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Improving Medication Adherence for African American Patients with Hypertension

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Walden University

College of Nursing

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Kimberly Fitzgerald

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Walden University

2022

Abstract

Improving Medication Adherence for African American Patients with Hypertension

by

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MS, Walden University, 2014

BS, Clayton State University, 2000

Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

August 2022

Abstract

Adherence to antihypertensive medications is essential for positive outcomes in treating hypertension (HTN). But the rate of nonadherence to antihypertensive medications among African Americans (AA) is low. The purpose of this DNP project was to develop a clinical practice guideline (CPG) that would assist in improving hypertensive medication adherence in the AA patient population as well as assess whether the CPG would be recommended by a team of content experts for use in their practice. The Hypertension Medication Adherence CPG incorporated the medication adherence model and the transtheoretical model to generate evidence-based interventions. Grading of Recommendations Assessment, Development, and Evaluation method was used to critically appraise the evidence from the literature. A four-member expert panel evaluated the CPG using the Appraisal of Guidelines for Research and Evaluation II instrument to validate the content and ensure usability. A benchmark of 70% or greater was used to select the quality of each domain. All six-domains scored 96% or above and the overall assessment score was 100%. All four appraisers confirmed they would recommend the use of the CPG in their practice. CPGs can provide nurses with a roadmap to patient care by applying evidence-based interventions that encourage patients to adhere to their medications. The project has potential implications for social change as it could improve nursing practice around strategies for improving medication adherence in all disease modalities.

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Dedication

This project is dedicated in loving memory of my mother Hazel E. Fitzgerald, a mental health nurse, who instilled in me excellence, perseverance, and the desire for nursing and higher education. I also would like to dedicate this project to my amazing husband, Roderick Turner, who supported and encouraged me throughout this Journey.

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Section 1: Nature of the Project

Introduction

Hypertension (HTN) occurs when the force of blood in the blood vessels is continually high, leading to a systolic blood pressure level of 140 mm Hg or greater and a diastolic blood pressure level of 90 mm Hg or greater confirmed after several visits to the medical office (Whelton & Carey, 2018). Hypertension affects an estimated 1.39 billion people globally and is considered the leading cause of death worldwide (Centers for Disease Control and Prevention, 2020; Whelton & Corey, 2018). In the United States, Americans are greatly affected by HTN, and African Americans (AA) are disproportionately affected by this disease than non-Black Americans.

One of the primary reasons for poorly controlled blood pressure in African American patients is nonadherence to prescribed antihypertensive medications (Solomon et al., 2015). Although many effective antihypertensive medications are available to treat and control blood pressure, uncontrolled blood pressure and nonadherence to treatment continue to be a public health issue (Peacock, & Krousel-Wood, 2017). Medication nonadherence is a leading cause of cardiovascular disease, stroke, and kidney disease (Maraboto & Ferdinand, 2020).

There were no clinical practice guidelines (CPGs) in place at the three clinics that was the focus for this Doctor of Nursing (DNP) project. The key to therapeutic success is medication adherence; therefore, the attention of this evidence-based doctoral project was to create a clinical practice guideline for three out-patient clinics located in a large metropolitan area in Georgia. This evidence-based project brings positive social change

as it focused on creating a CPG with the goal to increase medication adherence for hypertensive patients. Medication adherence can significantly improve health outcomes and the overall health of African Americans, and better blood pressure management will lower the burden of health care costs related to the chronic effects of uncontrolled hypertension.

Problem Statement

Medication adherence is an essential component to improving hypertension. In the African American population, where medication nonadherence is sub-optimal, there is much opportunity for improvement. Lower medication adherence levels are associated with worsening blood pressure control and adverse effects such as cardiovascular disease, renal disease, stroke, and death (Gosmanova & Kovesdy, 2015). Further, In the United States, the health care cost associated with hypertension accounts for approximately \$131 billion (Kirkland et al., 2018).

At the three clinics which were the focus of this DNP project, there were no CPGs in place to address medication adherence for hypertensive patients. A current, evidence-based CPG can provide the clinical staff with a tool that can be used to enhance the consistency of patient care. The most significant benefit from the CPG is to improve the quality-of-care patients receive by reducing the variability in clinical practice and increasing known effective intervention, thereby improving health outcomes. CPGs extend a method of bridging the gap between patient choice, organization policy, local contexts, and best practice (Kredo et al., 2016). CPGs promote interventions that have been beneficial and endorsed as a vital part of quality medical practice for many years

(Kredo et al., 2016). It was the expectation that the introducing a CPG at the three clinics would increase antihypertensive medication adherence in the African American patient population leading to better hypertension management. The CPG will serve as a framework for clinical decisions, thereby reducing variability in clinical practice.

Adherence to antihypertensive treatment significantly reduces long-term cardiovascular risk (Vrijen et al., 2017). This doctoral project holds significance to nursing practice by strengthening the quality of nursing care using an evidence-based health care CPG. The CPG in this doctoral project provided clear recommendations for medication nonadherence which improved the consistency of care provided. Better blood pressure management can lower the burden of health care costs related to all the chronic effects of uncontrolled hypertension and can lead to better patient outcomes.

Purpose

The prevalence of nonadherence to hypertensive medications in patients treated at three medical clinics found in a large metropolitan area in Georgia was evident during a discussion with the clinics' executive medical director (EMD). Based on the conversation with the EMD, a decision was made to develop a CPG that the physicians and clinical staff could use to improve the rate of medication adherence in African American patients diagnosed with hypertension. This doctoral project addressed the meaningful gap in practice by developing the CPG with the overall goal to improve medication adherence.

CPGs are scientifically developed statements developed to aid clinicians and their patients in making decisions about health care and improving the quality of patient care (Murad, 2017). Empirical evidence shows that guidelines improve patient outcomes

(Murad, 2017). The guiding practice-focused question for this doctoral project was as follows: Will the development of a CPG with the goal of improving adherence to antihypertensive medication among African American patients be recommended by a team of content experts for implementation into their practice? This question was important because hypertension is more common in AA than any other race or ethnic group in the United States, and AA have a higher incidence of hypertension-related conditions such as cardiovascular disease and end-stage renal disease (Munter et al., 2017).

As suboptimal medication adherence continues to be a challenging problem for the African American population, findings from this doctoral project could potentially be used locally, statewide, or nationally to aid in increasing medication adherence for this population. If successful, the CPG had the potential to address the gap in practice. The CPG would help improve the adherence rate in patients with hypertension, therefore decreasing the mortality rate and reducing health care costs.

Nature of the Doctoral Project

Evidence supported the need to address antihypertensive medication nonadherence in the AA population. The sources of evidence used to the identified problem include the Walden University library databases, including CINAHL MEDLINE, Cochrane Database of Systematic Reviews, EBSCOhost, and ProQuest. Other Nursing journals and websites was used as resources for this project. The following keywords and phrases were used for the search: *AA population and medication adherence, Antihypertensive medication adherence, hypertension patient education,*

Hypertension, staff education, and EB hypertension clinical practice guidelines. Inclusion criteria included English articles published between 2005 to 2021. Exclusion criteria were non-English articles and outdated materials published before 2005.

Studies related to antihypertensive medication nonadherence in the African American population were the focus. For example, Maraboto and Ferdinand (2020) asserted that HTN in the United States is prevalent among AA individuals. The study's result uncovered numerous obstacles preventing optimal treatment of HTN in AA patients, including medication adherence and lifestyle; the patient's support system and familiar setting, which allows appropriate medical follow-up; and the community environment and access to health care. Solomon et al. (2015) similarly explored medication adherence to antihypertensive medications among 190 AA patients with HTN. The result of this study revealed that AA patients that have specific routines as to when they took their medications were more prone to be adherent to their antihypertensive medications compared to AA patients with inconsistent medication routines (Solomon et al., 2015). The results suggested that older patients were more likely to be compliant with taking medications than younger patients with variable medication-taking routines.

Antihypertensive medication adherence in AA patients is an essential component of improving hypertension. As medication adherence for AA patients is a growing concern, nurses are well-positioned to assist in improving patients' adherence; in doing so, nurses can prevent adverse outcomes. Nurses can utilize evidence-based interventions that encourage patients to adhere to their antihypertensive medications. These

interventions will help with blood pressure control and possibly reduce complications caused by nonadherence.

Approach

The approach used in this doctoral project to organize and analyze the evidence was guided by the Walden University Manual for CPG Development. First, approval was obtained from the administration from the participating out-patient clinics and then Walden University Institutional Review Board (IRB) approval. Next, the evidence from the literature was critically appraised using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) method to rate the sources of evidence (GRADE, 2020). The CPG was developed to increase medication adherence, which also helped gain better blood pressure control.

