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Strengthening Medication Adherence in African Americans Diagnosed with Hypertension

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Strengthening Medication Adherence in African Americans Diagnosed with Hypertension

A DNP Project Submitted to the
Graduate Faculty
of Jacksonville State University
in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Nursing Practice

By

Daphne L. Cockrell-James

Jacksonville, Alabama

August 02, 2024

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Abstract

Background: African Americans have a high rate of hypertension, which varies by region. Additionally, African Americans struggle to understand the risks of uncontrolled high blood pressure and the necessity of medication adherence in lowering strokes, heart attacks, and quality of life.

Purpose: The project aims to implement a patient education program to improve medication adherence and blood pressure control for African American patients in a primary care setting.

Methods: Twenty African Americans ages 18–65 with hypertension (130/80 mm Hg or above) and six months of nonadherence participated in this project. The pre-, mid-, and post-questionnaires assessed medication adherence and blood pressure control over six weeks using the Hill-Bone High Blood Pressure Scale. The American Heart Association toolkit was used for hypertension education.

Results: The Wilcoxon-Signed Rank Test compared median responses to the Hill-Bone Compliance to High Blood Pressure Therapy Scale at the study's midpoint and endpoint, indicating a notable shift in medication adherence or lifestyle. The Kruskal-Wallis test found no significant changes in systolic blood pressure readings following the intervention.

Conclusion: Though not statistically significant, the project was clinically significant in that improvement was noted in medication adherence. Several limitations must be considered, including a small sample size and a short duration of time.

Keywords: African American, hypertension, medication adherence

Acknowledgments

This project was guided by Dr. Laura Barrow, the DNP project Chair, and Dr. Parthenia Oliver, the DNP project preceptor.

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Strengthening Medication Adherence in African Americans with a Diagnosis of Hypertension

Hypertension (HTN) is one of the leading causes of premature death worldwide (World Health Organization, 2022). For a variety of reasons, the prevalence of HTN extends across all races, colors, genders, and socioeconomic groups. African Americans have one of the highest rates of HTN in the world (American Heart Association [AHA], 2022). HTN is one of the most treated conditions in primary care settings. It is also one of the most preventable and treatable diseases that can be improved through lifestyle changes. Because of the lack of symptoms, HTN is known as the "*silent killer*" (AHA, 2023). It can lead to strokes or heart attacks. Researchers noted that there continues to be a problem within certain cultures understanding the dangers of uncontrolled blood pressure and the disregard for medication adherence (Aggarwal et al., 2021; Jackson et al., 2021).

Background

Approximately 103 million U.S. adults have HTN, and approximately three-quarters of the individuals in the United States have uncontrolled HTN (Centers for Disease Control and Prevention [CDC], 2021). The annual cost of treating HTN is \$79 billion, which amounts to about 650 million prescriptions for blood pressure medications. The total cost for these prescriptions is about \$29 billion, \$3.4 billion of which is paid directly by patients, costing individuals an average of \$2500 (CDC, 2022).

African Americans continue to suffer from HTN at an alarmingly high rate, and the condition varies by region in the United States (CDC, 2019). Heart disease is a leading cause of death in Alabama, with an adjusted mortality rate of 298.3, with African Americans having the highest mortality rate of 22.6%. Of the percentage of the population with HTN, between 2011

and 2014, 56% either had a systolic pressure of at least 130 mm Hg, a diastolic pressure of at least 80 mm Hg, or were taking blood pressure medications (CDC, 2021).

According to the Alabama Department of Public Health (2023), Tuscaloosa County has an HTN rate of 67.6%, one of the highest rates in Alabama. The primary care clinic's performance measures for patients with controlled HTN were below the national average of 60% for the last two quarters. The clinic's first quarter was 42%, and the second quarter was 43%. Uncontrolled HTN affects 79.3% of the clinic's African American population. Healthcare practitioners and stakeholders need an approach to educating their patients about uncontrolled HTN and methods for motivating them to follow treatment recommendations.

