height, weight, and blood pressure.

The examination component consists of medical, dental, and psychological measurements administered by physicians, dentists, and specially trained medical and health technicians in specially designed mobile health examination centers. The NHANES survey results were easily repeatable. The repeated survey results have similar outcomes. Consistency was based on the oversampling performed for African Americans, Asian Americans, and Hispanic individuals, as well as for people over the age of 60. Due to the complex nature of the objective survey, accurate estimates of both diagnosed and undiagnosed conditions were made. It was the combination of interviews as well as medical examinations and diagnostic testing that enabled consistent, repeatable outcomes. Cultural and language difficulties were encountered, but the NHANES survey team was equipped with interpreters. Use of state-of-the-art technology also ensures the reliability of the survey [15].

The research questions and the associated hypotheses and null hypotheses are listed below. Perception of weight and what was done to reduce weight was of primary interest. Additionally, determining what would prevent someone from losing weight was included in this study. The questions included physical, emotional, and psychosocial inquiries.

Research Question Review
The NHANES database is comprised of an annual survey that includes both a medical examination and a questionnaire. The medical examination portion of the survey contained details about height, weight, blood pressure, and BMI, all of which was pertinent to this study. The questionnaire contained demographic information such as age, education, socioeconomic status, all of which were used as control variables in this study. Questions about general health perception and perception about weight were used as independent variables in this study. Further, the NHANES questionnaire queried about steps an obese individual could take to lose weight. This included exercising, eating less, and eliminating junk food. Specific questions were posed about limitations that would prevent someone from being successful in losing weight. Those included difficulty walking, chest pain, and difficulty in preparing meals. Activities of daily living that might be compromised because of physical, mental, or emotional barriers were important to determine reasons an individual was unsuccessful in attempts to lose weight. These were used as independent variables in this study. The objective in reviewing the NHANES database was to obtain questions that could be used in a review of obese women with hypertension. The hypotheses formulated were based on whether or not demographic, physical, or emotional barriers were the cause of an inability to lose weight. Overall perceptions and their impact on losing weight was the primary focus. The key element was an individual's perception of their weight. Based on the results of this secondary review, it was determined that an individual's perception about their weight was the driving factor in a decision to lose weight.

Ethical Considerations

Participation in the NHANES data collection process was voluntary, and no identifying information was recorded during the data collection process. Data were analyzed without individual bias. The data were properly handled, stored, and presented. The data were kept in a password-protected, encrypted computer, which has been in a locked office. Only the researcher has access to the stored data. Upon completion of the study and after seven years, the data will be destroyed using available software scrubbing techniques that will clear all data from the computer hard drive.

The Belmont Report (1979) is the ethical basis for all research. The basic ethical principles include respect for persons, beneficence, and justice. Respect requires protection of all participants and particularly those of diminished capacity, treating everyone as autonomous. No harm should come to participants. Any benefits should be maximized. Each participant is treated equally. Informed consent for the research is integral. This study incorporated all concepts of the Belmont Report [45]. The use of secondary data ensured that no access to the participants occurred and all information was de-identified. Thus, all participants were treated equally. The information provided by the participants was incorporated into this study without modification. No harm came to the participants, as there was no contact. The original investigation by NCHS and CDC in 2013 and 2014 included informed consent. The participants in the original investigation were given the results of their medical testing, thus maximizing the benefits of participation.

Summary

The results of the data analysis were expected to confirm the hypothesis for each of the five research questions. It was anticipated that the null hypothesis would be rejected for each of the five questions. Several findings were expected. It was expected that individuals with greater levels of perceived threats were more likely to engage in the following: (a) reduction in food intake, (b) food substitution for foods with lower caloric content, (c) reduction of fat intake, (d) increased exercise, (e) skipping meals, and (f) reduction or elimination of the consumption of junk food. Those individuals who experienced chest pain or chest discomfort (perceived threat) were more likely to adhere to weight-loss behaviors. Those who experienced physical, psychological and emotional limitations were less likely to adhere to weight-loss behaviors. Those who experienced difficulty walking were less likely to adhere to weight-loss behaviors. Those who experienced difficulty preparing meals (perceived barriers) were less likely to adhere to weight-loss behaviors.

Results
Background

The purpose of this study was to assess obese hypertensive women and weight-loss behaviors along with barriers to weight loss focusing on the stimulus-response theory and the social cognitive theory using HBM as a lens through which to conduct the research. Using the NHANES database enabled a review of data collected from obese hypertensive women that were representative of the U.S. population based on the selection criteria used by NHANES. HBM explains an individual's adherence to health behavior. The framework relates the perceived threat of health problems, perceived benefits of health behaviors perceived barriers to health behaviors, self-efficacy, and cues to behavioral changes [25]. An attempt was made to fill this gap in knowledge by examining the relationships between perceived barriers to weight loss and adherence to weight-loss behaviors in obese adult women with hypertension.

This study included a quantitative analysis of obese, hypertensive women. The study employed secondary data from the NCHS database. Initially, the plan was to use 2011-2012 survey results. However, survey respondents in the 2011-2012 survey years did not answer all questions on the survey. The questions posed for this quantitative analysis represented only a select portion of the survey. Participants did not answer many of the questions in the survey. In the 2009-2010 survey, there were 161 participants that could be used for this research. This necessitated adding additional survey years to reach the saturation point of 395 individuals for this research. By adding the 250 participants from 2011-2012 and 2013-2014 surveys, the final total participants used for the research was 411. The Capella University Institutional Review Board was contacted about the additional survey years and added that information to the approved research plan.

The survey years included 2009-2010, 2011-2012 and 2013-2014. The total number of participants across these three survey years was 411. The data for 2009-2010 and 2011-2012 survey were different from the 2013-2014 survey, as the age of participants in 2013-2014 was categorized as younger than 20and older than 20 years of age. The categorization for the earlier years was females less than 18 years of age and females greater than 18 years of age. The data were analyzed using SAS [44]. The decision to use SAS instead of SPSS was related to the ability of SAS to analyze huge amounts of data and the ability to manipulate that data based on the variables utilized.

This chapter includes a description of the sample used to conduct this study. The hypothesis utilized in this study was identified. The results of the study are provided along with pertinent details highlighted in several tables.

Description of the Sample

The data extracted from the U.S. Department of Health and Human Services, Center for Disease Control (CDC), National Center for Health Statistics (NCHS), database were publicly available. The data included obese, hypertensive women over the age of 18. NCHS survey years included 2009-2010, 2011-2012, and 2013-2014. The number of participants analyzed across these survey years totaled 411.

The NHANES database observations consisted of 1,726 observations read, 411 observations used, and 1,315 observations with missing values. Cases that were missing data were excluded from this research. The 411 participants in this survey answered all questions related to this research. As seen in Table 1, the age range in the 411 observations was from age 41 to age 80.

