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Primary Health Care in Preliminary Hypertension Management: A Literature Review

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Abstract

Purpose: The purpose of the article is to evaluate and emphasize the role of primary health care (PHC) in managing hypertension. It systematically reviews the integration of various pharmacological, non-pharmacological, and technological strategies used in PHC to improve hypertension outcomes. By analyzing studies from different regions and methodologies, the article identifies effective interventions, challenges, and areas requiring improvement in hypertension management.
Methodology: This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standard statement. Our search strategy used electronic databases, namely Pubmed, Scopus, and Google Schoolar. Journal searches were conducted in November 2024. Pubmed and Scopus searches used the search keywords "Primary Health Care" OR "Primary Care" AND "Hypertension" AND "Management".
Results: Our search strategy identified a total of 2698 articles. After full-text reading, 19 relevant journals were found.
Applications/Originality/Value: The article's originality lies in its comprehensive review of primary health care's (PHC) role in managing hypertension, integrating recent evidence (2019–2024) from diverse regions. It highlights the importance of combining medications, lifestyle changes, and technology (e.g., telemonitoring, ABPM) while addressing barriers like poor access, low adherence to guidelines, and socio-economic disparities. By focusing on practical solutions, such as better training, patient education, and programs like Indonesia's PROLANIS, the article offers valuable insights for improving hypertension management, particularly in low-resource settings, emphasizing a holistic, actionable, and globally relevant approach.

Introduction

Hypertension is a medical condition characterized by elevated blood pressure that can damage vital organs if not properly managed. As one of the major risk factors for cardiovascular disease, hypertension causes a significant health burden to both individuals and public health systems. Data from the World Health Organization (WHO) shows that the prevalence of hypertension continues to increase, especially in countries with high levels of urbanization and unhealthy lifestyles (WHO, 2021). Based on data from the World Health Organization (WHO) in 2018, there are around 1.13 billion people in the world with hypertension, meaning that 1 in 3 people in the world are diagnosed with hypertension. This number continues to increase every year, it is estimated that by 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 10.44 million people die from hypertension and its complications (WHO, 2018).

Primary health care is one of the pillars of health transformation focused on meeting health needs based on the life cycle that is easily accessible and affordable to the community, family and individual levels (Kemenkes RI., 2023). Primary health care (PHC) has a very important role in the management of hypertension, as it is the first point for detection, treatment, and long-term management of this condition. The advantages of PHC lie in its affordability, ease of access, as well as a more holistic approach in treating patients. Hypertension management at PHC involves not only the administration of antihypertensive drugs, but also education regarding dietary changes, exercise, and stress management. In addition, socio-economic factors, access to health facilities, and public awareness also play an important role in the successful management of hypertension at the community level (Klein & Agarwal, 2018).

It is important for primary care health workers to be trained in effective and evidence- based hypertension management strategies. Interdisciplinary collaboration, increased patient awareness, as well as utilization of

information technology in remote blood pressure monitoring, are measures that can support management efforts (Van der Sande & Nwankwo, 2020).

Method

This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standard statement. The desired primary outcome was to understand hypertension management programs in primary health care. Our search strategy used electronic databases, namely Pubmed, Scopus, and Google Schoolar. Journal searches were conducted in November 2024. Pubmed and Scopus searches used the search keywords "Primary Health Care" OR "Primary Care" AND "Hypertension" AND "Management". On Google Schoolar using the search keyword allintitle: AND Hypertension AND Management "primary health care" OR "Primary Care". The eligibility criteria we used were inclusion criteria in the form of publications between 2019 to 2024 on hypertension management in primary health care and Exclusion criteria were journals that discussed cardiovascular or diabetes myelitis. Study selection Articles were screened based on title and abstract. The full text of relevant articles was retrieved and independently assessed by our six authors.

