Hypertension Knowledge, Medication Adherence, and Self-efficacy Skills

Among African American Males in New York City

By

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Abstract

The effective management of hypertension required an individual to be knowledgeable about the disease, adhere to prescribed medications, and have the confidence to execute the behaviors necessary to manage the disease. The objective of the study was to assess knowledge of hypertension between Black American born and Black non-American born male patients, and to determine if there were association between self-efficacy skills and medication adherence among these hypertension men. The study sample consisted of African American/Black Male (n = 315) participants from 30 Community/ Migrant Health Centers (C/MHCs) in New York City. Secondary data was used from a larger clinical trial. Univariate and bivariate analyses were conducted using SPSS Package to determine factors that were attributed to medication adherence and self-efficacy. Younger age group (18-44 years) p = 0.62. There was no difference in hypertension knowledge by nationality or country of origin; p = 0.70. High school graduates or lower had similar hypertension knowledge scores compared to at least some College education; p = 0.96. There was no difference in hypertension knowledge by marital status, p = 0.91. This study is a call for action to help reduce overall morbidity and mortality relating to hypertension. It will bring awareness to policy makers to fund more hypertension programs in African American Communities and more research funding that will promote more patient education, adherence to medical treatment and consequently decrease the number of mortality and morbidity associated with uncontrolled hypertension among African American males.
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“Trust in the Lord with all your heart, and lean not on your own understanding, in all your ways acknowledge Him, and He shall direct your paths” Proverbs 3:5-6

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Chapter 1: Introduction

Hypertension is one of the most dangerous risk factors for heart disease (CDC, 2015). According to Delacroix (2014), 66.9 million Americans have high blood pressure, 36% of that population suffer from uncontrolled high blood pressure. Hypertension is considered a risk factor for cardiovascular diseases and premature mortality. Persell (2011) defines hypertension as “a systolic blood pressure $\geq 140$ mmHg or diastolic blood pressure $\geq 90$ mmHg (p. 18).” Nwankwo et al., (2012) state that the worldwide prevalence of hypertension is 40%, while in the U.S. the prevalence of high blood pressure 29.1%. Despite public health efforts to reduce the prevalence of hypertension and its subsequent health consequences among African Americans, significant efforts are needed to target African American males who are disproportionately affected. Knowledge of hypertension, self-efficacy skills, and medication adherence are some of the factors that might contribute to effective management of hypertension among African American males (Gbenga et al., 2003).

This chapter will provide a detail background of hypertension, prevalence of hypertension, racial/ethnic and gender disparities of hypertension, and morbidity and mortality that are linked to hypertension. Other topics that will be covered include hypertension knowledge and self-efficacy skills, medication adherence and non-adherence, relationship between self-efficacy and medication adherence, research question/hypothesis and the theoretical framework health belief model. Chapter two provides a thorough literature review of reasons for the disparities among African American males regarding hypertension. Chapter three focuses on the methodology of this study, it describes participants, and discusses data collection and analysis. Chapter four provides the analysis and results sections. Finally, chapter five summarizes this
research and recommend further research that is needed in the arena of African Americans who have uncontrolled hypertension.

**Prevalence of Hypertension**

Hypertension is a serious problem worldwide. According to World Health Organization ([WHO], 2003) hypertension affects 970 million people and about 68 million adults have high blood pressure. Globally the overall prevalence of hypertension in adults aged 25 and over was around 40% in 2008 (WHO, 2015). The age-adjusted prevalence of hypertension among U.S. adults aged 18 and over was 29% in 2011–2012 (Nwankwo et al., 2013). According to Fryar et al., (2006) the prevalence of hypertension is significantly higher among African Americans (45%) than among European Americans (29%). Since 2011, no change has occurred in the prevalence of hypertension, but disparities in the prevalence of hypertension among racial/ethnic groups are the highest among non-Hispanic black adults (CDC, 2011). Among NYC adults, the prevalence of hypertension was 26% and was similar for men and women (Angell et al., 2008).

**Racial/Ethnic and Gender Disparities of Hypertension**

Although hypertension affects every racial/ethnic group, studies have indicated that this disease disproportionally affects African Americans (CDC, 2014; Huntley et al., 2013). A national research conducted by Huntley et al., (2013) indicates that African American patients were 40% more likely to have high blood pressure in comparison to Caucasians, and 10% less frequent to control their blood pressure (Huntley et al., 2013). The American Heart Association (2013) indicates that the rates of hypertension were higher in men than in women until age 45, however after 65 years old this condition reverses and women are more likely to have this condition than men.
African Americans are the least adherent to either life changes or to prescribed medications due to low education level, in some cases illiteracy, poor relationship with health care providers, knowledge about medications and their side effects, psychological factors, social and socio economic support, access to health care, lack of health insurance, longer and ongoing treatment, and mainly a lack of individual responsibility for his/her health (Hajjar & Kotchen, 2000).

**Mortality and Morbidity of Hypertension**

Hypertension is a risk factor for heart diseases such as stroke and heart failure. High blood pressure contributed to approximately 45% of death in men and approximately 55% in women in the U.S. (Mozzafarian, 2009). Among this group, African American males had the highest rates for hypertension of 52% (Mozzafarian, 2009). High blood pressure is listed as the primary or contributing cause of death for 326,000 Americans in 2006 (CDC 2013). In 2010 it cost the United States $76.6 billion in health services, medications, and missed days of work (Lloyd-Jones et al., 2010). According to Ford et al., (2010) the age-adjusted prevalence of the death among African Americans connected to hypertension (HTN) is 31.8 % compared to 23.3 % for whites.

**Hypertension Knowledge**

The Department of Health and Human Services (HHS), and National Heart, Lung, and Blood Institute (NHLBI) (2007) state that more than 75% of Americans are aware that hypertension can lead to strokes and heart disease. Despite this knowledge, high blood pressure remains an important public health problem (Ong et al., 2007). Furthermore, many health care providers are not able to communicate a treatment plan for patients to understand and follow appropriately.
Self-efficacy Skills

Self-efficacy is confidence in one’s ability to perform certain behaviors that are necessary to achieve specific outcomes (Bandura, 1977). Self-efficacy skills are common elements in self-management programs intended to improve chronic illness (Du et al., 2010; Swendeman et al., 2009). In order to effectively manage hypertension, African Americans must feel confident in practicing the appropriate self-care behaviors. Among African American with hypertension, self-efficacy has been associated with self-report and objective measures of adherence to medication regimen (Kressin et al., 2007; Fernandez et al., 2008).

Individuals with good self-efficacy had significantly increased chances of being adherent to medication regimens, consuming low-salt diets, engaging in physical activity, not smoking, and utilizing common weight management strategies (Warren-Findlow et al., 2013). Ingersoll and Cohen (2008) states that, African American patients characterize diets as a very strict and difficult to comply with. Additional, studies have found that self-efficacy has been demonstrated to be a predictor of African Americans’ participation in other healthy behaviors such as diet and weight loss (Pawlak et al., 2009) as well as physical activity (Martin et al., 2005).

Medication Adherence

Medication adherence usually refers to patients’ ability to conform to a provider’s recommendation with respect to timing, dosage, and frequency of taking their medications as prescribed (Ho et al., 2009). Patients’ adherence to medical treatment usually depends on the relationship between the patient and the physician (Brown et al., 2011). The authors also mentioned that adherence to medication regimen is very
important in management of any disease as well as in improving the quality life of patients. Medication adherence is one of the barriers minority groups face in accomplishing optimal health care; yet, there is an inexplicably small number of studies examining methods to improve medication adherence for these groups (Hu et al., 2014). African Americans are more likely to complain of uncomfortable side effects from drugs, which may contribute to their low adherence (Bosworth et al., 2006). Manias et al., (2010) add that the influence of patients’ health beliefs, values, communication style, native language, lifestyle, social structure and support, and socioeconomic status must be taken into consideration when speaking about intervention to improve adherence. An intervention that is good for folks of one ethnicity may not be as effective for individuals of a different background (Manias et al., 2010).

