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THE ROLE OF NURSE-LED HEALTH EDUCATION IN HYPERTENSION MANAGEMENT: A SCOPING REVIEW OF EXISTING STRATEGIES AND UNADDRESSED GAPS IN KENYA

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ABSTRACT

Hypertension remains a major public health concern, particularly in low- and middle-income countries (LMICs) like Kenya, where control rates are suboptimal due to healthcare delivery gaps. Although nurse-led interventions have shown effectiveness in managing chronic diseases globally, their role in hypertension care within Kenya's healthcare system remains underutilized. This scoping review explores the impact of nurse-led health education interventions in hypertension management and identifies gaps in their implementation.

A systematic literature search was conducted across major academic databases, including PubMed, Google Scholar, CINAHL, and the WHO Global Health Library, using predefined search terms. Studies examining physician-led, pharmacist-led, community-based, and nurse-led hypertension interventions were analyzed for effectiveness and limitations. Inclusion criteria encompassed peer-reviewed articles, systematic reviews, and government reports published within the last decade.

Findings indicate that physician-led models dominate hypertension care in Kenya but often lack structured patient education and adherence support. Pharmacist-led and community-based interventions have demonstrated improvements in medication adherence but remain inadequately integrated into routine care. Nurse-led interventions, which emphasize patient education, lifestyle counseling, and follow-up care, have shown success in other regions but face barriers such as workforce constraints, lack of standardized education programs, and minimal policy integration in Kenya.

This review underscores the need for structured nurse-led hypertension education interventions to improve patient adherence and blood pressure control. Key policy recommendations include the development of task-shifting frameworks, specialized nurse training, integration of nurse-led interventions into Universal Health Coverage (UHC) policies, and the implementation of pilot nurse-led hypertension clinics in Level 4 and 5 hospitals. Additionally, mobile health technologies can enhance adherence monitoring and follow-up care. Consideration of gray literature, including government policies and unpublished reports, provided contextual insights but revealed challenges in accessing comprehensive data. The PRISMA diagram illustrates the study selection process, and Appendix C presents a data extraction table summarizing key studies on hypertension management interventions.

1.0 INTRODUCTION

Hypertension is a leading cause of cardiovascular diseases, stroke, and kidney failure, contributing significantly to morbidity and mortality worldwide. Effective management requires a combination of pharmacological treatment, lifestyle modifications, and patient education to improve long-term outcomes. In Kenya, physician-led models dominate hypertension care, focusing primarily on diagnosis and medication prescription. However, these models often lack structured education and adherence support, leading to suboptimal blood pressure control.

Nurse-led interventions have emerged as an effective strategy for managing chronic conditions by providing continuous education, lifestyle counseling, and adherence monitoring. Globally, studies have demonstrated that nurse-led programs enhance patient outcomes by promoting self-management and improving medication adherence. Despite this evidence, Kenya has yet to integrate structured nurse-led hypertension education into its healthcare system effectively.

This review aims to explore existing research on hypertension management in Kenya, with a specific focus on identifying gaps in nurse-led interventions. By examining current practices, challenges, and potential solutions, this study seeks to provide insights into how nurse-led models can be implemented to improve hypertension outcomes in Kenya's healthcare settings.

2.0 BACKGROUND

Hypertension is a major global public health concern, affecting approximately 1.28 billion adults worldwide, with the majority residing in low- and middle-income countries (WHO, 2021). It is a leading risk factor for cardiovascular diseases, stroke, and kidney failure, contributing significantly to morbidity, mortality, and healthcare costs. Despite advancements in antihypertensive treatments and management strategies, hypertension control rates remain suboptimal, particularly in resource-limited settings like Kenya. Studies indicate that only a small fraction of hypertensive patients achieve adequate blood pressure (BP) control due to poor adherence, lack of structured patient education, and gaps in healthcare delivery.