Problem Identification

The clinic's main concerns were HTN management and medication adherence. The DNP student and stakeholders identified a persistent gap between the national and organizational levels of blood pressure control. Healthcare practitioners at the clinic noticed established patients diagnosed with HTN were either not refilling prescriptions on time or at all. The clinic lacks an education-based intervention for the patients. The practitioners at the clinic want to improve performance scores by improving medication adherence by implementing an education-based intervention.

Problem Statement and PICOT Question

African American individuals continue to have the highest prevalence of HTN; this is especially true for women (AHA, 2022). Untreated or uncontrolled HTN is the single most common contributing factor for cardiovascular disease and a significant cause of renal disease. Due to the potentially fatal risk factors for HTN, this student created an evidence-based educational intervention to improve medication adherence and blood pressure control in a

primary care setting. Currently, 54% of African American patients with HTN treated at the clinic had uncontrolled HTN and were not adhering to the prescribed medication regimens. The PICOT question was, In African American patients with uncontrolled hypertension, does providing evidence-based education, compared to current practice, improve medication adherence and decrease blood pressure over six weeks?

Review of Literature

This student conducted a literature search using the following databases: The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, and PubMed. A comprehensive search generated 262 articles using the following terms: African American or Black, hypertension, high blood pressure, elevated blood pressure, noncompliance or nonadherence, educational intervention or learning intervention, teaching, medications, and education sessions or education system. After using the limiting factors of peer review with the full article, the past 5 years, the English language, and adult age (18 and up), 47 articles were found. The literature revealed three prominent themes: health literacy/communication, insurance coverage, and hypertensive medication adherence scales.

Health Literacy/Communication

Health literacy is essential to understanding a medical diagnosis, instructions for treatment, including prescriptions, and how to navigate health services in a complicated system. Low health literacy affects healthcare outcomes. Eighty-seven million Americans have inadequate health literacy (Muvuka et al., 2020). Age, education, race, and socioeconomic status affect health literacy (Butzner et al., 2023; Jackson et al., 2021). Javadzade et al. (2018) suggested that health literacy initiatives and other evidence-based interventions can help change behaviors. Joho (2021) emphasized the importance of technology, digital health, and

bioinformatics to transform and improve patient care. Effective health literacy strategies should prioritize health inequality. Improving health literacy for patients with HTN improves self-care and awareness of potential consequences (Mourey-Lavizzo et al., 2021; Thomas et al., 2023).

Historically, the African American community has faced mistrust and unethical treatment regarding communicating information about their health (Jackson et al., 2021; Javadzade et al., 2018). The African American population has developed a pessimistic outlook toward the healthcare industry (Jackson et al., 2021; Thomas et al., 2023). Health literacy influences drug adherence, which is often overlooked in the African American community. Most patients with HTN live in low-literacy and low-health literacy settings, causing a lack of knowledge (Colvin et al., 2022; Goldman et al., 2020; Hamrahian et al., 2022). Patients in these areas had reduced medication adherence compared to those in a more prevalent health literacy area (Butzner et al., 2023; Javadzade et al., 2018; Muvuka et al., 2020). Improved health literacy and communication can assist patients in understanding how to treat HTN properly.

Insurance Coverage

In addition to low health literacy, the cost of healthcare, health insurance, and medications are factors related to uncontrolled HTN (Chaturvedi et al., 2023; Choudhry et al., 2022). Abel et al. (2023) found that women had lower drug adherence than men, while others found no difference compared to men (Choudhry et al., 2022; Spike et al., 2020). Many African American patients with HTN often do not understand the significance of medication adherence in controlling their condition. The limited or lack of insurance coverage is also likely a factor in the nonadherence concerns of this health group. African Americans are less likely to be enrolled in Medicare or private insurance (Butzner et al., 2023; Colvin et al., 2022;). Lack of medical insurance is a significant barrier to medication nonadherence (Goldman et al., 2020; Hamrahian

et al., 2022). Similarly, the inability to afford medications is a common barrier to medication adherence (Goldman et al., 2020; Hamrahian et al., 2022).