**Medication Non-Adherence**

Luscher (2013) stated that medication non-adherence is a vitally significant health concern because it influences the quality of life and consequently can lead to disability and mortality, and also affects the productivity of the workforce. According to the American Heart Association, (2013) and Malmstrom et al., (2007) there are many factors affecting adherence to hypertensive medication regimen: knowledge of medication, long and ongoing treatment, education level, literacy, and poor relationship with health care provider, beliefs about medication and side effects, psychological factors, social support, socio-economics, access to health care, lack of health insurance, asymptomatic disease and inconvenience. Usually medication non-adherence is associated with increasing age, male gender, non-white race, lower income, obesity, smoking, cognitive impairment, disease burden, and lower social support (Briesacher, Gurwitz, & Soumerai, 2008). This
condition can also cause a financial burden on individuals, families, and health care workers (Schoenthaler et al., 2009). African American men between the ages of 18 and 49 years have the lowest rates of adherence, awareness, treatment, and control of high blood pressure of all age/race/gender groups in the United States (Malmstrom et al., 2007). Malmstrom et al., (2007) reported that 50-70 % of African-American men have been diagnosed with hypertension but failed to adhere to medication regimen or lifestyle modification. African American men are usually not convinced of the need for medication therapy. As a result, hypertension among African Americans has steadily increased over the years compare to whites (Martin, 2011).

**Relationship between Self-Efficacy and Medication Adherence**

Accurate medication adherence and self-efficacy to properly adhere to a regime are essential for every hypertensive patient (Breaux-Shropshire et al., 2012). The positive relationship between self-efficacy and medication adherence is one in which the patient is ready to follow the health care provider’s recommendations and realize that medication adherence will improve the disease outcome. The relationship between self-efficacy and medication adherence is especially important for Among African Americans whose self-efficacy medication adherence is quite low (Fernandez et al., 2011).

**Research Questions/Hypothesis**

Are African American U.S. born males more knowledgeable about hypertension than non-African American non-U.S. born males?

Ha: African American U.S. born males are more knowledgeable about hypertension than non-African American born U.S. males.
Ho: There is no difference in hypertension knowledge between African American U.S. born males their non-African American U.S. born counterparts.

2. Is there an association between patients’ self-efficacy skills and adherence to hypertensive medications?

Ha: There is positive association between self-efficacy skills and adherence to hypertensive medications.

Ho: There is no association between self-efficacy skills and adherence to hypertensive medications.

**Purpose Statement**

This thesis has two purposes: (1) to assess the knowledge of hypertension among African American male patients; and (2) to determine the association between self-efficacy skills and medication adherence among African American males who were diagnosed with hypertension in New York City (NYC).

**Theoretical Framework Health Belief Model**

The Health Belief Model (HBM) is the theoretical framework that will guide this research. The HBM suggests that a person's belief in a personal threat of an illness or disease together with a person's belief in their efficacy of the recommended health behavior or action will forecast the probability that the person will adopt the behavior. The HBM states that an individual's course of action often depends on the person's opinions of the benefits and barriers related to health behavior. There are six components
of the HBM. The first component of HBM is perceived susceptibility. This component assumes the person's personal perception of the risk of attaining an illness or disease. The second component of HBM is perceived severity. This component assumes a person's feelings on the significance of diminishing an illness or disease (or leaving the illness or disease untreated). The third component of HBM is perceived benefits. This component assumes a person's perception of the efficacy of various actions presented to lessen the threat of illness or disease (or to cure illness or disease. The fourth component of HBM is perceived barriers. This component assumes a person's feelings on the obstacles to perform a suggested health action. As the result, the person would assess the effectiveness of the actions against the perceptions that it may be costly, unsafe, time-consuming, or troublesome. The fifth component of HBM is cue to action. This component assumes the stimulus required to start the decision-making process to admit a recommended health action. These signals can be internal (chest pains, wheezing, etc.) or external (advice from others, illness of family member, The sixth component of HBM is self-efficacy which refers to the level of a person's assurance in his/her ability to successfully perform a behavior. Self-efficacy is a concept in many behavioral theories because it directly relates to whether a person accomplishes the chosen behavior.

This model is applicable to patient with hypertension if that patient wants to manage his/ her disease and develop the confidence to use the skills associates with management. For example, when the patient is diagnosed with hypertension, he/she will determine how severe the condition will impact their quality of life. Based on their perception on the severity of the illness, the patient will determine how the medication will benefit them and improve his/her quality of life. For example, to perceive the
benefits of the medication (if the patient hesitates about the quality of it) the health care provider or a pharmacist should explain the positive aspects of adhering to the medicine, information about the medicine at is relates to other patients’ outcome who took this medicine, and/or give instructions in taking the medication and discuss the time period in which it will take for the medication to take effect. As to the cues to action the patient may combine health care providers who will consistently reminding the patient of the necessity of taking the medicine, advising the patient to use a marked calendar in order to not to forget to take the medicine, or send periodic reminders via e-mail to the patient. Bowry et al., (2011) states that the patients who recognize high susceptibility, severity, benefit, and cue to action will have a higher adherence to medication compared to those who do not.

Definitions of Terms

*Cardiovascular disease:* Generally refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart attack, chest pain (angina) or stroke. Other heart conditions such as those that affect your heart's muscle, valves or rhythm, also are considered forms of heart disease (American Heart Association, 2011).

*Hypertension:* “Hypertension is defined as an elevated blood pressure in the arteries” (Huntley et al., 2013).

*Hypertension Knowledge:* is general understanding a person has about hypertension.

*Intervention:* A set of actions that promote change (CDC, 2011).

*Lifestyle Modification:* Eliminating old behavior and adapting to new behavior change (WHO 2009).
Medication Adherence/Compliance: Medication adherence usually refers to whether patients take their medications as prescribed as well as whether they continue to take a prescribed medication (Ho et al., 2009).

Medication Non-adherence/Non-Compliance: is the number of doses not taken or taken incorrectly that jeopardizes the patient's therapeutic outcome (Ho et al., 2009).

Self-Efficacy: Self-efficacy is confidence in one’s ability to perform certain behaviors that are necessary to achieve specific outcomes (Bandura, 1994).

Assumptions, Limitations, and Delimitations

Assumptions

I assumed that the participants were able to read and understand questions correctly and also provided accurate information concerning their knowledge and self-efficacy skills on hypertension. It is my assumption that the health educators received proper training to conduct research and to properly take participants blood pressure.

Limitations

This study design was specifically limited to African Americans/Black males who were at least 18 years old, speak fluent English, received care at their primary physician for at least 6 months. Participants must be diagnosed with hypertension, have uncontrolled blood pressure and take at least one antihypertensive medication.

Delimitations

The sample size for this study were 315 participants who had been receiving care for the past 6 months, from 30 community health care centers in New York. Participants
had to identify themselves as African Americans or Black. Patients who did not speak English were excluded from the study. Participants must be diagnosed with hypertension, have uncontrolled blood pressure and taking at least one antihypertensive medication.

**Significance of the Study**

Hypertension is a risk factor for many diseases and conditions that affect the body, especially diseases related to the cardiovascular system (AHA, 2012; Rosebdorf et al., 2007). Rosendorff et al., (2007) mentioned that hypertension is a key independent risk factor for the development of coronary artery disease, stroke, and renal failure. The AHA (2012) also states that high blood pressure damages kidneys, limbs, and eyes. High blood pressure may also damage the circulatory system causing the arteries to be susceptible to damage. Tightened arteries or a blood clot can briefly block the movement of blood to the brain, which can cause an ischemic attack (TIA), or mini stroke. AHA (2012) adds that high blood pressure is a significant risk factor for mild cognitive impairment and vascular dementia. Contracted blood vessels restrict the blood supply, as the result, the kidneys become less and less capable of removing toxins (AHA, 2012). Sexual dysfunction in both men and women is another result of high blood pressure. High blood pressure can cause erectile dysfunction (ED), painful ejaculation, and impotence (AHA, 2012). Bones can become weak, fragile, and more predisposed to fractures and breaks.

Hypertension and its complications have an enormous impact on the health care system. According to Mozzafarian et al., (2015), in the United States the total direct and indirect costs related to high blood pressure in 2011 were $46 billion. These costs
included health care services, medications, and working disability. Approximately one-half of the total cost was spent on prescription drugs alone.