Table 1: Age in Years at Screening

Age	Frequency	Percent
41 to 50	6	1.46
51 to 60	35	8.51
61 to 70	225	54.75
71 to 80	145	35.28
Total	411	100

The education level ranged from less than 9th grade with 44 observations to a college graduate with 72 observations indicated in Table 2.

Table 2: Person's Education Level

Education Level	Frequency	Percent
< 9th grade	44	10.71
9-11th grade	73	17.76
High school graduate/GED	99	24.09
Some college or AA	123	29.93
College graduate or above	72	17.52
Total	411	100

As seen in Table 3, the income level ranged from 0-$4,999 to $100,000 and above. There were four observations in the lowest income level and 45 observations at the highest income level. The most frequently occurring observation about income level was in the $25,000 to $34,999 range with 54 observations as delineated in Table 3.

Table 3: Annual Household Income

Annual Household Income	Frequency	Percent
0-$4,999	4	0.97
5,000-9,999	15	3.65
10,000 -14,999	47	11.44
15,000-19,999	22	5.35
20,000-24,999	34	8.27
25,000-34,999	54	13.14
35,000-44,999	45	10.95
45,000-54,999	33	8.03
55,000-64,999	15	3.65
65,000-74,999	24	5.84
20,000 and over	14	3.41
under 20,000	4	0.97
75,000-99,999	38	9.25
100,000 and over	45	10.95
Refused	13	3.16
Don't know	4	0.97
Total	411	100

Ethnicity was inclusive of Mexican American, Hispanic, non-Hispanic White, non-Hispanic Black and non-Hispanic Asian. Most of the participants were non-Hispanic White with a total of 183 observations, and non-Hispanic Black with a total of 135 observations as listed in Table 4.

Table 4: Race

Race/Hispanic Origin	Frequency	Percent
Mexican American	39	9.49
Other Hispanic	43	10.46
Non-Hispanic White	183	44.53
Non-Hispanic Black	135	32.85
Non-Hispanic Asian	11	2.68
Total	411	100

Marital status in Table 5 included a comprehensive listing of 196 participant observations of married individuals and 114 observations of widowed individuals. Only 23 observations indicated never married.

Table 5: Marital Status

Marital Status	Frequency	Percent
Married	196	47.69
Widowed	114	27.74
Divorced	61	14.84
Separated	13	3.16
Never married	23	5.6
Living with partner	3	0.73
Refused	1	0.24
Total	411	100

Data were analyzed at the 95% confidence level ($\alpha = .05$) using SAS. Hierarchical regression analysis was used to analyze the research questions. Control variables were entered into each model. Then, independent variables were entered into the model, and their effects were assessed for statistical significance.

Hypothesis Testing

All variables were entered into SAS. Data were analyzed at the 95% confidence level ($\alpha = .05$). Hierarchical regression analysis was used to analyze the data with respect to the research questions. One hierarchical multiple regressions were performed for each dependent variable. Each model had one dependent variable. The control variables and independent variables were entered into each model in blocks. Each block was assessed for statistical significance to answer the research questions [46].

Table 6 shows the analysis of variance used for Model 2 where weight perception was added to the first model. The first model only included the control variables. The second model added weight perception, WHQ030, to the control variables. Based on this outcome, the null hypothesis was rejected as weight perception does impact a cue to action, which was a decision to lose weight.

Table 6: Analysis of Variance

Source	df	Sum of Squares	Mean Square
Model	2	79.89086	7.26281
Error	399	733.51060	1.83837
Corrected Total	410	813.40146	
Root MSE	1.35587	R2	0.0982
Dependent Mean	1.16058	Adj R2	0.0734
Coeff Var	16.82618		

None of the other hypotheses were statistically significant. The following hypotheses were rejected based on this study:

Hypothesis 2 that assessed individuals experiencing pain and experiencing chest discomfort was rejected, as participants were not motivated to lose weight. Although individuals experienced physical and psychological limitations (Hypothesis 3), that did not spur a cue to action to begin a weight-loss program. Hypothesis 4, assessing difficulty walking, did not impact the decisions to lose weight. Hypothesis 5, difficulty preparing meals, did not impact the decision to lose weight. The remaining null hypotheses were accepted. The hierarchical multiple regressions revealed that how an individual considered their weight was statistically significant, with a $p < .0001$. The significance threshold was set at .05. The variance inflation factor was 1.04. An independent samples t-test

was conducted for the independent variables. It was determined that there was a significant difference in the scores with a t-value equal to 1.96 for "how do you consider your weight." The analysis of variance showed that perception of weight was a cue to action to lose weight based on the F-value $F (2,399) =26.62$, $p <.001$. This result indicates that how an individual considers their weight may be the impetus to take action and begin a weight-loss program. All other independent values were less than that t value, as shown in Table 7. None of the other independent variables were statistically significant. Table 7 shows the parameter estimates with all the independent variables and the control variables.

Table 7: Parameter Estimates

Variable	df	B	SE	t	p|	β	VIF	95% Confidence Limits	
Intercept	1	3.45	1.17	2.93	.003	0	0	1.13	5.76
Age in years at screening	1	-0.03	0.009	-3.48	.0006	-0.17	1.09	-0.05	-0.01
HH ref person's education level	1	0.14	0.05	2.41	.01	0.12	1.16	0.02	0.25
Annual household income	1	0.004	0.004	1.12	.26	0.05	1.04	-0.003	0.01
Race/Hispanic origin w/ NH Asian	1	0.10	0.06	1.53	.12	0.07	1.08	-0.02	0.23
Marital status	1	-0.007	0.01	-0.40	.68	-0.01	1.01	-0.04	0.02
How do you consider your weight	1	-0.16	0.08	-1.96	.05	-0.09	1.04	-0.32	0.0007
Physical, mental, emotional limitations	1	-0.18	0.15	-1.18	.23	-0.05	1.06	-0.50	0.12
Preparing meals difficulty	1	0.09	0.57	0.16	.87	0.007	1.06	-1.04	1.22
Walking for a quarter mile difficulty	1	-0.12	0.08	-1.57	.11	-0.07	1.10	-0.28	0.03
General health condition	1	0.04	0.08	0.53	.59	0.02	1.16	-0.12	0.21
SP ever had pain or discomfort in chest	1	-0.14	0.17	-0.86	.39	-0.04	1.08	-0.49	0.19

Summary
How do you consider your weight (Question1 WHQ 030) was statistically significant with a p-value <.001. When women have a poor perception of themselves because of their weight, they will plan to take measures to reduce their weight as demonstrated in this study. This is accomplished via exercise, improved nutrition, and updating hair, make-up, and clothes. As they reduce weight, people begin to notice, and the positive reinforcement offers an opportunity to remain on the path to more confidence and an enhanced sense of self. This often results in making other lifestyle changes that include education, career path, and family and social interactions.

