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Evaluation of Nursing Knowledge and Compliance with Evidence-Based Hypertension Management Protocols at Kabaya District Hospital

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ABSTRACT: Background: Hypertension remains a major global public health concern and a leading contributor to cardiovascular morbidity and mortality. Nurses play a critical role in hypertension management through screening, monitoring, medication administration, patient education, and lifestyle counseling. However, the effectiveness of these interventions largely depends on nurses' knowledge and their compliance with evidence-based management protocols. This study aimed to evaluate the level of nursing knowledge and its influence on compliance with evidence-based hypertension management protocols at Kabaya District Hospital in Rwanda.

Methods: A cross-sectional descriptive quantitative design was employed. The target population consisted of registered nurses directly involved in hypertension care, and a sample of 57 nurses was selected from a total population of 67 using Yamane's formula and purposive sampling. Data were collected using structured questionnaires and observation checklists administered through both face-to-face and online surveys. The instruments assessed nurses' socio-demographic characteristics, knowledge, and compliance with hypertension management protocols. Data were coded in Microsoft Excel and analyzed using SPSS version 25. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized the data, while Spearman's rho correlation analysis was used to examine the relationship between knowledge and compliance. Ethical approval was obtained from the University of Gitwe Ethical Review Board and Kabaya District Hospital administration.

Findings: The findings revealed that nurses demonstrated a very high level of knowledge regarding evidence-based hypertension management protocols (composite mean = 4.41, SD = 0.929) and a very high level of compliance in implementing these protocols (composite mean = 4.38, SD = 0.939). A strong positive and statistically significant relationship was found between nursing knowledge and compliance ($\rho = 0.762$, $p < 0.001$), indicating that higher levels of knowledge are associated with improved adherence to hypertension management protocols. However, workload pressures were identified as a factor that may affect full compliance.

Conclusion: The study concludes that strengthening nurses' knowledge through continuous professional development and institutional support is essential for improving adherence to evidence-based hypertension management protocols and enhancing patient outcomes. Future research should explore additional organizational and contextual factors influencing compliance in similar healthcare settings.

KEYWORDS: Nursing Knowledge, Compliance with Hypertension Management , Evidence-Based Practice, Hypertension Management, Nursing Practice, Patient Care Quality

INTRODUCTION

Hypertension remains one of the most significant contributors to cardiovascular morbidity and mortality worldwide, demanding consistent application of evidence-based management strategies across all levels of care. Nurses play a central role in screening, monitoring, patient education,

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medication administration, and lifestyle counseling core components of hypertension control. However, the effectiveness of these interventions largely depends on nurses' knowledge and their compliance with established evidence-based protocols. Evaluating these dimensions within institutional settings such as Kabaya District Hospital is essential to strengthen quality of care and improve patient outcomes.

Globally, studies indicate that while evidence-based hypertension guidelines are widely available, compliance and knowledge gaps persist. For example, only 19.5% of patients were managed in accordance with comprehensive hypertension guidelines in one study (Ataro et al., 2023), reflecting implementation deficiencies. Although adherence to certain protocol components exceeded 80%, compliance with specific nursing controls was reported at 61.8% (Delgado et al., 1990), demonstrating inconsistency in practice. Furthermore, research emphasizes that strengthening nursing education and structured training significantly enhances adherence and blood pressure outcomes (Pelaj & Arslani, 2020). These findings suggest that knowledge alone may not guarantee optimal compliance, highlighting the need for institutional evaluation.

In Africa, the challenge is more pronounced due to health system constraints and limited structured training programs. Evidence from nurse-led hypertension interventions shows that enhanced training significantly improves blood pressure control (Commodore-Mensah et al., 2023). However, guideline adherence remains suboptimal, with only 19.5% compliance reported in some African settings (Ataro et al., 2023). The development of continent-wide certification programs to train 50,000 nurses underscores a recognized knowledge gap in hypertension management (Dzudie et al., 2018). These findings reveal that although policy-level efforts are ongoing, compliance with evidence-based protocols remains inconsistent across facilities.

