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## **Improving Medication Adherence in African American Adult Females with Hypertension**

Donald Welch

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IMPROVING MEDICATION ADHERENCE IN AFRICAN AMERICAN  
ADULT FEMALES WITH HYPERTENSION

by

Donald Welch

A Doctoral Project  
Submitted to the Graduate School,  
the College of Nursing and Health Professions  
and the School of Leadership and Advanced Nursing Practice  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Nursing Practice

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## ABSTRACT

The World Health Organization (WHO) reported that adherence among patients with chronic diseases averages nearly 50% in developed countries (Lam & Fresco, 2015). Medication non-adherence is recognized as a significant public health issue that leads to poor health outcomes and added healthcare costs. Multiple African American adult females with hypertension have a high prevalence of non-adhering to their treatment plan. Numerous factors lead to poor medication adherence, including socioeconomic factors, therapy-related factors, patients-related factors, condition-related factors, and health system/healthcare team-related factors (Lam & Fresco, 2015). Medication adherence can lead to a decreased risk of adverse outcomes such as stroke and heart attack, improved patient satisfaction, and reduction in healthcare costs.

The purpose of this Doctor of Nursing Practice (DNP) project was to identify factors that affect medication non-adherence among African American females diagnosed with hypertension through the use of the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire*. A retrospective chart review was completed on each participant that completed the questionnaire. The results of the DNP project indicated that medication adherence is an issue in this specific population. The project suggested a policy implementation at the healthcare facility that will incorporate the use of the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire*. The change will be done to help identify barriers to medication non-adherence early; thereby, potentially decreasing the risk of stroke, heart attack, and other co-morbid diseases.

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## DEDICATION

I would like to first give thanks to my Lord and Savior for helping me through this process. I dedicate this project to my wife, Danielle Welch, and family.

To my wife Danielle, I want to thank her for supporting me through this journey over the last couple of years. To my family, I would also like to thank you for the support, thoughts, and prayers throughout this process.

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## LIST OF ABBREVIATIONS

<i>AFP</i>	American Family Physician
<i>AHRQ</i>	Agency for Healthcare Research and Quality
<i>APRN</i>	Advanced Practice Registered Nurses
<i>CDC</i>	Centers for Disease Control and Prevention
<i>CVD</i>	Cardiovascular Disease
<i>DBP</i>	Diastolic Blood Pressure
<i>DNP</i>	Doctor of Nursing Practice
<i>IHI</i>	Institute of Healthcare Improvement
<i>IRB</i>	Institutional Review Board
<i>JNC</i>	Joint National Committee
<i>MMAS</i>	Morisky Medication Adherence Scale
<i>SBP</i>	Systolic Blood Pressure
<i>U.S.</i>	United States
<i>USDHHS</i>	United States Department of Health and Human Services
<i>USM</i>	The University of Southern Mississippi
<i>WHO</i>	World Health Organization

## CHAPTER I - INTRODUCTION

According to the Centers for Disease Control and Prevention (CDC), more than 859,000 Americans die of heart disease, stroke, and other cardiovascular diseases every year, approximating one-third of all casualties in the United States (U.S.) (CDC, 2019). These diseases can be detrimental to the economy, costing our healthcare system around \$213 billion a year (CDC, 2019). Heart disease and stroke are the first and fifth leading causes of death each year (CDC, 2019). National risk factors for heart disease and stroke include the following: (a) high blood pressure, (b) high low-density lipoprotein cholesterol, (c) diabetes, (d) smoking, including secondhand smoke, (e) obesity, (f) unhealthy diet, and (g) physical inactivity (CDC, 2019).

Hypertension is one of the utmost common diseases that affect humans throughout the world (U.S. Department of Health and Human Services Administration [USDHHS], 2012). Hypertension is a key risk factor for heart disease and stroke and is often referred to as the “silent killer” because there are typically no forewarning signs or symptoms (CDC, 2019). Hypertension harms the lining of the arteries, making them more susceptible to plaque accumulation that narrows the arteries leading to the heart and brain (CDC, 2019).

The most commonly used definition of hypertension was published by the Joint National Committee (JNC) on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure in its 2013 seventh report (USDHHS, 2012). Based on the recommendations from the JNC, the classification of blood pressure is the average of two or more readings each taken at two or more visits after initial screening for adults 18 years of age or older (USDHHS, 2012). Normal systolic blood pressure (SBP) is lower

than 120 mm Hg and diastolic pressure (DPB) is lower than 80 mm Hg (USDHHS, 2012). Pre-hypertension is classified as an SBP between 120 and 139 mm Hg and a DBP between 80 to 99 mm Hg (USDHHS, 2012). Stage one blood pressure is an SBP ranging between 140 to 159 mm Hg and a DBP between 90 to 99 mm Hg; whereas, stage two blood pressure is an SBP that is equal to or more than 160 mm Hg and DBP equal to or more than 100 mm Hg (USDHHS, 2012).

The Eighth Joint National Committee (JNC 8) released evidence-based treatment recommendations regarding when pharmacologic treatment should be commenced (American Family Physician [AFP], 2014). In the general population adults age 60 and older, pharmacologic treatment should be initiated when the SBP is 150 mm Hg or higher or when the DBP is 90 mm Hg or higher (AFP, 2014). For adults younger than 60, pharmacologic treatment should be initiated when SBP is greater than 140 mm Hg and the DBP is greater than 90 mm Hg (AFP, 2014). If target blood pressure is not met within one month, therapy should be adjusted.

Many patient factors affect hypertension. Patient factors can be defined as characteristics that patients possess, or have control over, that have an impact on care (USDHHS, 2012). Examples of patient factors are age, race, diet, and lifestyle choices. Examples of how patient factors influence blood pressure control include the following: (a) age, (b) cultural differences, (c) health literacy, (d) work status, (e) co-morbid diagnosis, and (f) socioeconomic status (USDHHS, 2012).

Hypertension usually becomes poorer with age and more challenging to control. Cultural differences may impact perceptions of causation, diet choices, and level of distress about weight gain (Neiman et al., 2017). Health literacy affects the patient's

ability to understand the education provided and to ask appropriate questions (Neiman et al., 2017). Work status may influence income, health insurance, and the ability to access health care at any given time (Neiman et al., 2017).

A patient with co-morbid diagnoses complicates their treatment choices, increases the cost of care and their ability to follow their care plan (Neiman et al., 2017).

Also, socioeconomic status may impact access to medications and food choices (Neiman et al., 2017). Health system factors often involve finance and operational issues such as cost, scheduling systems, and location (Neiman et al., 2017).

Several effective efforts have been established to improve medication adherence. An identified proven cost-effective strategy for reducing unintentional non-adherence is the use of pillboxes and blister packs to categorize medication regimens in simple methods (Neiman et al., 2017). Combining the ease of packaging with effect behavioral prompts such as electronic pill monitors can help prompt patients to take their medication and provide messages to health care providers when dosages are missed, helps increase medication adherence (Neiman et al., 2017). Interventions that include team-based collaborative care have shown to be effective in increasing medication adherence rates as well (Ahuja et al., 2018; Neiman et al., 2017). Lowering economic barriers, construing system-based strategies that address health disparities and advances in health information technology have also shown to be beneficial in improving medication adherence rates among individuals with hypertension (Neiman et al., 2017).

The Morisky Medication Adherence Scale (MMAS), developed in 2008, is the most commonly used questionnaire worldwide to measure medication adherence in patients with hypertension (Uchmanowicz et al., 2019). Based on the criteria used, the

usefulness of the MMAS as a source of blood pressure control in clinical settings was confirmed (Uchmanowicz et al., 2019). The MMAS is a low cost and simple method to provide input on the causes of medication non-adherence (Uchmanowicz et al., 2019).

The *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* is the second most commonly used questionnaire worldwide to assess barriers to medication adherence (Escamilla et al., 2015). The *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* examines three important behavioral domains of high blood pressure treatment—reduced-sodium intake, appointment keeping, and medication-taking (Miyong et al., 2000). This scale is comprised of 14 items in three subscales; furthermore, each item is a four-point Likert type scale (Miyong et al., 2000). This brief instrument provides a simple method for clinicians in various settings to use to assess patients' self-reported compliance levels and to plan suitable interventions (Miyong et al., 2000).

### Background

Hypertension with an increase in heart failure is more common in women than men (Tackling & Borhade, 2019). African American (AA) females can develop hypertension and/or heart failure starting in their early twenties (Tackling & Borhade, 2019). African American women tend to have higher rates of obesity and diabetes, increasing their risk for hypertension and stroke (CDC, 2019). Women are more likely to have uncontrolled blood pressure and recent studies have shown that certain classes of blood pressure medication may be less effective contributing to another reason for non-adherence (Tackling & Borhade, 2019).

Medication adherence is influenced by many factors along the continuum of health care (Neiman et al., 2017). Various patient-related factors related to medication



non-adherence include factors that are unintentional such as forgetting to take medications or obtain refills, inadequate understanding of dosing or schedules (Neiman et al., 2017). Intentional factors relating to medication non-adherence include the following: active decision to stop or modify a treatment regimen based on ability to pay, beliefs or attitudes about their disease, feeling better so only need to take medicine when symptoms occur, medication side effects, and anticipations for improvement (Neiman et al., 2017; Ozunal et al., 2019).

Further patient-related barriers include lack of engagement in handling decisions, diminished cognition (related to aging or disease), substance abuse, depression, and other psychological conditions (Neiman et al., 2017). Provider related factors include barriers to communicating with patients and their caregivers, complex dosing regimens, and limited coordination of care among various providers (Neiman et al., 2017). Health care system and service delivery factors include limited access to an appropriate provider for prescriptions or refills, limited drug coverage, high costs and copayments, unclear medication labeling and instructions, limited accessibility of culturally appropriate patient education materials, and insufficient provider time to review benefits, risks, and alternatives to prescribed medications (Neiman et al., 2017).

### Significance

Over 50 million Americans who have high blood pressure necessitate some form of treatment. In 2006, an estimated 44,879 million visits to the doctor were due to hypertension (USDHHS, 2012). Data from the National Health and Nutrition Examination Survey in 2005-2006 revealed that African Americans had a significantly greater prevalence (41%) compared with non-Hispanic whites (28%) and Mexican

Americans (22%) (USDHHS, 2012). The prevalence of pre-hypertension also increased with age and was higher in men (43%) than in women (39%) (USDHHS, 2012).

Hypertension is more common, more severe, develops at an earlier age and leads to more clinical problems in African Americans than in age-matched non-Hispanic Whites (USDHHS, 2012).

Of the following factors concerning uncontrolled hypertension, medication non-adherence is correlated with higher rates of hospital admissions, suboptimal health outcomes, increased sickness, and impermanence and increased health care costs (Neiman et al., 2017). In the U.S., 3.8 billion prescriptions are created annually. Almost one in five new prescriptions are never filled and among those that are filled, 50% are taken incorrectly, particularly in regard to timing, dosage, frequency, and duration (Neiman et al., 2017). Whereas rates of non-adherence across the U.S. have remained stable, direct healthcare costs associated with medication non-adherence alone have grown to approximately 100 to 300 billion of U.S. health care dollars spent annually (Neiman et al., 2017). Improving medication adherence is a public health priority and could lower the economic and health burdens of several diseases and chronic conditions (Neiman et al., 2017).