After the development of the guideline, a predetermined four-member expert panel evaluated the guideline using the Appraisal of Guidelines, Research, and Evaluation (AGREE) II instrument to approve the content and to make recommendations. The guideline was revised based on the recommendations. Once revisions were made, the revised guideline was presented to the expert panel. A discussion took place to validate the content and ensure usability. After usability was validated, a final report was developed and disseminated to the key stakeholders.

In the United States, hypertension disproportionately affects AA men and women compared to white or other ethnic minorities (Spikes et al., 2019). AA tends to have different beliefs related to the cause and treatment of HTN compared to other groups (Spikes et al., 2019). These beliefs conflict with health care providers, creating barriers in

reaching optimal antihypertensive medication adherence and blood pressure control (Spikes et al., 2019). The literature supported the need to address the nursing gap of medication nonadherence in three out-patient clinics in the southeast United States. The problem statement and the practice focus question aligned and helped to address the gap. Essentially, this project aimed to develop a CPG in the out-patient clinics and have the physicians and nurse practitioners of the clinics evaluate the guideline for its quality and usability to assist the health care providers in being effective in assisting patients' adherence with antihypertensive medications.

Significance

There are many adverse health consequences of medication nonadherence in hypertensive patients including uncontrolled hypertension, hypertensive crises, myocardial infarction, chronic heart failure, kidney failure, premature mortality and disability, and hospitalization (Burnier & Egan, 2019). Cardiovascular risk and outcomes are affected by the extent of blood pressure control, which correlates with medication adherence (Conn et al., 2015). Therefore, medication adherence is crucial for better patient outcomes. Key stakeholders, such as nurses, practitioners, physicians, hospitals, and insurance companies, have vital roles in addressing the problem of medication nonadherence. Health care organizations, clinicians, and insurance companies can collaborate and develop public awareness campaigns stressing the importance of medication adherence. By doing so, they can possibly increase medication adherence and decrease health care costs related to repeated hospitalization.

The prevalence of uncontrolled hypertension in AA patients is a growing concern. The development of clinical guidelines is a method that incorporates evidence into nursing practice. The purpose of this evidence-based doctoral project was to introduce a CPG in three out-patient clinics with the overall goal to improve antihypertension medication adherence in African American patients. The potential contribution to the nursing practice was to provide a roadmap to patient care by providing the latest and high-quality, evidence-based health care.

There is opportunity to improve quality, cost-efficiency, and patient care in every health care setting. CPGs have the potential to raise the standard of clinical care in many different health care settings. Within research, the ability to use a study's findings in other contexts, situations, times, or populations implies transferability (Rodon & Sese 2008). This doctoral project has potential transferability, which can be used locally, statewide, or nationally aiding in increasing medication adherence, not only for hypertensive African American patients but for almost any patients who requires prescribed medication for chronic diseases.

This doctoral project supported fostering social change by focusing on improving health outcomes for African American patients. The CPG that was developed applied current EBP to clinical practice resulting in possible improving medication adherence for hypertensive AA patients. The project also has potential implications for social change as it could improve nursing practice in the area of strategies for improving medication adherence in all disease modalities.

Summary

A considerable part of uncontrolled hypertension in AA patients is related to antihypertensive medication nonadherence. Section 1 provided a brief overview of hypertension as it relates to antihypertensive medication nonadherence in an African American population residing in a large city located in the southeastern United States. This section also described the local nursing practice problem, provided the purpose of this DNP project and the significance of the project to the nursing practice. Section 2 presents background and context information related to this DNP project. This section provides a review of the literature, describe, and provided rationales for concepts, models, and/or theories used in the projects, and explain the project's relevance to the nursing practice.

Section 2: Background and Context

Introduction

Poor medication adherence to hypertensive medication is a problem in the AA population. As lower medication adherence levels are associated with worsening blood pressure control and adverse effects such as cardiovascular disease, renal disease, stroke, and death, an increase in adherence can significantly improve patient outcomes (Gosmanova & Kovesdy, 2015). Further, the economic impact related to uncontrolled hypertension and its adverse outcomes can be costly. Clinical practice guidelines offer a method of bridging the gap between policy, best practice, local contexts, and patient choice (Kredo et al., 2016). Out of concern for medication nonadherence in the AA population, it was necessary for the development of a CPG that would assist in improving medication compliance in this patient population. The purpose of this DNP project was to develop a CPG to improve medication adherence to antihypertension medications for the AA patient population in three out-patient clinics. A four-member expert panel evaluated the GPG to validate the content and ensure usability. This section introduces the model that was utilized for this DNP project, the significance, and relevance to the nursing practice, the context that medication adherence has on the AA patients, and the DNP student's role.

Concepts, Models, and Theories

Medication Adherence Model

The medication adherence model (MAM; 2002) and the transtheoretical model (stage of change; TTM) were used as the theoretical frameworks for this DNP project.

The MAM, which was developed by Mary Jean Johnson in 2002, describes the process of medication adherence and provides a guide for health care providers in assessing medication taking in individuals with hypertension (Johnson, 2002). The structure of the MAM is the idea that two types of nonadherence contribute to inconsistent medication taking, the intentional decision to miss medications and the unintentional interruptions that lead to not taking medications (Johnson, 2002). The three core concepts identified in the model are:

1. Purposeful actions: Patients initiating and sustaining medication adherence are dependent on the deliberate decision to take medications based on perceived need, effectiveness, and safety.
2. Patterned behavior: Patients establish medication-taking patterns through access, routines, and remembering.
3. Feedback: Individuals use information, prompts, or events during the appraisal process to evaluate health treatment (Johnson, 2002).

The MAM was developed to illustrate the process of medication adherence in individuals undergoing treatment for hypertension (Johnson, 2002). The MAM framework is appropriate for this DNP project as it portrays the process of starting and maintaining medication adherence from the hypertensive patient's perspective (Johnson, 2002). By understanding patients' reasons for nonadherence, health care clinicians will be better equipped to care for these patients.

Transtheoretical Model

The transtheoretical model was founded in 1982 by James Prochaska and Carlo DiClemente (Prochaska & DiClemente, 1982). The transtheoretical model (TTM) is used to understand the stages individuals progress through while changing behaviors and can help select interventions. The TTM has five stages that reflect one's interest and motivation to alter a problem behavior (Bosworth et al., 2008). Precontemplation, the first stage, shows unmotivated people who are unwilling to change or to recognize that a problem exists. The next stage is contemplation, where there is an awareness and acknowledgment of the problem and consideration for changing the behavior. During this stage, patients can discuss the disadvantages and advantages associated with, taking an antihypertensive medication to prevent a stroke. Preparation is the stage where there is planning for the change in behavior in the near future. It is in this stage where patients have moved from thinking about the issue to doing something about it. In the next stage, action, change happens as patients gain confidence that they have the willpower to continue the change journey. It is expected that the changing behavior will last for a period of less than 6 months. Stage 5 of change is maintenance. In this stage, there is a focus on lifestyle modification to stabilize the behavior change and prevent possible relapse. Behaviors related to the medication taking can be complicated, requiring multiple methods to improve adherence.

The TTM was appropriate for this DNP project. It provided the clinicians with a framework allowing them to choose interventions that correlated with each stage that

patients go through as behavior is changed. The TTM can also help clinicians predict and improve adherence to prescribed antihypertensive medications.

Relevance to Nursing Practice

Medication nonadherence is not a new problem, but there is no one solution to solve this problem. There are many reasons why patients do not take medications as prescribed. Some reasons for nonadherence are the patient not understanding the directions, forgetfulness, multiple regimens for taking medications, side effects, or the patient feeling the medication is not working (Neiman et al., 2017). Cost was also listed a factor causing medication nonadherence.

Nonadherence to antihypertensive medications is the most common cause of poor blood pressure control, resulting in repeated hospital admissions (Georgiopoulos et al., 2018). Of patients who were prescribed antihypertensive medications, 50 to 80 % had low adherence rates (Georgiopoulos et al., 2018). Nonadherence to medications can lead to worsening clinical outcomes, exacerbation of chronic conditions, re-hospitalization, and increased health care costs (Verloo et al., 2017). Up to 10% of hospital readmissions have been attributed to nonadherence to medications (Verloo et al., 2017).

The benefits of improving antihypertensive medication adherence include decreasing morbidity and mortality, decreasing hospitalizations, controlling health care costs, and providing a higher quality of life for the patient. Statistically speaking, out of the 3.8 billion prescriptions that are written annually in the United States, approximately one in five new prescriptions are never filled, and about 50% are taken incorrectly (Neiman et al., 2017). In the United States, the rate of nonadherence has remained

somewhat stable. However, the health care cost associated with nonadherence has grown to approximately \$100- \$300 billion of U.S. health care dollars spent annually (Neiman et al., 2017).

Improving medication adherence is a public health priority; therefore, the nursing profession must be at the forefront leading the way. Nurses can contribute to improving medication adherence by providing patients with education and resources. For example, nurses can ensure that patients receive information about their medications such as instructions, dosing, schedule, and side effects. Nurses can also educate patients on the risks associated with nonadherence. Additionally, nurses can assist patients with avenues to reduce the cost of medications, such as allowing for generic drugs, using medication discount cards, or using online pharmacies.