Public health efforts have failed to reach the goal of Healthy People 2010 in improving high blood pressure among African Americans (Davis, 2000). This population continues to experience uncontrolled blood pressure (Wang, 2005). Based on the aforementioned, it is imperative to continue to bring awareness of this disease and to enable and empower members of the community with knowledge and tools to prevent hypertension. This study has potential to raise awareness to U.S government agencies for funding programs to African American communities and promote more patient education to reduce hypertension and subsequently reduce other complications due to hypertension among African Americans males.
Chapter 2: Literature Review

Background of Hypertension

Hypertension is a very serious risk factor for heart disease and stroke. It is the primary reason of heart mortality, and the fourth leading cause of mortality in the U.S. (CDC2010). Hypertension is the cause of death of approximately 30% of adults in the US (CDC, 2002). Hypertension prevalence increases with age and drops with increasing income level (Gillespie and Hurvitz, 2013). In 2007–2010, high blood pressure prevalence among the adult population aged ≥18 was 27% while the age-adjusted prevalence of hypertension control was 48% (Yoon et al., 2013). Individuals who are 65 and older are among those with the highest rate of hypertension (72%), (Gillespie and Hurvitz, 2013)

Prevalence of Hypertension

De Lima et al., (2011) state that African Americans are at a greater risk of hypertension; they are less inclined for optimal blood pressure with more negative outcome than that of white population. Age group, race/ethnicity, educational level, country of birth, family income, health insurance, diabetes, obesity, and disability status are the motives for the significant differences in the dominance of hypertension (Kreatsoulas, 2010). Controlled hypertension has nothing to do with age, educational attainment, or income level (National Heart, Lung, and Blood Institute, 2003 & Bertoia et al., 2012). Since 1960, non-Hispanic African American adults are most susceptible for high blood pressure mortality (CDC, 2005–2008, 2011, 2012, & 2013). According to
Beroia et al., (2012) Non-Hispanic African American had a higher rate of hypertension (41%) than non-Hispanic whites (29%) and Hispanics (28%). According to Gillespie and Hurvitz (2013) adults born in the U.S. had a higher rate of hypertension (31%) than non-U.S. born adults (26%).

According to Warren-Findlow et al., (2011), to manage any chronic disease, including hypertension, one has to take care of his/her self. Bosworth, H. B., & Oddone, E. Z. (2002) believe that self-efficacy is especially important to hypertension self-care. Self-efficacy is also closely related with antihypertensive medication adherence (Fernandez et al., 2008 and Schoenthaler et. al., 2009) because if individuals do not have the skills to successfully medicate themselves, they may not take the medications as prescribed. It is very important to mention that self-efficacy is a changeable characteristic and, consequently, is open to intervention (Leventhal et al., 2008 & Marks et al., 2005).

Most African Americans males are sure that hypertension is curable (Schoenthaler 2012), and its outcome depends on the hypertensive patients’ adherence to the prescribed medications. Warren-Findlow et al., (2011) believe that, self-efficacy of hypertension is closely associated with the hypertensive patients’ adherence to at least five or six prescribed medications and the knowledge about regular blood pressure control will decrease their blood pressure. Based on the information presented by U.S. Department of Health and Human Services (2004), the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) state that hypertensive individuals are engaged in six self-care activities such as adhering to antihypertensive medication regimens, maintaining or losing weight, following a low-salt

Fryar et al. (2010) state that African Americans are more inclined to hypertension than their white peers (45.2% versus 29.1%) while Howard et al., (2006) believe that African Americans are less likely to control their blood pressure than the Whites because of the poor medication adherence to the prescribed medications and poor adherence to self-care behavior, health disparities between African Americans and Whites (Bosworth et al., 2008). Kressin et al., (2007) mention that African Americans are more often prescribed more medications than their white counterparts, and they more often complain about the side effects, which might influence their low adherence (Bosworth et al., 2008).

Fernandez et al., (2008) believe that hypertension is the most prevalent chronic disease in the U.S. and it indicates the racial disproportion of mortality between African Americans and whites (American Heart Association, 2006). Fernandez et al., (2008) presented information published by Centers for Disease Control Prevention (2005) which states that African Americans have a higher percentage of hypertension than the whites Americans (40% vs. 28%). Yet, only 30% of African Americans are most likely to control their blood pressure while the number of whites Americans comprised 35% (Hertz et al., 2005). According to the World Health Organization (2003) African Americans also show low medication adherence (50–70%). Bosworth et al., (2006); Burt et al., (1995) state that poor African Americans’ adherence to blood pressure (BP) control
is responsible for excessively higher rates of poor hypertension-related outcomes in comparison to the white Americans. According to Allegrante and Marks (2003) & Catz et al., (2000), hypertensive patients who demonstrate positive self-efficacy also demonstrate their adherence to a variety of health-related behaviors such as dietary recommendations, exercise regimens, and self-management behaviors.

Fernandez et al., (2008) contends that there is still a lack of material that would clearly describe the significance of self-efficacy and its influence on the behavior of the patients with chronic diseases, especially hypertensive African Americans. In connection with this problem, Ogedegbe et al., (2003) stated that “we developed and evaluated the reliability of Medication Adherence Self-Efficacy Scale (MASES) in hypertensive African American patients.” According to Ogedegbe et al., (2003), MASES was created to measure efficacy beliefs concerning patients’ adherence to prescribed anti-hypertensive medications. The quality and the reliability of the MA-SES were tested in a sample of 72 hypertensive African Americans (Ogedegbe et al., 2003).

This group of scientists also creates a shortened variant of MASES called the MASES-R, which consists of 13 items that measure patients’ opinions of their ability to follow the prescribed anti-hypertensive medications according to the variety of existing situations. Twelve out of 13 items examined patients’ confidence in a variety of the situations such as being busy at home, or with patients who show no symptoms of the disease, traveling, and etc. and their ability to adhere to the prescribed medications as a part of their daily routine. Alongside with the original MASES, the MASES-R also demonstrates psychometric properties. One of the main advantages of the MASES-R is
its ability to focus on special situations within which patients’ self-efficacy may show different results (Ogedegbe et al., 2003).

The Percentage of Morbidity and Mortality

According to the American Heart Association (2013), in 2009, 61,762 individuals died because of high blood pressure listed as the primary cause of death, out of them there were 20,286 white males, 6,574 black males, 26,201 white females, and 6,951 black females. According to the same source, from 1999 to 2009 the death rate from high blood pressure increased 17.1 percent, and the actual number of deaths rose to 43.6 percent. The rate of the morbidity and mortality is so high that Healthy People 2020 decided to decrease the high blood pressure frequency among adults to 26.9% and to increase the prevalence of high blood pressure control amongst adults with hypertension to 61.2% (CDC, 2013).

Definition and Classification of Hypertension

Center for Disease control defines “High blood pressure as a common condition in which the force of the blood against your artery walls is high enough that it may eventually cause health problems, such as heart disease” Borghi et al., (2011) stated that the types and the four stages of hypertension, primary or essential hypertension, and secondary hypertension. In primary hypertension, the blood volume in the body is abnormally high and gradually develops over the years. The risk factors associated with essential hypertension include ethnicity (mostly African Americans), 35 years of age and old, family history of hypertension, high salt intake, stress, insulin resistance, low physical activity, obesity, smoking, alcohol consumption, and aging process.
Secondary hypertension is caused by pre-existing conditions such as chronic kidneys disease or endocrine system impairments (American Heart Association, 2014). Hypertension is often called a “silent killer” because many people have it and don’t know about it. That’s why regular BP control is vitally necessary if you want to live a long healthy life. De Lima et al., (2011) state that African Americans are at a greater risk of hypertension; they are less inclined for optimal blood pressure with more negative outcome than that of the white population.