### Purpose of the Project

The purpose of this Doctor of Nursing Practice (DNP) project was to identify factors that affect medication non-adherence among African American females diagnosed with hypertension through the use of the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire*. The long-term goal of this DNP project will be to produce a practice change that will increase medication adherence among African American adult

females. Variables including age, gender, diagnosis of hypertension, and year diagnosed with hypertension, co-morbid diseases such as obesity and diabetes, number of medications, educational level, were examined and expounded on. The findings of this DNP project were distributed to key stakeholders in an executive summary. An executive summary is used to advocate a resolution to a specific problem. This executive summary is projected to show the benefits of identifying and addressing the barriers of African Americans with hypertension to increase medication adherence, reducing the probability of stroke and heart attack.

### Needs Assessment

Hypertension is a prevalent disease affecting many throughout the U.S. but is more common in the African American female population. The main targeted blood pressure is less than 140/90. The use of the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* in managing patients with hypertension has revealed many positive benefits in identifying risk factors for medication non-adherence and improving hypertension.

### *National and State Data*

Approximately 78 million U.S. adults (one in three) have hypertension with only about 48% of these having their blood pressure under control (CDC, 2018). About 7 in 10 people who have their first heart attack or stroke have a diagnosis of hypertension (CDC, 2018). The leading cause of death in Mississippi is heart disease with an adjusted mortality rate of 237.5 per 100,000 population in 2016 (CDC, 2018).

In 2017, 40.8% of adults living in Mississippi, over 18 years of age had a diagnosis of hypertension (CDC, 2018). Out of the 2,984,100 people living in Mississippi

in 2017, 265 per 100,000 had a diagnosis of heart disease and an estimated 50 per 100,000 had suffered from a stroke (CDC, 2018). The most common age groups that had a diagnosis of hypertension were the following: 35 years of age and 45-64 years of age (CDC, 2018).

Hypertension was more common in African Americans when compared to other ethnic groups in 2017 (CDC, 2018). High sodium consumption can lead to a diagnosis of hypertension (CDC, 2018). Americans who are two years of age and older consume on average around 3,400 mg of sodium each day, which is well over the recommended 2,000 mg recommended by dietary guidelines (CDC, 2018).

#### *Regional and Facility Data*

Effective management of hypertension is the goal of all primary care providers, especially in the African American population. The current population of Jones County, MS is 68,000 (U.S. Census Bureau [USCB], 2018). Approximately 43.5% of the population in Jones County had a diagnosis of hypertension. The poverty rate for Jones County is 19.9% and an estimated 83% have at least a high school education (USCB, 2018).

Approximately 1300 patients access the primary care clinic in southern Mississippi every month where the DNP project was conducted. Nearly five to eight patients a day present to the clinic with hypertension needing medication refills, with the majority being female. Uncontrolled hypertension from medication non-adherence can lead to adverse consequences such as heart attack, other cardiovascular diseases, and stroke. The desired outcome for this project was to identify barriers that affect medication

adherence, in order to provide better patient care in the African American adult female population.

### Synthesis of Evidence

The following databases were utilized in the search for articles related to the DNP project, which included the following: (a) Google Scholar, (b) ScienceDirect, (c) PubMed, and (d) MEDLINE. A total of 60 articles were searched using the following search terms: medication adherence, African Americans, hypertension, heart disease, attitudes of health, JNC 8 guidelines, economic costs of chronic diseases, and barriers. Out of the 60 articles found, the number of articles was narrowed down to 31, and then, only 15 were used for this literature review. Two outcome-based organizations that contributed insight to the DNP project were the Agency for Healthcare Research and Quality (AHRQ) and the Institute for Healthcare Improvement (IHI). The clinical question the project will seek to answer is, “In African American females diagnosed with hypertension, does the use of a screening questionnaire help to identify factors that affect medication non-adherence over a six-week period?”

The following is a synthesis of the current literature regarding the medication adherence topics: barriers to medication adherence in African American females with a diagnosis of hypertension and the effects of addressing barriers on blood pressure control. According to Ferdinand et al. (2017), patients who do not adhere to prescribed courses of medication are at greater risk of adverse outcomes. In 2011, the American College of Preventive Medicine revealed five key factors that affect medication adherence and recommended research and monitoring efforts be focused on them, these include:

(a) socioeconomic factors, (b) health care system-related factors, (c) medical condition-related factors, and (d) patient-related factors (Ferdinand et al., 2017).

Many variables contributing to medication non-adherence in African American adult females have been identified throughout the literature, which include the following: running out of medicine, bothered by side effects of medication, change in his or her daily routine, discomfort when asking the healthcare provider questions, frequent reporting that health care visits were stressful, and the exhibition of depressive symptoms (Martin et al., 2010). Health care providers who provide care to rural, poor hypertensive patients should routinely assess self-management behaviors, logistical barriers, and emotional health (Martin et al., 2010). The creation of clinical encounters that reduce the stressful nature of healthcare visits and encouraging patient question-asking behavior are also imperative for the optimal management of hypertension (Martin et al., 2010).

#### Barriers to Medication Adherence

Identifying barriers such as low income and helping patients find available community resources, helps establish a trusting relationship with them and lets them know that the provider is invested in their health (Fongwa et al., 2008). This study supported the need for identification of barriers to medication adherence, ongoing education for managing hypertension, early screening for depression, the development of culturally sensitive hypertension education material and the formation of support groups for African American women with hypertension (Fongwa et al., 2008). Mutual trust is essential to the patient and healthcare provider relationship and the achievement of positive health outcomes (Abel & Efird, 2013). Healthcare providers need to show capability, caring behaviors, good interpersonal skills, and aspiration to promote the

health of the patients they serve on a daily basis. On another note, trustworthy patients need to be honest, adhere to the treatment regimen, and perform self-care behaviors (Abel & Efir, 2013).

### *Socioeconomic Factors*

Multiple barriers affecting medication non-adherence have been identified throughout the literature, with the most important being socioeconomic factors. Socioeconomic factors such as illiteracy, unemployed, higher out-of-pocket costs for medications and care, cultural beliefs reflecting mistrust in providers and the healthcare system, lack of transportation, lack of support systems, and greater living distance from the medical clinics were identified consistently in studies that were conducted to determine the causes of medication non-adherence (Ferdinand et al., 2017; Rimando, 2015). Participants in several studies would alter the dosing of their medications in order to counterweigh the cost of prescriptions and take medications only when symptoms would arise such as headache and dizziness (Ferdinand et al., 2017; Rimando, 2015). Present-day research shows that non-adherence is associated with increases in hospitalization and use of other medical resources, and these differences have been proven to translate into substantially higher costs for non-adherent patients and populations (Ferdinand et al., 2017; Rimando, 2015).

### *Education and Literacy*

Levels of education and literacy were contributing factors in this population. The inability of patients to read prescription labels and lack of understanding was associated with increased cardiovascular-related emergency department visits, as well as emergency visits related to heart failure (Rimando, 2015). With providers acknowledging

and addressing these barriers during the clinical visit, medication adherence can be improved among African Americans with hypertension (Devkota et al., 2016; Rimando, 2015).

### *Mental Illnesses*

Some different views were explored regarding the relationship between mental illnesses and medication non-adherence. A cross-sectional study was conducted by Spikes et al. (2019) to determine the association between demographic, clinical factors, depressive symptoms, beliefs about hypertension, and social support with medication adherence in middle-aged African American Adults with hypertension. A small but significant relationship was found between medication adherence and co-morbidities. Depressive symptoms, high blood pressure beliefs, and social support did not have a significant relationship with medication adherence in this particular study; however, an overall higher non-adherence rate in females was noted when compared to males (Spikes et al., 2019). The *Hill-Bone Compliance to Hypertension Therapy Questionnaire* was used to detect compliance in this particular study.

AlGhurair and colleagues (2012) conducted a systematic review of the literature to determine what adherence barriers were included in each instrument and to describe the psychometric properties of the World Health Organizational model with patient, condition, therapy, socioeconomic, and healthcare system/team-related barriers (AlGhurair et al., 2012). Some studies revealed a link between age, self-efficacy, and depression predicted adherence with hypertension medication and patients' health literacy was also associated with non-adherence and poorer outcomes in CVD (AlGhurair et al., 2012; Lee et al., 2018). The results of the systematic review of the literature



recommended that the MMAS or *Hill-Bone Compliance Questionnaire* be used in addition to the Epidemiologic Studies Depression Scale Short-Form (AlGhurair et al., 2012; Lee et.al, 2018).

### *Effects of Addressing Barriers*

Establishing trusting relationships between African American women and healthcare providers is essential to decreasing rates of hypertension. Participants felt as if the providers did not want to stay in the room long, and address all their concerns; therefore, they were skeptical about coming back for a follow-up visit. The participants assumed that all healthcare providers would treat them the same way and felt as if they could manage their hypertension alone without medication. Involving patients in the decision-making process has shown to be beneficial in patients adhering to their medications and attending regular follow-ups.

Trust can be earned over time as the patient and healthcare provider get to know each other by working together to ensure those accurate medical conclusions are obtained and the best course of treatment is determined and carried out (Abel & Efird, 2013; Kochler et al., 2018). Healthcare providers trusting their patients implies the belief that patients will seek timely health care, reveal sensitive information, and follow their recommended treatment plan (Abel & Elfird, 2013). Research has indicated that minority/ethnic groups are less likely than Whites to receive needed services, procedures, and routine treatments for common health problems and for diseases such as cancer, cardiovascular disease, and diabetes (Abel & Elfird, 2013). When the prevalence of hypertension is delineated by race and sex, hypertension is greater for African American women (Abel & Efird, 2013; Kochler et al., 2018). In order to provide meaningful care

and reduce rates of non-adherence, providers must not only focus on the disease process itself but also consider their patients' views and perceptions affecting their diagnosis of hypertension as well (Abel & Efird, 2013; Kochler et al., 2018).

### Self-Perception of Hypertension

Several self-perceptions of hypertension have been identified through current evidence-based research. Participants thought medication use would be lifelong, did not want to worry about taking medications every day, so they would take self-made remedies such as boiled garlic, spicy foods, pickle juice, cinnamon and oatmeal-like their families had done in the past to maintain normal blood pressure. Several participants had the attitude that even though their mother or father had hypertension or died of a heart attack, it did not mean that they were at risk.

Also, African Americans thought that providers would not help them in the same way as they would help someone who was of higher socioeconomic status (Fongwa et al., 2008; Jongen et al., 2019). Poverty was a major factor in this community, limiting choices for healthy lifestyles such as nutritious foods, recreational physical activity, and being able to access health care timely (Fongwa et al., 2008; Jongen et al., 2019). These themes indicated areas for interventions to improve medication adherence among this high-risk group with particular emphasis on assessing perceptions of the causes of hypertension and knowledge of the disease, reducing the risk of heart attack, stroke, and other adverse events (Pettey et al., 2016).