In the past, it was believed that medication nonadherence was mainly related to patient lack of education. A lot of research focused on patient education with the hopes of improving medication adherence. While knowledge deficit is a significant obstacle to medication nonadherence, and strategies to improve the knowledge deficit should include education, this strategy alone is not enough to maintain adherence over time. Medication nonadherence is a multidimensional issue. Van Camp et al. (2012) found in their research that even when patients are fully informed about their medications and the importance of taking them, there can be other barriers that deter them from taking the medications.

In their study, Van Camp et al. (2012) used nurse-led education and reinforced counseling, which allowed nurses to understand medication intake behaviors of patients. By understanding the medication-taking behaviors, the nurses then collaborate with the

patients individually to find solutions to the different barriers that threaten nonadherence. As nurses incorporate interventions into standard practices, all patients are given an opportunity to be asked about medication intake and given counseling to enhance medication adherence (Van Camp et al., 2012).

When health care practices focused on increasing hypertension awareness and education for patients, Lewis, Ogedegbe, and Ogedegbe (2012) found in their study that education alone was not enough. They indicated that knowledge deficit was not the primary factor responsible for poor medication adherence among African Americans with hypertension. African American patients were generally able to describe the health benefits associated with medication adherence correctly and had adequate knowledge of the significance of hypertension in their population (Lewis, Ogedegbe & Ogedegbe, 2012). Lewis, Ogedegbe, and Ogedegbe (2012) concluded that a complex set of patient, provider, and health care system factors could be the source of the antihypertensive medication nonadherence in hypertensive African American patients.

The benefits of improved medication adherence are numerous. In order to develop effective strategies and interventions to increase hypertensive medication adherence in African American patient population, understanding factors associated with their nonadherence is key. This doctoral project helps advance nursing practice by illustrating how nursing interventions on antihypertensive medication adherence can lead to increased medication adherence and better patient health outcomes. This project also brings awareness of racial disparities related to medication adherence in hypertensive African Americans.

Local Background and Context

In the United States, approximately half a million deaths in 2018 included hypertension as a primary or contributing cause (Centers for Disease Control [CDC], 2020). Minority populations experience a higher rate of hypertension diagnosis and according to the CDC (2020), the minority population most at risk includes African Americans and Hispanics. Only about 1 in 4 adults with hypertension have their condition under control (CDC, 2020). Medication nonadherence is a contributing factor for uncontrolled hypertension in the AA patient population.

Institutional Context

The setting for this doctoral project was three outpatient internal medicine clinics located in a large metropolitan area in the south-eastern United States. The clinics are operated by a group of internal medicine physicians who also utilize nurse practitioners in the practice. The other staff includes medical assistants and a clinic manager. The clinics' mission is to provide safe, affordable, and compassionate care in a family environment.

The patient population seen in the clinic is approximately 90% African Americans. The payor sources for patients that attend these clinics varies from Medicaid, Medicare, commercial insurances, and self-pay. A great majority of the AA patient population in these clinics have hypertension and are prescribed antihypertensive medication. Because of the increasing rate of nonadherence to antihypertensive medications in this patient population and the need for a quick solution, this DNP project was conceived.

Terms and Definitions

African American is defined as an American of African and black African descent (Merriam-Webster Dictionary, "(n.d.)).

Clinical Practice Guidelines are scientifically developed statements that are developed to assist clinicians and their patients in making decisions about health care and aimed to improve the quality of patient care (Murad, 2017).

Hypertension (High blood pressure or HTN) is when the "force of blood pushing against blood vessel walls is consistently too high." It is measured in millimeters of mercury. (Heart.org, 2021).

Medication Nonadherence is defined as either the intentional or unwitting failure to take medications as prescribed (Hugtenburg et al., 2013).

State and Federal Context

Medication nonadherence is an importance public health problem at the state and federal levels. The Centers for Medicare & Medicaid (CMS) is a federal agency that administers the Medicare program and works with States on administering Medicaid. CMS is dedicated to improving cardiovascular health in the Medicare population. In 2007, The National Council on Patient Information and Education (NCPIE) issued *Enhancing Prescription Medicine Adherence: A National Action Plan*. This plan called for a national mobilization to reduce the adverse health and economic consequences associated with this medication nonadherence. Today, NCPIE continues to research medication nonadherence looking for ways to improve adherence and patient outcomes. Other State and National originations and independent foundations are dedicated to

improving medication nonadherence by providing patients with education and assistance with out-of-pocket costs of medications.

Role of the DNP Student

As a family nurse practitioner (FNP), I have an extensive clinical background in emergency care, urgent care, hemodialysis, and primary care. I see and provide care for many AA patients who have hypertension. In my practice, daily, I see patients that have poor to nonadherence to prescribed antihypertensive medications. I also witness the consequences of the nonadherence to medications, such as disease progression, hospitalization, and even death. Working in the primary care setting has given me greater awareness of the issue of medication nonadherence in the AA population and the need to find approaches to fix the issue.

The role of the student in this DNP project was to develop a CPG that the physicians and clinical staff could follow to improve medication adherence in AA patients diagnosed with hypertension. The Executive Medical Director of the clinics felt it was particularly important to standardize the care patients receive at all three clinics. After the development of the CPG, a predetermined expert panel evaluated the guideline to approve the content and make any recommendations. The guideline was revised based on the recommendations, and the revised guideline was presented to the expert panel to validate the content and ensure usability. After usability had been validated, the DNP student submitted a final version which was disseminated to the key stakeholders.

Seeing the effects that uncontrolled hypertension can take on one's health is overly concerning. One of my first FNP jobs was in a hospital-based hemodialysis (HD) unit. Seeing so many young AA hypertensive patients requiring HD was troubling. Working in primary care has allowed me the opportunity to care for AA patients with hypertension and the opportunity to see how big of a problem medication nonadherence is. My concern for the health of the AA patient population was the motivation for this doctoral project. Because the clinics did not have any protocols in place, there are no potential biases.

Summary

A considerable part of uncontrolled hypertension in AA patients is related to antihypertensive medication nonadherences. Nurses can lead the way by applying evidence-based interventions that encourage patients to adhere to their medications, leading to better patient health outcomes. Section 2 provided background and context information for the DNP project and described the concepts, models, and theories used in the DNP project. The relevance to nursing practice and the role of the DNP student was also presented. Section 3 showed the analysis of collected evidence for this DNP project.

Section 3: Collection and Analysis of Evidence

Introduction

Poor medication adherence to antihypertensive medication continues to be a problem in the AA population. The issue of poor medication adherence is associated with worsening blood pressure control and adverse effects such as cardiovascular disease, renal disease, stroke, and death (Gosmanova & Kovesdy, 2015). The purpose of this DNP project was to improve the rate of antihypertensive medication adherence in the AA patient population by developing a CPG based on evidence that would be used by the physicians and clinical staff caring for AA patients diagnosed with hypertension. The CPG was evaluated by an expert panel to validate the content and ensure usability. The setting for this doctoral project took place in three out-patient internal medicine clinics located in a large metropolitan area in the southeastern United States, where the patient population of the clinic is approximately 90% African Americans. In Section 3, I discuss the collection and analysis of evidence that was used to answer the practice-focused question for this DNP project.

Practice-Focused Questions

Minority populations experience a higher rate of hypertension diagnosis, and those most at risk are African Americans and Hispanics (CDC, 2020). Medication nonadherence is a contributing factor for uncontrolled hypertension in the AA patient population. At the DNP project site, there was a large AA patient population, many of whom had hypertension. In this patient population there were also a substantial problem with medication adherence. Because there is no CPG in place at the three clinics to

address HTN medication adherence, consistency in HTN care varied from provider to provider and from one site to the other site. A current, evidence-based CPG provided the clinical staff with a tool that could provide a clear and concise approach to the management of hypertension, enhance consistency of patient care, and increase medication adherence. Medication adherence can lead to better health outcomes. Thus, the practice-focused question for this project was “Will the development of a CPG with the goal of improving adherence to antihypertensive medication among African American patients be recommended by a team of content experts for implementation into their practice?” The purpose was to introduce a CPG at the three clinics, which would increase antihypertensive medication adherence in the African American patient population leading to better hypertension management.

Sources of Evidence

The sources of evidence that was used for this DNP clinical practice guideline project included Walden University library databases, CINAHL, MEDLINE, Cochrane Database of Systematic Reviews, EBSCOhost, PubMed, and ProQuest. Other nursing journals and websites was used as resources for this project. The search focused on articles that discuss hypertensive medication adherence in AA patients, along with those that discuss evidence-based guidelines for improving medication adherence. The databases were used to narrow down the evidence focusing on the clinical problem and discover evidence that would provide a clear and concise approach to medication adherence. The following keywords and phrases were used for the search: *AA population and medication adherence, Antihypertensive medication adherence, hypertension patient*

education, Hypertension, staff education, and EB hypertension clinical practice guidelines. Inclusionary criteria include English articles published between 2005 to 2021. Exclusionary criteria were non-English articles, outdated materials published prior to 2005, no peer-reviewed articles, unreliable sources, and study participants under the age of 18.