There were some factors that did not impact the decision to lose weight among the 411 participants in this study. Pain and the experience of chest discomfort did not impact decisions to lose weight. Additionally, factors such as physical, psychological, and emotional limitations did not influence the participants' decisions to lose weight. Having mobility difficulties or having difficulty preparing meals also did not impact the decision to lose weight. These findings are consistent with some literature found regarding the decision to lose weight [11]. For instance, techniques that are used in these programs include establishing goals, tracking intake, making changes in the environment, self- monitoring, and establishing a support network per Landsberg et al [11]. These are actions that an individual would take once a decision to lose weight is made. These techniques, without the cue to action, did not have positive results. Appetite control and perceived hunger or a desire to eat can frustrate individuals who attempt to implement weight-loss behaviors [12]. This is true for any individual embarking on a

weight-loss program. Weight-loss intervention may be successful if opportunities are provided to overcome obstacles and implement long-term behavioral modifications according to Warner et al [13]. Unlike the Be Fit Be Well study highlighted by Warner et al. (2013), the present study found that only the perception of weight was the motivating factor. This study focused on the relationship between perceived threats to one's health and adherence to weight-loss behaviors in obese adult women with hypertension per Coventry et al [14]. Results of this study were dissimilar to those of Coventry et al [14]. Both Daddario (2007) and Rosenstock (1966) found that the use of HBM was successful in adherence to health behavior. This study confirmed that there is a relationship to weight perception and a cue to action in deciding to lose weight. The WISEWOMAN study found that 1 in 3 women did not perceive themselves to be at risk per Vaid et al.

The decision to lose weight may be highly individualized and traditional ways of thinking about weight loss may need more examination. However, the substantive finding was that the decision to lose weight was related to the cue to action of weight perception (WHQ030, how do you consider your weight). The first hypothesis was supported, which means there is a statistically significant relationship between perception of weight and a decision to lose weight. This may give the medical community another tool to use in the effort to promote weight loss. Hypothesis 2 was not supported, which indicates that there was no significant relationship between chest pain and a decision to lose weight. Hypothesis 3 was not supported, showing that physical, psychological, and emotional factors did not impact decisions to lose weight. Hypothesis 4 was

not supported, which means that there was no statistically significant relationship between difficulty walking and a decision to lose weight. Hypothesis 5 was not supported, which offers evidence that there is no statistically significant relationship between difficulty in preparing meals and a decision to lose weight. Further discussion of the findings of this study is presented in Chapter 5.

Discussion, Implications, Recommendations
Summary of the Results
The focus of this study was on obese women with hypertension and adherence to health behaviors using data from the NHANES database. Many factors were considered that included experiencing pain when engaging in the activity, difficulty walking a few blocks, difficulty preparing meals, and other physical and emotional barriers to losing weight.

There are many studies related to weight-loss strategies, which focus on restricting dietary intake and increased exercise to promote a healthy lifestyle. Long-term weight loss is a great obstacle for anyone participating in a weight-loss program. It was determined that the cue to action influenced perceptions of the ability to lose weight and to maintain the weight loss long term.

The only statistically significant outcome of this study was in relation to the first question: WHQ030: How do you consider your weight? Based on a p-value of.0000002769, how an individual perceives their weight is the determinant of decisions to lose weight. The null hypothesis was rejected for Research Question 1.

Additional hypotheses were studied, and the null hypotheses were confirmed for Research Questions 2-5, given the lack of statistical significance. There was no relationship between the experience of chest pain and adherence to weight-loss behaviors. There was no relationship between physical, psychological, and emotional limitations and adherence to weight loss behaviors. There was no relationship between difficulty walking and adherence to weight-loss behaviors. There was no relationship between difficulty in preparing meals and adherence to weight-loss behaviors.

Discussion of the Results
The demographic characteristics of the study participants did not impact the outcome. Those who were older, with more education, and financially secure would make the same decisions, based on how each individual perceived their weight, as those who were younger, less educated, and who had less access to financial resources. Individuals over the age of 40 provided answers to the questions pertinent to the research. Incomplete questionnaires were excluded from the total 411 participants. It should be noted that the non-responses may have been due to question fatigue. If the individual perceived their weight negatively, decisions would follow to undertake weight-loss strategies. If an individual did not perceive their weight negatively, no action would be taken to lose weight.

Perception of weight status impacts decisions to lose weight and to maintain a diet that will enable long-term weight loss. If an individual is satisfied with their body image, they are less likely to undertake weight-loss strategies. Positive body image is not impacted by what the medical community has indicated as the norm for height and weight. Physical, psychological, and social influences do not result in decisions to diet and lose weight. Medical conditions that compromise health are not sufficient grounds for changing dietary habits when an individual is satisfied with their body.

In contrast, if an individual is dissatisfied with their weight, they will undertake efforts to lose weight. If an individual is dissatisfied with their weight, and their weight is impacting their health and activities of daily living, they will comply with medical directives to improve diet to lose weight. Poor body image adversely impacts an individual's ability to participate in educational and work activities. Establishing coping mechanisms is integral to begin the process of setting long-term weight reduction goals per Corda et al [34].

The outcome of this research reinforces the importance of body image as a determining factor in taking steps to lose weight. Similarly, immediate gratification is not realistic in a weight-loss strategy. Positive reinforcement of small victories must be a continual source of encouragement for those struggling to lose weight according to Li-Wei et al [36].

Despite taking a cue to action to lose weight based on perception of weight, many factors such as appetite control, perceived hunger, and increasing activity to promote weight loss frustrate an individual. The perception of weight and the cue to action is just the start of the journey to weight loss.

Attempting this process alone without trained support and the support of those who are facing the same struggle can result in failure [12]. Maintenance of weight loss over time requires long-term lifestyle changes per Wadden et al [47].

In contrast to studies that support the outcome of this research, there are other studies that do not address the concept of perception of weight in their programs. The WISEWOMAN study addressed the risk of heart disease and the fact that 1 in 3 women did not recognize the risk despite suffering from obesity and hypertension according to Vaid et al [18]. The WISEWOMAN study did not address weight perception as a factor in beginning to address obesity and its associated co morbidities. The Bet Fit Be Well program addressed financial, personal, professional, and other obstacles to participating in a weight-loss program per Warner et al [13]. This program did not address weight perception as an obstacle to weight-loss success. Bariatric surgery is an extreme measure for weight loss. Individuals who have bariatric surgery may continue to engage in poor eating behaviors post-surgery. One example is picking and nibbling, which is counter to long-term maintenance of weight loss per Concepcion et al [48]. Along with behavior modification, addressing the perception of weight is an important factor to consider when counseling bariatric surgery candidates. Emotional stress that includes family relationships, a sense of insecurity, and lack of self-worth contributes to obesity [49]. Reductions in energy expenditure continue as more sedentary employment expands and home management activities are less than in previous decades. Exercise and housework is a small portion of overall energy expenditure according to Lavie et al [50].