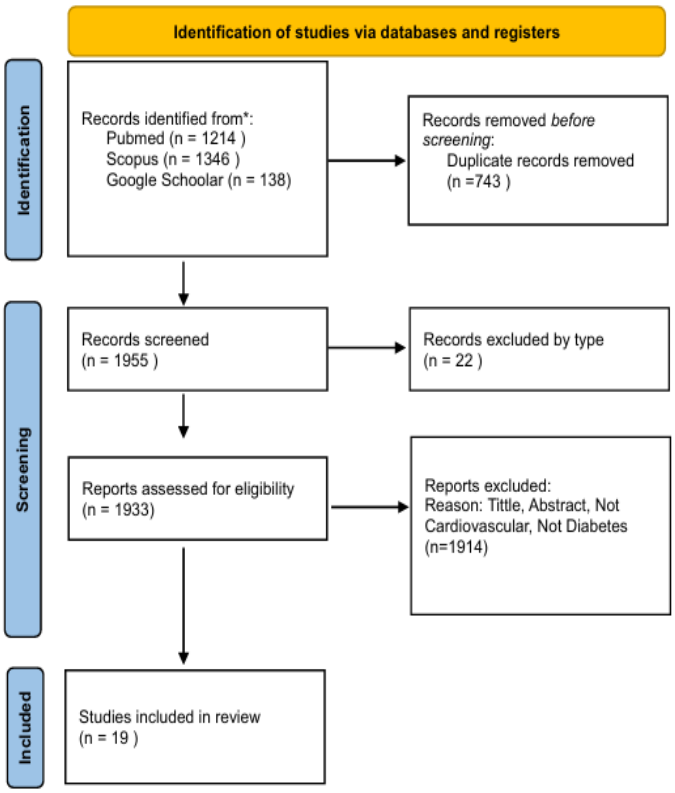

Figure 1. Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

Result and Discussion

Our search strategy identified a total of 2698 articles. This included results from Pubmed (n=1214), Scopus (n=1346) and Google Schoolar (n=138), as per the PRISMA chart in Figure 1. After deduplication, 1955 articles were retrieved and selected based on file type, title and abstract criteria. This resulted in 36 articles that were relevant for our study. After full-text reading, 19 relevant journals were found.

Table 1. Relevant journals were found.

No.	Author Name	Type of Journal	Findings
1.	Alkaff, et. al., 2020	retrospective cohort study	This study evaluates the effectiveness of the Chronic Disease Management Program (PROLANIS)

			in controlling hypertension and comorbidities at the Wates Community Health Center. The results showed that blood pressure (BP) was successfully maintained within the normal range; however, improvements in comorbidities such as body mass index (BMI), lipid profile, and renal function were inconsistent.
2.	Magboul, et. al., 2021	Cross sectional	The study "Management of Hypertension in Primary Health Care Centers: Blood Pressure Control and Antihypertensive Drug Classes, Khartoum State, 2018" revealed that 52.1% of hypertensive patients in Khartoum had uncontrolled hypertension, despite a high level of medication adherence, namely 92.7 %. Most patients (58.1%) underwent monotherapy, which correlated with worse blood pressure control, while combination therapy showed better results. Factors such as advanced age and higher levels of education were associated with increased control. Barriers to adherence include financial constraints and lack of understanding of the importance of treatment. This study underscores the need for improved patient education and better access to treatment to improve hypertension management outcomes in primary health care settings.
3.	Hellgren, et. al., 2023	Structured interview	This journal investigates hypertension management in 76 primary health care centers (PHCCs) across Sweden, highlighting significant variability in adherence to established guidelines. The main findings revealed that although lifestyle factors and renal function are frequently monitored, albuminuria is often overlooked. Only half of the centers used dedicated teams for hypertension care, most of which were nurse-led. Blood pressure is mostly measured in a sitting position, with limited use of home monitoring. Disparities in care practices across regions can lead to inequities, especially for the elderly population. This study emphasizes the need for standardized measurement techniques and better integration of home monitoring to improve hypertension management outcomes in Sweden
4.	Kollias, et. al., 2023	Cross sectional study	The HYPEDIA study conducted in Greece evaluated hypertension treatment strategies in primary care based on the 2018 ESC/ESH guidelines, involving 3,122 patients, of whom 25% were untreated hypertensives. Key findings revealed that higher BMI and male gender were associated with uncontrolled blood pressure (BP), with more than half of treated patients

			still experiencing uncontrolled hypertension. Many physicians initiated treatment with monotherapy rather than the recommended two-drug combination, especially for newly diagnosed patients, and nearly half of treated patients did not intensify their treatment, indicating physician inertia and suboptimal adherence to guidelines. This study emphasizes the need for increased education and strategies for primary care physicians to improve BP management and adherence to established guidelines.
5	Zhu et al., 2022	Observational study	This study assesses the feasibility and utility of ABPM in diagnosing “white coat” hypertension in patients who exhibit high blood pressure in the clinic but are normal at home. Of the 68 patients examined, 54 met the analysis criteria, of which 24% were confirmed to have "white coat" hypertension and the other 76% had persistent hypertension. Results show that ABPM can improve the accuracy of diagnosis and management of hypertension, and reduce the risk of unnecessary treatment. Although there are challenges in implementing ABPM in primary care, this study shows that this method can be applied effectively to improve patient care
6	Qin et al., 2024	Qualitative study	This study explores hypertension management in primary health care in China using a Group Model Building (GMB) approach. In a workshop involving 14 stakeholders, 42 variables related to hypertension management were identified which were then refined into 26 variables after discussion. A Causal Loop Diagram (CLD) was created to visualize the relationships between variables, highlighting five reinforcing loops and four balancing loops. Key intervention points identified include the establishment of Community/Regional Medical Associations, increased motivation of community health workers (CHWs), and promotion of Family Doctor Contract Services (FDCS). This study emphasizes the potential of GMB in encouraging collaboration and consensus among stakeholders to improve hypertension management, despite limitations related to the impact of COVID-19 on the workshop format and participants' unfamiliarity with GMB methods. This study received ethical approval and all participants provided informed consent.
7	Grant et al., 2019	RCT	This study evaluates the effectiveness of telemonitoring and self-monitoring methods in the management of hypertension in primary