General Literature Review

Improving medication adherence is a public health priority; therefore, the nursing profession must be at the forefront leading the way. CPGs are scientifically developed statements that are developed to assist clinicians and their patients in making decisions about health care and aim to improve the quality of patient care (Murad, 2017). An evidence-based CPG can provide the physicians, nursing, and clinical staff with a tool that can provide a clear and concise approach to management of hypertension, enhance consistency of patient care, and increase medication adherence.

To reduce the global burden of elevated blood pressure, the International Society of Hypertension (ISH) developed worldwide practice guidelines for the management of hypertension in adults (Unger et al., 2020). The ISH Guidelines Committee used evidence-based content and then tailored standards of care in a format that is easy to use by clinicians, nurses, and community health workers (Unger et al., 2020). In their guideline, Section 8 addresses medication nonadherence. Poor antihypertensive treatment adherence correlates with the magnitude of BP elevation and is an indicator of poor prognosis (Unger et al., 2020). Nonadherence to antihypertensive treatment is multifactorial and includes causes associated with the health care system,

pharmacological therapy, the disease, patients, and their socioeconomic status (Unger et al., 2020). The guideline recommends that at every visit and prior to making any medication adjustment, adherence to antihypertensive treatment and medications should be evaluated. Strategies to improve medication adherence include reducing polypharmacy, using single-pill combinations, once-daily dosing, home BP monitoring, and providing patient adherence feedback (Unger et al., 2020).

This DNP project CPG was developed using EBP research that supports using CPGs in the clinical practice that aid in improving medication adherence. A CPG based on a systematic review of clinical and epidemiological evidence on the diagnosis and management of hypertension in primary care was reviewed as part of this DNP project. This CPG, which was developed by a panel of multidisciplinary experts from the Veteran Administration (VA) and the Department of Defense (DOD), describes the critical decision points in the diagnosis and management of hypertension in primary care and provides evidence-based recommendations and practices for practitioners (VA/DoD Clinical Practice Guidelines, 2020). The guideline consists of two clinical algorithms and 28 evidence-based recommendations. Recommendations included in the CPG for medication adherence include HTN education, blood pressure goal setting, home blood pressure monitoring, regular follow-ups, and technology-based interventions such as electronic transmission of data, telemonitoring and mobile applications (VA/DoD Clinical Practice Guidelines, 2020). As medication adherence is a critical component in chronic disease management for HTN, this CPG recommended assessing medication

adherence at every patient visit. The benefits of non-pharmacologic therapy should also be reinforced at every patient visit.

Procedure

The approach that was used in this doctoral project was guided by the Walden University Manual for Clinical Practice Guideline Development. The evidence from the literature was critically appraised using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) method. In the development of CPGs, the role of the DNP team is crucial. The DNP team included the DNP student, medical director, four-person expert panel, and the end-users (i.e., six staff providers, three nurses, and six medical assistances). The role of the student in this DNP project was to develop a CPG that the physicians and clinical staff can follow to improve medication adherence in AA patients diagnosed with Hypertension. After the development of the CPG, the medical director and four-person expert panel role was to evaluate the guideline to authorize the content and make any recommendations using the Appraisal of Guidelines, Research, and Evaluation (AGREE) II instrument. The guideline was revised based on the recommendations, and the revised guideline was presented to the expert panel and end-users. The four-person expert panel and end-users' role was to validate the modified content and ensure usability. I as the DNP student submitted a final version of the guideline, which was disseminated to the key stakeholders and end-users.

Protections

The introduction of this CPG did not require the collection of any data from patients or patients' family members. Therefore, there were no risks of patient

information being compromised. This CPG focused on ways to improve the rate of antihypertensive medication adherence in the AA patient population. Data were collected from the four-member expert panel, who were chosen for their scientific and clinical expertise. Participants of the expert panel were given the consent for anonymous questionnaire prior to participating in the project. The four-person expert panel members were made aware that their participation was voluntary and that they could withdraw at any time. Approval for this DNP project was obtained from Walden University's Institutional Review Board and the practice site (approval no. 03-03-22-0391042). This doctoral project did not disclose any proprietary data, sensitive material, or confidential information.

Analysis and Synthesis

A Walden University literature matrix was used to help organize the research studies. The literature matrix allows for a tool to compile details about the sources and allow for an easy way to retrieve citation information. There were 42 articles chosen for the review and the evidence from the literature was critically appraised using the GRADE method to rate the sources of evidence (GRADE, 2020). GRADE has four levels of evidence which rates the quality of evidence as very low, low, moderate, and high. GRADE provides a reproducible and transparent framework for grading certainty in evidence (Mustafa et al., 2013). In the very low level of evidence, the true effect is probably markedly different from the estimated effect. In the high level of evidence, the authors have a lot of confidence that the true effect is similar to the estimated effect (Mustafa et al., 2013). The data abstracted from studies classified as moderate to high

were included in the development of the CPG, and studies classified as low to very low were excluded. The information gathered from the research articles were used to create the antihypertensive medication adherence CPG.

The AGREE II tool was the framework used to guide the development of the CPG and to assess the quality of the guideline. The AGREE II instrument is a valid and dependable tool that provides a methodological strategy for the development of CPGs. The AGREE II instrument also informs what information and how the information ought to be reported in the CPG. The AGREE II consists of 23 key items organized within six domains. In Domain 1, the scope and purpose of the guideline, the specific health questions and the target population is the focus. Domain 2 focuses stakeholders' involvement, representation, and views of the target population. Domain 3, rigor of development, focuses on the process used to gather and synthesize the evidence. Clarity of presentation is the focus of Domain 4, which deals with the language, structure, and format of the CPG. Domain 5, applicability, pertains to barriers to implementation and strategies to improve uptake and cost implications. Lastly, Domain 6, editorial independence, is concerned with biases and competing interests with the formation of the recommendations. The purpose of scoring is to identify the limitations of the CPG and to select high-quality CPGs to implement. The higher the AGREE score, the more confident the users can be that the CPG was developed using an evidence-based approach.

Summary

Section 3 revisited the local problem, gap-in-practice, and the practice focused question. The sources of evidence, which were relied on to address the practice-focused

question, were identified. A step-by-step description of how the evidence was collected was provided. Lastly, a description of the systems used for recording, tracking, organizing, and analyzing the evidence was outlined.

Section 4 addresses the finding of the project and implications that resulted from the analysis and synthesis of the evidence. Recommendations from the panel members was discussed and the strengths and limitations of the project.

Section 4: Findings and Recommendations

Introduction

Adherence to antihypertensive medications is essential for positive outcomes in treating HTN. Although many effective antihypertensive medications are available to treat and control blood pressure, uncontrolled blood pressure and nonadherence to treatment continue to be a public health issue (Peacock & Krousel-Wood, 2017). In the United States, Americans are affected by hypertension immensely. African Americans are disproportionately affected by this disease than non-Black Americans. This evidence-based doctoral project aimed to introduce a hypertension medication adherence practice guideline (Appendix A) in three outpatient clinics with the overall goal of improve antihypertension medication adherence in African American patients. The guiding practice-focused question for this doctoral project was “Will the development of a CPG with the goal of improving adherence to antihypertensive medication among African American patients be recommended by a team of content experts for implementation into their practice?” Evidence from the literature was critically appraised using the GRADE method to rate the sources of evidence and develop a CPG (GRADE, 2020).

In Section 4, I address the findings and implications that resulted from the analysis and synthesis of the evidence. I also present the expert panel members’ recommendations which are to adapt the Hypertension Medication Adherence Practice Guideline into practice. Finally, I discuss the strengths and limitations of the project.

Findings and Implications

Improving medication adherence is a public health priority. The benefits of improving antihypertensive medication adherence include decreasing morbidity and mortality, decreasing hospitalizations, controlling health care costs, and providing a higher quality of life for the patient. CPGs are scientifically developed statements designed to assist clinicians and their patients in making decisions about health care and aim to improve the quality of patient care (Murad, 2017). A review of the literature supports the use of CPGs to provide the physicians, nursing, and clinical staff with tools that provide clear and concise approaches to the management of hypertension, enhance consistency of patient care, and increase medication adherence. CPGs extend a method of bridging the gap between patient choice, organization policy, local contexts, and best practice (Kredo et al., 2016). CPGs promote interventions that have been proven beneficial and discourage ineffective ones. To reduce the global burden of elevated blood pressure, the ISH developed worldwide practice guidelines for managing hypertension in adults (Unger et al., 2020). The ISH Guidelines Committee used evidence-based content presented in recently published guidelines and then tailored standards of care in a format that is easy to use by clinicians, nurses, and community health workers (Unger et al., 2020).