Existing research has primarily focused on physician-led and community-based hypertension management models, often neglecting the potential of structured, hospital-based nurse-led interventions. While physician-led models prioritize diagnosis and pharmacological treatment, they often lack structured patient education, adherence support, and long-term follow-up care. Community-based interventions, such as community health worker (CHW) programs and mobile health (mHealth) applications, have shown promise in improving patient engagement but remain poorly integrated into formal hospital settings. Pharmacist-led strategies, though effective in enhancing medication adherence, lack the continuity of care provided by nurses who engage in routine patient interactions.

This scoping review differs from previous studies by focusing specifically on the integration of nurse-led health education into Kenya's healthcare system. Unlike past research that has examined general hypertension management strategies, this review aims to synthesize evidence on the role of nurses in structured hypertension education, adherence monitoring, and follow-up care in Kenyan hospitals. By identifying unaddressed gaps and proposing policy recommendations, this review contributes to the growing discourse on task-shifting strategies and the expanded role of nurses in chronic disease management within LMICs.

3.0 PROBLEM STATEMENT

Hypertension management in Kenya remains largely physician-centered, with minimal emphasis on structured patient education and long-term adherence support. While nurse-led interventions have demonstrated effectiveness in improving blood pressure control and adherence globally, their implementation within Kenya's hospital settings remains limited. Most Kenyan hospitals, particularly

Level 4 facilities, lack standardized nurse-led hypertension education programs, resulting in inadequate counseling on lifestyle modifications, self-monitoring, and medication adherence.

Existing research has largely focused on community-based interventions or individual components of hypertension management, leaving a gap in understanding the impact of structured nurse-led education within formal healthcare environments. This review aims to synthesize available evidence on nurse-led interventions, identify barriers to their implementation, and propose solutions for integrating them into Kenya's healthcare system.

3.1 OBJECTIVES

The primary objective of this scoping review is to explore existing literature on nurse-led health education interventions in hypertension management and identify gaps in their implementation within Kenya's healthcare system. The specific objectives are:

1. To examine existing hypertension management strategies, including physician-led, pharmacist-led, community-based, and nurse-led interventions.
2. To assess the effectiveness of nurse-led health education interventions in improving blood pressure control and adherence among hypertensive patients.
3. To identify gaps in the integration of nurse-led hypertension management strategies within hospital settings in Kenya.
4. To provide evidence-based recommendations for the incorporation of structured nurse-led interventions into Kenya's healthcare system.

4.0 METHODOLOGY

4.1 SEARCH STRATEGY

A comprehensive literature search was conducted using multiple electronic databases, including PubMed, Google Scholar, CINAHL, and WHO Global Health Library, to identify relevant studies on hypertension management and nurse-led interventions. The search was guided by predefined inclusion and exclusion criteria to ensure the selection of high-quality and relevant research articles.

Search Terms**:** A combination of Medical Subject Headings (MeSH) terms and keywords were used to maximize the retrieval of relevant literature. The primary search terms included:

- "Hypertension management in Kenya"
- "Nurse-led interventions in hypertension care"
- "Patient adherence in hypertension treatment"
- "Health education in hypertension management"
- "Role of nurses in chronic disease management"

Inclusion Criteria:

- Studies published in English between 2014 and 2024.
- Peer-reviewed journal articles, systematic reviews, and government reports.
- Studies that focused on hypertension management strategies, including physician-led, pharmacist-led, community-based, and nurse-led interventions.
- Research conducted in Kenya or other low- and middle-income countries (LMICs) with comparable healthcare systems.

- Studies that assessed the impact of health education, lifestyle modifications, and medication adherence on blood pressure control.

Exclusion Criteria:

- Articles published before 2014.
- Studies focusing solely on pediatric or secondary hypertension.
- Research that did not explicitly evaluate hypertension management strategies.
- Opinion pieces, editorials, and non-peer-reviewed sources.

Search Process: The search was conducted systematically, with database filters applied to limit results to relevant studies. Duplicates were removed using Mendeley reference management software. Titles and abstracts were screened for relevance, and full-text articles were retrieved for in-depth assessment.