			practice, by comparing mobile text-based systems and paper diaries in the context of the TASMINH4 trial. The results showed that telemonitoring facilitated better communication and allowed faster treatment adjustments, although there were concerns regarding data privacy. Meanwhile, paper-based methods are easier to integrate into general practice workflows. The study identified factors influencing acceptability, such as patient comfort and engagement, as well as challenges such as suitability for less tech-savvy patients and data management issues. Both methods were deemed cost-effective and easy to adopt, with recommendations for further qualitative research to explore better implementation strategies.
8	Sukkarieh et al., 2020	Observational study	study conducted at KAMC, Riyadh, exploring factors influencing blood pressure (BP) control in hypertensive patients, found that 63% of patients had controlled BP, an increase from 45% in a 2013 national survey. better BP control compared with those on four or more medications (odds ratio [OR] 2.62; P = 0.006). In addition, taller patients (every 10 cm increase) were also more likely to have controlled BP (OR 1.44; P = 0.006). Although there was no significant association between body mass index (BMI) and BP control, the study noted that men had better BP control than women, possibly due to post-menopausal hormonal changes. This study concluded that two-drug regimens were more effective for BP control than monotherapy or regimens involving three or more drugs, and suggested the need for further research to confirm these findings.
9	(Alkaff et al., 2020)	RCT	This study evaluated the effectiveness of a clinical decision support system (CDSS) in improving adherence to hypertension management guidelines in primary care through a pragmatic trial conducted at 94 primary care sites in China. Despite some limitations, such as reliance on surrogate outcomes and lack of consideration of diet, this study aims to provide valuable insights into hypertension management, including a comparison of different antihypertensive therapies in the context of low- and middle-income countries. Data were collected via a customized electronic health record, and blood pressure measurements were performed with a validated automated sphygmomanometer. The trial also

			included a nested LIGHT-ACD study to compare changes in blood pressure and control rates among various initial antihypertensive regimens. Research results will be disseminated through conferences and scientific journals, with ethical oversight in place and disclosure of funding sources and potential conflicts of interest.
10	(Londoño Agudelo et al., 2023)	Control before after study	This study provides a comprehensive overview of the management and control of hypertension, especially in low- and middle-income countries, emphasizing the importance of health system improvements, communication between patients and providers, and strategies adapted to the cultural context. Studies in Cuba suggest that structured interventions involving training for health care providers and education for patients can increase adherence to antihypertensive treatment and the proportion of patients with controlled hypertension. Although positive results were achieved, challenges such as low patient attendance at education sessions still need to be addressed. Overall, interventions at the primary health care level have proven effective in improving hypertension management outcomes, although further research is needed for wider implementation.
11	Marin-Couture, *et. al.*, 2024	Randomized controlled trial	This journal presents a comprehensive evaluation of the impact of interdisciplinary lifestyle interventions in managing stage 1 hypertension and improving cardiometabolic health in primary care settings. Through a series of studies, the journal highlights the significant benefits of lifestyle changes—such as diet (especially the DASH diet), physical activity, and weight management—on blood pressure control and overall cardiovascular health. Key findings showed that while most interventions led to reductions in systolic and diastolic blood pressure, individual responses varied, with some participants experiencing unfavorable changes. This study underscores the feasibility and effectiveness of integrating lifestyle medications into hypertension management, advocating for a personalized health care approach and the importance of monitoring medication use in hypertensive patients. Overall, the evidence supports non-pharmacological strategies as an important component in the management of hypertension and improvement of cardiovascular outcomes.