The Hypertension Medication Adherence Practice Guideline (Appendix A) was created to assist clinicians and their patients with tools and strategies to improve medication adherence using the research findings. Four physicians were chosen on the expert panel because of their expertise in internal medicine and caring for AA

hypertensive patients. The CPG was introduced to the expert panel for review, authorization of the content, and to make any recommendations. The AGREE II instrument (Appendix B) was used by the panel to appraise the CPG. The four-member panel was made aware that their evaluation of the CPG would remain anonymous. They were also made aware that the name and location of the clinics would be masked.

The AGREE II instrument is normally used for appraisal of new CPGs to document validity (Brouwers et al., 2010). The AGREE II instrument consists of 23 key items organized within six domains. In Domain 1, the scope and purpose of the guideline, the specific health questions, and the target population is the focus. Domain 2 focuses on stakeholders' involvement, representation, and the target population views. Domain 3, rigor of development, focuses on the process used to gather and synthesize the evidence. Clarity of presentation is the focus of Domain 4, which concentrates on the language, structure, and format of the CPG. Domain 5, applicability, pertains to barriers to implementation and strategies to improve uptake and cost implications. Lastly, Domain 6, editorial independence, is concerned with biases and competing interests in the formation of the recommendations (Brouwers et al., 2010).

Scoring aims to identify the CPGs' limitations and to select high-quality CPGs to implement. The higher the AGREE score, the more confident the users are that the CPG was developed using an evidence-based approach. The questions in the instrument were rated on a 7-point scale, with 1 being *strongly disagree* up to 7, which is *strongly agree*. After the appraisal, scores of each domain were computed, then the scores of the individual items were divided by the maximum possible score and expressed in a

percentage. Prior to beginning the AGREE II appraisal, a threshold of greater than 70% was used as benchmark to select the quality of each domain. The domain appraisal scores from the CPG are shown in Table 1.

Table 1

AGREE II Clinical Guideline Evaluation Instrument Scores

Panel Members (PM)	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Overall Guideline Assessment
PM 1	21	20	52	21	27	14	7
PM 2	21	20	54	21	27	14	7
PM 3	21	21	56	21	26	14	7
PM 4	21	21	56	21	28	14	7
Scores	84/84	82/84	218/224	84/84	108/112	56/56	28/28
Percentage	100	97	97	100	96	100	100

Domain 1 Scope and Purpose

Domain 1 of the AGREE II tool consists of three questions that address whether the overall objective of the CPG is described and if the health question and the target population are described. The total score was 100% for this domain. The experts had no questions or suggestions for improvement for Domain 1 and agreed that the CPG met the objectives of Domain 1.

Domain 2 Stakeholder Involvement

Domain 2 of the AGREE II tool consists of three questions that address stakeholder involvement, views and preferences of the target population, and end-users are clearly identified. The score for this domain was 97% which indicates the experts agreed that the CPG met the objectives for stakeholders' involvement.

Domain 3 Rigor of Development

Domain 3 of the AGREE II tool consists of eight questions that address the rigor of development of the CPG. The questions focused on strategies used to search for evidence, criteria for including and excluding evidence, and strengths and limitations of the evidence. Additional questions focused on the health benefits, side effects, and risks when formulating the recommendations. Domain 3 also questioned if the CPG had been reviewed by the expert prior to its publication and if the CPG included procedures for updating the guideline. The score for this domain was 97 % indicating that the expert agreed that the development of the CPG followed the appropriate steps to develop a high-quality guideline.

Domain 4 Clarity of Presentation

Domain 4 of the AGREE II tool consists of three questions that address the format of the guideline, language, and structure. The score for this domain was 100 % which indicates the expert panel agreed that the CPG was well written and clearly understood.

Domain 5 Applicability

Domain 5 of the AGREE II tool consists of four questions that address barriers and facilitators to implementation. The questions also addressed if the CPG provided advice or tools on putting the CPG into practice and the resources implications of utilizing the CPG. The score for this domain was 96 % which indicates the expert panel agreed that the CPG would be appropriate to practice.

Domain 6 Editorial Independence

Domain 6 of the AGREE II tool consists of two questions that address editorial independence, which is concerned with biases and competing interests in formation of the recommendations. The score for this domain was 100% which indicates the expert panel agreed that there was no competing interest, and no funding or funding body was required for the development of this CPG.

Overall Assessment of Guideline

Overall assessment rates the overall quality of the CPG and whether it would be recommended for use in practice. The overall assessment score for the CPG was 100%. All four appraisers stated they would recommend the CPG for use in their clinical practice. One of the appraisers commented that hypertension is a chronic disease for which there is no cure; therefore, the goal is to control the disease and keep it from getting worse. The appraisal stated that medication adherence is the key, and this CPG will be great in assisting in improving medication adherence. Another appraiser noted that the team-based approach, which included providers, nurses, and other clinical staff in enhancing medication adherence, was excellent. All four appraisers agreed that the self-monitoring of blood pressure and electronic adherence aids as medications reminders would increase medication adherence in their practice. Overall, the expert panel gave positive feedback and excellent scores for the medication adherence CPG.

There is an opportunity to improve quality, cost-efficiency, and patient care in every health care setting. CPGs have the potential to raise the standard of clinical care in many different health care settings such as outpatient clinics, inpatient units, and entire

health care systems, therefore positively impacting individuals, communities, institutions, and health care systems. This CPG was developed by applying current EBP to clinical practice. Better blood pressure management will lower the burden of health care costs related to uncontrolled hypertension's chronic effects. This evidence-based doctoral project supports fostering social change by focusing on improving health outcomes for African American patients who are disproportionately affected by HTN.

Recommendations

Medication adherence describes how a patient correctly follows medical advice regarding taking medications. Nonadherence occurs when medication is prescribed, but the patient fails to take the medicine or fails to take the medication correctly. Medication nonadherence is a public health problem and is widespread. The gap-in practice at the three outpatient clinics was that there were no formal guidelines to address HTN medication adherence. The consistency in HTN management varied from provider to provider and from one site to the other site. A current, evidence-based CPG provides the clinical staff with a tool that offers a clear and concise approach to managing hypertension, enhances patient care consistency, and increases medication adherence. My recommendations to address this gap in practice included a CPG that listed the following:

Developing Treatment Plans/Goal Setting

Before starting treatment, it is essential to set blood pressure goals. After goals are set, a treatment plan should be put in place and discussed with the patient in detail. Have the patient verbalize the treatment plan in their own words to ensure they understand the plan.

1. Discuss / Emphasize
 - a. Lifestyle modification
 - b. Role of each drug and importance of taking as prescribed
 - c. Explain how often to take the medications
 - d. Explain Side effects of medication
 - e. Address Adherence issues

Strategies to Improve Medication Adherence

1. B/P self-monitoring

Patient self-monitoring of BP is an important part of adherence and an important focus of the American Heart Association 2017 HTN guidelines.

Instruct patient to monitor blood pressure regularly and keep a blood pressure log. The log will be reviewed at the next visits. If necessary, check the patient' home blood pressure monitor for accuracy and train the patient on the proper use of the monitor.

2. Single Pill Combinations

Single-pill combination therapy, also known as a fixed-dose combination in managing hypertension, is accepted as a safe and efficient means of reducing treatment complexity and rapidly improving blood pressure control (Bruyn et al., 2022).

3. Once-daily dosing

Studies have shown that once-daily antihypertensive agents have the highest adherence compared with twice-daily or multiple daily doses, including greater adherence to the prescribed timing of doses (Flack & Nasser, 2011).

4. Pill boxes

Studies have shown that patients who use pillboxes to organize their medications have better medication adherence than nonusers.

5. Electronic Adherence Aids

Numerous methods and devices are available for patients to use as a reminder to take their medications. These electronic aids are unique watches with alarms, pillbox timers, “smart pill” containers, and automated pill dispensers.

A medication alert watch with a vibrating alarm can be used to privately signal the patient that it is time to take the medication (Figge, 2014).

6. Text messaging & Email Reminders

Text messaging and email reminders are potential solutions to the failure to take medications as directed. A systematic review indicated that text messaging interventions had improved patients’ medication adherence rate 85% (Ershad et al., 2016).

7. Celebrate Patient for reaching blood pressure goal

Positive feedback encourages and intensifies change. Celebrating each minor change is important in keeping patients motivated to do the right thing.

8. Good Rx Discount Card

As prescription prices can differ between pharmacies, the GoodRx discount program finds the current prices and discounts to help the provider find the

lowest cost pharmacy for the prescribed medications. GoodRx is 100% free and is great for patients that must pay out of pocket for medications or for patients that have poor medication coverage with their insurance.