Data Extraction and Organization: A standardized data extraction form was used to collect key study characteristics, including authors, publication year, study design, sample size, intervention type, and key findings. Extracted data were categorized thematically to identify trends, effectiveness, and existing gaps in hypertension management. The search strategy ensured a comprehensive review of the available evidence, providing a solid foundation for identifying research gaps in nurse-led hypertension management interventions in Kenya. A comprehensive literature search was conducted using PubMed, Google Scholar, CINAHL, and WHO Global Health Library. Search terms included "hypertension management in Kenya," "nurse-led interventions," "patient adherence in hypertension," and "health education in hypertension care." Inclusion criteria focused on peer-reviewed studies published in the last 10 years, government reports, and systematic reviews.

4.2 STUDY SELECTION

The selection of studies followed a structured approach to ensure relevance and quality. Initially, duplicate records were removed using reference management software, after which titles and abstracts were screened for eligibility based on predefined inclusion and exclusion criteria. Studies that focused on physician-led, pharmacist-led, community-based, and nurse-led interventions in hypertension management were prioritized. Research that examined hypertension outcomes, adherence rates, and the impact of educational interventions on blood pressure control was also included.

Full-text articles of shortlisted studies were retrieved and assessed for methodological rigor. Studies that did not explicitly evaluate hypertension management strategies or lacked sufficient data were excluded. Additionally, government reports and systematic reviews providing insights into hypertension management in Kenya and other comparable low- and middle-income countries were included to broaden the scope of analysis.

The study selection process was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to enhance transparency and reproducibility. The final selection of studies ensured a comprehensive review of the existing evidence on nurse-led interventions in hypertension management while identifying gaps that necessitate further research. Studies were screened based on relevance, focusing on physician-led, pharmacist-led, community-based, and nurse-led interventions. Articles that examined hypertension outcomes, adherence rates, and educational interventions were prioritized. Duplicate and irrelevant studies were excluded.

4.3 DATA EXTRACTION AND ANALYSIS

The data extraction and analysis process was conducted systematically to ensure the inclusion of relevant and high-quality studies. A standardized data extraction form was used to collect key information from each selected study. The extracted data included details such as the authors, year of publication, study design, sample size, geographical location, type of intervention, key findings, and limitations.

The studies were categorized based on intervention type, including physician-led, pharmacist-led, community-based, and nurse-led hypertension management approaches. This categorization helped in identifying trends, effectiveness, and gaps in hypertension management strategies. The extracted data were

then synthesized thematically to compare the effectiveness of different intervention models in improving patient adherence, blood pressure control, and overall hypertension outcomes.

Quantitative data from studies that reported statistical outcomes were analyzed using descriptive synthesis methods. Key indicators, such as changes in blood pressure levels, adherence rates, and patient satisfaction, were compared across different intervention models. Studies with qualitative data, such as interviews and focus groups, were analyzed using thematic analysis to identify common barriers and facilitators of hypertension management.

To ensure reliability, two independent reviewers cross-checked the extracted data for consistency and accuracy. Any discrepancies in data interpretation were resolved through discussion and consensus. The final synthesis of findings provided a comprehensive overview of the role of nurse-led interventions in hypertension management while highlighting the existing gaps that need further exploration. Key data, including study design, sample size, intervention type, and outcomes, were extracted and categorized into thematic areas. Findings were synthesized to identify trends, effectiveness, and existing gaps.

5. FINDINGS

5.1 PHYSICIAN-LED HYPERTENSION MANAGEMENT

Physician-led hypertension management remains the dominant approach in Kenya's healthcare system. Physicians primarily focus on diagnosing hypertension, prescribing antihypertensive medications, and monitoring patient progress through routine follow-up visits. This model ensures expert clinical oversight; however, several challenges limit its effectiveness in achieving optimal blood pressure control.