Conclusions Based on the Results
The weight-loss industry is a billion-dollar initiative that promotes a reduction in calories for weight loss. Although an individual may elect to embark on one of the many diet plans available, they will only be successful if they are dissatisfied with their current weight, according to the results of this research. To address obesity, psychological intervention may be needed to overcome the misperception that individuals have about their weight status. It is important to help

individuals set goals and perform self-monitoring. Clinicians must provide coaching and reinforcement for attaining goals. Face-to-face interactions and web-based telemedicine approaches can have similar outcomes per Appel et al [51]. There is no strong evidence to support the use of meal replacement over a low-calorie diet. However, radical diets that are very restrictive are usually unsuccessful over the long term. Emotions, whether positive or negative, can result in overeating. Family responsibilities and social life can create barriers to weight loss [52]. Problem-solving skills can be effective; this may include learning to state the problem, identifying solutions, setting goals, determining what does or does not work, and changing direction as needed. Developing and enhancing problem- solving skills helps individuals cope with the hurdles associated with behavioral change per Venditti et al [19].

Encouraging exercising can increase appetite. Individuals who exercise may compensate by eating more, and they may require more rest due to fatigue. As a result, they may not meet their weight-loss goals. Incorrect assessment of the caloric intake is also problematic. Selection of poor foods can also result in minimal weight loss. Metabolic responses that are evolutionary to protect the body from starvation may also prevent sustainable weight loss according to King et al [53].

Several assumptions were made for this study. First, it was assumed that there was a relationship between an individual's perceived weight, their health conditions, and adherence to weight-loss behaviors. The outcome of this research indicated that only perception of weight status was a cue to action to lose weight, despite co morbidities impacting overall health. Second, it was assumed that overcoming barriers preventing weight loss would enable adherence to a program of weight management. Regardless of socioeconomic barriers, it is only the perception of weight status that drives decisions for weight loss. Third, it was assumed that knowledge about a serious health condition and its impact would motivate individuals to implementa weight-loss strategy. The research results indicate that a serious health condition is not a motivating factor in decisions to lose weight.

Limitations
There were several limitations related to this research. Cues to action for weight loss among men were not assessed. Additionally, childhood obesity is a growing national concern, and this study did not include children. This research used secondary data. Primary research may elucidate more information about what drives misperceptions of weight loss and why the overall perception of weight is significant in decision making for implementing weight-loss strategies.

The study was cross-sectional, so causality could not be established. It was impossible to create a survey specifically designed for this study as secondary data were used. The self-report nature of the instrument used in this study may have limited the accuracy of the findings. Finally, all variables impacting the outcome behaviors analyzed in this study may not be accounted for in the study design.

Implications for Practice
The medical community can utilize the outcome of this research by focusing on a patient's perception of their weight status. If misperceptions exist, the medical community can utilize strategies to enable their patients to better align with height-and-weight categories that promote health. This process would require the assistance of a psychologist or psychiatrist.

Recommendations for Further Research
A primary research plan should be developed that addresses the perception of weight status and body habitus. This could be initiated within the community or within a health system. A psychologist or a psychiatrist should be consulted when designing survey questions and interpreting research findings to determine a course of action to modify misperceptions of weight status and body image.

Developing strategies involving community leaders to assist in encouraging individuals embarking on a weight-loss program and to offer support during periods of struggle may enhance success for those contemplating weight loss and in weight-loss management.

Developing a public policy that will provide areas dedicated to exercise such as parks for walking and bike paths will enable the community to participate in physical activity with little or no direct cost. This will possibly reduce sedentary activities.

Research that includes children and men will broaden the scope of strategies available for weight loss and weight-loss maintenance. Programs that assist parents in ensuring their children have adequate exercise and eat nutritiously balanced meals, avoiding fast food and sugary drinks, will promote healthy lifestyle decisions that children can embrace and continue through adulthood.

Ongoing use of the NHANES database to conduct research using a more current dataset may reveal new trends in the causes of obesity, the obstacles associated with weight loss, and the cues to action.

Research that includes the entire family—parents, children and even the extended family—may offer insight into the causes of obesity and hypertension and assist in the development of strategies to overcome and prevent these disorders.

Recommendations Based on Results
Genetics contributes to the risk for obesity. Family characteristics such as parenting style, socioeconomic level, poor diet, and overall environment can increase the risk of obesity. However, an absolute restriction of junk food can result in an interest in eating unhealthy food and result in obesity. Government and social interventions promoting healthy behavior should be considered. The selection of food is often associated with price. Making affordable healthy choices available may promote better food choices. Investing in recreational facilities that promote physical activity can offer options for exercise outside of a gym membership. Fast food is an easy option for busy families but has little nutritional value. Sugary drinks should be avoided, and reduced juice consumption in favor of a piece of fruit is preferable. Portion size is also problematic. Servings in most restaurants are larger than would be provided at home. Planning meals at home will assist in the battle against obesity. Healthy habits to prevent obesity should be started in childhood so that better choices are made in adulthood per Wadden et al [47].

Recommendations Based on Delimitations
Pregnancy is often the cause of obesity due to an excessive amount of weight gain during pregnancy. Optimizing the amount of weight gain during pregnancy can be beneficial to both the mother and the child [54]. Reviewing nutritional information on packages in the grocery store and understanding the caloric content of items

purchased in restaurants will assist in building awareness about energy intake. Promoting regular exercise that includes walking rather than the use of a car or public transportation will assist in increasing energy expenditure. Ongoing education in the doctor's office, along with encouraging women to undertake a weight-loss program and offering ongoing assistance with the many struggles that can ensue, will assist women in taking positive steps for themselves and their families according to Ogden et al [55]. Weight loss and management of obesity can result in an improved quality of life. However, women can have an unrealistic expectation about weight loss from both dieting and surgical alternatives [56]. Incorporating 45 to 60 minutes of exercise per day can assist in preventing weight gain [57]. Spending less time watching television and using the computer can increase overall physical activity levels according to Barradas et al [58-146].

Conclusion
The cue to action identified in this study is the perception of weight status. Education can be initiated in the schools to help young children understand the importance of maintaining a healthy weight. Assisting students in making better food choices along with encouraging regular exercise will enable them to maintain a healthy weight and avoid obesity and the chronic co morbidities associated with obesity. Furthermore, implementing community educational programs that provide education to families about preventing obesity will reinforce what students are learning at school.