### Strong Black Woman Concept

Current literature has supported that African American females have less control of their blood pressure when compared to males. African American females stated that it

was in their cultural responsibility to take care of their family members and that remembering or trying to take their medication daily was difficult (Petthey et al., 2016). Sometimes the women would be completely out of medication and did not have time to come back for a follow-up appointment, resulting in self-neglect. These themes indicated areas for interventions to improve medication adherence among this high-risk group with particular emphasis on assessing perceptions of the causes of hypertension and knowledge of the disease, reducing the risk of heart attack, stroke, and other adverse events (Petthey et al., 2016).

#### Significant Determinants of Better Medication Adherence

A couple of studies looked to determine what factors contributed to better medication adherence. The significant determinants of better medication adherence that were identified in more than one study included older age, retirement, and unemployment, duration of hypertension greater than 10 years, and a lower number of prescribed drugs (Uchmanowicz et al., 2019). This study concluded that medication adherence in older populations was greater than in younger people (Uchmanowicz et al., 2019).

As these studies have indicated, blood pressure medication adherence is still an issue and continues to be on the rise, especially in the African American female population (Greer & Ostwald, 2015). Adherence is defined as following the prescribed treatment, which includes medications, diet, and keeping appointments (Greer & Ostwald, 2015). The consequences of non-adherence lead to patients presenting with hypertensive urgencies, emergency department visits, and strokes (Greer & Ostwald, 2015). As advanced practice registered nurses (APRNs), a goal of decreasing medication

non-adherence can be reached by establishing a trusting relationship with the patient and healthcare team, identifying and addressing cultural values and beliefs, along with health literacy and other socioeconomic factors.

### Validated Questionnaires

Multiple studies regarding the use of questionnaires all revealed that the use of the MMAS questionnaire and the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* were the two most common questionnaires that had true validity and reliability in achieving results regarding the identification of barriers to medication non-adherence. The questionnaires are quick and not costly to use in the primary care setting to help address factors of medication non-adherence in patients who have a diagnosis of hypertension. A systematic literature review was performed by Miyong et al. (2000) to validate the use of the *Hill-Bone Compliance to Hypertension Therapy Questionnaire*. The internal consistency reliability and predictive validity were evaluated using two community-based samples of adults with a diagnosis of hypertension enrolled in clinical trials of hypertension and control (Miyong et al., 2000). In this study, high compliance scale scores predicted significantly lower levels of blood pressure and blood pressure control (Escamilla et al., 2015; Miyong et al., 2000).

### Framework and Theoretical Background

The theory of goal attainment will be used for this DNP project. Imogene King (1981) first initiated this theory in the 1960s. The main concept of this theory focuses on the nurse-patient relationship, setting goals, and taking actions to achieve those goals. The theory of goal attainment explores factors that can affect the accomplishment of goals such as roles, stress, space, and time (King, 1981).

Specific assumptions of the theory include the following: individuals are spiritual beings, individuals have the capacity to think, know, make choices, and select alternative courses of action, individuals have the ability through their language and other symbols to record their history and preserve their culture, individuals are open systems in transaction with the environment meaning that no separation exists between human beings and the environment, and individuals are distinctive and all-inclusive, are of intrinsic worth, and are capable of logical thinking and decision making in most situations and individuals differ in their needs, wants, and goals (Alligood & Tomey, 2010). King (1981) believed that “an understanding of the ways that human beings interact with their environment to maintain health was critical for nurses” (Alligood & Tomey, 2010, p. 2). The theory of attainment’s relationship to practice is obvious because the nurse functions primarily through interactions with individuals and groups within the environment (Alligood & Tomey, 2010). The theory provides the ability for nurses to construct individualized plans of care while encouraging active participation from patients in the decision-making process that will impact their long-term care (Alligood & Tomey, 2010). The three key concepts of this theory include: personal, interpersonal, and social (Alligood & Tomey, 2010).

The theory of goal attainment is based on the King Conceptual System (King, 1981). This system indicates that patient goals are met through the interaction of the patient and nurse along with other members of the healthcare team (King, 1981). The interaction between the nurse and patient occurs over time and the ultimate goal is finally reached. With medication non-adherence, this theory can be applied; furthermore,

improving communication to identify and address barriers, to achieve full medication adherence among African American females.

### Doctor of Nursing Practice (DNP) Essentials

*DNP Essential I.* The first DNP essential is scientific underpinnings for practice. This essential supports the notion of utilizing theory to create a framework for the DNP project (Eldridge, 2014). The theory of goal attainment is a systems theory that will be used for this DNP project. This theory promotes patient involvement in decision-making and goal obtainment with other members of the healthcare team in order to achieve the best health possible.

*DNP Essential II.* The second DNP essential explores an organizational and leadership component that emphasizes practice, ongoing improvement of health outcomes, and ensuring patient safety (Petersen, 2014). This DNP project will focus on improving medication adherence in African American females with a diagnosis of hypertension. The identification of barriers to non-adherence of blood pressure medication will be explored. If the results of the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* yield positive results, more than likely a practice change will be initiated.

*DNP Essential III.* The third DNP essential explores clinical scholarship and analytic methods for evidence-based practice (Tymkow, 2014). For DNPs to provide leadership for evidence-based practice, competence in knowledge development activities are required, which include: (a) the translation of research in practice; (b) the evaluation of practice; (c) activities aimed at improving the reliability of health care practice and outcomes; and (d) participation in collaborative research (Tymkow, 2014). By utilizing

the most current research to identify and address barriers to medication adherence, other members of the healthcare team may decide to engage in evidence-based practice to achieve better patient outcomes.

*DNP Essential IV.* The fourth DNP essential explores ways to utilize information systems to evaluate the following: programs of care, outcomes of care, care systems, and to provide leadership within healthcare systems related to the use of information systems (Burkart-Jayez, 2014). By analyzing the effects of identifying barriers of medication adherence through the use of the *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire*, this DNP project exhibited evidence of decreasing medication non-adherence. The *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* improved patient care in a collaborative effort leading to improved medication adherence and patient outcomes.

*DNP Essential VI.* The sixth DNP essential explores interprofessional collaboration for improving patient and population outcomes (Ash & Miller, 2014). Communication has been identified as one of the contributing factors related to medication non-adherence. By incorporating the use of the *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* primary practice, barriers can be identified and communication improved between providers and patients to achieve better health outcomes.

*DNP Essential VII.* The seventh DNP essential focuses on clinical prevention and population health to help improve the health of the nation (Schadewald & Pfeiffer, 2014). This DNP project will inform other healthcare providers regarding the issue of medication non-adherence. With compliance from all members of the healthcare team,

focusing on all aspects of health including barriers and not just the disease process itself, the risk of medication non-adherence can be reduced. By involving patients in the decision-making process, better patient outcomes and decreased financial burden for healthcare facilities can be achieved.

*DNP Essential VIII.* The eighth DNP essential explores creating an interdisciplinary environment while utilizing principles of autonomy and independence (White, 2014). Through enhanced communication among all members of the healthcare team, patient outcomes can be improved. Communication is essential for medication adherence to be achieved. Leadership skills are essential for APRNs, especially when it comes to initiating a change in clinical practice that will be effective and beneficial for patient outcomes. For this clinical practice issue to be addressed, the following leadership skills are needed: effective communication, fearlessness, being a role model, knowledge, and clinical competence, being compassionate, establish trust, and empathy (Chism, 2013).

#### Logic Model

The logic model served as a guide to evaluate the outcomes of the DNP project. The desired outcome of the project is to develop a practice change policy that incorporates the use of the *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* in an effort to improve medication adherence among African American females with a diagnosis of hypertension. This outcome was measured using a chart review and questionnaire to determine if the participants were adherent to taking their blood pressure medication and factors affecting adherence. Refer to Appendix H for the logic model.



## Summary

Detecting reasons and aligning interventions for individuals with hypertension are needed to improve medication adherence (Neiman et al., 2017). Outcomes can also be improved by recognizing populations at increased risk for non-adherence and addressing broader reasons for their non-adherence such as low health literacy (Neiman et al., 2017). Health literacy is lower among the elderly, racial and ethnic minorities, and persons living in poverty (Neiman et al., 2017).

Interventions to improve medication adherence could be more effective if patients' health literacy, cultural background, language preference, and proficiency are taken into account when designing communication and education materials for patients (Neiman et al., 2017). The *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* can be used in the primary care clinical setting to help healthcare providers assess medication compliance and plan appropriate intervention to improve the patients' overall quality of health. The goal of this project was to use the *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* to identify factors for medication non-adherence in African American females; thereby, aiding the healthcare provider in knowing what to address to improve compliance in this population. Methods will be outlined in Chapter II.

## CHAPTER II – METHODS

### Context

The setting for this DNP project was a rural family health clinic located in South Central Mississippi. This facility is one of six walk-in clinics that provides family and urgent care services to the southeastern population of Mississippi, averaging approximately 1300 patients a month. This healthcare facility houses a total of six exam rooms and serves both pediatric patients greater than the age of six months and the adult population. Hypertension is defined as an SBP greater than or equal to 140 or diastolic pressure greater than or equal to 90 (USDHHS, 2012). The target blood pressure for all individuals is less than 139/90 (CDC, 2019; USDHHS, 2012).

### *Target Population*

The population of interest for this DNP project, which included a retrospective chart review and screening questionnaire, is African American adult females 18 to 65 years of age, who were diagnosed with hypertension since January 2017 to the present. Inclusion criteria included the following: patients who had a diagnosis of hypertension, patients diagnosed with hypertension since January 2017 to present, English speaking, female, African American, who were at least 18 to 65 years of age and are currently taking medication for hypertension. Exclusion criteria included the following: hypertension patients who were less than 18 years of age, male gender, any race other than African American, hypertension diagnosis before January 2017, non-English and not taking any hypertension medication. Medication non-adherence in patients who had a diagnosis of hypertension can lead to heart attack, stroke, or even death (CDC, 2019).

### *Design*

A quantitative and descriptive design was used for this DNP project. A retrospective chart review of the patients' hypertension history was conducted over a six-week period on patients who were present at the clinic, that met the above inclusion criteria. The descriptive design was a way to identify and examine variables that contribute to the occurrence of medication non-adherence. By identifying barriers to medication non-adherence after administering the *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* survey, the data collected helped to determine why medication adherence occurs and how it can be reduced. The identification of barriers led to an increase in blood pressure control and adherence, helping to reduce the risk of adverse long-term outcomes such as heart disease and stroke.

### *Procedures*

Convenience sampling was used for this project, targeting a sample of at least 20 participants or more as they came to the walk-in clinic. Participants must have a diagnosis of hypertension and meet the above inclusion criteria. The DNP project was conducted one day a week for a total of six weeks. Informed consent was explained thoroughly and obtained before participation in this study.