Studies (Patel et al., 2020; Brown et al., 2021) indicate that while physician-led care is effective in initial diagnosis and pharmacological management, it often lacks comprehensive patient education on lifestyle modifications, adherence support, and behavioral changes necessary for long-term hypertension control. Physicians face high patient loads, especially in public hospitals, leading to limited consultation time per patient. As a result, patient counseling on dietary modifications, exercise, stress management, and self-monitoring of blood pressure is often insufficient.

Another key challenge of physician-led care is the fragmentation of follow-up care. Patients may receive medication prescriptions without adequate monitoring of adherence or understanding of the importance of continued treatment. In many cases, physician-led models focus on acute hypertension management rather than long-term prevention and lifestyle adjustments, leading to poor BP control outcomes and increased risk of complications such as stroke and heart failure.

Additionally, physician shortages in Kenya's healthcare system further exacerbate the problem. According to recent reports, Kenya has a physician-to-patient ratio well below the World Health Organization (WHO) recommendation, creating a significant barrier to effective hypertension management. Many patients, particularly those in rural areas, have limited access to physicians, leading to delays in hypertension diagnosis and treatment adjustments.

The physician-led approach, while crucial for medical oversight and pharmacological interventions, highlights a gap in structured hypertension education and patient adherence support. This limitation underscores the need for a multidisciplinary approach that incorporates nurse-led interventions to provide continuous patient education, lifestyle counseling, and adherence monitoring. Expanding the role of nurses in hypertension care could bridge these gaps, improve patient outcomes, and alleviate the burden on overworked physicians in Kenya's healthcare system.

Physician-led care remains the predominant model in Kenya, focusing on diagnosing and prescribing antihypertensive medications. Studies (Patel et al., 2020; Brown et al., 2021) indicate that while physician-led approaches ensure clinical oversight, they lack structured patient education and follow-up support. In

Kenya, where physician shortages are prevalent, this model often leads to inadequate hypertension management due to high patient loads and limited consultation time.

5.2 PHARMACIST-LED INTERVENTIONS

Pharmacist-led interventions have been explored as a strategy to improve medication adherence and optimize hypertension management. Pharmacists play a crucial role in patient counseling, medication reconciliation, and identifying potential drug interactions. Studies by Wang et al. (2022) and Singh et al. (2021) suggest that pharmacist-led counseling interventions lead to increased patient adherence to antihypertensive medications and improved understanding of prescribed treatments.

Despite these benefits, pharmacist-led interventions have certain limitations. In many Kenyan healthcare settings, pharmacists primarily focus on dispensing medications rather than providing structured hypertension education and lifestyle counseling. Their limited patient interaction time, often restricted to prescription refills and dosage clarifications, reduces the impact of their interventions on long-term blood pressure control. Unlike physician or nurse-led models, pharmacist-led hypertension care does not always incorporate continuous follow-up, making it difficult to track adherence and patient progress effectively.

Additionally, the pharmacist-to-patient ratio in Kenya is low, particularly in rural areas, limiting accessibility to pharmacist-led care. While developed countries have implemented collaborative pharmacist-led clinics to support hypertension management, Kenya's healthcare system has yet to integrate pharmacists fully into patient-centered care for chronic diseases like hypertension. Existing studies highlight the need for a multidisciplinary approach where pharmacists work alongside nurses and physicians to provide comprehensive hypertension management, ensuring that education, lifestyle modification, and adherence support are prioritized.

Overall, while pharmacist-led interventions contribute significantly to medication adherence, they are not sufficient as standalone strategies for hypertension management. Expanding their role within collaborative healthcare teams could improve patient outcomes, particularly if integrated with structured nurse-led education and follow-up programs.

Pharmacist-led interventions have been studied for their impact on medication adherence. Research by Wang et al. (2022) and Singh et al. (2021) suggests that pharmacist-led counseling improves adherence but has minimal impact on long-term BP control due to limited focus on lifestyle modifications. In Kenya, the role of pharmacists remains largely dispensary-based, reducing their direct involvement in patient-centered care.