Overall, researchers highlighted the need for practitioners to take time to understand the patient's history and build rapport. African Americans are more likely to decline treatment because of medical skepticism (Harvin et al., 2020). Additionally, assessing patients' ability to pay for medication is equally critical (Chaturvedi et al., 2023).

Hypertensive Medication Adherence Scales

The Hill-Bone Compliance to High Blood Pressure Therapy Scale (HB-HBP) was recommended for assessing and improving medication compliance. According to Commodore-Mensah et al. (2023), the HB-HBP is a research-designed, highly reliable, cost-effective, and concise tool for clinical monitoring and evaluating self-reported medication adherence in HTN treatment. According to Commodore-Mensah (2023), the HB-HBP is a brief, easy-to-use assessment that can be administered through brief interviews and disease-specific questionnaires, in contrast to the Morisky Medication Adherence Assessment (MMAS 8), MASES, and other related scales, which are not disease-specific for diseases such as hypertension (Chatziefstratiou et al., 2019). This scale evaluates patients' knowledge and awareness of medication adherence in HTN control (Commodore-Mensah et al., 2023; Marseille et al., 2021). The HB-HBP is a better fit for this project since it can provide information for educational activities to raise adherence levels while assessing the success of the interventions (Chatziefstratiou et al., 2019).

Theoretical Framework

One of the earliest models of behavior was the Health Belief Model (HBM). HBM includes the following components: perceived susceptibility, perceived severity, perceived benefits, cues to actions, and self-efficacy (Azadi et al., 2021). This model can be valuable for

improving outcomes related to HTN by addressing factors that influence individuals' decisions and actions. The HBM was used as a guide to fill the gap in clinical practice by customizing interventions for each person according to their unique barriers and perceptions. The HBM provided structure for this project by centralizing the focus on motivation and decision-making (Azadi et al., 2021). Using HBM's perceived benefits, patients can examine how medicine, lifestyle adjustments, and regular checkups improve health (Joho, 2021). People are more inclined to value educational intervention if they can see results. The HBM recognizes that personal beliefs and behaviors affect health decisions and can help or hinder blood pressure treatment. Furthermore, this model provided broader guidelines and general ideas for this project through educational campaigns, cultural sensitivity, better communication strategies, educational literacy, motivations, and willingness to change (Azadi et al., 2021).

Quality Improvement Methodology

Graham and colleagues created the Knowledge-to-Action (KTA) framework in the 2000s to aid in bridging the gap between research knowledge and its practical application (Ham-Baloyi, 2022). KTA comprises the knowledge creation phase and action. Health literacy has a more significant impact on African Americans with HTN who have lower incomes and education levels (Muvuka et al., 2020). By employing the knowledge creation phase, healthcare providers can use education and supportive approaches for community health promotion to encourage and reinforce medication adherence and lifestyle changes among HTN patients to reduce blood pressure (Tam et al., 2020).

The Action Cycle phase consists of operationalizing the knowledge (Ham-Baloyi, 2022). Healthcare providers can use the KTA framework to educate patients by incorporating, integrating, and applying evidence-based interventions in the primary care setting.

Project Design

The setting for the DNP project is a rural primary care clinic in the Southeastern United States. This facility comprises ten clinical sites providing comprehensive care for families, including urgent care services. Four physicians and 12 nurse practitioners use the facility to see an average of 20 patients daily. African Americans age 18–65 with HTN (130/80 mm Hg or above) and documentation of at least six months of nonadherence to treatment were selected as candidates for the DNP project. Exclusion criteria included non-African heritage, medication adherence of at least six months, or those under the age of 18. The educational Institutional Review Board approved this project (see Appendix A). Protection of human subject training was completed (see Appendix B).