In order to collect the data for the retrospective chart review, a practitioner-developed tool was utilized. A practitioner-developed tool was used for each individual chart review to compile and organize the data efficiently. The informed consent was included to be able to get information verbally also, if not able to get all information from the chart listed on the practitioner-developed tool.

Questions on the practitioner-developed tool regarding the number of times skipped medication and appointments and visited the clinic for hypertension were from within the last year. Participants were identified by using the date for that particular day and the number of the order that they came into the clinic. Also, the *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* regarding perceptions attitudes, and beliefs of medication adherence were given to the patients whose charts were reviewed.

Data was gathered and then entered using the SPSS software comprising a frequency distribution table. The age ranges were compiled into the following categories: 18 to 20 years of age, 21 to 29 years of age, 30-39 years of age, 40-55 years of age, and 56-65 years of age. After the results were obtained from the DNP project, an executive summary that includes the use of the *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* was presented to the healthcare facility. An executive summary and results of the project were provided to the stakeholders of the clinical facility to determine the implementation of this screening questionnaire in the future.

#### *Assumptions*

Of the data collected at this site, assumptions were made that the information and documentation regarding the prevalence of medication non-compliance are true. The following assumptions for this project were that the healthcare facility would document medication administration, medication non-adherence, and measures to help reduced medication non-adherence appropriately at every office visit. Also, the *Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* elicited reliable responses and the respondents fully understood the questions they were asked.

### *Essential Protection of Human Subjects*

Institutional Review Board (IRB) approval was obtained from The University of Southern Mississippi (USM) (19-386) and the IRB from the clinic where the chart review and questionnaire were conducted. Consent for treatment of risk issues in regards to the protection of human subjects was not be required; however, a waiver of consent form was required. Information that was obtained for the DNP project was included in the following: (a) demographics such as age, race, education level, sex, and social class; (b) when diagnosis of HTN was first made; (c) personal medical history including obesity, history of myocardial infarction (MI), stroke, and coronary artery disease, smoker or non-smoker; (d) number of times visited the clinic for HTN; (e) supportive family; (f) number of times skipped or stopped medication; and (g) sodium intake.

### Summary

Chapter II outlined the process of what was done for this DNP project. *The Hill-Bone Compliance to High Blood Pressure Therapy Questionnaire* was utilized to determine factors that affect medication adherence in the African American female population. Chapter III will discuss the results of this project in further detail.

## CHAPTER III - RESULTS

### Statistical Analysis of Data

After approval from the USM IRB was obtained, the DNP project was conducted once a week for a total of six weeks, from the end of August through the first week of October. A convenience sample comprised of 23 total participants was used for this DNP project. Each participant received a consent form and explanation of the DNP project before being given the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire*. The descriptive statistical method used for this DNP project was a frequency analysis.

The *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* was a 14 item questionnaire that ranked responses on a 4 point Likert Scale, from 1 (all of the time), 2 (most of the time), 3 (some of the time), and 4 (none of the time) to determine if the participant was compliant with taking their blood pressure medication. A total of three questions were listed to assess sodium intake, two questions to determine whether or not the participant made appointments, and 9 questions regarding taking their medication. Overall, the majority of participants answered all questions with the following responses that they are only compliant with taking their blood pressure medication 2 (most of the time) and 3 (some of the time). The participants' responses to this questionnaire indicated the usefulness and value of using the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* in the primary care setting for patients who have been diagnosed with hypertension in this population. The frequency data generated by SPSS for the questionnaire are listed below in Table 1

Table 1

*Frequencies of Response for Questionnaire (n=23)*

Question	Response							
	All of the time		Most of the time		Sometimes		Never	
	N	%	N	%	N	%	N	%
Forget to take high BP medicine	2	8.7	7	30.4	10	43.5	4	17.4
Decide not to take high BP medicine	1	4.3	6	26.1	9	39.1	7	17.4
How often do you eat salty food?	4	17.4	4	17.4	13	56.5	2	8.7
How often shake salt on food before eating?	4	17.4	4	17.4	12	52.1	3	13
How often do you eat fast food?	4	17.4	6	26.1	11	47.8	2	8.7
How often do you make the next appointment upon leaving doctor office?			5	21.7	9	39.1	9	39.1
Miss Scheduled appointments	1	4.38	2	8.7	17	73.9	3	13
Forget to get prescriptions filled			7	30.4	11	47.8	5	8.7
Run out of high BP medicine	4	17.4	6	26.1	11	47.8	2	8.7
How often do you skip high BP medicine before going to the doctor?	1	4.3	4	17.4	14	60.9	4	17.4
How often do you miss taking high BP pills when feeling better?	2	8.7	4	17.4	11	47.8	6	26.1
How often do you miss taking high BP pills when you feel sick?	3	13	7	30.4	8	34.8	5	21.7
How often do you take someone else's high BP pills?					10	43.5	13	56.5
How often do you miss taking your high BP pills when you are careless?			4	17.4	15	65.2	4	17.4

Descriptive statistics and frequencies were used to analyze the data from the questionnaire and self-made practitioner tool. Data were analyzed using Microsoft Excel spreadsheet and the SPSS software. The data generated by SPSS for the descriptive statistics of the participants are listed below in Table 2. The average age range for this DNP project was between 56-65 years of age yielding 39.1% (n=9) of the participants. The average body mass index was 26-30 representing 30.4% (n=7) of the total participants and 69.6% (n=16) of the participants were classified as low-income status.

Table 2

*Descriptive Statistics of Author Developed Tool Form (n=23)*

Variables		N	%	Mean (SD)
Gender				
	Female	23	100	
Age				47.13 (12.85)
Race/Ethnicity				
	African American	23	100	
Education				
	High school	14	60.9	
	Some college	9	39.1	
Social Class				
	Low income	16	69.6	
	Middle income	07	30.4	
Supportive Family				
	Yes	16	69.6	
	No	07	30.4	
BMI				
	21-25	3	13	
	26-30	7	30.4	
	31-35	4	17.4	
	36-40	2	8.69	
	41-45	3	13	
	46-50	1	4.34	
	51-55	2	8.69	
	60-65	1	4.34	
Smoker- implications				
	Yes	5	21.7	
History of heart disease or stroke				
	PVD	1	4.35	
	CAD	1	4.35	
Stroke		2	8.69	
Sodium Intake				
	1-2 grams	20	86.9	
	>2grams	3	13.1	
Year diagnosed with HTN				
	2017	7	30.4	
	2018	6	26.1	
	2019	10	43.5	
Number of times skipped medication within a year				
	0-2	5	21.7	
	3-4	6	26.1	
	5-10	12	52.2	
Number of times visited the clinic for HTN within past year				
	1-3	15	65.21	
	4-6	5	21.7	
	6-9	3	13.04	
Length of time been out of medicine before current visit				
	1-2 weeks	15	65.2	
	1 month	7	30.4	
	5 months	1	4.35	



## Summary

The purpose of this DNP project is to identify factors that affect medication non-adherence among African American females diagnosed with hypertension through the use of the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire*. While filling out the screening questionnaire, most participants reported they could not afford the office visit to obtain medication refills and past experiences with other healthcare providers were not good; therefore, they would just use their medication when symptoms occurred such as headache or experiencing dizziness. The majority of participants had a low-income status and no education past high school that played a role in them being non-adherent. Approximately 73.9 % (n=17) of the participants answered that they miss their scheduled appointments, which seemed to be the main contributing factor of medication non-adherence.

The second contributing factor to medication adherence in this population was carelessness that led to them not taking their medication. An average of 65.2% (n=15) of the participants had been out of their medication for one to two weeks before coming to the clinic. Some participants stated that they did not understand they had to take their medication every day and what adverse consequences could occur. When participants ran out of their medication, 43.5% (n=10) of participants took other family members' blood pressure medication in the event they were symptomatic and needed something right then.

The third most frequent reason patients were not compliant with their medications was that 47.8 % (n=11) would forget to get prescriptions filled or they would completely run out. Approximately 52.2% (n=12) of participants stated they skipped their medication

at least five to ten times within the year. The logic model helped as a guide to obtaining short term and long-term goals of this project, leading to an increased awareness of medication non-adherence and the effects on patients and healthcare providers. The data from the questionnaire and self-made practitioner data tool concluded that using a questionnaire like the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* is beneficial in identifying factors of why medication adherence-occurs. By improving medication adherence, the risk of stroke, heart attack, and other co-morbid diseases can be reduced.

## CHAPTER IV – DISCUSSION

### Summary

The three most common reasons identified throughout this DNP project resulting in medication non-adherence include the following:

- Missing scheduled appointments due to lack of funds, past experiences were not good with other healthcare providers;
- Carelessness that led them to not taking their medication; and
- Forget to get prescriptions filled.

The comparison of results with other studies reviewed for this DNP project resulted in very similar results. Although sample sizes were larger in the review of literature, all studies revealed that the majority of participants that were non-adherent with taking blood pressure medication were classified as low-income, average educational level around high school. The participants were not aware of options to obtain medications if their insurance has lapsed; therefore, they missed appointments, skipped medication to conserve what they had or took only when they were symptomatic such as having a headache.

Some strengths of the project were that the forms were simplified, easy for patients to understand, and the honesty and willingness of participants to take part in the survey. Studies have shown that medication non-adherence can be detrimental not only for the patient but for the economy as well (CDC, 2019). Medication non-adherence can result in stroke, heart attack, and other co-morbid diseases (CDC, 2019).

King's theory of goal attainment was the framework model used for this project. This theory is focused on nurse-patient relationships, setting goals, and taking actions to

achieve those goals. This theory was utilized by exploring patient factors that affected their non-adherence with blood pressure medication so that providers would know areas to focus on during the clinical visit. By allowing patients to take part in their healthcare plan, patients have shown to be more likely to achieve their goals such as being adherent with their medication and wanting to come back to the doctor. Utilizing the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* is a way to meet all aspects of the theory of goal attainment, improving medication adherence.

### Lessons Learned

For the future, improvements of the intervention would be to change the time frame in which the question was asked: “how many times have you skipped medication?” This would be changed from over a year to over the past month. Also, the time frame of conducting the DNP project would be changed to include one extra day during the week and a total of 12 weeks instead of 6 weeks to increase the sample size. Lastly, the patient’s current blood pressure while in the clinic would be added to the self-made data collection tool form.

### Implications for Future Practice

The use of the data obtained from the questionnaire has been presented to the physician and administration over the clinic in an executive summary in hopes that the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* can be incorporated at this primary clinic, to achieve better compliance with medication adherence. Several participants stated that a lot of times they would not have transportation to come to the clinic or they did not have any money to pay for their visit and medications. They were not aware of the resources available to help them obtain their medication.

Other implications for future research would include incorporating other co-morbidities such as diabetes and mental illnesses. This DNP project demonstrates social determinants of health play a major factor in medication adherence among African American females in this specific region. Identifying those factors and bringing to light the knowledge gained in this DNP project could help provide equal opportunities for this specific population.