Patient Follow-Up

Patient follow-up is a significant element of the visit. During the follow-up visit, review blood pressure logs, and discuss any medication side effects and any problems with medication adhering. An appropriate follow-up plan is discussed with the patient during the follow-up (see Table 2). Take time to build a trusting relationship with the patient, so they will know you are sincerely concerned about health care. The providers and staff should create a blame-free environment that encourages patients. Take time to discuss and inform the patient that between visits, they will be getting reminders via emails, texts, or phone calls regarding taking medication and blood pressure monitoring.

Table 2

Algorithm for Follow-Up Visit

Initiating Drug Therapy	Follow up 2 to 4 weeks
Patient Making Progress	Follow up 4 to 6 weeks
Patient has Control	Follow up 2 to 4 months

I highly recommend that this CPG be integrated into the clinical practice of these three outpatient clinics. The target population will benefit immensely if the CPG is implemented into practice. The benefits of improving antihypertensive medication adherence include decreasing morbidity and mortality, decreasing hospitalizations,

controlling health care costs, and providing a higher quality of life for the patient. The Hypertension Medication Adherence Practice Guideline (Appendix A) gives the clinical staff a tool that they can use to help increase medication adherence in the AA patient population and lead to better health outcomes.

Strengths and Limitations of the Project

There was a significant amount of evidence to support the use of CPGs to improve medication adherence in hypertensive patients. Strengths of this doctoral project CPG include its development. The Hypertension Medication Adherence Practice Guideline was developed using the AGREE II as a framework for its development and assessing the quality of the guideline. AGREE II is a valid and reliable framework to use in the development of CPGs. Another strength is that CPGs are known to improve the consistency of care patient receives. Patients with the same complications receive different care depending on their clinician, hospital, or location (Woolf et al. 1999). CPGs offer a solution, as patients will be cared for the same regardless of which facility, they receive care from, or which provider treats them. Another strength of the CPG is it is based on evidence that has recommendations that are easy to understand and utilizes a team approach. The limitation of this project was that there were few CPGs with an emphasis on antihypertensive medication adherence in the AA patient population.

Summary

In conclusion, results from this DNP project have shown that CPGs can be very effective in assisting in improving medication adherence. Although few studies had CPGs directly for the AA hypertensive patient population, the evidence was significant on the

use of CPGs for improving HTN care. Therefore, there is a need for future projects that assess the use of CPGs in antihypertensive medication adherence in AA patients and the development of tools to measure the results of the CPGs as it relates to blood pressure improvement.

Section 5: Dissemination Plan

Introduction

The introduction of the Hypertension Medication Adherence Practice Guideline received positive reviews. CPGs are beneficial, but project dissemination plans are needed so the end-user is aware they exist and agree to incorporate them into their practice. Plans are currently being made to introduce and disseminate the CPG into the clinical practice at the three out-patient clinics. The medical director and clinic administrator plan to use PowerPoint presentations and staff in-services to disseminate and implement the CPG.

The National Primary Care Conference would also provide a venue to disseminate the CPG to the broader nursing profession. The targeted audience at this conference is family medicine and internal medicine physicians, nurse practitioners, physician assistants, and other health care professionals. One of the program's main objectives is to provide the participants with tools and knowledge to formulate comprehensive, evidence-based interventions and treatment strategies that will reduce modifiable risk factors and improve long-term patient outcomes. Publication of the Hypertension Medication Adherence Practice Guideline is a future goal that will assist in dissemination to the broader nursing profession.

Analysis of Self

This DNP journey has been awe-inspiring. As a practitioner, this project has enhanced my knowledge of EBP and how to integrate it into practice. I used the knowledge gained from developing the Hypertension Medication Adherence CPG to

assist the non-compliant patient in my clinical practice. This project has given me the confidence to mentor other students on their DNP journey.

As a scholar, this DNP project experience has given me tools that helped improve my writing and communication skills immensely. Additionally, as a scholar, this project experience has given me a better understanding and appreciation for evidence-based research. This DNP project journey has made me a more confident project manager. I could plan, set goals, and improve my organization skills. This project experience helped me understand that effective communication and transparency are critical components in developing CPGs. Lastly, this project experience revealed that guidelines are ineffective if a robust plan for dissemination and implementation is not carefully planned.

The completion of the project has provided me with so much insight. The work has been challenging and time-consuming. One of my biggest challenges occurred at the beginning of my journey as my first chosen project topic was too broad and too time-consuming. After speaking to the program director, I was approved to change my topic and project type. The most important insight I gained was to keep going and never give up.

Summary

The prevalence of uncontrolled hypertension in AA patients is a growing concern. Adherence to antihypertensive medications is essential for positive outcomes in treating these patients with HTN. There is an opportunity for improvement in the African American population, where medication nonadherence is suboptimal. Low medication adherence rates are associated with worsening blood pressure control, cardiovascular

disease, renal disease, stroke, and death (Gosmanova & Kovesdy, 2015). The development of CPGs provides a method of bridging the gap between patient choice, organization policy, local contexts, and best practice while incorporating evidence into practice.

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Hypertension Medication Adherence Guideline

for Primary Care Providers

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2022



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Introduction / Scope / Purpose

Poor medication adherence to antihypertensive medication continues to be a challenging problem in the African American population. Poor medication adherence is associated with worsening blood pressure control and adverse effects such as cardiovascular disease, renal disease, stroke, vision loss and death (Gosmanova & Kovesdy, 2015). Clinical Practice Guidelines have been endorsed as a vital part of quality medical practice for many years (Kredo et al., 2016). CPGs offer a method of bridging the gap between patient choice, organization policy, local contexts, and best practice. CPGs promote interventions that have been proven beneficial and discourage ineffective ones

The purpose of this Clinical Practice Guideline is to improve the rate of antihypertensive medication adherence in the AA patient population. The benefits of improving antihypertensive medication adherence include decreasing morbidity and mortality, decreasing hospitalizations, controlling health care costs, and providing a higher quality of life for the patient. A current, evidence-based CPG can provide the clinical staff with a tool that can provide a clear and concise approach to the management of hypertension, enhance consistency of patient care, and increase medication adherence. Medication adherence can lead to better health outcomes.

Stakeholders involved in the development of this CPG include the DNP student, medical director, and a four-person expert panel. The intended users for this CPG include the medical director, clinical providers, nurses, and medical assistances of the three out-patient Clinics. The most significant benefit from this CPG is to improve the

quality-of-care patients receive by reducing the variability in clinical practice and increasing known effective intervention, thereby improving health outcomes.

The sources of evidence that helped with the development of this Clinical Practice Guideline include the Walden University library databases, including CINAHL MEDLINE, Cochrane Database of Systematic Reviews, EBSCOhost, and ProQuest. Inclusionary criteria include English articles published between 2005 to 2021. Exclusionary criteria included non-English articles and outdated materials published before 2005.

The evidence from the literature has been critically appraised using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) method to rate the sources of evidence (Grading of Recommendations Assessment, Development, and Evaluation [GRADE], 2020). The guideline has been externally reviewed and evaluated by a four-person expert panel using Appraisal of Guidelines, Research, and Evaluation (AGREE) II instrument to approve the content prior to its publication. Updates to this CPG will be done yearly or as critical evidence-based material is released. The Medical director and Administrator will appoint a person or group to make necessary updates to the CPG. When there are no updates to be added to the CPG, the appointed persons will sign off on the CPG as reviewed.

The author declares no competing interests. No funding or funding body was received for the development of this CPG.

Hypertension

Hypertension (HTN) occurs when the force of blood in the blood vessels is continually high. Hypertension is defined as a systolic blood pressure level of 140 mm Hg or greater and a diastolic blood pressure level of 90 mm Hg or greater confirmed after several visits to the medical office (Whelton & Carey, 2018).

Medication Nonadherence

Medication Adherence describes the degree to which a patient correctly follows medical advice regarding taking medications. Nonadherence occurs when a medication is prescribed but the patient fails to take the medication or fails to take the medication correctly. Medication nonadherence is a public health problem and is widespread.

Developing Treatment Plans / Goal Setting

Before starting treatment, it is essential to set blood pressure goals. After goals are set, a treatment plan should be put in place and discussed with the patient in detail. Have the patient verbalize the treatment plan in their own words to ensure they understand the plan.

1. Discuss / Emphasize
 - a. Lifestyle modification
 - b. Role of each drug and importance of taking as prescribed
 - c. Explain how often to take the medications
 - d. Explain Side effects of medication
 - e. Address Adherence issues

Strategies to Improve Medication Adherence

B/P self-monitoring

Patient self-monitoring of BP is an important part of adherence and an important focus of the American Heart Association 2017 HTN guidelines. Instruct patient to monitor blood pressure regularly and keep a blood pressure log. The log will be reviewed at the next visits. If necessary, check the patient' home blood pressure monitor for accuracy and train the patient on the proper use of the monitor.

Single Pill Combinations

Single-pill combination therapy, also known as a fixed-dose combination in managing hypertension, is accepted as a safe and efficient means of reducing treatment complexity and rapidly improving blood pressure control (Bruyn et al., 2022).