In Rwanda, progress has been observed in the quality of hypertension care, with a reported mean quality score of 5.86 out of 7 in district health facilities (Ndateba et al., 2023). However, only 30.1% of patients achieved controlled blood pressure, indicating a potential gap between knowledge, protocol adherence, and patient outcomes (Ndateba et al., 2023). Similarly, adherence to antihypertensive medication was reported at 70.6% in one district hospital (Mbabazi et al., 2024), yet optimal control remains limited.

Despite these insights, there is limited empirical evidence examining the direct relationship between nursing knowledge and compliance with evidence-based hypertension management protocols in district hospitals such as Kabaya District Hospital. Therefore, this study seeks to fill this gap by systematically evaluating nursing knowledge, compliance levels, and their statistical relationship to inform targeted institutional interventions.

Research Questions

This study aims to evaluate the level of nursing knowledge and its influence on compliance with evidence-based hypertension management protocols at Kabaya District Hospital. Specifically, the investigation seeks to address the following questions:

1. What is the level of nurses' compliance with the evidence-based hypertension management protocol at Kabaya District Hospital?
2. What is the level of nursing knowledge regarding evidence-based hypertension management protocols at Kabaya District Hospital?
3. Is there a statistically significant relationship between nursing knowledge and compliance with evidence-based hypertension management protocols at Kabaya District Hospital?