References
1. Lackland DT, Weber MA (2015) Global burden of cardiovascular disease and stroke: Hypertension at the core. Canadian Journal of Cardiology 31: 569-571.
2. Rapsomaniki E, Timmis A, George J, Pujades-Rodriguez M, Shah AD, Denaxas S, et al. (2014) Blood pressure and incidence of twelve cardiovascular diseases: Lifetime risks, healthy life-years lost, and age-specific associations in 1.25 million people. The Lancet 383: 1899-1911.
3. Kirby JB, Liang L, Chen H, Wang Y (2012) Race, place, and obesity: The complex relationships among community racial/ethnic composition, individual race/ethnicity, and obesity in the United States. American Journal of Public Health 102: 1572-1578.
4. Re RN (2009) Obesity-related hypertension. Ochsner Journal 9: 133-136.
5. Bastien M (2016) Overview of epidemiology and contribution of obesity to cardiovascular disease. European Journal of Clinical Nutrition 70: 414-423.
6. Batsis J, Mackenzie A, Barre LK, Lopez-Jimenez F, Bartels SJ (2014) Sarcopenia, sarcopenic obesity and mortality in older adults: Results from the National Health and Nutrition Examination Survey III. European Journal of Clinical Nutrition 68: 1001-1007.
7. Memish ZA, El Bcheraoui C, Tuffaha M, Robinson M, Daoud F, et al. (2014) Obesity and associated factors-Kingdom of Saudi Arabia, 2013. Preventing Chronic Disease 11: E174.
8. Weber M, Schiffrin E, White WB (2014) Clinical practice guidelines for the management of hypertension in the community. Journal of Clinical Hypertension 16: 14-26.
9. Tylka TL, Annunziato RA, Burgard D, Daníelsdóttir S, Shuman E, et al. (2014) The weight-inclusive versus weight-normative approach to health: Evaluating the evidence for prioritizing well-being over weight loss. Journal of Obesity 2014: 983495.
10. Green EC, Murphy E (2014) The wiley Blackwell encyclopedia of health, illness, behavior and society.
11. Landsberg L, Aronne LJ, Beilin LJ, Burke V, Igel LI, et al. (2012) Obesity-related hypertension: Pathogenesis, cardiovascular risk, and treatment: A position paper of The Obesity Society and the American Society of Hypertension. The Journal of Clinical Hypertension 15: 14-33.
12. Skolnik NS, Ryan DH (2014) Pathophysiology, epidemiology, and assessment of obesity in adults. Journal of Family Practice 63: S3-S10.
13. Warner ET, Glasgow RE, Emmons KM, Bennett GG, Askew S, et al. (2013) Recruitment and retention of participants in a pragmatic randomized intervention trial at three community health clinics: Results and lessons learned. BMC Public Health 13: 1471-2458.
14. Coventry PA, Fisher L, Kenning C, Bee P, Bower P (2014) Capacity, responsibility and motivation: A critical qualitative evaluation of patient and practitioner views about barriers to self-management in people with multimorbidity. BMC Health Services Research 14: 536-559.
15. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics (2013) National Health and Nutrition Examination Survey, (NHANES), 2011-2012.
16. Baban A, Craciun C (2007) changing health-risk behaviors: A review of theory and evidence-based interventions in health psychology. Journal of Cognitive & Behavioral Psychotherapies 7: 45-67.
17. Allen C (2014) Supporting effective lifestyle behavior change interventions. Nursing Standard 28: 51-58.
18. Vaid I, Wigington C, Borbely D, Ferry P, Manheim D (2011) WISEWOMAN: Addressing the needs of women at high risk for cardiovascular disease. Journal of Women's Health 20: 977-982.
19. Venditti EM, Wylie-Rosett J, Delahanty LM, Mele L, Hoskin MA, et al. (2014) Short and long-term lifestyle coaching approaches used to address diverse participant barriers to weight loss and physical activity adherence. International Journal of Behavioral Nutrition and Physical Activity 11: 16-40.
20. Robinson T (2014) Track 7: From individual choice to population prevention: solutions and interventions. Obesity Reviews 15: 206-248.
21. DeMarco VG, Aroor AR, Sowers JR (2014) The pathophysiology of hypertension in patients with obesity. Nature Reviews Endocrinology 10: 364-376.
22. Ewing R, Meakins G, Hamidi S, Nelson AC (2014) Relationship between urban sprawl and physical activity, obesity, and morbidity–update and refinement. Health & Place 26: 118-126.
23. Rosenbaum L (2014) "Misfearing"-culture, identity and our perceptions of health risks. New England Journal of Medicine 370: 595-597.
24. Rosenstock IM (1966) Why people use health services. Milbank Quarterly 44: 1107-1108.
25. Daddario DK (2007) A review of the use of the health belief model for weight management. MEDSURG Nursing 16: 363-366.
26. Schüz B, Wurm S, Warner L, Wolff J, Schwarzer R (2014) Health motives and health behavior self-regulation in older adults. Journal of Behavioral Medicine 37: 491-500.
27. Brook RD, Appel LJ, Rubenfire M, Ogedegbe G, Bosognano

JD, et al. (2013) Beyond medications and diet: Alternative approaches to lowering blood pressure: A scientific statement from the American Heart Association. Hypertension 61: 1360-1383.

28. Schoenberg N (1997) A convergence of health beliefs: An "ethnography of adherence" of African-American rural elders with hypertension. Human Organization 56: 174-181.

29. Romero-Corral A, Somers VK, Sierra-Johnson J, Thomas RJ, Collazo-Clavell ML, et al. (2008) Accuracy of body mass index in diagnosing obesity in the adult general population. International Journal of Obesity 32: 959-966.

30. US Department of Health and Human Services, Centers for Disease Control and Prevention (2014) Nutrition Examination Survey: Sample Design 2011-2014.

31. Raghupathi W, Raghupathi V (2014) big data analytics in healthcare: Promise and potential. Health Information Science Systems 2: 1-10.

32. Cheng HG, Phillips MR (2014) Secondary analysis of existing data: Opportunities and implementation. Shanghai Archives of Psychiatry 26: 371-375.

33. Duncan C, Duff Cloutier J, Bailey PH (2007) Concept analysis: The importance of differentiating the ontological focus. Journal of Advanced Nursing 58: 293-300.

34. Corda KW, Quick V, Schefske S, DeCandia J, Byrd-Bredbenner C (2010) Toward a polytheoretical framework for health behavior change. American Journal of Health Studies 25: 211-230.

35. Drolet MJ (2014) The axiological ontology of occupational therapy: A philosophical analysis. Scandinavian Journal of Occupational Therapy 1: 2-10.

36. Li-Wei C, Szrek H, Leite R, Peltzer K, Ramlagan S (2015) Risks deter but pleasures allure: Is pleasure more important? Judgment & Decision Making 10: 204-218.

37. Umemoto A, Holroyd CB (2015) Task specific effects of reward on task switching. Psychological Research 79: 698-707.

38. Crosby R, Noar S (2010) Theory development in health promotion: Are we there yet? Journal of Behavioral Medicine 33: 259-263.

39. Yilmaz K (2013) Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. European Journal of Education 48: 311-325.

40. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion (2013) WISEWOMAN works: A collection of success stories from program inception through 2002.