In the Journal of Clinical Hypertension (Giles, 2005) which is newly labeled as the "official" journal of the American Society of Hypertension (ASH), defines hypertension as “a progressive cardiovascular syndrome, arising from complex and interrelated etiologies. Early markers of the syndrome are often present before blood pressure elevation is observed; therefore hypertension cannot be classified solely by discrete blood pressure thresholds. Progression is strongly associated with functional and structural cardiac and vascular abnormalities that damage the heart, kidneys, brain, vasculature, and other organs, and lead to premature morbidity and death” (Giles, 2005). ASH classifies four forms of hypertension, “normal” and three others (Chobanian et al., 2003). According to ASH, Stage 1 includes the patients who were earlier classified by the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) as pre-hypertensive; they do have cardiovascular risk factors or earlier signs of disease, but their heart is not damaged. Their blood pressure levels are usually between 120/80 mm Hg and 139/89 mm Hg. Stage 2 includes hypertensive patients whose BP is ≥ 140/90 mm Hg and/or who have two or more disease signs or evidence of early organ damage. Stage 3 includes
hypertensive patients whose BP is $\geq 140/90$ mm Hg and/or clinical proof of obvious organ damage or CVD or have suffered cardiovascular diseases. Yet, there exist different opinions concerning the “new” definition. Koslis et al., (2005) believe that “new” definition is more exact and essential because it presents a more complete picture of hypertension. According to the author, using JNC 7 classification was challenging for physicians because they have to think of separate risk factors besides high blood pressure, for example cholesterol and diabetes. However, Materson (2005), though thinking that the new definition is “noble,” acknowledges that such definition is rather complicated and that’s why difficult for the physicians to make proper treatment decisions (Materson, 2005).

**How is hypertension diagnosed and measured**

Usually, blood pressure is presented in two numbers, the top, systolic and the bottom, diastolic. Systolic pressure shows the pressure when the heart is beating while diastolic pressure indicates when the heart is resting between beats. American Heart Association (2014) considers that normal blood pressure is below 120/80 mm Hg. Adults who have systolic BP from 120 to 139 and diastolic BP is 80 to 89 (or both) are considered to be “pre-hypertensive.” Those patients who have a systolic pressure of 140 systolic or higher and/or 90 diastolic or higher that stay high over time are considered to be “hypertensive” (American Heart Association, 2014)

**Factors related to non-adherence**

According to Jin et al., (2008) there are a number of factors that are related to therapeutic non-compliance. These factors may be divided into patient-centered factors,
therapy-related factors, social and economic factors, healthcare system factors, and disease factors. Jin et al. (2008) admit that the impact of some of these factors is undisputable, while others’ might cause contradiction.

**Prevalence of non-adherence**

Fischer et al., (2010) state that non-adherence to even basic medications have become a significant public health problem. Numerous studies reveal that newly prescribed medications necessary for the treatment of the diseases such as chronic hypertension (28.4%), hyperlipidemia (28.2%), and diabetes (31.4%) are identified as not adherent (Fischer et al., 2010). The numbers of morbidity and mortality in chronic diseases are closely associated to medication non-adherence (Ho et al., 2006; Sokol et al., 2005). Last decade reports state that many people stop taking medications just after filling the first prescription (WHO, 2003) which is identified as “primary adherence” and is considered to be a very important step because taking medicines at the beginning of treatment for both acute and chronic diseases is vitally necessary (Andrade et al., 2006). For example, Vrijens et al., (2008) found out that about 50% of hypertensive patients stop taking antihypertensive medications within one year since the initial prescription. Vrijens et al., (2008) also state that on any one day, hypertensive patients omit approximately 10% of the prescribed doses of hypertensive medications. Scientists speak of different reasons of medication non-adherence, as for example intentional and non-intentional. Intentional non-adherence is an active process when the patient deliberately chooses to drop taking medications himself (Lowry et al., 2005). Unintentional non-adherence is passive in which patients most likely to be either careless or forgetful about adhering to the treatment regimen (Vrijens et al., 2008). According to
CDC’s Noon Conference (2013), non-adherence causes approximately from 30% to 50% of treatment failures and 125,000 deaths annually. Non-adherence to statins increases the virtual risk for mortality from 12% to 25%.

In addition, non-adherence to cardio protective medications increased risk of cardiovascular hospitalizations (10% to 40%) and mortality (50% to 80%). Poor adherence to heart failure medications increase the number of cardiovascular-related emergency department visits. CDC’s Noon Conference (2013) informs that from 20% to 30% patients never fill the prescribed medication, and 50% of patients do not make refills of the prescribed medications. According to American Heart Association (2014), almost half of 187 million of American patients do not take prescribed medication. It means that are not adhered to the drug regimen. According to National Health and Nutrition Examination Survey, African Americans have the highest prevalence of hypertension in the United States, which is almost 32% of the adult population (Center for Disease Control and Prevention/National Center for Health Statistics, 2000). With that, the sixth report of the Joint National Committee on Prevention Detection (1997) state that African Americans’ poor adherence to prescribed antihypertensive medications is the main obstacle on the way to regular blood pressure control and, consequently, to a healthy life.

**Prevalence of adherence**

Medication adherence is usually understood as whether patients take their medications regularly as they are prescribed as well as they continue to take them for a
needed period of time. Medication adherence behavior can be divided into two main concepts: adherence and persistence; adherence denotes the amount of drugs used during a certain period of time while persistence means far-reaching duration of drug therapy (Caetano et al., 2006 & Cramer et al., 2008). Patients with high BP who regularly take prescribed medications constitute 72% and those with gout only 37% (Briesacher et al., 2008).

Medication adherence is of special attention to clinicians, healthcare systems, and other investors because the numbers of medication non-adherence is rampant and very much related to the adverse outcomes and higher costs of care (Osterberg et al., 2005). In Gurwitz et al., (2003) opinion, the situation with medication adherence in the US is especially serious because the U.S. populations are getting older and have to take more medications to treat chronic diseases. Only 51% of Americans treated for hypertension are adherent to their long-term therapy (CDC’s Noon Conference, 2013). Scientists mention different reason of poor adherence such as poor communications between healthcare providers and patients, fear of side effects, high medication costs, interaction with other prescriptions, and simple forgetfulness (National Council on Patient Information and Education, 2013). Medication adherence is necessary for the patients who suffer chronic diseases such as diabetes, heart disease and cancer. According to US Centers for Disease Control and Prevention (2008), approximately one in two Americans have chronic disease, and to treat such patients, the government spends three out of every four on medical expenses. To improve patients’ attitude towards the prescribed medication, it is absolutely necessary to encourage adherence to prescribed medications,
and to avoid costly emergency department visits and hospitalizations (American Heart Association, 2009).

To close the adherence gap means to improve the quality of health care, to stimulate better chronic care supervision, and to promote better health outcomes. Some researchers came to the conclusion that adherence proportions during the first year of therapy across a range of chronic medical conditions are usually treated with conservation therapy (Briesacher et al., 2008). Claxton et al., (2001) add that electronic monitoring studies show that even chronically sick patients who regularly make refills of their prescriptions take only half of their doses. Claxton et al., (2008) also state that adherence is in close proportion to the number of times a patient must take their medicine each day. The average adherence for the patient who take their medication only once a day constitute approximately 80% in comparison to about 50% for those patients who have to take medications four times a day (Briesacher et al., 2009). Gwadry-Sridhar et al., (2009) admits that patients are more ardent to taking their medication a day before or after seeing their physician. (Pan et al., 2008) inform that several studies have proved that medication adherence increase by almost 13% if patients take a fixed-dose combination of two diabetes medicines in comparison to those who take two separate diabetes medicines. The same can be said about hypertensive patients, the adherence to hypertensive medications rises to 80% if patients take a fixed-dose combination and less than 70% will adhere to hypertensive medications if they take two separate medicines.

Side effect is another fact that reduces medication adherence. Patients who report that they have side effects are 3.5 times less likely to be adherent to medication. And on
the contrary, hypertensive patients who don’t feel any side effects have significantly better adherence for over a four-year period (Conlin et al., 2001). Even commercially insured patients who are treated for hypertension indicated significantly better adherence among the patients who take angiotensin receptor blockers (ARBs) than among those taking several other types of antihypertensive medicines, despite a considerably higher out-of-pocket payment for ARBs (Taira et al., 2006).

Poor adherence to antihypertensive medications can bring either adverse results such as stroke or myocardial infarction (Chobanian et al., 2003; Munger et al., 2007) or can make primary physician increase the dosage of antihypertensive medications or add additional antihypertensive medications. With that, Ogedegbe et al., (2003) Elliott Wj et al., (2008), Kressin et al., (2007) admit that there are many barriers to drug adherence such as a higher number of antihypertensive agents, annoying adverse effects, low socioeconomic status, and private beliefs concerning the treatment of hypertension. Munger et al., (2007) believe that such aspects as female gender, younger age, higher education, higher socioeconomic status, and fewer antihypertensive drugs are related to higher rates of medication adherence.