This DNP project would be beneficial to other clinics' as it would promote medication adherence among this specific population. Overall improvement in health was the key motivation behind this DNP project for this population, which is sometimes vastly overlooked. The data from this DNP project could be used to provide support for outreach programs that would possibly impact patient compliance rates; in turn, organizations would benefit from better reimbursement and patient care.

After reviewing the DNP project results, challenges were noted that could be focused on in the future. The incidence of patients who had a diagnosis of HTN had increased from January 2017 through October 2019 from 30.4 % to 43.5 %. Also, 65.21% of participants had only visited the clinic one to three times a year; therefore, healthcare providers spending more time with patients at their visit addressing obesity, blood pressure, and other issues is crucial to help improve their health conditions. Approximately 3 of the participants had a body mass index that ranged between 51 and 65. If obesity can be controlled, then health problems such as hypertension, heart disease, stroke, and other co-morbidities can possibly be reduced leading to a better quality of life.

By using the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire*, rates of medication adherence can be improved upon by addressing these factors. In the

future, the continued use of the *Hill-Bone Compliance Blood Pressure Therapy Questionnaire* in the primary clinic setting, a DNP project can be done by having the patients come back in three months to see if medication adherence has increased and also to compare the number of visits and hospitalizations before and after this questionnaire was used. Research is imperative to help continue to identify areas of focus for better compliance with medication among African American women.

### Limitations

A few limitations were identified throughout this DNP project. One limitation of this DNP project was the small sample size from which the data collection was attained. Another limitation of this DNP project was that it was conducted at only one clinical setting. Also, the length of the DNP project was done only once a week on the weekend for six weeks to gather information; therefore, the larger sample size may have been achieved if data would have been gathered during the week too. No barriers were encountered while the DNP project was being conducted.

### Conclusion

The purpose of this project was to obtain more knowledge on reasons for medication non-adherence in African American females with a diagnosis of hypertension. Medication non-adherence is a leading cause of stroke and heart attack throughout the U.S. today. The use of the *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* was used as a screening tool in identifying reasons and areas to make improvements for medication non-compliance through this DNP project and answered yes to the following question, “In African American females diagnosed with hypertension, does the use of a screening questionnaire help to identify factors that affect

medication non-adherence over a six week period?” Using the data related to barriers identified in this project, future researchers can focus on methods to correct the barriers to increase medication compliance for African American females.

## APPENDIX A – Literature Table

Author(s) & Date	Purpose or Research Question(s)	Research Design/ Level of Evidence	Sampling Method, Size, & Setting	Results	Strengths	Weaknesses	Implications for Practice
Abel & Efird, 2013	This study assessed the relationship between trust and medication adherence.	Cross-sectional Pilot Study  Level of Evidence: 2	80 African American females between 18 and 60 years of age taking one or more medications for HTN. Participants were recruited through the use of flyers to various businesses. Data was collected in a private one-hour session, using the Hill Bone Compliance Questionnaire and Trust in Physician Survey.	The mean age of participants was 48 to 57 years of age, the majority of participants 67% were employed, 30% had low incomes. Increasing levels of trust in the health care provider were independently associated with greater medication adherence (P trend = 0.015).	The findings were consistent with various other studies regarding trust in the health care provider and medication adherence. Several studies have cited distrust of the medical community as the rationale for non-adherent health behaviors	Small convenience sample, other factors besides trust in the health care provider may impact medication adherence, the use of self-report measures may introduce personal bias.	The use of the Hill Bone Compliance Questionnaire is beneficial in helping healthcare providers understand and address the reasoning behind non-adherent health behaviors
Ferdinand et al. (2015)	The aim of this systematic review was to explore cardiovascular disease, developing patient-provider team-based strategies, and alleviating health care disparities, and improving evidence to better understand medication adherence.	Systematic Review  Level of evidence: 1	The authors independently searched their respective databases to achieve the collaborative objective, which was to identify factors of medication adherence, interventions to improve adherence and specific features of FDA activities that can help address adherence. Published studies were included if they were considered to be significant	Five key factors were documented that affect adherence: socioeconomic factors, health care system-related factors, medical condition-related factors, therapy-related factors, and patient-related factors. Women were less likely than men to adhere to prescribed long-term medications for diabetes and CVD. African American race and low socioeconomic status were two main factors. Involving the patient in the plan of care improves outcomes.	The findings were consistent with several studies that the African American race, female sex, had a high rate of noncompliance with hypertension medications. Also, team-based care and monitoring of adherence can be effective in improving medication adherence and outcomes.	One of the major weaknesses of this literature review was that it did not include the exact number of research articles reviewed and excluded	Cardiovascular disease and medication non-adherence is the leading cause of mortality in the U. S. Addressing and identifying barriers to medication non-adherence and improving teamwork in the healthcare setting can enhance patient outcomes.



			and relevant towards the objective set forth in this initiative				
Fongwa et al. (2008)	The purpose of this study was to identify factors associated with adherence to hypertension treatment in African American women	Qualitative Study  Level of Evidence: 2	Focus group interviews with hypertensive African American women who received treatment from an ambulatory inner-city free clinic in West Los Angeles. Five focus group interviews were conducted with 20 hypertensive African American women, 35 years and older. 10 to 12 people invited, but only one to eight attended per group. Study advertised via a poster in the clinic and neighborhood. Patients were selected based on the following criteria: African American women with HTN, receiving treatment, at least 35 years old, and met JNC 7 classification for HTN.	Factors associated with adherence to treatment in hypertensive African American women were in three categories: beliefs about HTN, facilitators of adherence to treatment, and barriers to adherence to treatment. The final sample included 20 hypertensive African American women, aged 35-68, high school educated 90% of the women used a free clinic for their HTN care.	Findings contribute to closing gap on the paucity of information on adherence to hypertension treatment factors among African American women. Provides a model for working with low income and minority ethnic groups and foundation for low-income urban African American women with HTN.	Small sample size Study participants were low-income women who received treatment for HTN from an inner-city free medical clinic and are not representative of African American women in general.	There is a need to screen African American women for depression, provide individualized information each woman needs to adhere to prescribed treatment for HTN.

Greer & Ostwald (2015)	The aim of this study was to evaluate the effectiveness of a 6-week culturally tailored intervention for 60 African American women with HTN.	Randomized Control Trial  Level of evidence: 2	Six 90-minute sessions were offered once a week for 6 weeks to groups of 8 to 12 women. 60 African American women, aged 29 to 86 with primary HTN were recruited from 4 rural locations to determine the effectiveness of an intervention on knowledge, attitudes, beliefs, bp med adherence.	A significant favorable overall main effect time was found for SBP and DBP for both groups. The higher achievement was noted among African American women who had higher educational levels and good support systems.	The attitudes and beliefs of African American women were consistent with those in other studies. Culture plays a significant role in how HTN is perceived and educational level.	The study was conducted in a rural area of Texas with African American women, generalizability to other populations are limited, small sample size. Intervention only lasted 6 weeks.	Including spiritual and cultural components is vital to improving medication adherence among African American women. Decreased sodium intake is a major challenge in African Americans and needs to be continuously addressed.
Koehler et al. (2018)	The purpose of this study was to identify African American explanatory models of hypertension with a focus on disease etiology, in order to increase provider understanding of how African American patients conceptualize their hypertension and how this information can be used to foster provider-patient trust and engagement.	Qualitative Study  Level of evidence: 2	The study included 12 in-depth, semi-structured interviews with hypertensive African American patients living in Philadelphia. Interview questions were related to barriers to managing HTN in their neighborhood and social environment, what they thought caused HTN, and environmental factors that influenced HTN. Purposeful sampling was used, at least 18	Five themes from participants emerged: stress causes HTN, unsafe neighborhoods lead to stress and can raise blood pressure, the financial stressors of everyday living can make HTN worse, emotional distress from strained social relationships can make HTN worse and lack of access to health care and healthy food in the community contributes to HTN.	The study is comparable to other studies that state the significant association between ecological stressors and HTN, and stress, especially in African Americans. Previous studies have found that neighborhood environments have a substantial effect on adult health outcomes, influencing morbidity and mortality and contributing to social disparities in HTN.	This study had a small sample size and specific demographics that may not render results generalizable to the African American population.	Findings have important implications for health care providers and community clinics serving the African American population. This study shows that providers need to take more time with their patients even if of low socioeconomic status, and barriers and other patient's views need to be explored in aiding the best outcome for the patient with HTN.

			years of age, African American, lived in Philadelphia and had dx of HTN for at least 2 years.				
Petty et al. (2016)	The aim of this study was to examine African Americans' perceptions of adherence to medications and lifestyle changes prescribed to treat HTN.	Qualitative Study  Level of Evidence: 5	Purposeful sampling was used, recruiting Southern African Americans with HTN aged 21 to 64 years of age, from a free, faith-based clinic. Interviews about perceptions related to adherence to treatment of HTN and analyzed verbatim transcripts using content analysis and comparison, also conducted medical record audits. 29 AA participated. Exclusion criteria: dementia, deafness and speech impairment.	29 AA participated, 52% female, 38% were less than 50 years of age, 52% had taken HTN meds for greater than 5 years. Audits indicated that 65% had uncontrolled HTN during the previous year. Participants were poor and uninsured. 17 had high BP on at least one clinic visit, 45% males, and 80 % females. Females took 1-2 more pills than males did for HTN. Many participants reported running out of medication, unable to schedule an office visit, using home remedies: pickle juice and vinegar, and females were less controlled.	The perceived causes of HTN were linked in many ways to self-treatment instituted by participants and were consistent with findings of other studies of AA with HTN. This study pointed out that knowledge was an important finding in this sample and was a barrier to adherence to lifestyle changes	Workers at the free clinic could not locate medical records for three participants; therefore, medical record data only covered 26 of the 29 participants. Also a small, non-randomized sample of participants from one faith-based clinic and explored perceptions of poor African Americans receiving free care.	This study provided that perceptions of the causes of HTN influence self-treatment attempted by patients. This evidence recommends that clinicians should explore patients' perceptions of the causes of HTN, self-treatments tried. Medication adherence can be assessed quickly with the Morisky or HB scale.
Rimando (2015)	The purpose of this study was to understand the perceived barriers to and facilitators of HTN self-management among underserved African American older adults in a southeastern clinic.	Qualitative Descriptive Study  Level of Evidence: 5	28 African Americans (males and females) aged greater than 55 years, diagnosed with HTN, either controlled or uncontrolled HTN, at an urban cardiovascular health clinic in a	28 African American patients participated in the study, the average age was 62, ranging from 55 to 75. Patients were high school educated, married, low-income, uninsured, 86% reported they self-managed their HTN, and 14% stated they could not manage their HTN. Perceived barriers to HTN management included lack of	The study used a sampling of underserved African American Adults in the Southeast. Also, individual semi-structured interviews were used, where a lot of other studies have	Patients may have provided the researcher with socially desirable answers about their HTN self-management. The study was done at one HTN clinic in the Southeast. Also, patients'	This study addresses the importance of patient-provider communication, cultural competency, and health literacy in improving HTN education and medication adherence for underserved