After selecting the 20 participants, the DNP student ensured that each participant signed consent forms. Patients were informed of their right to decline. This student oversaw the project's intervention implementation, data collection, storage, and discard. All collected information was kept confidential and identifiable by the numbers assigned to the questionnaire. The collected data was stored in a locked cabinet and shredded after the study. De-identified data was encrypted in a spreadsheet.

Secondary data was obtained from the electronic health record, and identifying patient information was removed. Pre-, mid-, and post-blood pressure readings and the HB-HBP questionnaires were performed biweekly for six weeks, totaling three sessions. The HB-HBP is divided into three sections: (1) medication compliance, (2) appointment, and (3) salt consumption items, which are all rated on a four-point Likert scale (Kim et al., 2000). Participants were asked to indicate the frequency of specific behavior using a 4-point Likert scale: 1 (all the time), 2 (most of the time), 3 (some of the time), and 4 (none of the time). The

questionnaires cover aspects of forgetting to take medications, deciding not to take medications, dietary habits, including fast-food consumption, adherence to medical appointments, and medication management during various medical health problems. The patients received educational information about HTN via biweekly phone calls. Each biweekly phone call lasted approximately 15 minutes after the initial face-to-face 30-minute orientation meeting.

Educational content came from the American Heart Association's Toolkit for HTN, which includes the definition of HTN, the signs and symptoms of HTN, and self-awareness of HTN.

Blood pressure readings and HB-HBP scores were evaluated to assess the effects of educational intervention and medication adherence. The Wilcoxon signed-rank test was used to analyze pre-, mid-, and -post-questionnaire scores and systolic and diastolic blood pressure. Gender differences were assessed by the Chi-square test of association and the Mann-Whitney test.

Project Results and Evaluation

Descriptive statistics (means, standard deviation) were used to describe the demographics of the study participants and changes in outcome for this study. The study involved 20 participants, averaging age 56.9 years (SD = 14.63). Of the participants, 80% had completed high school. All participants had 100% health insurance and were prescribed medications for their health management.

The result of a Wilcoxon-signed rank test compared median responses from the Hill-Bone Compliance to High Blood Pressure Therapy Scale at the mid-point and at the end of the study, suggesting a notable shift in medication adherence or lifestyle. Specifically, there was a statistically significant decrease in the median ranking associated with specific questions, such as decreased use of sodium and never taking someone else's high blood pressure medicines.

By the end of the study, fewer participants acknowledged occasionally forgetting to take their high blood pressure medication or deciding not to take it. A statistically significant majority (65%) of the participants reported rarely forgetting to take their blood pressure medication. Regarding sodium intake, 45% reported often shaking salt on their food before consuming it. Regarding appointment management, making the next doctor appointment was predominantly done some of the time (35%), whereas missing scheduled appointments were evenly spread across all time frames (25% for each). There are statistically significant changes when comparing the results of the Wilcoxon-signed ranked test from the survey at the initial time point to the study's endpoint ($T = 21$, $p\text{-value} = 0.036$). An examination of systolic blood pressure (SBP) and diastolic blood pressure (DBP) was also analyzed to see the intervention's biological impact. The initial systolic blood pressure averaged 143.4 mm Hg ($SD = 8.86$), and the initial diastolic blood pressure averaged 80.2 mm Hg ($SD = 4.87$). At the study's midpoint, the average SPB was 140.35 mm HG ($SD = 8.13$), and the average DBP was 78.7 mm Hg ($SD = 4.62$). At the end of the study, the average SPB decreased to 137/75 mm Hg ($SD = 9.10$), and the average DBP decreased to 75.8 mm Hg ($SD = 3.98$). The results of the Kruskal-Wallis test indicated no statistically significant changes in systolic blood pressure at the 0.05 level of significance following the intervention. This suggests that the intervention did not significantly impact overall blood pressure at any of the assessed time points ($H = 0.75$, $DF = 2$, $p = 0.155$). However, the graph below compares the distribution of SPB at each time point and seems to show a potential downtrend, as shown in Figure 1. Even though the results were not statistically significant, they were clinically significant.