**Does self-efficacy help or hinders adherence to medication adherence?**

Munger et al., (2007) and Ogedegbe et al., (2004) state that some studies have confirmed the argument that self-efficacy have a positive effect on medication adherence. According to Bandura et al., (1995) self-efficacy means the ability of patients to take their medications under different circumstances –whether they travel, do not feel well, or have undesirable effects and have an ability to make themselves take their medications as
an everyday habit. Ogedegbe et al., (2004) also inform that there exists evidence “that higher levels of self-efficacy or social support can improve drug adherence.” Self-efficacy is known to be a good predictor of a wide choice of health behaviors” (Gbenga et al., 2003)
Chapter 3: Methodology

**Description of the CAATCH trial**

The original researcher used a longitudinal prospective study and a cross sectional survey which will be my main focus. The study was based on Counseling African Americans to Control Hypertension (CAATCH) trials in New York City that consist of five multi-level interventions which were divided in two components; 3 components interactive computerized hypertension education, home BP monitoring, and monthly behavioral counseling on lifestyle modification after a detection survey was collected. There were 315 African American men chosen from 30 Community/Migrants Health Centers that met the criteria.

**Sampling Method**

There were 315 hypertensive African American participants randomly selected from 30 Community/ Migrant Health Centers (C/MHCs). These participants were at least 18 years of age, spoke fluent English, visited their primary physician for at least 6 months, took at least one antihypertensive medication, and have uncontrolled blood pressure. The participants who met the required criteria had to go through a onetime interview and preliminary examination. Blood pressure was taken by using a BP monitor. All participants gave their written consent to take part in the study, which was approved by the New York University Medical Center Institutional Review Board (NYUIRB).

**Research Design/ Procedures**
This is a quantitative, cross-sectional study that used secondary data that was collected by the original researchers. The data were collected from a case detection survey that was used to provide a multi-level intervention for African-American/Black males to improve their blood pressure. The cross sectional survey was used because it can provide a snapshot of different groups at one time (Baumgartner and Hensley, 2013). This study analyzed a set of factors that may be linked with medication adherence and self-efficacy among African American/black men.

Participants

The original researcher included 315 participants in the study. Participants have to be at least 18 years old or older, have been diagnosed with hypertension, have uncontrollable blood pressure, taking at least one antihypertensive medication, and have visited the clinic twice during the past year.

Inclusion

The original study utilized a community health center in which 25% of its patients reported that they were African American/black. The study sample participants comprised a total of 315 individuals between the ages of 18 and 65 years. In addition study participants were African American/blacks, spoke fluent English, and received care at their primary physician for at least 6 months. Participants must have been diagnosed with hypertension, have uncontrolled blood pressure and taking at least one antihypertensive medication.
Exclusion

People who do not speak English, unable to or unwilling to complete a screening, and those who did not want to provide informed consent. Those who were unable to complete screening and standard assessments were excluded from the study. People were also excluded if they participated in a previous hypertensive study and if the circumference of the arm was greater 42 cm.

Data Collection Method

The data collection method deployed in this study is the survey. Survey research, acquires information about one or more groups of people, is used to attain information regarding why African men are not compliant with hypertensive medication and lifestyle modification to help reduce or manage disease. Lack of knowledge, health beliefs, myth, education level and misconception about the disease, lack of resources, support groups and culture were measured. Survey research is one of the most commonly used forms of research in the field of medicine and health care. The model that was used for this study is a quantitative study using linear regression to determine if there is a relationship between non-adherence and patients’ cultural beliefs of health care services. This study used questionnaires that created flexibility for reaching a larger sample size as shown in similar research. Questionnaires were submitted by health care professionals with the intention to increase the likelihood of response rates and provide easy accessibility for participants. Finally, this format was less time consuming. Results remained uncontaminated in a secured database and generated significant results.
Measures

**Dependent Variables**

Hypertension knowledge is the general understanding a person has about high blood pressure was measured in the CAATCH trial using a new 17-item questionnaire of high blood pressure (attached in Appendix 1). It was meant to give an indication of knowledge at a point in time in the trial. Participants who completed the intervention study were accessed to determine their understanding of hypertension.

**Medication Adherence**

Medication Adherence was assessed using a five-item scale developed by Morisky et al., (1986). The Morisky scale is a simple and practical tool that provides immediate feedback on patient treatment adherence behavior and the psychosocial and biological factors that may lead to or sustain poor adherence. It asks patients to respond “yes” or “no” to the following questions: “Over the past week, have you taken your blood pressure medication as you should on schedule?” Do you ever forget to take your medicine?” “Are you careless at times about taking your medicine?” When you feel better do you sometimes stop taking your medicine?” and “Sometimes if you feel worse when you take the medicine, do you stop taking it?” Participants were coded on a dichotomous scale (adherent or non-adherent). If they responded “no” to all items, they were considered as “adherent,” and if they responded “yes” to one or more items, they were considered “non-adherent.” Score of 0= High adherence; Score of 1-2= Medium adherence; score of 3-5= low adherence.
Self-efficacy was assessed with the Medication Adherence Self-Efficacy Scale (MASES) (Ogedegbe et al., 2003). This is a 26-item questionnaire that is used to assess patients’ confidence in their ability to take their antihypertensive medications in a variety of situations. For example, participants were asked how sure they are about taking their blood pressure medications “when there is no one to remind you,” “when you do not have symptoms,” “when you have other medications to take,” and their ability to “fill your prescriptions whatever they cost.” Items are scored from 1 to 4, with 1 meaning not at all sure and 4 meaning extremely sure. A total score on the measure was computed by averaging across responses to all items. Higher scores indicated a greater level of self-efficacy. By measuring efficacy at 2 or more time periods, the scale is also useful to measure how a patient’s personal life events (emotional, occupational, behavioral, illness or health concerns) have affected self-efficacy over time.

**Independent Variable**

Hypertension was the independent variable. The researchers used a trained research assistant to take blood pressure readings from the patients. Upon each visit, patients took three consecutive blood pressure readings. BP should normally be less than 120/80 mm Hg (less than 120 systolic and less than 80 diastolic) for an adult age 20 or over (American Heart Association, 2015).

**Covariates**

Covariates are secondary variables that may impact the outcome of the study. In this study, I used age, country of origin, and education level of the participants.
Data analysis

Different categorical variables of frequency and percentage distributions were used to create patient characteristics. Furthermore, the means and standard deviations were reported as the values for continuous variables. For additional impact the graded regression were used to determine if other independent factors were also causing medication adherence. Univariate analyses were used to provide a breakdown of participants’ age, marital status, nationality and educational level. Bivariate analyses were used to determine factors that are attributed to medication adherence and self-efficacy. Linear regression used appropriately to determine correlation among the variables. A demonstration of a 2-tailed P value ≤ 0.05 had a statistical importance. All analyses were performed by using Statistical Package for the Social Sciences, Version 20 software (SPSS Inc., Armonk, NY, USA).

Ethical Consideration

Approval for this study was obtained from New York State University (NYU) School of Medicine Department of Population Health, Institutional Review Board responsible for Human Subjects in research. The study was supported by the National Heart, Lung, and Blood Institute (NHLBI)/Grant #: R01 HL78566 (PI: Ogedegbe). Participants name, and personal information were excluded from the survey, participants were identified by generic code. Participants signed the informed consent afterwards they are stored in locked offices under locking file cabinets only researchers will have access to information.
Chapter 4: Data Analysis

The purpose of Chapter 4 is to present the results of the study. The demographic data include age, nationality, education, and marital status and the dependent variables are hypertension knowledge, and medication adherence and self-efficacy of 315 African American males who are diagnosed with high blood pressure.

**Research Questions/Hypothesis**

Research Question 1
Are black American-born males more knowledgeable about hypertension than black non-American-born males?

Ha: American-born males are more knowledgeable about hypertension than non-American males.

Ho: There is no difference in hypertension knowledge between black males born in American and their non-American-born counterparts.

Research Question 2
Is there an association between patients’ self-efficacy skills and adherence to hypertensive medications?

Ha: There is an association between self-efficacy skills and adherence to hypertensive medications.