			southeastern state. Face to face semi-structured interviews was conducted.	money, lack of motivation to exercise, and fear of injury. Perceived facilitators of HTN management included weight loss, unexpected dx of HTN, family members with HTN/diabetes, and social support.	used focus groups for data collection	answers were not compared with their physicians' answers to determine whether HTN education was provided to them.	African Americans
Uchmanowicz et al. (2019)	This study aimed to estimate medication adherence in HTN patients aged >60 and to explore determinants of adherence with HTN treatment in this group	Systematic Review and Meta-analysis  Level of Evidence: 1	A systematic search of the PubMed, Scopus, and Google Scholar using the Cochrane guidelines was performed. The analysis included articles published between January 1, 2000, and June 30, 2018. Patients were considered adherent if they scored greater than 6 pts. on the MMAS.	Thirteen studies including a total of 5,247 patients were available for the meta-analysis. The adherence of patients from Western countries (Europe and the U.S.) was higher than in other patients. The significant determinants of better adherence identified in more than one study were older age, retirement/unemployment, duration of HTN greater than 10 years and a lower number of prescribed drugs.	This study compared with previous studies that found causes of lower adherence were socioeconomic factors, primarily financial and economic barriers in the access to health care services.	The search was limited only to publications in PubMed, Scopus, and Google Scholar. A number of eligible studies were small. Only once questionnaire (adherence scale MMAS, was used)	This study gives a need for the continuation of exploring and addressing factors in the primary care setting that affect medication adherence in the older population.
Escamilla et al. (2015)	The purpose of this study was to compile validated questionnaires measuring adherence to pharmacological antihypertensive treatments.	System Review  Level of Evidence: 1	Literature research was undertaken using three databases: US National Library of Medicine, EMBASE, and Latin American and Caribbean Health Sciences.	A total of 234 articles were retrieved. Of these, only 12 articles were included, that had 15 validation processes for 6 questionnaires: The MGL, Hill-Bone Compliance to HTN Therapy Scale, MMAS-8, TAQPH, and MBG.	This study validated the use of several questionnaires that could be used to discover reasons for medication non-adherence solely for patients	Publication bias could be an issue because of a general tendency to publish only positive results, studies were only used for 4 languages.	The review provides great information for daily practice. The use of questionnaires, especially the MMAS or Hill-Bone Compliance Questionnaire can be used to help identify

			Articles had to include at least one validity test and one reliability test of the questionnaire. Articles started at the beginning of the indexing of the database until July 8, 2013.		with dx of HTN.		medication non-adherence and ways to improve.
Miyong et al. (2000)	This study aimed to validate the use of the Hill-Bone Compliance to High Blood Pressure Therapy Scale.	System Literature Review  Level of Evidence: 1	Internal consistent reliability and predictive validity were evaluated using two community-based samples of HTN adults enrolled in clinical trials of HTN and control.	In this study, high compliance scale scores predicted significantly lower levels of blood pressure and blood pressure control.	This study compared to other studies invalidating the use and reliability of the Hill Bone Compliance Scale for medication adherence.	This study only examined one scale. Small sample size.	This study shows that this brief instrument provides a simple method for clinicians in various settings to use to assess patient's self-reported compliance levels and to plan appropriate interventions.
Lee et al. (2018)	The objective of this study was to examine the causal paths among financial availability, patient attitudes and beliefs, and cost-related non-adherence.	Quant. Study  Level of Evidence: 2	A nationally representative sample (n=4,818) from the National Health Interview Survey, selected respondents were aged 65 older and had a dx of HTN and/or diabetes, and prescribed medication for at least one condition.	Six percent of respondents reported cost-related medication non-adherence in the previous 12 months. The effects of financial resource availability on CRN was mediated through perceived medication affordability, access to health care, and patient satisfaction with health care services.	This study supported other studies that financial resource availability, patients' attitudes and beliefs, and CRN were linked together.	The study relied on self-reported data, which are subject to bias. The model did not include questions such as the perceived need for medication and perceived concerns about medication use.	This study revealed the need to focus on the patient's ability to afford medications and that patient satisfaction/trust with healthcare providers played a major part in medication adherence.
Spikes et al. (2019)	The purpose of this study was to determine the association between demographic	Cross-sectional study  Level of Evidence: 2	A cross-sectional study of (N=120) African Americans (mean age 49, 22.5%	A small but significant relationship was found between medication adherence and the number of comorbidities.	This study revealed that the impact of belief systems regarding HTN and	Most of the participants from this study were of higher economic status and female.	The Hill Bone Compliance Survey is a validated and reliable tool to assess medication

	, clinical factors, depressive symptoms, HTN beliefs, and social support with medication adherence in middle-aged AA adults with HTN		men) with a current dx of HTN. Participants were recruited from various community practice networks that include a diverse group of AA's located in a Southeastern metropolitan city, were at least 18 years of age or older, and met at least 2 cardiovascular risk factors. The HB Compliance questionnaire was used also.	Depressive symptoms, high blood pressure beliefs and social support did not have a significant relationship with medication adherence. However, there was an overall higher non-adherence rate in females when compared to males.	decision-making has a big effect on medication adherence.  The Hill Bone Compliance Questionnaire was used to detect compliance.	Small sample size. I did not agree with other studies that these factors were significant although the sample was limited.	adherence. Some studies have shown that there is a relationship between depression and non-adherence, so these factors still need to be addressed in the clinical setting
AlGhurair et al. (2012)	This study aimed to determine what adherence barriers were included in each instrument and to describe the psychometric properties of the WHO model with patient, condition, therapy, socioeconomic, and health care system/team-related barriers	System Review  Level of Evidence: 1	Five databases were used: Medline, Embase, Health and Psychological Instruments, CINAHL, and International Pharmaceutical Abstracts were searched from 1980 to September 2011. The search identified 1712 citations, 74 articles met inclusion criteria, and 51 surveys were identified. Studies eligible for inclusion	The Morisky Medication Adherence Scale was the most commonly used survey. Only 20 surveys (39%) had established reliability and validity evidence. Other commonly used surveys included the Hill-Bone Compliance questionnaire, Belief about Medicine questionnaire and many others. Some studies showed a link between age, self-efficacy, and depression was predictive of adherence with HTN medication. Patients' health literacy was also associated with non-adherence and poor outcomes in CVD.	This study used multiple databases to review articles to be used, and also there was a large range of documents used to gather data on the validity and reliability of scales to use in practice.  This study revealed the need for addressing and identification of barriers to medication adherence stating that collaborative provider communication was associated	There were several limitations to this study. Only studies published in English were used. Search was restricted to HTN only, with no other diseases. The development of measures of adherence barriers may be influenced by the time period in which the study was performed.	The Morisky Scale or the Hill-Bone scale can be used in addition to the Epidemiologic Studies Depression Scale Short-Form.

			were observational and experimental studies that measured patient-perceived barriers of adherence, and 18 years of age or older, and English peer-reviewed articles.		with better adherence.		
Devkota et al. (2016)	The purpose of this study was to identify barriers existing in hypertension treatment and control in the municipalities of Kathmandu district in Nepal.	Cross-sectional mixed-method study  Level of Evidence: 2	A study conducted in Kathmandu district in Nepal between January and July 2015. Participants were selected randomly, 587, with dx of HTN further assessed for control of HTN. 20 participants having uncontrolled HTN took part in a two focused group discussion and two cardiac physicians participated in in-depth interviews.	Only 191 participants were identified as hypertensive. 118 were aware of their problem, 93 were taking medications, 46 had controlled HTN. The most commonly cited barriers for treatment and control of HTN were: worried that medicine has to be taken lifelong, perceived side effects of drugs, non-adherence to medication, lost to follow-up, inadequate counseling from a physician, and lack of national guidelines for HTN treatment. More females were identified with HTN than males.	Study findings revealed that uncontrolled HTN occurred largely in this female population. This study was compared to similar studies that non-adherence leads to the poor outcome of HTN.	The small sample size was used for this study. This study was also conducted in one place.	This study revealed that there is a need to effectively address barriers that affect HTN treatment and management. This study suggested that a policy should be introduced to healthcare facilities to help them improve adherence to medication and long-term outcomes.
Jongen et al. (2019)	This study investigated knowledge and perceptions of HTN in a rural area of South Africa to increase awareness of HTN and CVD in this population	Qualitative Mixed Methods Study  Level of Evidence: 2	451 participants attending a follow-up visit between August 2017 and January 2018 completed a questionnaire on CV risk perception. 60 participants	74.3% have intermediate to good knowledge of HTN and 11.8% had poor knowledge. Poverty was identified as a major barrier in this community limiting choices for healthy lifestyles such as nutritious foods, recreational physical activity and being able to access health care timely. Three main themes emerged from data:	This study revealed that major barriers such as poverty and access to healthcare, getting medicines needs to be addressed. The large sample size used First comprehens	This population could have been more aware of health issues such as HTN due to regular visits, and may not be representative of the general population. The study was	The prevalence of HTN in the African American race continues, there is an urgent need to improve health awareness and address the social determinants of health-supporting

			were invited to participate in six focus group discussions of which 56 participated	perceptions and misperceptions of HTN, HTN prevention and management challenges on the community level, and recommendations for raising awareness in the community about HTN.	ive mixed-methods study on the perception of HTN in rural South Africa.	conducted in a rural geographic location in South Africa, limiting the generalizability of the findings to urban settings.	healthy lifestyle choices.
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APPENDIX B – Practitioner Developed Data Collection Tool

Identification # \_\_\_\_\_

Age:\_\_\_\_\_ Sex:\_\_\_\_\_ Race:\_\_\_\_\_

Ht:\_\_\_\_\_ Wt:\_\_\_\_\_ BMI:\_\_\_\_\_

Smoker: Y or N Ethnicity:\_\_\_\_\_ Social Class:\_\_\_\_\_

Current medicine taking for hypertension:\_\_\_\_\_

Education level completed:\_\_\_\_\_

Year diagnosed with Hypertension:\_\_\_\_\_

History of other cardiac diseases/stroke:\_\_\_\_\_

Number of times visited the clinic for Hypertension within the past  
year:\_\_\_\_\_

Supportive family:\_\_\_\_\_

Number of times skipped or stopped medication within the past year  
\_\_\_\_\_

Appx sodium intake per day within the past year:\_\_\_\_\_

When was patient last seen for hypertension:\_\_\_\_\_

## APPENDIX C – Data Collection Method

### Hill-Bone Compliance to Blood Pressure Medication Scale

No.	Item	Response: 1. All of the Time 2. Most of the Time 3. Some of the Time 4. None of the Time
1.	How often do you forget to take your high blood pressure medicine?	
2.	How often do you decide NOT to take your high blood pressure medicine?	
3.	How often do you eat salty food?	
4.	How often do you shake salt on your food before you eat it?	
5.	How often do you eat fast food?	
6.	How often do you make the next appointment before you leave the doctor's office?	
7.	How often do you miss scheduled appointments?	
8.	How often do you forget to get prescriptions filled?	
9.	How often do you run out of high blood pressure pills?	
10.	How often do you skip your high blood pressure medicine before you go to the doctor?	
11.	How often do you miss taking your high blood pressure pills when you feel better?	
12.	How often do you miss taking your high blood pressure pills when you feel sick?	
13.	How often do you take someone else's blood pressure pills?	
14.	How often do you miss taking your high blood pressure pills when you are careless?	