Figure 1*Changes in Systolic Blood Pressure*

Conclusion

A DNP project examined the potential efficacy of an educational intervention led by healthcare professionals. The primary objective was to evaluate whether this educational intervention could effectively enhance adherence to prescribed blood pressure medication among African American patients in a primary setting. As a result, the six-week project's evidence-based intervention had no meaningful impact on medication adherence, according to the statistical findings. However, the clinical effect of the intervention shows a downward trend in blood pressure readings. Although not statistically significant, the project results were clinically significant. Participants' responses to survey questions supported improvement in medication adherence. An apparent limitation of this study was the small sample size and short duration of time. The project can be sustained by adopting the Hill-Bone Compliance for Hypertension scale as a part of the treatment regimen for patients with chronic high blood pressure. The triage nurse

can initiate the questionnaire and obtain patient information during patient visits. The HB-HBP will help develop and implement personalized treatment plans and provide a quick synopsis of the patient's medication adherence, appointment-keeping, and diet. Another helpful instrument that can aid in sustaining the project is the American Heart Association Toolkit, which can provide user-friendly education to patients about hypertension. Furthermore, simplifying the medication regimen to a single dose instead of multiple doses can aid in adherence. Focus and follow-up appointments can help set achievable goals, track progress, evaluate drug efficacy, and address patient concerns. The appointment time should provide a chance for comprehensive education and supportive care.

During the survey, most participants believed that receiving continual reminders and information on their medical status would help them remember and eventually establish a habit of medication adherence, dietary modification, and regular doctor checks. Overall, this DNP student considered this project a success. This student broadened her knowledge of evidence-based practice related to hypertension management and improving clinical practice. An evidence-based intervention that utilizes the Health Belief Model can help patients in the clinic develop healthier habits. This includes adopting better dietary habits, reducing sodium intake, sticking to scheduled appointments, and adhering to medication regimens.

Summary

Many primary care healthcare practitioners believed that African American patients diagnosed with hypertension needed some form of intervention to improve their non-adherence to medication instructions tailored to promote better blood pressure control. Morbidity and mortality rates in hypertension patients continue to rise, which inspired this student to seek out a way to address this issue. This project was designed to determine a better method of addressing

HTN management and medication adherence concerns. Many patients who were diagnosed with HTN were either not taking medications as prescribed, not refilling prescriptions on time, or not refilling them at all. The data suggests that with continued implementation, the project can lead to improved medication adherence and decreased blood pressure in the African American population.

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Appendix A
JSU IRB Approval Letter



Institutional Review Board for the Protection of Human Subjects in Research 203

Angle Hall
700 Pelham Road North
Jacksonville, AL 36265-1602

November 9, 2023

Daphne Cockrell-James
Jacksonville State University
Jacksonville, AL 36265

Dear Daphne:

Your protocol for the project titled "Strengthening Medication Adherence in African Americans Diagnosed with Hypertension" protocol number 11092023-03, has been approved by the JSU Institutional Review Board for the Protection of Human Subjects in Research (IRB).

If your research deviates from that listed in the protocol, please notify me immediately. One year from the date of this approval letter, please send me a progress report of your research project.

Best wishes for a successful research project.


Sincerely,

A handwritten signature in black ink that reads 'Sarah Donley'.

Sarah Donley
Human Protections Administrator, Institutional Review Board

Appendix B

CITI Training



Completion Date 01-Aug-2023
Expiration Date 01-Aug-2026
Record ID 57264114

This is to certify that:

Daphne James

Has completed the following CITI Program course:

Social and Behavioral Responsible Conduct of Research
(Curriculum Group)


Social and Behavioral Responsible Conduct of Research
(Course Learner Group)

1 - RCR
(Stage)

Under requirements set by:

Jacksonville State University

Not valid for renewal of certification through CME.



Collaborative Institutional Training Initiative

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