Ho: There is no association between self-efficacy skills and adherence to hypertensive medications.
Demographic Characteristics of the Participants

A total of 315 African American/Black males participated in this study. Figure 1 shows the ages of the participants. Most of the study participants (64.4%) were between ages 45 and 64 years old; approximately 25% were 65 years and older, and 14% were between ages 18 to 45 years.
The population consisted of 75% American-born males (Figure 2). The remaining participants originated from countries such as Dominican (2%), Haiti (7%), Jamaica (16%), Multi-Nationality (3%), Other Central or S. American (8%), Other West Indian/Non-Latino Caribbean (6%), Puerto Rican (6%), Trinidadian (5%) and Unknown Nationality (17%). Table 1 shows the details of the participants by nationality.

Table 1
Population Description by Nationality

<table>
<thead>
<tr>
<th>Variable</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>220 (75.9)</td>
</tr>
<tr>
<td>Dominican</td>
<td>2 (0.7)</td>
</tr>
<tr>
<td>Haitian</td>
<td>7 (2.4)</td>
</tr>
<tr>
<td>Jamaican</td>
<td>16 (5.5)</td>
</tr>
<tr>
<td>Multi-Nationality</td>
<td>3 (1.0)</td>
</tr>
<tr>
<td>Other Central or S. American</td>
<td>8 (2.8)</td>
</tr>
<tr>
<td>Other West Indian/Non-Latino Caribbean</td>
<td>6 (2.1)</td>
</tr>
<tr>
<td>Puerto Rican</td>
<td>6 (2.1)</td>
</tr>
<tr>
<td>Trinidadian</td>
<td>5 (1.7)</td>
</tr>
<tr>
<td>Unknown Nationality</td>
<td>17 (5.9)</td>
</tr>
</tbody>
</table>
Figure 2.

Figure 2a. Participant Description by Nationality
The marital status of the participants is documented in Figure 3. Majority of the participants were married (34%), never married (29%), divorced (18%), separated (15%), and widowed (4%). Most of the participants had a high school diploma or vocational
education or less (71%), while 29% had some college degree or more.

Seventy-one percent (71%) of the participants had high school education or less, while 29% had some college degree (Figure 4).
## Bivariate Analysis of Hypertension Knowledge vs. Covariates

### Average Hypertension Knowledge Score vs. Age, Nationality, Marital Status, and Education

<table>
<thead>
<tr>
<th>Age Category</th>
<th>Mean HK (± SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young age (18-44 years)</td>
<td>15.3 (± 1.43)</td>
<td>0.62</td>
</tr>
<tr>
<td>Middle Age (45-64 years)</td>
<td>15.0 (± 1.55)</td>
<td></td>
</tr>
<tr>
<td>Older Age (≥ 65 years)</td>
<td>15.1 (± 1.79)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nationality</th>
<th>Mean HK (± SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>15.1 (± 1.53)</td>
<td>0.70</td>
</tr>
<tr>
<td>Dominican</td>
<td>15.5 (± 0.71)</td>
<td></td>
</tr>
<tr>
<td>Haitian</td>
<td>14.7 (± 0.76)</td>
<td></td>
</tr>
<tr>
<td>Jamaican</td>
<td>15.2 (± 1.60)</td>
<td></td>
</tr>
<tr>
<td>Multi</td>
<td>13.5 (± 3.54)</td>
<td></td>
</tr>
<tr>
<td>Other Central or S. American</td>
<td>14.9 (± 1.95)</td>
<td></td>
</tr>
<tr>
<td>Other West Indian/ Non-Latino Caribbean</td>
<td>14.3 (± 3.59)</td>
<td></td>
</tr>
<tr>
<td>Puerto Rican</td>
<td>14.5 (± 1.52)</td>
<td></td>
</tr>
<tr>
<td>Trinidadian</td>
<td>15.8 (± 0.96)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>15.8 (± 1.26)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Mean HK (± SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>15.1 (± 1.71)</td>
<td>0.91</td>
</tr>
<tr>
<td>Divorced</td>
<td>14.9 (± 1.78)</td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td>15.1 (± 1.30)</td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td>15.2 (± 1.48)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>15.5 (± 0.93)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Mean HK (± SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School/Technical Certification or less</td>
<td>15.1 (± 1.633)</td>
<td>0.96</td>
</tr>
<tr>
<td>Some College to Graduate</td>
<td>15.1 (± 1.41)</td>
<td></td>
</tr>
</tbody>
</table>
The hypertension knowledge score ranged from 0 -17. There was no statistical difference between hypertension knowledge and the covariates (age, nationality, marital status, and educational level). However, younger age group (18-44 years) had greater knowledge of hypertension (15.3), compared to middle aged and older patients (p=0.62). Trinidadians and people who identified their national origin as “unknown” nationality had the highest hypertension knowledge score (both 15.8), while those who with the lowest hypertension knowledge score identified themselves as multi-nationality and Other West Indian/Non-Latino Caribbean nationality were 13.5 and 14.3 respectively (p = 0.70). High school graduates or lower had similar hypertension knowledge scores (15.1) compared to at least some College education (p=0.96). Widowed males had a slightly higher hypertension knowledge score (15.5) than males with other marital status (p = 0.91).
Table 2. Medication Adherence vs. Age, Nationality, Marital Status and Education

<table>
<thead>
<tr>
<th>Age Category</th>
<th>High Adherence % (Morisky Score=0)</th>
<th>Medium Adherence % (Morisky Score= 1-2)</th>
<th>Low Adherence % (Morisky Score= 3-5)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-44 years</td>
<td>0</td>
<td>6.9</td>
<td>6.2</td>
<td>0.01</td>
</tr>
<tr>
<td>45-64 years</td>
<td>2.6</td>
<td>45.5</td>
<td>18.2</td>
<td></td>
</tr>
<tr>
<td>≥ 65 years</td>
<td>0</td>
<td>18.6</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American</td>
<td>2</td>
<td>70</td>
<td>28</td>
<td>0.03</td>
</tr>
<tr>
<td>Jamaican</td>
<td>7</td>
<td>73</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Other West Indian/ Non-Latino Caribbean Trinidadian</td>
<td>0</td>
<td>83</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Puerto Rican</td>
<td>0</td>
<td>83</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Haitian</td>
<td>0</td>
<td>71</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Other Central or S. American Multi</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Dominican</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>0</td>
<td>20.7</td>
<td>7.6</td>
<td>0.15</td>
</tr>
<tr>
<td>Divorced</td>
<td>0.7</td>
<td>23.2</td>
<td>10.1</td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>0.4</td>
<td>14.1</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td>1.5</td>
<td>10.5</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>0</td>
<td>2.9</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School/or less</td>
<td>3.1</td>
<td>73.9</td>
<td>23.0</td>
<td>0.15</td>
</tr>
</tbody>
</table>
There was a high significant difference in medication adherence among the age groups. Middle-aged subjects (45-64 years) achieved medium level of medication adherence (Morisky Score=0), compared to younger (18-44 years) and (older > 65 years) subjects (p=0.01). There was significant difference in the percentage of subjects with high, medium, and low adherence across the various nationalities; p=0.03. Dominican (50%) and Trinidadian populations (20%) had the greater percentage of subjects who achieved high adherence to medication (i.e. Morisky score of 0). No statistical significance was observed for medication adherence among educational levels and marital status. However, greater levels of medium and high medication adherence (Morisky score=0) was observed for participants with high school education compared to those with at least some college education (p=0.15) No difference in proportion of high, medium, or low medication adherence by marital status (p=0.15). There was no significant difference in medication adherence by African-American status (p=0.11).
Table 3
Self-Efficacy vs. Age, Nationality, Marital Status and Education

<table>
<thead>
<tr>
<th>Age Category</th>
<th>Mean SE (± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young age (18-44 years)</td>
<td>57.0 (± 16.13)</td>
<td>0.55</td>
</tr>
<tr>
<td>Middle Age (45-64 years)</td>
<td>59.4 (± 15.04)</td>
<td></td>
</tr>
<tr>
<td>Older Age (≥ 65 years)</td>
<td>62.4 (± 15.39)</td>
<td></td>
</tr>
</tbody>
</table>