12	Galic et al (2024)	Preliminary report	This study evaluated the effectiveness of the coordinated care model (POZ PLUS) in the pharmacotherapy management of patients with hypertension and comorbidities in primary care, conducted from July 2018 to September 2021 involving 90 patients, of which 59 received coordinated care and 31 were in the control group. Preliminary results showed a trend toward greater blood pressure reduction among patients in the coordinated care group, although there were no statistically significant differences in medication use or blood pressure control between the two groups. This study highlights the importance of coordinated care in improving health outcomes for hypertensive patients and suggests the need for further research to confirm these findings.
13	Teh XR, Lim MT, Tong SF, Husin M, Khamis N, Sivasampu S (2020)	Analisis Cross-Sectional	This article provides a comprehensive overview of hypertension management in Malaysia, with a focus on type 2 diabetes mellitus (T2DM) patients and analysis of 13,784 medical records from primary care clinics. Findings showed that approximately 30% of T2DM patients with proteinuria did not receive recommended antihypertensive medications, and only 42.8% of hypertensive patients had well-controlled blood pressure. Additionally, approximately 50% of patients are obese, and less than 50% receive appropriate treatment. Counseling about exercise was positively associated with blood pressure control, while use of two or more antihypertensive agents was negatively associated. This article emphasizes the need for improvements in hypertension management strategies and adherence to guidelines to improve patient health outcomes.
14	Jafar TH, Tan NC, Allen JC, et al 2024	Qualitative study	journals indicate that the intervention was well received by healthcare providers and patients, with strong support for its effectiveness in improving blood pressure control and patient adherence to treatment. Participants proposed several improvements, including integration of treatment algorithms into electronic medical records and improved communication systems, as well as recommending expanding the intervention to other chronic conditions. These findings suggest that the intervention aligned with participants' health values and goals, and improved understanding and management of hypertension
15	Schaefer, et. al., 2022	Qualitative study	This article is a qualitative study that explores patient and health care provider

			perspectives regarding hypertension management in a tribal health system in Alaska, involving a focus group with 16 Alaska Native and American Indian patients and five providers. Key findings suggest that patients often view hypertension as a temporary condition related to stress, while providers view it as a chronic problem. Although both groups agreed on the importance of lifestyle changes and home monitoring, there were discrepancies in patient engagement in these practices. This article highlights the need for better communication and shared decision-making to improve hypertension management, as well as noting study limitations such as the small sample size and data collected in 2017, which suggests the need for further research.
16	Midlov, et. al., 2020	RCT	This article summarizes studies of mobile phone-based self-management systems for hypertension, with a focus on their development, usability, and effectiveness in improving blood pressure control and patient engagement in primary care settings. One of the main studies discussed is the PERHIT study, a multicenter randomized controlled trial in Sweden involving 900 hypertensive patients, in which patients were divided into an intervention group that used a self-management support system and a control group that received usual care. The aim of the study was to improve blood pressure control and patient adherence to treatment through technology and self-monitoring, as well as evaluate the impact on daily activities, risk awareness, and health care costs.
17	Ahmad. Et. Al. 2022	Cross sectional study	This study highlights the lack of knowledge and adherence to hypertension management guidelines among primary health physicians in Tanta, Egypt. Although many doctors recognized hypertension as a common health problem and felt they had been well trained, only 39.2% had read and implemented the guidelines, while 30.8% had only heard about them without having a copy. Although 68.3% received training, only 56.7% applied it in practice. Most physicians demonstrated fairly good knowledge (67.5%) of guidelines, especially in definitions and referral criteria, but had lower knowledge in treatment. The majority of doctors only partially adhered to the guidelines, especially in measuring blood pressure and taking patient histories. The conclusions of this study emphasize the need for increased

			education and resources to improve hypertension management in clinical practice.
18	Jo et al., 2019	Case study	This journal introduces the development of a web database system for a hypertension management program in low-income urban areas in Peru, aiming to improve data management and health of program participants. Before this system, data management was done manually, which caused difficulties and errors. With the new system, participant data can be entered and stored in real-time, significantly reducing data management time and costs, and improving data quality.
19	Rampamba et al., 2024	RAND/UCLA Appropriateness Method (RAM)	This study aims to develop evidence-based quality indicators for the management and monitoring of hypertension at PHC (Primary Health Care) level in South Africa. This indicator is expected to improve the quality and efficiency of clinical services and support the achievement of hypertension management goals. This research also considers the implementation strategies needed regarding workforce, facilities and drug supplies to implement these indicators at the PHC (Primary health care) level.

Based on the results of the literature review, primary health care is key in managing hypertension through various innovative and evidence-based approaches (Ahmad et al, 2022). Studies in Indonesia show the effectiveness of the PROLANIS program in controlling blood pressure of hypertensive patients, although results related to comorbidities such as BMI and lipid profile are still inconsistent (LITREV results) (Alkaff et al, 2022). Other studies in Sudan and Greece underscore the importance of using combination therapy over monotherapy to achieve better blood pressure control (Kollias et al, 2023). Barriers such as clinical inertia and low physician adherence to treatment guidelines are major challenges that affect treatment effectiveness (Klein and Agarwal, 2018).