41. Greaney ML, Quintiliani LM, Warner ET, King DK, Emmons KM, et al. (2009) Weight management among patients at community health centers: The Be Fit Be Well Study. Obesity and Weight Management 5: 222-228.

42. Ritzwoller DP, Glasgow RE, Sukhanova AY, Bennett GG, Warner ET, et al. (2013) Economic analyses of the Be Fit Be Well program: A weight loss program for community health centers. Journal of General Internal Medicine 28: 1581-1588.

43. Go AS, Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, et al. (2014) Heart disease and stroke statistics—2014 update: A report from the American Heart Association. Circulation 129: e28-e292.

44. SAS Institute Inc (2013) Base SAS® 9.4 Procedures Guide: Statistical Procedures, Second Edition. Cary, NC: SAS Institute Inc.

45. Belmont Report (1979) The Belmont Report: Ethical principles and guidelines for the protection of human subjects of research. https://videocast.nih.gov/pdf/ohrp_appendix_belmont_report_vol_2.pdf

46. Field A (2013) Discovering statistics using IBM SPSS statistics. Thousand Oaks, CA: Sage.

47. Wadden TA, Brownell KD, Foster GD (2002) Obesity: Responding to the global epidemic. Journal of Consulting and Clinical Psychology 70: 510-525.

48. Conceição EM, Crosby R, Mitchell JE, Engel SG, Wonderlich SA, et al. (2013) Picking or nibbling: Frequency and associated clinical features in bulimia nervosa, anorexia nervosa, and binge eating disorder. International Journal of Eating Disorders 46: 815-818.

49. Hemmingsson E (2014) A new model of the role of psychological and emotional distress in promoting obesity: Conceptual review with implications for treatment and prevention. Obesity Reviews 15: 769-779.

50. Lavie CJ, McAuley PA, Church TS, Milani RV, Blair SN (2014) Obesity and cardiovascular diseases: Implications regarding fitness, fatness, and severity in the obesity paradox. Journal of the American College of Cardiology 63: 1345-1354.

51. Appel LJ, Clark JM, Yeh H, Wang N, Coughlin JW, et al. (2011) Comparative effectiveness of weight-loss interventions in clinical practice. New England Journal of Medicine 365: 1959-1968.

52. Herriot AM, Thomas DE, Hart KH, Warren J, Truby H (2008) A qualitative investigation of individuals' experiences and expectations before and after completing a trial of commercial weight loss programmes. Journal of Human Nutrition and Dietetics 21: 72-80.

53. King NA, Caudwell P, Hopkins M, Byrne NM, Colley R, et al. (2007) Metabolic and behavioral compensatory responses to exercise interventions: barriers to weight loss. Obesity 15: 1373-1383.

54. Herring SJ, Rose MZ, Skouteris H, Oken E (2012) Optimizing weight gain in pregnancy to prevent obesity in women and children. Diabetes, Obesity and Metabolism 14: 195-203.

55. Ogden CL, Carroll MD, Kit BK, Flegal KM (2014) Prevalence of childhood and adult obesity in the United States, 2011-2012. JAMA 311: 806-814.

56. Klein S (2001) Outcome Success in Obesity. Obesity: A Research Journal 9: 354S-358S.

57. Frayling TM, Timpson NJ, Weedon MN, Zeggin E (2007) A common variant in the FTO gene is associated with body mass index and predisposes to childhood and adult obesity. Science 316: 889-894.

58. Barradas DT, Fulton JE, Blanck HM, Huhman M (2007) Parental influence on youth television viewing. The Journal of Pediatrics 151: 369-373.

59. Abusabha R., Achterberg C (1997) Review of self-efficacy and locus of control for nutrition- and health-related behavior. Journal of the American Dietetic Association 97: 1122-1133.

60. Arrow K, Dasgupta P, Goulder L, Daily G, Heal GM, et al. (2012) Are we consuming too much? Journal of Economic Perspectives 18: 147-172.

61. Bandura A, Adams NE (1977) Analysis of self-efficacy theory of behavioral change. Cognitive Therapy Research 1: 287-310.

62. Becker MH, Maiman LA, Kirscht JP, Haefner DP, Drachman RH (1977) The health belief modeland prediction of dietary

compliance: A field experiment. Journal of Health and Social Behavior 18: 348-366.

63. Bell JA, Kivimaki M, Hamer M (2014) Metabolically healthy obesity and risk of incident type 2 diabetes: A meta-analysis of prospective cohort studies. Obesity Review 15: 504-515.

64. Bennett GG, Greany ML, Quintiliani LM, Warner ET, King DK, et al, (2009) Weight management among patients in community health centers: The Be Fit Be Well study, Obesity and Weight Management 5: 222-228.

65. Bischoff SC, Damms-Machado A, Betz C, Herpertz S, Legenbauer T, et al. (2012) Multicenter evaluation of an interdisciplinary 52-week weight loss program for obesity with regard to body weight, co morbidities and quality of life-A prospective study. International Journal of Obesity 36: 614-624.

66. Boeing H, Bechthold A, Bub A, Ellinger S, Haller D, et al. (2012) Critical review: Vegetables and fruit in the prevention of chronic diseases. European Journal of Nutrition 51: 637-663.

67. Byrd JB, Brook RD (2014) A critical review of the evidence supporting aldosterone in the etiology and its blockade in the treatment of obesity-associated hypertension. Journal of Human Hypertension 28: 3-9.

68. Callahan D (2013) Obesity: Chasing an elusive epidemic. Hastings Center Report 43: 34-40.

69. Clarke VA, Lovegrove H, Williams A, Machperson M (2000) Unrealistic optimism and the health belief model. Journal of Behavioral Medicine 23: 367-376.

70. Cook JA, Mueser KT (2013) The challenge of obesity. Psychiatric Rehabilitation Journal 36: 129-132.

71. Dee A, Kearns K, O'Neill C, Sharp L, Staines A, et al. (2014) The direct and indirect costs of both overweight and obesity: A systematic review. BMC Research Notes 7: 242-258.

72. Delaney J (2015) Hypertension and obesity: How weight loss affects hypertension. Retrieved from www.obesityaction.org

73. Eilerman PA, Herzog CM, Luce BK, Chao SY, Walker SM, et al. (2014) A comparison of obesity prevalence: Military health system and United States populations, 2009-2012. Military Medicine 179: 462-470.

74. Esler M, Lambert G, Brunner-La Rocca HP, Vaddadi G, Kaye D (2003) Sympathetic nerve activity and neurotransmitter release in humans: Translation from pathophysiology into clinical practice. Acta Physiologica Scandinavica 177: 275-284.

75. Finfgeld DL, Wongvatunyu S, Conn VS, Grando VT, Russell CL (2003) Health belief modeland reversal theory: A comparative analysis. Journal of Advanced Nursing 43: 288-297.