CONCEPTUAL FRAMEWORK

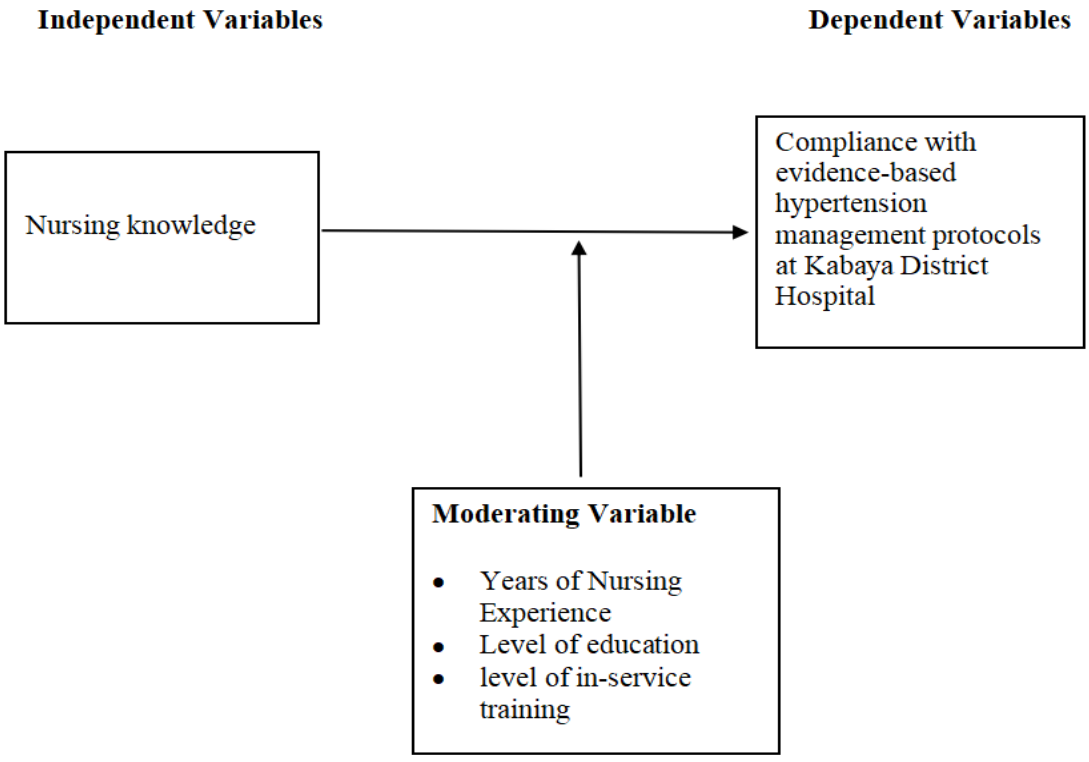


Figure 1. Conceptual Framework

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THEORETICAL FRAMEWORK

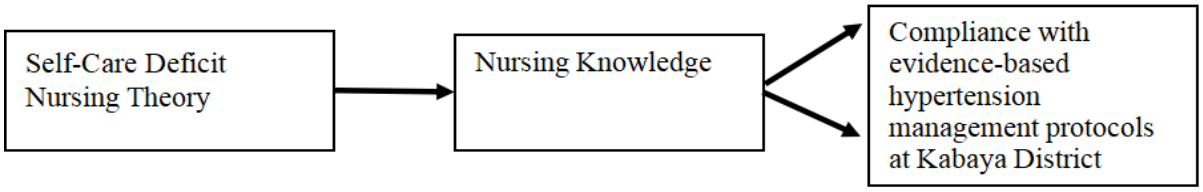


Figure.2. Theoretical framework

This study is guided by the Middle-Range Theory of Nursing in Hypertension Care, which emphasizes the relationship between nurses' professional knowledge and improved patient outcomes in hypertension management. The theory proposes that nurses, through their roles as educators, counselors, and advocates, significantly influence patient adherence to evidence-based hypertension management protocols. By providing health education, counseling, and clinical guidance, nurses help patients understand the importance of medication adherence, lifestyle modification, and regular monitoring, thereby improving compliance and treatment outcomes (Drevenhorn, 2018).

The theory also highlights key components such as patient empowerment, communication, advocacy, and evidence-based clinical practice, which guide nurses in implementing standardized hypertension care interventions. In this study, the framework is used to examine how nurses' knowledge influences compliance with hypertension management protocols at Kabaya District Hospital. Through structured education and counseling, nurses facilitate patient engagement and adherence, ultimately contributing to improved blood pressure control and reduced complications (Drevenhorn, 2018; Zhang et al., 2025).

METHOD

This study employed a cross-sectional descriptive quantitative design to assess nurses' knowledge and compliance with evidence-based hypertension management protocols at Kabaya District Hospital in Western Province, Rwanda. The target population included registered nurses directly involved in hypertension care, and a sample size of 57 nurses was determined using Yamane's formula (1967) from a total population of 67 nurses. Purposive sampling was used to select participants with direct experience in hypertension management. Data were collected using structured questionnaires and observation checklists through both face-to-face and online surveys to accommodate varying work schedules. The instruments assessed nurses' socio-demographic characteristics, knowledge, and compliance with hypertension management protocols. Data were coded in Microsoft Excel and analyzed using SPSS version 25, applying descriptive statistics (frequencies, percentages, means, and standard deviations) and inferential statistics, including Pearson's correlation to examine relationships between knowledge and compliance. Ethical approval was obtained from the University of Gitwe Ethical Review Board and Kabaya District Hospital administration. Participation was voluntary, informed consent was obtained from all participants, confidentiality was maintained through coded questionnaires, and all collected data were securely stored and scheduled for destruction six months after completion of the study.

RESULTS AND DISCUSSION

4.1. Respondents' Level of Nursing Knowledge Regarding Evidence-Based.

The level of nursing knowledge regarding evidence-based hypertension management at Kabaya District Hospital recorded an overall composite mean of 4.41 (SD = 0.929), indicating a very high level of knowledge among the nurses. Among the items, the highest mean score was observed for "I understand the recommended blood pressure thresholds for diagnosis of hypertension" (Mean = 4.53, SD = 0.868), reflecting strong mastery of critical diagnostic criteria. Conversely, the lowest mean score was recorded for "I am knowledgeable about follow-up intervals for hypertensive patients" (Mean = 4.23, SD = 1.018), indicating a minor gap in applying structured follow-up protocols.