The adoption of modern technology has also been instrumental in improving the outcomes of hypertension management at the primary level. Telemonitoring helps facilitate communication between patients and physicians, allowing for faster therapy adjustments (Grant, 2019). ABPM, on the other hand, improves diagnostic accuracy by identifying "white coat" hypertension, thereby reducing the risk of unnecessary treatment (Hellgren et al, 2023). However, barriers such as access to technology, data privacy, and limited resources in some regions are hindering widespread implementation (Jo et al, 2019).

Lifestyle-based approaches, such as the DASH diet, increased physical activity and weight management, have a positive impact on blood pressure control (Marin-Couture et al, 2024). Several studies have shown that these combined lifestyle approaches are effective in reducing both systolic and diastolic blood pressure (Sartori, 2021). However, the success of these interventions is highly dependent on patient personalization and consistency (Jafar et al, 2024). Lack of patient engagement, especially in communities with low education levels, reduces the effectiveness of this approach (Qin et al, 2024).

Socio-economic challenges are also a major issue affecting the effective management of hypertension in primary care (Rampamba et al, 2024). Patient education on the importance of medication and healthy lifestyle is often inadequate, especially in areas with limited financial and geographical access (Londono et al, 2024). Some studies, such as in Malaysia and Egypt, noted that the level of knowledge of patients and health workers regarding hypertension guidelines needs to be improved to achieve better outcomes. In addition, differences in the quality of primary care between more developed and less developed regions also contribute to inequities in hypertension management (Sartori, 2021).

The results from this literature emphasize the need for a holistic approach that includes pharmacological, non-pharmacological, and technological interventions to strengthen primary health care in the management of hypertension. Continuous education for physicians and patients, implementation of technologies such as telemonitoring and ABPM, and improved access to antihypertensive drugs can improve the success of hypertension management (Klein and Agarwal, 2018). In addition, the development of coordinated healthcare systems, such as the POZ PLUS model, has the potential to improve the effectiveness of care for patients with hypertension and comorbidities (Galic et al, 2024). Investments in health worker training and equitable provision of primary healthcare infrastructure are also important steps to reduce disparities and improve population health outcomes (Rampamba et al, 2024).

The risk of bias from our literature review is that observational and cross-sectional studies, such as those conducted by Alkaff et al. and Magboul et al., have a risk of selection bias due to sample selection that may not be representative of the wider population (Alkaff et al, 2020). In addition, information bias may arise from reliance on patient self-report, which is prone to inaccuracies (Jo et al, 2019). Experimental studies such as RCTs (e.g. by Grant et al. and Midlov et al.) face the risk of allocation bias if randomization is not performed transparently, as well as reporting bias if only positive outcomes are reported. Technology-based studies, such as telemonitoring, may also be affected by patient engagement bias due to technology access constraints. Qualitative studies, such as those conducted by Qin et al. and Schaefer et al., face the risk of interpretation bias as results rely heavily on the subjective analysis of the researcher. In addition, studies using secondary data, such as those by Jo et al., face data bias as the data may be incomplete or not current. To mitigate bias, it is important for observational studies to include representative populations, while RCTs need to ensure transparency of randomization and complete reporting of results (Kollias et al, 2023). In qualitative research, triangulation of data from multiple sources can reduce subjectivity, and secondary data validation should be performed to ensure relevance and accuracy. By managing these risks, results from research can be more reliable and relevant for clinical implementation (Qin et al, 2024).

Conclusions

Primary health care has a strategic role in the management of hypertension through the integration of various pharmacological, non-pharmacological, and technological approaches. Hypertension management programs such as PROLANIS in Indonesia and combination therapy-based interventions have shown effectiveness in controlling blood pressure, although challenges remain in correcting comorbidities and minimizing clinical inertia. Technologies such as telemonitoring and ABPM are shown to improve diagnostic accuracy and management efficiency, while lifestyle approaches provide additional benefits. in supporting blood pressure control. However, socio-economic barriers, disparities in access to technology, and lack of adherence to guidelines among health workers remain key challenges. Differences in quality of care across regions also exacerbate inequalities in hypertension management. Thus, a holistic approach that includes health worker training, patient education, provision of modern technology, and coordinated strengthening of primary healthcare systems is needed to improve the effectiveness and efficiency of hypertension management. These collaborative efforts are essential to reduce the disease burden of hypertension and prevent long-term complications.

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