76. Finkelstein EA, Ruhm CJ, Kosa KM (2005) Economic causes and consequences of obesity. Annual Review of Public Health 26: 239-257.

77. Framingham Heart Study 1948 -2015. http://www.nhlbi.nih.gov/research/resources/obesity/population/framingham.htm

78. Franko DL, Jenkins A, Rodgers RF (2012) Toward reducing risk for eating disorders and obesity in Latina college women. Journal of Counseling & Development 90: 298-307.

79. Gaines KK (2015) The Elephant in the room - Pandemic obesity. Urologic Nursing 3: 161-163.

80. Gillen S (2013) Every nurse urged to wage war on obesity and high blood pressure. Nursing Standard 27: 6-8.

81. Glanz K, Rimer B, Viswanath K (2008) Health Behavior and Health Education: Theory Research and Practice. San Francisco, CA: Jossey Bass.

82. Glasgow RE, Askew S, Purcell P, Levine E, Warner ET, et al. (2013) Use of RE-AIM to address health inequities: Application in a low-income community health center-based weight loss and hypertension self-management program. Translational Behavioral Medicine 3: 200-210.

83. Grieve E, Fenwick E, Yang HC, Lean M (2013) The disproportionate economic burden associated with severe and complicated obesity: A systematic review. Obesity Review 14: 883-894.

84. Harrison Pl, Pope J, Coberley C, Rula E (2012) Evaluation of the relationship between individual well-being and future health care utilization and cost. Population Health Management 15: 325-330.

85. Henry SL, Barzel B, Wood-Bradley RJ, Burke SL, Head GA, et al. (2012) Developmental origins of obesity-related hypertension. Clinical & Experimental Pharmacology & Physiology 39: 799-806.

86. Hoyt CL, Burnette JL, Auster-Gussman L (2014) "Obesity is a disease" examining the self-regulatory impact of this public-health message. Psychological Science 25: 997-1002.

87. Imes C, Burke LE (2014) The obesity epidemic: The United States as a cautionary tale for the rest of the world. Current Epidemiology Reports 1: 82-88.

88. James P, Pobee JW, 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.

89. Jones CJ, Smith H, Llewellyn C (2014) Evaluating the effectiveness of health belief model interventions in improving adherence: A systematic review. Health Psychology Review 8: 253-269.

90. Kennedy S (2011) The role of diet in lowering blood pressure. Nursing Standard 25: 39-47.

91. Kotchen TA (2008) Obesity related hypertension? Weighing the evidence. Hypertension 52: 801-802.

92. Kuk JL, Ardern CI, Church TS, Sharma AM, Padwal R, Sui X, Blair SN (2011) Edmonton obesity staging system: Association with weight history and mortality risk. Applied Physiology, Nutrition & Metabolism 36: 570-576.

93. Kumanyika SK, Whitt-Glover MC, Haire-Joshu D (2014) What works for obesity prevention and treatment in Black Americans? Research directions. Obesity Reviews 4: 204-212.

94. Kushner RF, Sur DK (2014) Principles and no pharmacologic management of obesity in adults. Journal of Family Practice 63: S15-S20.

95. Lasserre A, Glaus J, Vandeleur CL, Marques-Vidal P, Vaucher J, et al. (2014) Depression with atypical features and increase in obesity, body mass index, waist circumference, and fat mass, a prospective, population-based study. JAMA Psychiatry 71: 880-888.

96. Leal Neto J, Barbosa AR, Meneghini V (2016) Diseases and chronic health conditions, multimorbidity and body mass index in older adults. Revista Brasileira de. Cineantropometria & Desempenho Humano 18: 509-519.

97. Lee RE, Mama SK, Adamus-Leach HJ (2012) Neighborhood Street scale elements, sedentary time and cardio metabolic risk factors in inactive ethnic minority women. PLOS One 7: 1-7.

98. Leung G (2013) Health impact of diet in minority ethnic groups. Practice Nurse 43: 26-29.

99. Levandovski R, Harb A, Bernardi F, Allebrandt KV, Hidalgo ML (2012) A chronobiological policy to decrease the burden of hypertension and obesity in low- and middle-income population.

Biological Rhythm Research 43: 81-102.

100. Ligibel JA, Alfano CM, Courneya KS, Demark-Wahnefried W, Burer RA, et al. (2014) American Society of Clinical Oncology position statement on obesity and cancer. Journal of Clinical Oncology 32: 3568-3571.

101. Looney SM, Raynor HA (2013) Behavioral lifestyle intervention in the treatment of obesity. Health Services Insights 6: 15-31.

102. Lynch CP, McTigue KM, Bost JE, Tinker LF, Vitolins M, et al. (2010) Excess weight and physical health-related quality of life in postmenopausal women of diverse racial/ethnic backgrounds. Journal of Women's Health 19: 1449-1458.

103. Markofski MM, Carrillo AE, Timmerman KL, Jennings K, Coen PM, et al. (2014) Exercise training modifies ghrelin and adiponectin concentrations and is related to inflammation in older adults, The Journals of Gerontology: Series A 69: 675-681.

104. Marmorstein NR, Iacono WG, Legrand L (2014) Obesity and depression in adolescence and beyond: Reciprocal risks. International Journal of Obesity 38: 906-911.

105. Martin MY, Person SD, Kratt P, Prayor-Patterson H, Kim Y, et al. (2008) Relationship of health behavior theories with self-efficacy among insufficiently active hypertensive African American women. Patient Education and Counseling 72: 137-145.

106. Mittler JN, Martsolf GR, Telenko SJ, Scanlon DP (2013) Making sense of consumer engagement initiatives to improve health and health care: A conceptual framework to guide policy and practice. Milbank Quarterly 91: 37-77.

107. Mohamed S (2014) Functional foods against metabolic syndrome (obesity, diabetes, hypertension and dyslipidemia) and cardiovascular disease. Trends in Food Science & Technology 35: 114-128.

108. Moreira PVL, Baraldi LG, Moubarac JC, Monteiro CA, Newton A, et al. (2015) Comparing different policy scenarios to reduce the consumption of ultra-processed foods in UK: Impact on cardiovascular disease mortality using a modeling approach. PLOS One 10: e0118353.

109. Müller MJ, Lagerpusch M, Enderle J, Schautz B, Heller M, et al. (2012) beyond the body mass index: Tracking body composition in the pathogenesis of obesity and the metabolic syndrome. Obesity Reviews 2: 6-13.

110. Murphy S (2014) Survival of the fattest: Why we're wrong about obesity. New Scientist 222: 44-47.

111. Niederdeppe J, Roh S, Shapiro MA (2015) Acknowledging individual responsibility while emphasizing social determinants in narratives to promote obesity-reducing public policy: A randomized experiment. PLOS One 10: 1-11.

112. Ockene IS, Ellez TL, Rosal MC (2012) Outcomes of a Latino community-based intervention for the prevention of diabetes: The Lawrence Latino diabetes prevention projects. American Journal of Public Health 102: 336-342.