Table 1. Respondents' Level of Nursing Knowledge Regarding Evidence-Based

No	Description	Mean	Median	SD	Scale response	Qualitative descriptor
1	I am knowledgeable about the current evidence-based hypertension management guidelines used in my hospital.	4.39	5	0.996	Strongly Agree	Very High
2	I understand the recommended blood pressure thresholds for diagnosis of hypertension.	4.53	5	0.868	Strongly Agree	Very High
3	I am knowledgeable about first-line antihypertensive medications and their indications.	4.28	5	1.031	Strongly Agree	Very High
4	I understand the importance of risk stratification in hypertension management.	4.40	5	0.904	Strongly Agree	Very High

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5	I am familiar with lifestyle modification recommendations for hypertensive patients.	4.40	5	0.997	Strongly Agree	Very High
6	I understand the role of patient education in improving hypertension treatment adherence.	4.51	5	0.984	Strongly Agree	Very High
7	I am knowledgeable about counseling patients on salt reduction and dietary modification.	4.44	5	0.926	Strongly Agree	Very High
8	I understand how physical activity contributes to blood pressure control.	4.49	5	0.826	Strongly Agree	Very High
9	I am knowledgeable about medication adherence counseling strategies.	4.37	5	0.975	Strongly Agree	Very High
10	I understand the potential complications of uncontrolled hypertension.	4.46	5	0.946	Strongly Agree	Very High
11	I understand proper blood pressure measurement techniques.	4.49	5	0.869	Strongly Agree	Very High
12	I am knowledgeable about follow-up intervals for hypertensive patients.	4.23	5	1.018	Strongly Agree	Very High
13	I understand when referral to higher-level care is necessary.	4.37	5	0.858	Strongly Agree	Very High
14	I understand documentation requirements for hypertension management.	4.37	5	0.816	Strongly Agree	Very High
Composite Mean		4.41	5	0.929	Strongly Agree	Very High

Legend:1.00-1.80 = Strongly Disagree,1.81-2.60 = Disagree, 2.61-3.40= Neutral , 3.41-4.20 = Agree, 4.21-5.00= Strongly Agree

Respondents' Compliance with Evidence-Based Hypertension Management Protocols.

Table 2 presents the level of nurses' compliance. The composite mean of 4.382 (SD = 0.939) indicates a very high level of compliance overall. The highest-scoring items reflect nurses' adherence to lifestyle counseling, follow-up encouragement, and provision of equipment-supported hypertension management. The lowest-scoring item, "My workload affects my ability to fully comply" (Mean = 3.74, SD = 1.303), reflects challenges in operationalizing protocols under high workload conditions.

Table 2. Respondents' compliance with evidence-based Hypertension Management Protocols

No	Description	Mean	Median	SD	Scale response	Qualitative descriptor
1	I consistently follow the hospital's hypertension management protocol in my daily practice.	4.42	5	0.885	Strongly Agree	Very High
2	I ensure accurate blood pressure measurement before clinical decision-making.	4.49	5	0.947	Strongly Agree	Very High
3	I prescribe or administer antihypertensive medications according to established guidelines.	4.46	5	0.908	Strongly Agree	Very High
4	I provide lifestyle counseling to hypertensive patients during consultations.	4.51	5	0.848	Strongly Agree	Very High
5	I document hypertension management interventions accurately and completely.	4.42	5	0.925	Strongly Agree	Very High