**Nationality**

<table>
<thead>
<tr>
<th>Nationality</th>
<th>Mean SE (± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>59.1 (± 15.7)</td>
<td>0.61</td>
</tr>
<tr>
<td>Dominican</td>
<td>59.0 (± 9.9)</td>
<td></td>
</tr>
<tr>
<td>Haitian</td>
<td>51.5 (± 4.9)</td>
<td></td>
</tr>
<tr>
<td>Jamaican</td>
<td>63.8 (± 11.7)</td>
<td></td>
</tr>
<tr>
<td>Other Central or S. American</td>
<td>54.8 (± 14.4)</td>
<td></td>
</tr>
<tr>
<td>Other West Indian/ Non-Latino Caribbean</td>
<td>77.7 (± 0.58)</td>
<td></td>
</tr>
<tr>
<td>Puerto Rican</td>
<td>67.0 (± 15.6)</td>
<td></td>
</tr>
<tr>
<td>Trinidadian</td>
<td>58.5 (± 13.4)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>62.0 (± 21.0)</td>
<td></td>
</tr>
</tbody>
</table>

**Marital Status**

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Mean SE (± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>59.6 (± 11.0)</td>
<td>0.86</td>
</tr>
<tr>
<td>Divorced</td>
<td>62.0 (± 15.9)</td>
<td></td>
</tr>
<tr>
<td>Never Married</td>
<td>58.0 (± 16.1)</td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td>62.3 (± 17.0)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>61.5 (± 6.4)</td>
<td></td>
</tr>
</tbody>
</table>

**Education Level**

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Mean SE (± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School/Technical Certification or less</td>
<td>59.3 (± 15.76)</td>
<td>0.72</td>
</tr>
<tr>
<td>Some College to Graduate Education</td>
<td>60.3 (± 13.63)</td>
<td></td>
</tr>
</tbody>
</table>
No statistical significance was observed among the covariates with respect to self-efficacy to hypertensive medication. However, older age individuals (≥ 65 years) appear to have greater self-efficacy scores than younger, and middle aged individuals (p=0.55). Individuals with at least some college education had a slightly higher self-efficacy scores compared the high school graduates or lower (p = 0.72). Separated individuals had highest self-efficacy scores, compared to married, divorced, never married, or widowed subjects, but this was not significant (p = 0.86). Participants from Other West Indian/ Non-Latino Caribbean had the highest average Self-efficacy score (77.7), while Haitian population had the lowest (51.5); although this was not statistically significant (p = 0.61). After collapsing the nationalities into Americans and non-Non-Americans (Figure 3b), Non-Americans (Haitians, Trinidadians, Dominicans, Puerto Ricans) had greater Self Efficacy scores, compared to Americans (p=0.40).

Table 3b
Self-Efficacy Scores by National Identity

<table>
<thead>
<tr>
<th>Nationality</th>
<th>Mean Self-Efficacy Score</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>American</td>
<td>59.1 (± 15.67)</td>
<td>0.40</td>
</tr>
<tr>
<td>Non-American</td>
<td>61.9 (± 13.73)</td>
<td></td>
</tr>
</tbody>
</table>
Research Question 1

Are Black American-born males more knowledgeable about hypertension than Black non-American-born males?

Ha: American-born males are more knowledgeable about hypertension than non-American males.

Ho: There is no difference in hypertension knowledge between Black males born in American and their non-American-born counterparts.

Table 4.
Hypertension Knowledge Among American-born and Non-American-born Males

<table>
<thead>
<tr>
<th></th>
<th>Mean Hypertension Knowledge Score</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>American-born</td>
<td>15.1 (± 1.53)</td>
<td>0.41</td>
</tr>
<tr>
<td>Non-American-born</td>
<td>14.9 (± 1.72)</td>
<td></td>
</tr>
</tbody>
</table>

There was no statistical difference between the two groups with regards to hypertension knowledge (p = 0.41). American-born males diagnosed with hypertension have similar average knowledge of hypertension score (15.1 (± 1.53)) compared to Non-American-born males (14.9 (± 1.72). Therefore, results fail to reject the null hypothesis.
**Research Question 2**

Is there an association between patients’ self-efficacy skills and adherence to hypertensive medications?

Ha: There is an association between self-efficacy skills and adherence to hypertensive medications.

Ho: There is no association between self-efficacy skills and adherence to hypertensive medications.

Self-efficacy is associated with adherence with medication, unadjusted odds ratio (OR) = 0.975, 95% confidence interval= 0.95-1.00 (p=0.05). Therefore, based on the results, the null hypothesis is rejected. After adjusting for age, race, level of education, and depression, the effect was diminished with OR=0.98, 95% confidence interval = 0.96-1.01, 9=0.28 Hypertension knowledge and Perceived Stress both had a linear relationship with the Medication Adherence Scale.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>95% confidence interval</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy</td>
<td>0.98</td>
<td>0.96-1.01</td>
<td>0.28</td>
</tr>
<tr>
<td>Age</td>
<td>0.99</td>
<td>0.95-1.04</td>
<td>0.81</td>
</tr>
<tr>
<td>Nationality</td>
<td>0.83</td>
<td>0.66-1.06</td>
<td>0.13</td>
</tr>
<tr>
<td>Level of Education</td>
<td>2.53</td>
<td>1.01-6.37</td>
<td>0.05</td>
</tr>
<tr>
<td>Depression</td>
<td>1.148</td>
<td>1.04-1.27</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Also in a linear regression model, increasing Self-Efficacy scores was associated with lower adherence score (i.e. high adherence); p=0.02
Chapter 5: Discussion, Recommendations, and Conclusion

A random sample selected 315 African-American participants between of ages 18 and above was recruited for this study. The sample consisted of African American male populations who have been diagnosed with hypertension in the least for 6 months prior to data collection. The key demographic and biological variables in the study were age, marital status, education, and country of origin. The dependent variables included hypertension knowledge, medication adherence and self-efficacy for blood pressure management.

The age of the participants selected for the study varied widely from minimum 18 years of age to 65 and over. Most of the study participants (64.4%) were between ages 45 and 64 years old; approximately 25% was 65 years and older and 14% was between ages 18 to 45 years. With regard to their knowledge of risk factors, young participants are able to identify the right risk factors (e.g., stroke and a heart attack) sooner than those compared to middle age (45-64 years as well as the older age >65 years. The overwhelming majority of the patients were born Americans (75%), a little bit less than 10% were born in Jamaica, approximately 10% of the participants were from the unknown countries; less than 5% were from Central or South America and Haiti. The majority of the participants were married (34%), 29% were never married, 18% were divorced, 15%) were separated, and 4% were widowed. Most of the participants had a high school diploma or vocational education or less (71%), while 29% had college degree or more.
Medication Knowledge

There was no statistical difference between American-born and non-American-born hypertensive males with regards to knowledge of hypertensive medication \( (p = 0.41) \). American-born males diagnosed with hypertension have similar average knowledge of hypertension score \((15.1 (\pm 1.53)\) compared to Non-American-born males \((14.9 (\pm 1.72)\) based on the Morisky Scale \((0 -17)\). This indicated that their average knowledge score was high. One possible explanation for this similarity in medication knowledge is access to health-related health information on the Internet. I assumed that most people, once they have symptoms of an illness or are diagnosed with an illness, tend to research that information on the Internet to find out more about the condition. Also, the older population might get their information from their health care providers.

Medication Adherence

Nationality

The overall percentages of high medication adherence among hypertensive males from different countries were low (ranging from \(0 – 50\%\)). Non-American-born hypertensive male had significantly higher medium and high percentage of medication adherence rates (especially those born in Trinidad and Dominica) than American-born males \((p = 0.03)\).

A possible explanation is that African Americans/Black men continue to have trust issues with the medical system (Elder, et al., 2012). The distrust may affect medication adherence and ultimately lead to negative health outcomes.

Age
Medication adherence rates were also significantly higher between ages 45-64 than younger or older age groups. This finding was similar to a study conducted by Lewis, Schoenthaler, and Ogedegbe (2012). Possible explanations for these significant differences are many. First, some young men are of the belief that hypertension was a symptomatic illness (Savoca et al., 2009). In light of this myth, they might be waiting to have specific symptoms such as headaches or nosebleeds before they continue their medication as prescribed by their physician. According to the American Heart Association (2014), high blood pressure is largely symptomless. Also, in the study conducted by Lewis, Schoenthaler, and Ogedegbe (2012), younger men were found to have lower adherence rates to antihypertensive medications. Furthermore, they are reluctant to seek care because they feel that this is not a priority for them, they have their whole life ahead of them and they are looking for adventure and excitement.