113. O'Connor PJ, Martin B, Weeks CS, Ong L (2014) Factors that influence young people's mental health help-seeking behavior: A study based on the health belief model. Journal of Advanced Nursing 70: 2577-2587.

114. Oliveras A, de la Sierra A (2014) Resistant hypertension: patient characteristics, risk factors, co morbidities and outcomes. Journal of Human Hypertension 28: 213-217.

115. Pagoto S, Bodenlos JS, Kantor L, Gitkind M, Curtin C, et al. (2007) Association of major depression and binge eating disorder with weight loss in a clinical setting. Obesity Society 15: 2257-2259.

116. Palatini P, Saladini F, Mos L, Benetti E, Bortolazzi A, et al. (2013) Obesity is a strong determinant of hypertensive target organ damage in young-to-middle-age patients. International Journal of Obesity 37: 224-229.

117. Peabody KL, Pettit ML (2008) Theory smeary! An analysis of intrapersonal theories and models in health education. American Journal of Health Studies 23: 100-104.

118. Pearsall R, Smith D, Pelosi A, Geddes J (2014) Exercise therapy in adults with serious mental illness: a systematic review and meta-analysis. BMC Psychiatry 14: 117.

119. Perez Ferrer C, McMunn A, Rivera Dommarco JA, Brunner EJ (2014) Educational inequalities in obesity among Mexican women: Time trends from 1988-2012. PLOS One 9: e90195.

120. Persson PB, Bondke-Persson A (2013) Obesity: The BIG issue. Acta Physiologica 207: 1-4.

121. Petrogianni M, Kanellakis S, Kallianioti K, Argyropoulou D, Pitsavos C, et al. (2013) A multicomponent lifestyle intervention produces favourable changes in diet quality and cardio metabolic risk indices in hypercholesterolemia adults. Journal of Human Nutrition & Dietetics 26: 596-605.

122. Plotnikoff R, Morgan PJ, Lubans DR, Rhodes R, Costigan SA (2014) The intersection of theory, methods, and translation in guiding interventions for the promotion of physical activity: A case example of a research programme. Australian Psychologist 49: 110-126.

123. Ponce- Garcia I, Samarro-Ruida M, Carbayo-Herrensia JA, Division-Garrote JA, Artigao-Rodensas LM, et al. (2015) Prognotic value of obesity in both overall mortality and cardiovascular disease in the general population. PLOS One 10: e0127369.

124. Pratt LA, Brody DJ (2014) Depression and obesity in the U.S. adult household population, 2005–2010. NCHS Data Brief 167: 1-8.

125. Pretorius S, Stewart S, Carrington MJ, Lamont K, Sliwa K, et al. (2015) Is there an association between sleeping patterns and other environmental factors with obesity and blood pressure in an urban African population? PLOS One 10: 1-14.

126. Prochaska JO, DiClemente CC, Norcross JC (1992) In search of how people change: Applications to addictive behaviors. American Psychologist 47: 1102-1114.

127. Purkayastha S, Zhang G, Dongsheng C (2011) Uncoupling the mechanisms of obesity and hypertension by targeting hypothalamic IKK-b and NF-kB. Nature Medicine 17: 883-887.

128. Rahmouni K, Correia M, Haynes WG, Mark AL (2005) Obesity associated hypertension new insights into mechanisms. Hypertension 45: 9-14.

129. Ramachandran VS, Levy D, Benjamin EJ, Ellison RC, Johnson AD, et al. (2015) The Framingham heart study.

130. Remington PL, Wagner RC, Mark V (2010) Chronic disease epidemiology and control (3rded). Washington, DC: APHA Press.

131. Rubio-Valera M, Pons-Vigués M, Martínez-Andrés M, Moreno-Peral P, Berenguera A, et al. (2014) Barriers and facilitators for the implementation of primary prevention and health promotion activities in primary care: A synthesis through meta-ethnography. PLOS One 9: 1-13.

132. Sargent GM, Forrest LE, Parker RM (2012) Nurse delivered lifestyle interventions in primary health care to treat chronic disease risk factors associated with obesity: A systematic review. Obesity Reviews 13: 1148-1171.

133. Scarmo S (2014) Exercising the Truth: What works? What

doesn't? Nutrition Action Health Letter 41: 9-11.

134. .Shakudo M, Takegami M, Shibata A, Kuzumaki M, Higashi T, et al. (2011) Effect of feedback in promoting adherence to an exercise programme: a randomized controlled trial. Journal of Evaluation in Clinical Practice 17: 7-11.

135. Simonds SE, Pryor JT, Rayussin E, Greenway FL, Dileone R, et al. (2014) Leptin mediates the increase in blood pressure associated with obesity. Science Direct 159: 1404-1416.

136. Stacey FG, James EL, Chapman K (2015) A systematic review and meta-analysis of social cognitive theory-based physical activity and/or nutrition behavior change interventions for cancer survivors. Journal of Cancer Survival 9: 305-338.

137. Suggs LS, McIntyre C, Cowdery JE (2010) Overweight and obese sedentary adults' physical activity beliefs and preferences. American Journal of Health Studies 25: 69-77.

138. Sui Z, Turnbull DA, Dodd JM (2013) Overweight and obese women's perceptions about making healthy change during pregnancy: A mixed methods study. Maternal & Child Health Journal 17: 1879-1887.

139. Sumithran P, Prendergast LA, Delbridge E, Purcell K, Shulkes A, et al. (2011) Long-term persistence of hormonal adaptations to weight loss. New England Journal of Medicine 365: 1597-1604.

140. Sutherland ME (2013) Overweight and obesity among African American women: An examination of predictive and risk factors and weight-reduction recommendations. Journal of Black Studies 44: 846-869.

141. Sweeting HN (2007) Measurement and definitions of obesity in childhood and adolescence: A field guide for the uninitiated. Nutrition Journal 6: 632-639.

142. US Department of Health and Human Services, Centers for Disease Control and Prevention (2016) National Health and Nutrition Examination Survey.

143. Van Vliet-Ostaptchouk JV, Nuotio ML, Slagter SN, Doiron D, Fischer K, et al. (2014) The prevalence of metabolic syndrome and metabolically healthy obesity in Europe: A collaborative analysis of ten large cohort studies. BMC Endocrine Disorders 14: 9.

144. Whitt-Glover MC, Kumanyika SK, Haire-Joshu D (2014) Introduction to the special issue on achieving healthy weight in lack American communities. Obesity Reviews 15: 151-154.

145. Wingo BC, Carson TL, Ard J (2014) Differences in weight loss and health outcomes among African Americans and whites in multicentre trials. Obesity Reviews 15: 46-61.

146. Yanovski SZ, Yanovski JA (2014) Long-term drug treatment for obesity: A systematic and clinical review. JAMA 311: 74-86.