Once-daily dosing

Studies have shown that once-daily antihypertensive agents have the highest adherence compared with twice-daily or multiple daily doses, including greater adherence to the prescribed timing of doses (Flack & Nasser, 2011).

Pill boxes

Studies have shown that patients who use pillboxes to organize their medications have better medication adherence than nonusers.

Electronic Adherence Aids

Numerous methods and devices are available for patients to use as a reminder to take their medications. These electronic aids are unique watches with alarms, pillbox timers, “smart pill” containers, and automated pill dispensers. A medication alert watch with a vibrating alarm can be used to privately signal the patient that it is time to take the medication (Figge, 2011)

Text messaging & Email Reminders

Text messaging and email reminders are potential solutions to the failure to take medications as directed. A systematic review indicated that text messaging interventions had improved patients’ medication adherence rate 85% (Ershad et al., 2016)

Celebrate Patient for reaching blood pressure goal

Positive feedback encourages and intensifies change. Celebrating each minor change is important in keeping patients motivated to do the right thing.

Good Rx Discount Card

As prescription prices can differ between pharmacies, the GoodRx discount program finds the current prices and discounts to help the provider find the lowest cost pharmacy for the prescribed medications. GoodRx is 100% free and is great for patients that must pay out of pocket for medications or for patients that have poor medication coverage with their insurance.

Patient Follow-Up

Patient follow-up is a critical element of the visit. During the follow-up visit, review blood pressure logs, and discuss any medication side effects and any problems with medication adhering. An appropriate follow-up plan is discussed with the patient during the follow-up (for initial drug therapy, follow up 2 to 4 weeks, for patient making progress, follow up 4 to 6 weeks, and when the patient has control, follow up 2 to 4 months). Take time to build a trusting relationship with the patient, so they will know you are sincerely concerned about health care. The providers and staff should create a blame-free environment that encourages patients. Take time to discuss and inform the patient that between visits, they will be getting reminders via emails, texts, or phone calls regarding taking medication and blood pressure monitoring.

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Appendix B: AGREE II Tool for Evaluation of Clinical Practice Guideline

Interpreting Domain Scores is very important as they help identify strengths and limitations of the guidelines and help identify high quality guideline (AGREE II, 2017).

All AGREE II items are rated on the following 7-point scale:

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

Scale: (1) Strongly Disagree, (2) Disagree (3) Partially Disagree, (4) Neutral, (5) Partially Agree, (6) Agree, (7) Strongly Agree

Domain 1 Scope and Purpose

1. The overall objective(s) of the guideline is (are) specifically described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

2. The health question(s) covered by the guideline is (are) specifically described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

Comments:

Domain 2 Stakeholder Involvement

4. The guideline development group includes individuals from all relevant professional groups.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

5. The views and preferences of the target population (patients, public, etc.) have been sought.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

6. The target users of the guideline are clearly defined.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

Comments:

Domain 3 Rigor of Development

7. Systematic methods were used to search for evidence.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

8. The criteria for selecting the evidence are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

9. The strengths and limitations of the body of evidence are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

10. The methods for formulating the recommendations are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

11. The health benefits, side effects, and risks have been considered in formulating the recommendations.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

12. There is an explicit link between the recommendations and the supporting evidence.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

13. The guideline has been externally reviewed by experts prior to its publication.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

14. A procedure for updating the guideline is provided.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

Comments:

Domain 4 Clarity of Presentation

15. The recommendations are specific and unambiguous.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

16. The different options for management of the condition or health issue are clearly presented.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

17. Key recommendations are easily identifiable.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

Comments:

Domain 5 Applicability

18. The guideline describes facilitators and barriers to its application.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

19. The guideline provides advice and/or tools on how the recommendations can be put into practice.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

20. The potential resource implications of applying the recommendations have been considered.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

21. The guideline presents monitoring and/or auditing criteria.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

Comments:

Domain 6 Editorial Independence

22. The views of the funding body have not influenced the content of the guideline.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

23. Competing interests of guideline development group members have been recorded and addressed.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

Comments:

Overall Assessment of Guideline

1. Rate the overall quality of this guideline.

2. I would recommend this guideline for use.

Yes	
Yes, with Modifications	
No	

Comments:

Appraisal OF guidelines for research & evaluation II. (2017).

<https://www.agreetrust.org/wp-content/uploads/2017/12/AGREE-II-Users-Manual-and-23-item-Instrument-2009-Update-2017>.

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Appendix C: Disclosure of Expert Panelist Form for Anonymous Questionnaire

To be given to expert panelist prior to collecting questionnaire responses—note that obtaining a “consent signature” is not appropriate for this type of questionnaire and providing respondents with anonymity is required.

Disclosure to Expert Panelist:

You are invited to take part in an expert panelist questionnaire for the doctoral project that I am conducting.

Questionnaire Procedures:

If you agree to take part, I will be asking you to provide your responses anonymously, to help reduce bias and any sort of pressure to respond a certain way. Panelists' questionnaire responses will be analyzed as part of my doctoral project, along with any archival data, reports, and documents that the organization's leadership deems fit to share. If the revisions from the panelists' feedback are extensive, I might repeat the anonymous questionnaire process with the panel of experts again.

Voluntary Nature of the Project:

This project is voluntary. If you decide to join the project now, you can still change your mind later.

Risks and Benefits of Being in the Project:

Being in this project would not pose any risks beyond those of typical daily professional activities. This project's aim is to provide data and insights to support the organization's success.

Privacy:

I might know that you completed a questionnaire, but I will not know who provided which responses. Any reports, presentations, or publications related to this study will share general patterns from the data, without sharing the identities of individual respondents or partner organization(s). The questionnaire data will be kept for a period of at least 5 years, as required by my university.

Contacts and Questions:

If you want to talk privately about your rights in relation to this project, you can call my university's Advocate via the phone number [REDACTED] Walden University's ethics approval number for this study is 03-03-22-0391042.

Before you start the questionnaire, please share any questions, or concerns you might have.

Appendix D: Literature Review Matrix

Author Date	Research Question/ Hypothesis	Research Method	Analysis Results	Conclusion/ Recommendations For future	Grade
Bruyn Nyuyen Schutte Murphy Perel Webster (2022)	(1) whether SPC antihypertensives are on national EMLs, (2) whether SPC antihypertensives are recommended in national hypertension guidelines and (3) whether SPCs are available on the market.	Systematic Review	Eleven of 30 LMICs had all facilitators in place. Twenty-six countries had national hypertension guidelines (or similar) in place with SPCs being recommended in 18 of these.	Market access and international policy support for the use of SPC antihypertensives is strong. There is evidence of widespread market availability. Further research into the meso and micro level factors influencing the uptake of SPC antihypertensives may produce further learnings to support national governments, the health sector and industry in improving access to SPC antihypertensives.	Mod
Sarabi Sadoughi Orak Bahaadin-beigy (2016)	Whether text message reminders were effective in improving patients' adherence to medication.	Systematic Review	results indicated that text messaging interventions have improved patients' medication adherence rate (85%, 29.34).	This study demonstrated the potential of mobile phone text messaging for medication nonadherence problem solving.	High
Flack Nasser (2011)	Can a once- daily antihypertensive agent that provides genuine 24-hour BP control resulting in improved efficacy and long- term clinical outcomes.	Systematic Review	Studies demonstrated that once-daily antihypertensive agents have the highest adherence compared with twice-daily or multiple daily doses, including greater adherence to the prescribed timing of doses.	The number of daily antihypertensive doses affects clinical outcomes by influencing patients' abilities to remain adherent to their medication regimen.	Mod
Gosmanova Kovesdy (2015)	Is prescribing the right pill enough to keep patient adherent to antihypertension medication?	Systematic Review	The availability of effective drug therapy along appears to be insufficient to guarantee desirable Blood pressure results.	Poor adherence has been consistently shown to be associated with the worse survival, higher cardiovascular disease and ESKD in patients with HTN.	Mod