Secondly, men between ages 45-64 may not have as many co-morbidity conditions as those over 65 years. At this age they don’t want to be a statistic of death, they want to maintain their quality of life by adhering to medication regimen. Research has shown that medication adherence decreases when patients with chronic conditions are taking more than one medication (Coleman et. al, 2012). In addition, there might be drug interactions if these patients have multiple medications for different diseases. Therefore, adherence to hypertensive medications might be dependent on the side effects that an individual may experience.

Thirdly, if men over 65 years old experience side effects of some of these medications, this may cause them to not adhere to their medications, so overtime they may complain that the medication is working. There are at a point of their life they want
to enjoy the remaining time they have left, they can also forget to adhere to medication adherence. This belief may cause them to avert the medication regimen. This might have been the case with the participants who were 65 years and older.

**Self-efficacy and Medication Adherence**

The study revealed that self-efficacy was associated with medication adherence among the hypertensive patients (CI: 0.95 – 1.00; p = 0.05). The results are consistent with other studies of hypertensive African American males (Elder, et al., 2012; Warren-Findlow, et al., 2011; Lewis, Schoenthaler, and Ogedegbe, 2012). These studies have shown that patients who have higher self-efficacy skill usually have higher medication adherence rates.

**Recommendations**

To decrease the number of African Americans hypertensive patients, African American/Blacks should be persuaded that lifestyle changes are a must for them. Individuals have to understand and accept that lifestyle changes are a must in order to maintain quality of life and to increase life expectancy. Ferdinand (2009) states that though lifestyle is the core of antihypertensive care, deficiency of adherence to blood pressure medications is a forecast for poor hypertension outcome and is one of the essential factors of the serious health disparities concerning morbidity and mortality among hypertensive African Americans. Second, family members should be included in health behavior changes for positive patient outcomes. Peer to peer communication may also contribute to the hypertensive man’s self-confidence and encourage him/her adherence to medical treatment and blood pressure control. In this situation, African
American men may be more likely to talk about their health or get a blood pressure screening as a group than individually. Participation in various health programs might also be to the advantage of hypertensive patients, especially because these programs usually take place after working hours. Dr. Lewis discoursed on African American belief systems that can influence their medication adherence. According to Dr. Lewis, community dwelling does affect hypertensive African Americans’ beliefs and their adherence to antihypertensive medications (Ferdinand, 2009).

Accordingly, care providers should be very patient but persistent while explaining to African Americans the advantage of healthy food in comparison with traditional food addictions (Horowitz et al., 2015). Health care provider have to explain to him/her that hypertension is curable and its outcome to a large extent depends on the person himself: to his adherence to the prescribed medications, his taking care to regularly control his blood pressure, to practice healthy lifestyles behavior, and certainly try to consume healthy food rich in vegetables and fruit. Regular visits to his/ her care provide will also be very helpful to the patients because friendly and trusty relationship between the doctor and the patient is half of the battle. It will increase patient’s self- efficacy and the belief in the positive outcome.

To make hypertensive patients be more adhered to the antihypertensive medication, one the medical office staff members can call their patients to remind them to take his medications. Pharmacy staff can provide detailed information about the prescribed medications, their side effects and the importance of medication adherence. To come to a certain conclusion about the reasons of hypertension, Redmond et al., (2011) recommend future researchers to evaluate the relationships of gene-environment relations, job-related
stress, discrimination, and additional psychosocial issues associated with racial/ethnic disparities in the prevalence of hypertension among African Americans.

**Conclusion**

African Americans are one of the largest ethnic groups in the United States (The U. S. Department of Commerce, Bureau of the Census, 2001). Heart disease and hypertension are the main health problems related to African-American population. According to Campinha-Bacote (2007), leading causes of heart diseases and stroke in the USA. Ferdinand (2009) also admits that hypertension is one of the most severe diseases which kill people of all ethnicities. Rosamond et al., (2008) argue that in African Americans, the signs and symptoms of hypertension may often go unnoticed, and later causes severe complications. One of the problems associated with hypertension is adherence to antihypertensive medication regimens (Ferdinand, 2009). The American Heart Association (2009) contends that these diseases have cost the American government approximately $475 billion in 2009. Lloyd-Jones et al., (2010) are among the vast majority scientists who argue that African Americans have a much higher prevalence of hypertension than whites Americans. Hypertension is considered a leading cause of cardiovascular disease among African Americans. An excessive consumption of salt (one of the causes of hypertension) is believed among one of the behavioral characteristics of many African Americans. Günther et al., (2009) believe that lower adherence to dietary goods can be associated with lower prevalence of hypertension.

The Centers for Disease Control and Prevention’s Division for Heart Disease and Stroke Prevention (DHDSP) has released information that states that African American
men suffer disproportionately from high blood pressure in comparison to the white men. African American men’s knowledge on hypertension has increased, but not to the extent that they have become consistently adherent to the prescribed medication. There are a number of reasons that influence African Americans' attitude to how the treatment of the diseases. Knowledge, beliefs, and attitudes about hypertension among African Americans can affect their health behaviors, perceptions of susceptibility to hypertension, and adherence to treatment. Cooper et al., (2005) concluded that environmental and behavioral characteristics are more likely to be the reasons that cause a higher prevalence of hypertension in African Americans living in the U.S. Studies have shown that patients who are older than 65, have a low level of education, and/or have a low socioeconomic status are less likely to adhere to their medications, less likely to control their blood pressure, less likely to consume healthy food, and less likely to be involved in physical exercise. The relationship between African American patients and their health care providers is a significant component, in reducing the number of hypertensive African Americans. Mistrust between the patient and health care provider can negatively affect the patients’ adherence to the medications, healthy behavior, and self-efficacy.
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APPENDIX

Part 1: Demographics

1. Age:___________
2. Gender:____________
3. Marital Status:___________
4. Years of Living in US:_______________
5. Years of suffering from hypertension:_________________

Part 2: HTN Knowledge Questionnaire

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>TRUE</th>
<th>FALSE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**High blood pressure means the same as “hypertension”**

**High blood pressure runs in families**

**Blood pressure goes up as a person gets older**

**High blood pressure usually causes symptoms**

**High blood pressure can cause a person to have a stroke**

**High blood pressure can cause a person to have kidney problems**

**High blood pressure can cause a person to have a heart attack**

**High blood pressure can be treated with medicine**

**High blood pressure cannot be cured**

**A person who has high blood pressure should eat less salt**

**A person who has high blood pressure should eat less fat**

**A person who has high blood pressure should eat more fruits and vegetables**

**Eating more fruits and vegetables can help lower blood pressure**

**Exercise can lower a person’s blood pressure**

**Losing weight can lower a person’s blood pressure**

**Being overweight can cause high blood pressure**

**Bad diet can cause high blood pressure**

### Medication Adherence/ Self Efficacy Scale

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Over the past week, have you taken your blood pressure medicine as you should on schedule?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2  Do you ever forget to take your blood pressure medicine?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3  Are you careless at times about taking your blood pressure medicine?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4  When you feel better do you sometimes stop taking your blood pressure medicine?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5  Sometimes if you feel worse when you take your blood pressure medicine, do you stop taking it?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SITUATIONS</td>
<td>Not at all sure</td>
<td>A little sure</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>1 When you are busy at home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 When you are at work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 When there is no one to remind you</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 When you worry about taking them for the rest of your life</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 When they cause some side effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 When they cost a lot of money</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 When you come home late from work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 When you do not have any symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 When you are with family members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 When you are in a public place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 When you are afraid of becoming dependent on them</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 When you are afraid they may affect your sexual performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 When the time to take them is between your meals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 When you feel you do not need them</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 When you are travelling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 When you take them more than once a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 If they sometimes make you dizzy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 If they sometimes make you tired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 When you have other medications to take</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 When you feel well</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 If they make you want to urinate while away from home</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please rate how sure you are that you can carry out the following tasks:
<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>Get refills for your medications before you run out</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Make taking your medications part of your routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Fill your prescriptions whatever they cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Always remember to take your blood pressure medications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Take your blood pressure medications for the rest of your life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>