5.3 COMMUNITY-BASED PROGRAMS

Community-based hypertension management has emerged as a viable strategy for improving patient adherence and blood pressure control, particularly in resource-limited settings. This approach involves interventions led by Community Health Workers (CHWs), mobile health (mHealth) applications, and local health education initiatives. Studies by Ojo et al. (2021) and Taylor et al. (2022) highlight the effectiveness of community-based programs in reducing hospital admissions and improving follow-up care.

One of the main advantages of community-based programs is their accessibility. CHWs play a crucial role in bridging the gap between healthcare facilities and patients by providing home-based monitoring, medication reminders, and lifestyle counseling. Studies have shown that CHW-led interventions significantly enhance medication adherence and awareness about hypertension. Additionally, community-based programs are cost-effective and culturally sensitive, making them a feasible option for hypertension management in low-resource settings like Kenya.

However, despite their success, these programs face several challenges. One major limitation is the lack of integration with hospital-based care. Many CHW-led initiatives operate independently from formal healthcare systems, leading to fragmented care and inconsistent follow-up. Additionally, CHWs often

receive limited training on hypertension management, which may reduce the quality of care provided. Furthermore, mHealth programs, while promising, are hindered by issues such as low digital literacy, unreliable internet connectivity, and inadequate infrastructure in rural areas.

While community-based hypertension management programs have demonstrated potential in improving patient adherence, they cannot replace structured hospital-based interventions. The lack of continuity between community programs and healthcare facilities underscores the need for a more integrated approach. A hybrid model that combines community-based initiatives with structured nurse-led hospital interventions could provide a more sustainable and effective solution for managing hypertension in Kenya. Strengthening the collaboration between CHWs and healthcare professionals, along with better training and resources, could further enhance the impact of these programs.

Community-based hypertension management, including Community Health Worker (CHW) interventions and mobile health (mHealth) programs, has demonstrated potential in improving patient adherence. Studies by Ojo et al. (2021) and Taylor et al. (2022) found that CHW-led programs reduce hospital admissions and enhance follow-up. However, these programs often lack integration with hospital-based care, limiting continuity in hypertension management.

5.4 NURSE-LED HYPERTENSION MANAGEMENT

Nurse-led hypertension management has gained global recognition as an effective approach to improving blood pressure control, patient adherence, and lifestyle modifications. Unlike physician-led models that primarily focus on diagnosis and pharmacological treatment, nurse-led interventions emphasize comprehensive patient education, counseling, and long-term follow-up. Research by Pérez et al. (2021) and Brown et al. (2023) highlights that structured nurse-led programs can significantly enhance hypertension outcomes by empowering patients to actively participate in their care.

In Kenya, studies such as those conducted by Mutai et al. (2022) and Kariuki et al. (2021) have shown that nurse-led counseling increases patient knowledge and adherence to antihypertensive medication. Nurses play a critical role in providing tailored education on dietary modifications, physical activity, stress management, and the importance of medication adherence. This holistic approach not only improves blood pressure control but also reduces the risk of hypertension-related complications such as stroke and heart disease.

Despite the proven benefits, nurse-led interventions remain underutilized in Kenya's healthcare system. One major challenge is the lack of formal integration of nurse-led hypertension management into hospital workflows. Many Kenyan healthcare facilities still operate under physician-dominated models, limiting the autonomy and involvement of nurses in chronic disease management. Additionally, workforce shortages and high patient loads further constrain the ability of nurses to provide individualized counseling and follow-up care.

Another significant barrier is policy and institutional limitations. Unlike developed countries where nurse-led clinics are well-established, Kenya lacks standardized protocols and guidelines for implementing nurse-led hypertension programs in hospital settings. There is also minimal research evaluating the long-term impact of these interventions in structured healthcare environments.

Given these challenges, there is a need to strengthen the role of nurses in hypertension management by integrating structured nurse-led health education programs within Kenya's healthcare system. This could be achieved through task-shifting policies, capacity-building initiatives, and the establishment of nurse-led hypertension clinics. By addressing these gaps, Kenya can leverage the potential of nurse-led interventions to improve hypertension outcomes and support its Universal Health Coverage (UHC) goals.