Bosworth Olsen Neary Grubbs Svetkey Adams Oddone (2008)	NA	Evaluating a randomized controlled Health Decision Model as the theoretical model for identifying factors to focus on in the tailored behavioral intervention.	self-reported medication adherence increased by 9% in the behavioral group vs. 1% in the non-behavioral group.	The intervention is easily implemented and is designed to enhance adherence with prescribed hypertension regimen, particularly among those with low literacy. We have observed significant improvements in self-reported medication adherence at 6-months	High
Burnier Egan (2019)	NA	Systematic review	recent guidelines have emphasized the important need to address drug adherence as a major issue in hypertension management.	Understanding the categories of factors contributing to nonadherence is useful in managing nonadherence.	Mod
Conn, V. S., Ruppar, T. M., Chase, J. A., Enriquez, M., & Cooper, P. S. (2015).	The problem of poor medication adherence prompted investigators to conduct clinical trials testing interventions to improve medication taking among adults with HTN.	Systematic review and Meta-analysis	This comprehensive meta-analysis of interventions documented significant but modest post intervention improvements in medication adherence among hypertensive patients.	Future research should strive for minimizing risks of bias common in this literature, especially avoiding self-report adherence measures.	High
Hugtenburg, J. G., Timmers, L., Elders, P. J., Vervloet, M., & van Dijk, L. (2013).	NA	A meta-analysis This paper summarizes the definitions and taxonomy of adherence with medication, as well as types and causes of nonadherence. In addition, interventions aimed at improvement of adherence are discussed	A systematic review of 72 studies reported that motivational interviewing outperformed traditional advice in 80% of cases	There is not just one solution for the nonadherence problem that fits all patients. To improve adherence effectively, there is a need for a tailored approach based on the type and cause of nonadherence and the specific needs of the patient.	Mod
Kredo, T., Bernhardsson, S., Machingaidze, S., Young, T.,	Usefulness of CPG	A meta-Analysis	Over time, CPGs have shifted from opinion-based to evidence-informed, including	CPG development and implementation have attracted the most international interest and activity,	Mod

Louw, Q., Ochodo, E., Grimmer, K., (2016).			increasingly sophisticated methodologies and implementation strategies, and thus keeping abreast of evolution in this field of research can be challenging.	whilst CPG updating, adopting, adapting and impact evaluation are less well addressed. the next decade will see significant further research into tools to underpin best practices in CPG activities.	
Lewis, L. M., Ogedegbe, C., & Ogedegbe, G. (2012).	This article examines the current understanding of patient, clinical, provider and health care system factors associated with medication adherence in hypertensive African-Americans.	Systematic review	Studies demonstrated that patient and clinical factors, such as self-efficacy and depression, are consistently associated with medication adherence in hypertensive African-Americans patients.	Recommends that interventions targeted at increasing medication adherence among hypertensive African-Americans focus on self-efficacy. It is also imperative that clinicians screen hypertensive patients for depression and treat, if necessary.	Mod
Maraboto, C., & Ferdinand, K. C. (2020)	The aim of the review is to improve understanding of the underlying pathophysiologic mechanisms and identify the optimal approach to deliver the best care for African American patients.	Systematic review	Uncontrolled hypertension (HTN) in the U.S. is particularly prevalent and devastating among black individuals, who disproportionately suffer the consequences of this condition to a greater extent compared with persons in other racial/ethnic groups.	The African American patients represent a very high-risk population with high incidence of CVD and end-organ damage. Therefore, a more aggressive and tailored approach including a multidisciplinary team should be implemented to properly care for these patients.	High
Muntner, P., Abdalla, M., Correa, A., Griswold, M., Hall, J., et al. (2017).	The JHS is a longitudinal observational study designed to identify cardiovascular disease (CVD) risk factors among blacks and to develop the infrastructure for training the next generation of health disparities researchers	longitudinal observational study	Compelling evidence for achieving high blood pressure control rates in blacks has been demonstrated in clinical trials and routine clinical practice	Future Considerations: Determine whether tailored interventions aimed at intentional and unintentional reasons for not taking antihypertensive medication as prescribed can improve adherence and blood pressure control.	Low
Murad, M. H., (2017).	NA	systematic review	empirical evidence shows that adherence	Trustworthy clinical practice guidelines	Mod

			to guidelines improves patient outcomes; however, adherence to guidelines is variable. Therefore, guidelines require active dissemination and innovative implementation strategies.	should be based on a systematic review of the literature, provide ratings of the quality of evidence and the strength of recommendations, consider patient values, and be developed by a multidisciplinary panel of experts.	
Peacock, E., & Krousel-Wood, M. (2017).	The purpose of this article is to provide an overview of the current status and recent developments regarding interventions to improve adherence to antihypertensive medications for primary prevention of cardiovascular events.	systematic reviews	Modest changes in adherence can lead to clinically significant reductions in BP	More high-quality studies on the effectiveness of various approaches for improving adherence and health outcomes are needed.	Mod
Solomon, A., Schoenthaler, A., Seixas, A., Ogedegbe, G., Jean-Louis, G., & Lai, D. (2015).	whether having a medication-taking routine contributes to increased medication adherence.	practice-based randomized controlled trial	Findings showed that medication-taking consistency was significantly associated with better medication adherence	more research is needed on the number and type of antihypertensive prescriptions per patient and optimal BP control.	High
Spikes, T., Higgins, M., Quyyumi, A., Reilly, C., Pemu, P., & Dunbar, S. (2019).	To determine the associations among demographic and clinical factors, depressive symptoms, hypertension beliefs, and social support with blood pressure medication adherence in middle-aged African American adults with a diagnosis of hypertension.	A cross-sectional study	A small but significant relationship was found between medication adherence and number of comorbidities ($r = 0.19, P = .04$). In a multivariate regression model, after controlling for gender, comorbidities remained associated with medication adherence ($\beta = 0.77, P = .04$). Depressive symptoms, high blood pressure beliefs, and social support did not have a significant relationship with	Multiple comorbidities may have a positive impact upon medication adherence. Further study is needed in a larger sample of African Americans who have a diagnosis of hypertension in addition to other comorbidities requiring medication management.	Low

			medication adherence.		
Unger, T., Borghi, C., Charchar, F., Khan, N. A., Poulter, N. R., Prabhakaran, D., Ramirez, A., Schlaich, M., Stergiou, G. S., Tomaszewski, M., Wainford, R. D., Williams, B., & Schutte, A. E. (2020)	mission to reduce the global burden of raised blood pressure (BP) with the development of a CPG	Systematic review	CPG work to reduce BP and increase adherence	Every effort should be made to achieve essential standards of care to reduce hypertension-induced cardiovascular morbidity and mortality. In addition to BP control, the therapeutic strategy should include lifestyle changes, body weight control and the effective treatment of the other risk factors to reduce the residual cardiovascular risk	Mod
Van Camp, Y.P., Huybrechts, S.A., Van Rompaey, B. & Elseviers, M.M. (2012). Nurse Led Education	Aims to synthesize the effect of nurse-led interventions on adherence to chronic medication.	Systematic review and meta-analysis	Counselling was the intervention most frequently assessed, mostly given face-to-face, but also in groups and via electronic messages. All interventions enhanced adherence.	Counselling appears to be an effective approach that nurses can use to supplement other methods, building a multifaceted strategy to enhance adherence. Tackling nonadherence seems to demand continuous efforts and follow-up.	High
Van Camp, Y.P., Huybrechts, S.A., Van Rompaey, B. & Elseviers, M.M. (2012).	Assessed the effects of nursing interventions to improve medication adherence among discharged, home-dwelling, and older adults.	Systematic Review	In total, 14 studies were included, incorporating 2,028 participants. Interventions were nurse-led in seven studies and nurse-collaborative in seven more. In nine studies, medication adherence was higher in the intervention group than in the usual-care group, and this difference reached statistical significance in eight studies. The five remaining studies showed no difference in	Nurse-led and nurse-collaborative interventions moderately improved adherence among discharged older adults. There is a need for large, well-designed studies using highly reliable tools for measuring medication adherence.	High

			medication adherence.		
Vrijens, B., Antonious, S., Burnier, M., Sierra, A., & Volpe, M. (2017).	Assess medication adherence in hypertension	Systematic Review	Medication adherence is a multifaceted issue and consists of three components: initiation, implementation, and persistence. A combination of methods is recommended to measure adherence, with electronic monitoring and drug measurement being the most accurate.	Patient-tailored and measurement-guided interventions are required to achieve sufficient adherence to therapeutic drug regimens. Achieving satisfactory adherence may have far greater impact than any other maneuver to improve antihypertensive treatments, and health care systems must evolve to meet this challenge.	Mod
Whelton PK, & Carey RM (2017).	NA	Systematic Review	emphasizes accurately measuring BP, averaging readings, and using out-of-office BPs to confirm an office diagnosis and recognize white-coat or masked hypertension. Choosing antihypertensive drug therapy should be influenced by comorbidities with an indication to use an agent that concurrently lowers BP	Most adults requiring antihypertensive drug therapy should be treated initially with 2 agents, especially those who are African American or have stage 2 hypertension. The goal during hypertension treatment should be an SBP of less than 130 mm Hg and a DBP of less than 80 mm Hg (SBP <130 mm Hg in adults ≥65 years).	High
Ershad Sarabi, R., Sadoughi, F., Jamshidi Orak, R., & Bahaadinbeigy, K. (2016)	Aimed to provide evidence addressing the question of whether text message reminders were effective in improving patients' adherence to medication.	Systematic Review	The results of this systematic review indicated that text messaging interventions have improved patients' medication adherence rate (85%, 29.34).	This study demonstrated the potential of mobile phone text messaging for medication nonadherence problem solving.	High