\* Reverse coding

Note:

Scale and subscale scores are calculated by summing individual items.

Reducing sodium intake subscale: Items 3,4,5

Appointment keeping subscale: Items 6,7 Medication taking subscale: Items 1, 2, 8,9,10,11,12,13,14

## APPENDIX D – King’s Theory of Goal Attainment

### Framework Model

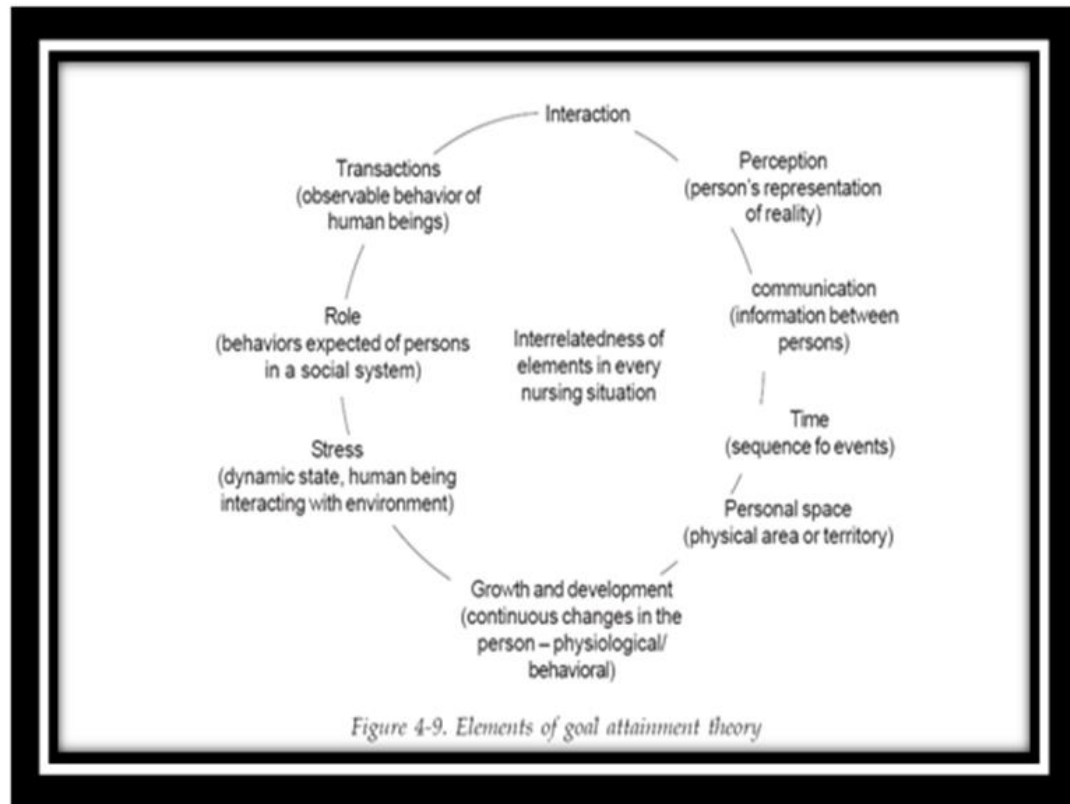


Figure A1. *Kings Theory of Goal Attainment Framework Model.*

(King 1981, <http://imogenekingtheory.blogspot.com/p/key-concepts.html>)

APPENDIX E – Permission to Use Hill Bone Questionnaire

Please consider this as permission to use the Hill-Bone Scale. \*

Below are links to the Hill-Bone Scales along with several relevant articles reporting on the validation and use of the scale. We would like to request that you cite the scale using the references provided. We would appreciate you sharing the findings of your research with us.

Please don't hesitate to reach out to us at [SON-HillBone@jhu.edu](mailto:SON-HillBone@jhu.edu) if you have any follow-up questions.

Best,

The Hill-Bone Scales team

*\* **Note: Please do not share these documents with anyone else outside your project. We ask that anyone who wishes to use the scale should submit a formal request using the link provided for proper***

## APPENDIX F – DNP Essentials

I. Scientific Underpinnings for Practice	The theory of goal attainment is a theory that will be used to link clinical practice with patient outcomes; thereby, improving interactions between the clinical provider and patient to achieve their healthcare goals.
II. Organizational and Leadership for Quality Improvement and Systems Thinking	The identification and assessment of barriers through the use of the Hill-Bone Compliance to Blood Pressure Therapy Scale may improve medication adherence among African American females with hypertension in the primary care setting. A practice change will more than likely be established to improve patient safety and satisfaction; thereby, decreasing the risk of stroke and CVD.
III. Clinical Scholarship and Analytical Methods for Evidence-Based Practice	This DNP project assesses the methods that are currently used to improved medication adherence among patients with hypertension. After these new methods are critiqued and analyzed, a new policy will be implemented for the patient with hypertension to improve medication adherence.
IV. Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care	By analyzing the effects of identifying barriers of medication adherence through the use of the Hill-Bone Compliance to High Blood Pressure Therapy Scale, this study will exhibit evidence of decreasing medication non-adherence. The Hill-Bone Compliance to High Blood Pressure Therapy Scale will improve patient care in a collaborative effort leading to improved medication adherence and patient outcomes.
V. Health Care Policy for Advocacy in Health Care	If the assumptions of this DNP project prove to be true, advocacy for a practice change will be implemented to decrease medication non-adherence in patients with hypertension; thereby, reducing the risk of heart attack and stroke. This will improve patient satisfaction as well as patient outcomes.
VI. Interprofessional Collaboration for Improving Patient and Population Outcomes	Communication has been identified as one of the contributing factors related to medication non-adherence. By incorporating the use of the Hill-Bone Compliance to High Blood Pressure Therapy Scale questionnaire in primary practice, barriers can be identified and communication improved between providers and patients to achieve better health outcomes.
VII. Clinical Prevention and Population Health for Improving the Nation's Health	This project will inform other healthcare providers regarding the issue of medication non-adherence. With compliance from all members of the healthcare team, focusing on all aspects of health including barriers and not just the disease process itself, the risk of medication non-adherence can be reduced. By involving patients in the decision-making process, this will lead to better patient outcomes and decreased financial burden for healthcare facilities.
VIII. Advanced Nursing Practice	Through enhanced communication among all members of the healthcare team, patient outcomes can be improved. This is essential for medication adherence to be achieved. Leadership skills are essential for APRNs, especially when it comes to initiating a change in clinical practice that will be effective and beneficial for patient outcomes. For this clinical practice issue to be addressed, the following leadership skills are needed: effective communication, fearlessness, being a role model, knowledge and clinical competence, being compassionate, establish trust, and empathy

## APPENDIX G – Logic Model

Inputs	Outputs		Outcomes - Impact	
	Activities	Participation	Short	Long
<p>Partners- for this project will need input from nurse practitioners and healthcare facility of interest to gather statistical data</p> <p>Time- this project will take approximately four to six weeks to gather data to compare the improvement of medication adherence before and after the MMAS questionnaire and attitude survey was administered.</p> <p>Research base- this will consist of a literature review and other activities done throughout the semester regarding the DNP project.</p> <p>Equipment- a computer will already be provided to search the most current literature and websites such as the AHRQ, CDC, and IOM, for analysis of medication non-adherence that will be used for the study.</p>	<p>Obtain feedback from members of the healthcare team (nurse practitioners and doctors) regarding the institutional policy.</p> <p>Conduct chart review and questionnaire to identify the number of patients who are non-adherent with medication and barriers affecting compliance.</p>	<p>Key players will include members of the healthcare team along with the institutions' board of directors and business managers.</p> <p>Satisfaction from employees with identifying medication non-adherence using the MMAS questionnaire and attitudes survey, but also with patients in quality care being given and decreasing risk of adverse outcomes such as heart attack and stroke.</p>	<p>Increase the awareness and knowledge of medication adherence among other healthcare providers and key players of the healthcare facility.</p> <p>Increase the awareness of risks of stroke, heart attack, and other adverse outcomes if medication is not taking as directed.</p>	<p>The quality of patient care delivered is increased by identifying and addressing barriers to medication non-adherence as evidenced by patients keeping follow-up appointments and blood pressure controlled.</p> <p>Policies The institutional policy is enforced to help decrease the rate of medication non-adherence and control blood pressure by identifying and addressing barriers based on evidence from research.</p>

## APPENDIX H – USM IRB Letter of Approval

### NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-19-386

PROJECT TITLE: Improving Medication Adherence In African American Adult Females With Hypertension

SCHOOL/PROGRAM: School of LANP, Leadership & Advanced Nursing

RESEARCHER(S): Donald Welch, Cathy Hughes

IRB COMMITTEE ACTION: Approved

CATEGORY: Expedited

Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

PERIOD OF APPROVAL: August 26, 2019

Donald Sacco, Ph.D.  
Institutional Review Board Chairperson

## APPENDIX I –Executive Summary

The DNP project was conducted at one of your clinical facilities to determine medication adherence among African American females. The questionnaire and demographic results are attached to this document. Medication adherence costs the U.S. billions of dollars each year due to increased hospitalizations and physician visits for hypertension. Current literature studies have supported that medication adherence is an ongoing issue and that African Americans have the highest level of uncontrolled blood pressure when compared to other ethnic groups.

The *Hill-Bone Compliance to Blood Pressure Therapy Questionnaire* was administered to a total of 23 participants, one day a week, over a six-week period. The questionnaire evaluates three different areas that affect medication adherence, which include the following: sodium intake, appointment scheduling, and medication. The results of the study revealed three major factors that affect medication adherence in this group: missing scheduled appointments due to lack of funds, past experiences were not good with other healthcare providers, carelessness that led them to not taking their medication- did not understand had to take every day, would just take family members if needed and forgetting to get prescriptions filled. The questionnaire proved to show positive results and answered yes to the following PICO question: “In African American females diagnosed with hypertension, does the use of a screening questionnaire help to identify factors that affect medication non-adherence over a six week period?” By incorporating the use of this screening tool into your current practice, medication adherence can be improved upon; thereby, potentially reducing the risk of heart attack and stroke.