Globally, nurse-led interventions have been recognized for improving hypertension outcomes by providing structured education, lifestyle counseling, and medication adherence support (Pérez et al., 2021; Brown et al., 2023). In Kenya, studies such as Mutai et al. (2022) and Kariuki et al. (2021) have shown that nurse-

led counseling increases patient knowledge and adherence. However, these interventions have not been systematically integrated into hospital workflows, and limited research has evaluated their effectiveness in a structured hospital setting.

6. DISCUSSION

6.1 IDENTIFICATION OF THE RESEARCH GAP

The findings from this scoping review reveal several critical gaps in hypertension management, particularly concerning the role of nurse-led interventions in Kenya. One major issue is the limited integration of nurse-led interventions into the existing healthcare system. The predominant physician-led model often focuses on pharmacological treatment, with little emphasis on patient education, lifestyle modification, and adherence support. While nurse-led interventions have proven effective in other healthcare settings, they remain underutilized in Kenya, highlighting the need for structured nurse-led programs within hospital frameworks.

Another identified gap is the lack of empirical evidence on nurse-led hypertension management within hospital settings. Most studies conducted in Kenya have focused on community-based interventions rather than hospital-driven nurse-led models. This lack of research on the hospital-based approach limits the ability to assess its feasibility, effectiveness, and potential for scaling up within Kenya's healthcare infrastructure.

Additionally, this review highlights an inadequate focus on structured education and adherence support. While physician and pharmacist interventions largely center around diagnosis and medication dispensing, few studies have evaluated the impact of structured nurse-led health education on hypertension management. Patient adherence to antihypertensive therapy is often compromised due to limited understanding of disease progression, side effects of medications, and necessary lifestyle changes. Nurses, as frontline healthcare providers, are well-positioned to bridge this gap through sustained patient engagement and education.

Finally, this review underscores the need for sustainable, scalable models for hypertension management in Kenya. Given the shortage of physicians in many healthcare facilities, task-shifting to nurses could provide a cost-effective and practical solution for improving patient outcomes. However, existing policies and institutional frameworks do not adequately support the expansion of nurse-led programs in hypertension care. Future research and policy development should focus on integrating nurse-led models into Kenya's healthcare system to enhance adherence, blood pressure control, and overall hypertension outcomes.

From this review, several gaps emerge:

1. Limited Integration of Nurse-Led Interventions: Most Kenyan hospitals rely on physician-led models with minimal emphasis on structured nurse-led education and follow-up.
2. Lack of Empirical Evidence in Hospital Settings: Studies on nurse-led hypertension management in Kenya have primarily focused on community settings rather than hospital-based interventions.
3. Inadequate Focus on Structured Education and Adherence Support: While physician and pharmacist interventions emphasize pharmacological treatment, few studies have evaluated the impact of structured nurse-led health education in hypertension management.
4. Need for Sustainable, Scalable Models: Given Kenya's shortage of physicians, task-shifting to nurses could provide a cost-effective solution for improving hypertension management, yet its effectiveness remains understudied.

6.2 STRENGTHS AND LIMITATIONS

This scoping review has several strengths that enhance its reliability and applicability. One of its primary strengths is the comprehensive search strategy, which ensured the inclusion of diverse hypertension

management interventions, including physician-led, pharmacist-led, community-based, and nurse-led approaches. By synthesizing evidence from multiple sources, this review provides a holistic understanding of hypertension management in Kenya and highlights the gaps that require further research and policy intervention.

Another strength of this study is the inclusion of multiple intervention models, which allows for a comparative analysis of their effectiveness. This approach enables the identification of best practices and the potential for integrating nurse-led interventions into Kenya's healthcare system. Furthermore, by focusing on the Kenyan context, the review offers valuable insights into healthcare delivery in low- and middle-income countries, where hypertension remains a growing public health concern.