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6	I regularly educate patients about medication adherence.	4.39	5	0.921	Strongly Agree	Very High
7	I encourage patients to attend scheduled follow-up appointments.	4.53	5	0.847	Strongly Agree	Very High
8	I assess patients' understanding of hypertension during consultations.	4.39	5	0.881	Strongly Agree	Very High
9	I provide individualized counseling based on patients' socioeconomic context.	4.44	5	0.887	Strongly Agree	Very High
10	I reinforce lifestyle modification messages at every patient encounter.	4.39	5	0.881	Strongly Agree	Very High
11	My workload affects my ability to fully comply with hypertension management protocols.	3.74	5	1.303	Agree	High
12	My access to updated hypertension guidelines influences my compliance.	4.33	5	1.024	Strongly Agree	Very High
13	My hospital provides adequate equipment for proper hypertension management.	4.53	5	0.826	Strongly Agree	Very High
14	My prior training in hypertension management improves my compliance with protocols.	4.23	5	1.102	Strongly Agree	Very High
15	My collaboration with other healthcare professionals enhances protocol adherence.	4.46	5	0.908	Strongly Agree	Very High
Composite Mean		4.382	5	0.939	Strongly Agree	Very High

Legend:1.00-1.80 = Strongly Disagree,1.81-2.60 = Disagree, 2.61-3.40= Neutral , 3.41-4.20 = Agree, 4.21-5.00= Strongly Agree

Relationship Between Nurses' Knowledge and Compliance with Hypertension Management Protocols.

This section presents the relationship between nurses' knowledge and compliance with evidence-based hypertension management protocols at Kabaya District Hospital. The Spearman's rho correlation coefficient was computed to determine the strength and direction of the association between these variables. The analysis revealed a rho value of 0.762*, symbolizing a strong positive correlation, indicating that higher levels of nursing knowledge are associated with better compliance to hypertension management practices. Additionally, the p-value (<0.001) symbolizes that this relationship is highly statistically significant, suggesting that the observed association is unlikely to have occurred by chance and confirming a meaningful link between nurses' knowledge and adherence to evidence-based protocols

Table 3. Relationship Between Nurses' Knowledge and Compliance with Hypertension Management Protocols

Variable	Spearman's rho	P-value	Decision	Interpretation
Knowledge	0.894***	< 0.001	Reject H0	Strong positive correlation

Legend: 0.00–0.29 = weak, 0.30–0.49 = low, 0.50–0.69 = moderate, 0.70–0.89 = strong, 0.90–1.00 = very strong

CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

The study concludes that nurses at Kabaya District Hospital possess very high levels of knowledge and demonstrate strong compliance with evidence-based hypertension management protocols. Nurses showed strong competency in hypertension diagnosis, medication administration, lifestyle counseling, and patient education. A strong positive relationship was found between knowledge and compliance ($\rho = 0.762$, $p < 0.001$), indicating that increased nursing knowledge significantly improves adherence to clinical guidelines. However, operational challenges such as workload and resource constraints may affect the consistent implementation of these protocols.

The findings imply that strengthening nurses' knowledge and skills is essential for improving adherence to evidence-based hypertension management protocols and ensuring quality patient care. The study highlights the importance of continuous professional development, supportive institutional policies, and adequate resources to sustain high standards of hypertension management. Enhancing nurses' educational capacity and clinical competencies can contribute to better blood pressure control, improved patient outcomes, and reduced complications associated with hypertension.

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It is recommended that healthcare institutions implement regular training programs, refresher courses, and mentorship initiatives to strengthen nurses' competencies in hypertension management. Hospitals should also ensure adequate staffing, provide updated clinical guidelines, and promote multidisciplinary collaboration among healthcare professionals. Additionally, future studies should explore other factors influencing compliance, such as leadership support, institutional culture, and nurse-to-patient ratios, using multi-center and longitudinal research designs.

This study has some limitations that should be considered when interpreting the findings. The research was conducted in a single hospital with a relatively small sample size, which may limit the generalizability of the results to other healthcare settings. The cross-sectional design also captured data at one point in time, making it difficult to establish causal relationships. Furthermore, the use of self-reported questionnaires may have introduced response bias, as participants might have overreported their compliance with hypertension management protocols.

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