## REFERENCES

- Abel, W. M., & Efird, J. T. (2013, December 5). The association between trust in health care providers and medication adherence among Black women with hypertension. *Frontiers in Public Health, 1*(66), 1-6. <http://dx.doi.org/10.3389/fpubh.2013.00066>
- Ahuja, R., Ayala, C., Tong, X., Wall, H. K., & Fang, J. (2018, April 5). Public awareness of health-related risks from uncontrolled hypertension. *Preventing Chronic Disease: Public Health Research, Practice, and Policy, 15*.  
<http://dx.doi.org/10.5888/pcd15.170362>
- AlGhurair, S. A., Hughes, C., Simpson, S. H., & Guirguis, L. M. (2012, August 20). A systematic review of patient self-reported barriers of adherence to antihypertensive medications using the World Health Organization multidimensional adherence model. *The Journal of Clinical Hypertension, 14*, 877-886. <http://dx.doi.org/10.1111/j.1751-7176.2012.00699.x>
- Alligood, M. R., & Tomey, A. M. (2010). *Nursing Theorists and Their Work* (7<sup>th</sup> ed.). M Mosby Elsevier.
- American Family Physician. (2014, October 1). JNC 8 guidelines for the management of hypertension in adults. *American Academy of Family Physicians, 90*, 503-504.  
Retrieved from <https://www.aafp.org/afp/2014/1001/p503.html>
- Ash, L., & Miller, C. (2014). Interprofessional Collaboration for Improving Patient and Population Health. In M. E. Zaccagnini, & K. W. White (Eds.), *The Doctor of Nursing Practice Essentials: A New Model for Advanced Practice Nursing* (2nd ed., pp. 217-250). Jones and Bartlett Learning.

- Burkart-Jayez, S. (2014). Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care. In M. E. Zaccagnini, & K. W. White (Eds.), *The Doctor of Nursing Practice Essentials: A New Model for Advanced Practice Nursing* (2nd ed., pp. 133-155). Jones & Bartlett Learning.
- Centers for Disease Control and Prevention (CDC). (2018). DHDSP Data Trends and Maps. Retrieved from <https://www.cdc.gov/dhdsp/maps/dtm/index.html>.
- Centers for Disease Control and Prevention (CDC). (2019). Heart Disease and Stroke Prevention. Retrieved from [http://www.cdc.gov/dhdsp/data\\_statistics/fact\\_sheets/fs\\_bloodpressure.htm](http://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_bloodpressure.htm)
- Chism, L. A. (2013). Chapter 2: Leadership, collaboration, and the DNP graduate. In L. A. Chism (Ed.), *The doctor of nursing practice: A guidebook for role development and professional issues, second edition* (pp. 35-58). Jones & Bartlett Learning.
- Devkota, S., Dhungana, R. R., Pandey, A. R., Bista, B., Panthi, S., Thakur, K. K., & Gajurel, R. M. (2016, August 2). Barriers to treatment and control of hypertension among hypertensive participants: a community-based cross-sectional mixed-method study in municipalities of Kathmandu, Nepal. *Frontiers in Cardiovascular Medicine*, 1-9. <http://dx.doi.org/10.3389/fcvm.2016.00026>
- Eldridge, C. (2014). Nursing Science and Theory: Scientific Underpinnings for Practice. In M. E. Zaccagnini, & K. W. White (Eds.), *The Doctor of Nursing Practice Essentials: A New Model for Advanced Practice Nursing* (2nd ed., pp. 3-31). Jones & Bartlett Learning.

- Escamilla, B. P., Trigo, L. F., & Corpas, J. G. (2015, April 13). Identification of validated questionnaires to measure adherence to pharmacological antihypertensive treatments. *Patient Prefer Adherence*, 9, 567-578.  
<http://dx.doi.org/10.2147/PPA.S76139>
- Ferdinand, K. C., Senatore, F. F., Jeter, H. C., Cryer, D. R., Lewin, J. C., Nasser, S. A., ... Califf, R. (2017). Improving medication adherence in cardiometabolic disease. *Journal Of The American College of Cardiology*, 69(4), 1-15  
<http://dx.doi.org/10.1016/j.jacc.2016.11.034>
- Fongwa, M. N., Dela Cruz, F. A., & Hays, R. D. (2018, November 26). African American women's perceptions of the meaning of support groups for improving adherence to hypertension treatment: a conceptual model. *Nursing Open*, 1-11.  
<http://dx.doi.org/10.1002/nop2.266>
- Fongwa, M. N., Evangelista, L. S., Hays, R. D., Martins, D. S., Elashoff, D., Cowan, M. J., & Morisky, D. E. (2008). Adherence treatment factors in hypertensive African American Women. *Vascular Health and Risk Management*, 4, 157-166. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2464745>
- Fongwa, M., Nandy, K., Yang, Q., & Hays, R. (2015). The facilitators of and barriers to adherence to hypertension treatment scale. *Journal of Cardiovascular Nursing*, 30, 484-490. <http://dx.doi.org/10.1097/JCN.0000000000000206>
- Greer, D. B., & Ostwald, S. (2015). Improving adherence in African American women with uncontrolled hypertension. *Journal of Cardiovascular Nursing*, 30, 311-318.  
<http://dx.doi.org/10.1097/JCN.0000000000000152>

- Jongen, V. W., Lalla-Edward, S. T., Vos, A. G., Godijk, N. G., Tempelman, H., Grobbee, D. E., ... Klipstein-Grobusch, K. (2019, March 25). Hypertension in a rural community in South Africa: what they know, what they think they know and what they recommend. *BioMed Central Public Health*, 19(341), 1-10.  
<http://dx.doi.org/doi.org/10.1186/s12889-019-6642-3>
- King, I. M. (1981). *A Theory of Goal Attainment: General concepts of human behavior*. John Wiley & Sons.
- Koehler, K., Lewis, L., & Cronholm, P. F. (2018, January 8). Neighborhood and social influences on blood pressure: An exploration of causation in the explanatory models of hypertension among African Americans. *Journal of Community Medicine*, 1, 1-8. Retrieved from <https://meddocsonline.org/journal-of-community-medicine/neighborhood-and-social-influences-on-blood-pressure-an-exploration-of-causation-in-the-explanatory-models-of-hypertension-among-African-americans.pdf>
- Lam, W. Y., & Fresco, P. (2015, August 5). Medication Adherence Measures: An overview. *BioMed Research International*, 2015, 1-12.  
<http://dx.doi.org/10.1155/2015/217047>
- Lee, S., Jiang, L., Dowdy, D., Hong, Y. A., & Ory, M. G. (2018). Attitudes, beliefs, and cost-related medication non-adherence among adults aged 65 or older with chronic diseases. *Preventing Chronic Disease: Public Health Research, Practice, and Policy*, 15(148), 1-10. <http://dx.doi.org/10.5888/pcd15.180190>
- Martin, M. Y., Kohler, C., Kim, Y. I., Schoenberger, Y. M., Litaker, M. S., Prayor-Patterson, H. M., Clarke, S. J., Andrews, S., & Pisu, M. (2010). Taking less than

prescribed: medication non-adherence and provider-patient relationships in lower-income, rural minority adults with hypertension. <http://dx.doi.org/10.1111/j.1751-7176.2010.00321>

Miyong, K. T., Hill, M. N., Bone, L. R., & Levine, D. M. (2000). Development and testing of the Hill-Bone Compliance to High Blood Pressure Therapy Scale. *Progress in Cardiovascular Nursing*, 15, 90-96. Retrieved from <http://www.ncbi.nlm.nih.gov/m/pubmed/10951950>

Nursing theories. (2012). *Imogene King's Theory of goal attainment*. Retrieved from: [http://currentnursing.com/nursing\\_theory/goal\\_attainment\\_theory.html](http://currentnursing.com/nursing_theory/goal_attainment_theory.html)

Neiman, A. B., Ruppar, T., Ho, M., Garber, L., Weidle, P. J., Hong, Y., ... Thorpe, P. G. (2017, November 17). CDC Grand Rounds: improving medication adherence for chronic disease management- innovations and opportunities. *Centers for Disease Control and Prevention*, 66. Retrieved from <https://www.cdc.gov/mmwr/volumes/66/wr/mm6645a2.html>

Ozunal, Z. G., Tahirbegolli, I. A., Baykal, M., Ates, B., Tahirbegolli, B., Kilic, Y., ... Uresin, A. Y. (2019). The drug adherence and lifestyle factors that contribute to blood pressure control among hypertensive patients. *The European Research Journal*, 1-8. <http://dx.doi.org/10.18621/eurj.431174>

Petersen, S. (2014). Systems thinking, healthcare organizations, and the advanced practice nurse leader. In M. E. Zaccagnini, & K. W. White (Eds.), *The Doctor of Nursing Practice Essentials: A New Model for Advanced Practice Nursing* (2nd ed., pp. 37-58). Jones & Bartlett Learning.

- Petty, C. M., McSweeney, J. C., Stewart, K. E., Cleves, M. A., Price, E. T., Heo, S., & Souder, E. (2016). African Americans' perceptions of adherence to medications and lifestyle changes prescribed to treat hypertension. *SAGE Publications*, 1-12. <http://dx.doi.org/10.1177/2158244015623595>
- Rimando, M. (2015, August 7). Perceived barriers to and facilitators of hypertension management among underserved African American older adults. *Ethnicity and Disease*, 25, 329-336. <http://dx.doi.org/10.18865/ed.25.3.329>
- Schadewald, D., & Pfeiffer, J. (2014). Clinical prevention and population health for improving the nation's health. In M. E. Zaccagnini, & K. W. White (Eds.), *The Doctor of Nursing Practice Essentials: A New Model for Advanced Nursing Practice* (2nd ed., pp. 257-294). Jones & Bartlett Learning.
- Spikes, T., Higgins, M., Quyyumi, A., Reilly, C., Pemu, P., & Dunbar, S. (2019). The relationship among health beliefs, depressive symptoms, medication adherence, and social support in African Americans with hypertension. *Journal of Cardiovascular Nursing*, 34, 44-51. <http://dx.doi.org/10.1097/JCN.0000000000000519>
- Tackling, G., & Borhade, M. B. (2019, May 5). Hypertensive heart disease. *StatPearls Publishing*. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK539800/>
- Tymkow, C. (2014). Clinical scholarship and evidence-based practice. In M. E. Zaccagnini, & K. W. White (Eds.), *The Doctor of Nursing Practice Essentials: A New Model for Advanced Practice Nursing* (2nd ed., pp. 61-122). Jones & Bartlett Learning.

- Uchmanowicz, B., Jankowska, E. A., Uchmanowicz, I., & Morisky, D. E. (2019, March 1). Self-Reported medication adherence with Morisky medication adherence scales and its determinants in hypertensive patients aged >60 Years: A systematic review and meta-analysis. *Frontiers in Pharmacology*, 10(168), 1-11.  
<http://dx.doi.org/10.3389/fphar.2019.00168>
- U. S. Department of Health and Human Services. (2012). Hypertension Control.  
Retrieved from <https://www.hrsa.gov/sites/default/files/quality/toolbox/508pdfs/hypertensioncontrol.pdf>
- U.S. Census Bureau. (2018). Census in Jones County, Mississippi.  
Retrieved from <https://www.census.gov/quickfacts/jonescountymississippi>
- White, K. (2014). Emerging Roles for the DNP. In M. E. Zaccagnini, & K. W. White (Eds.), *The Doctor of Nursing Practice Essentials: A New Model for Advanced Practice Nursing* (2nd ed., pp. 355-413). Jones & Bartlett Learning.