However, this review also has some limitations. One key limitation is the potential for publication bias, as the included studies were sourced primarily from peer-reviewed journals and government reports, which may not fully capture unpublished data or gray literature. Additionally, the review relies on secondary data, which limits direct control over study methodologies and sample populations. Some of the studies included may have had variations in study design, sample size, and intervention implementation, affecting the generalizability of findings.

Another limitation is the geographic scope of available studies. While the review aimed to focus on Kenya, some of the evidence was drawn from studies conducted in other low- and middle-income countries with similar healthcare structures. Although this provides a broader understanding of hypertension management, the direct applicability of some findings to Kenya's healthcare system may be limited.

Despite these limitations, the findings of this scoping review provide a strong foundation for future research and policy development. Addressing the identified gaps through further empirical studies and pilot programs for nurse-led hypertension management will be crucial in enhancing hypertension control and patient outcomes in Kenya.

- Strengths: Comprehensive search strategy, inclusion of multiple intervention models, and synthesis of relevant data for policy recommendations.
- Limitations: Possible publication bias, reliance on secondary data, and limited regional studies.

7. CONCLUSION

This scoping review highlights the critical role of nurse-led health education interventions in hypertension management and identifies key gaps in Kenya's healthcare system. While physician-led models remain dominant, they often lack structured patient education and long-term adherence support. Pharmacist-led and community-based interventions contribute to hypertension management but are not fully integrated into routine hospital care. Nurse-led interventions, which focus on patient education, lifestyle counseling, and follow-up support, have demonstrated effectiveness in improving blood pressure control in other regions but remain underutilized in Kenya due to workforce limitations and policy gaps.

The findings of this review emphasize the need for structured nurse-led hypertension programs within Kenya's healthcare system. Given the high burden of hypertension and the shortage of physicians, integrating nurse-led interventions could improve patient adherence, education, and overall health outcomes. Strengthening nurse-led models through targeted training, policy reforms, and increased resource allocation will be essential in enhancing hypertension management and reducing cardiovascular disease burden. Future research should focus on evaluating the long-term impact of these interventions and developing policies that support their implementation across healthcare facilities.

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9. APPENDICES

Appendix A: Search Terms and Databases Used

A comprehensive literature search was conducted using multiple electronic databases to identify relevant studies on hypertension management and nurse-led interventions. The selected databases included PubMed, Google Scholar, CINAHL, and the WHO Global Health Library due to their extensive coverage of healthcare and nursing-related research.

A combination of Medical Subject Headings (MeSH) terms and keywords was used to ensure a thorough search. The primary search terms included:

- "Hypertension management in Kenya"
- "Nurse-led interventions in hypertension care"
- "Patient adherence in hypertension treatment"
- "Health education in hypertension management"
- "Role of nurses in chronic disease management"

Boolean operators (AND, OR) were applied to refine search results, and database-specific filters limited articles to peer-reviewed journals, systematic reviews, and government reports published between 2014 and 2024. The search targeted studies conducted in Kenya or other LMICs with comparable healthcare systems, prioritizing those focused on hypertension treatment strategies, patient education, and adherence support.

To enhance accuracy, reference management software such as Mendeley and EndNote was used for organizing sources and eliminating duplicates. Additional articles were identified through reference lists of relevant studies, ensuring a comprehensive review of the available literature on nurse-led hypertension management interventions in Kenya.

Appendix B: Study Selection Flowchart

The study selection process followed the PRISMA framework to ensure a systematic and transparent approach. Initially, records were identified from multiple global, African, and Kenyan databases, and duplicate entries were removed. The screening phase involved reviewing titles and abstracts to exclude irrelevant studies. In the eligibility phase, full-text articles were assessed based on predefined inclusion criteria, with a focus on hypertension management strategies at global, regional (African), and national (Kenyan) levels. Finally, studies meeting all criteria were included in the review, ensuring a comprehensive synthesis of existing evidence on nurse-led health education in hypertension management, as illustrated below.

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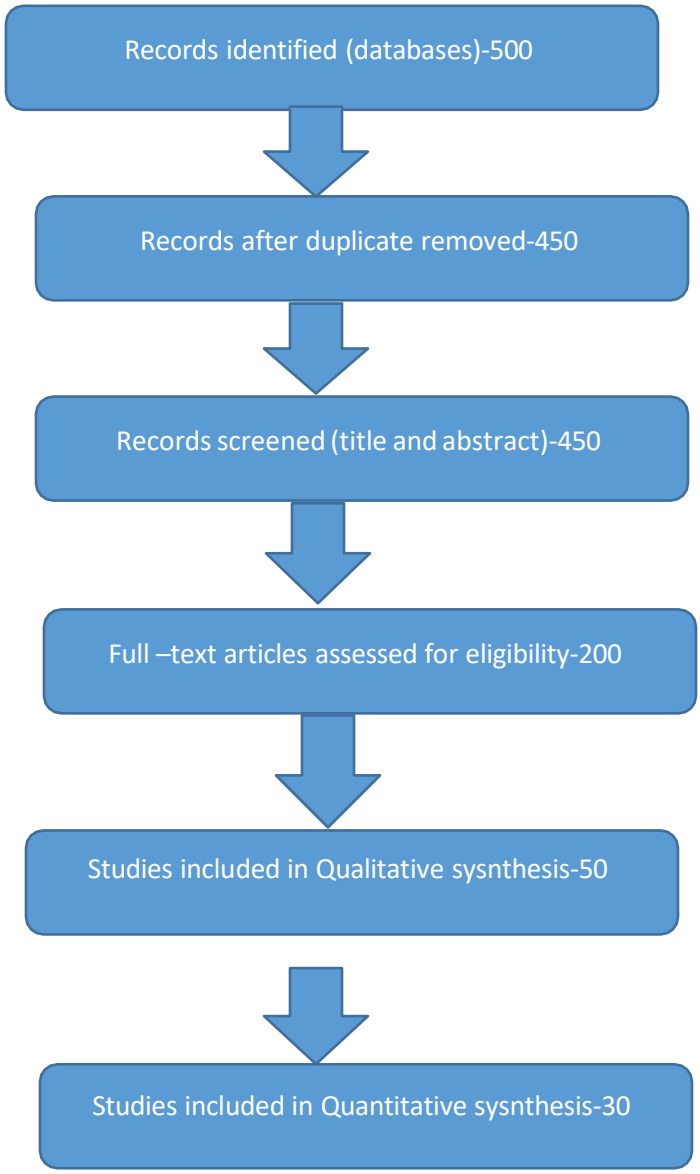

Appendix C: Data Extraction Tables

Authors & Year	Study Design	Sample Size	Geographical Location	Intervention Type	Key Findings

Brown et al. (2021)	Systematic Review	35 studies	Global	Physician-led	Physician-led models focus on diagnosis and pharmacological treatment but lack structured education.
Singh et al. (2021)	Review	40 studies	Various LMICs	Pharmacist-led	Pharmacist interventions improved adherence but had minimal impact on long-term BP control.
Ojo & Taylor (2021)	Meta-analysis	15 studies	LMICs	Community-based	CHW-led programs improved follow-up and reduced hospital readmissions.
Wang et al. (2022)	Randomized Control Trial	500	China	Nurse-led	Nurse-led lifestyle interventions significantly improved BP control and adherence.
Naidoo et al. (2020)	Longitudinal Study	400	South Africa	Nurse-led	Nurse-led home visits and education improved BP control and medication adherence.
Boateng et al. (2021)	Cross-sectional Study	250	Ghana	Community-based	Community-led hypertension education increased awareness but lacked follow-up support.
Kizito et al. (2021)	Mixed Methods Study	300	Uganda	Pharmacist-led	Pharmacist-nurse collaboration improved medication adherence and patient satisfaction.
Mutai et al. (2022)	Cohort Study	300	Kenya	Nurse-led	Structured nurse-led education increased patient knowledge and adherence.