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A comparison of international hypertension management guidelines in primary care settings: Focus on studies done between 2017 to 2025

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Abstract

Background: Hypertension remains the leading modifiable risk factor for global morbidity and mortality, affecting over 1.3 billion adults worldwide and contributing to more than 10 million premature deaths annually. Despite the availability of multiple international clinical practice guidelines, substantial variation persists in diagnostic thresholds, treatment initiation criteria, risk stratification, and blood pressure targets. These inconsistencies may contribute to disparities in hypertension detection, management, and control, particularly between high-income countries (HICs) and low- and middle-income countries (LMICs), where the burden of disease is greatest.

Objective: This systematic review aimed to compare international hypertension management guidelines used in primary care settings, with a focus on differences in diagnostic criteria, treatment recommendations, risk stratification approaches, and reported patient outcomes across income settings.

Methods: A PRISMA 2020-compliant systematic review was conducted using MEDLINE, PubMed, PubMed Central, Cochrane Library, Web of Science, ResearchGate, and Google Scholar. Studies published in English between 2017 and 2025 were identified using a PICO-based search strategy. Eligible studies compared two or more international hypertension guidelines relevant to adult primary care populations. Data extraction was performed using a structured framework, narrative synthesis was applied, and methodological quality was assessed using the Critical Appraisal Skills Programme (CASP) tool.

Results: Following screening of 35,495 records, four high-quality review studies met the inclusion criteria. Across guidelines, there was broad consensus on the importance of lifestyle modification and stepwise pharmacological therapy using first-line agents. However, notable differences were observed in diagnostic blood pressure thresholds—most prominently the lower threshold of ≥130/80 mmHg recommended by the ACC/AHA—as well as in treatment targets, cardiovascular risk assessment models, and implementation strategies. Guideline quality varied significantly by income setting, with LMIC guidelines more likely to lack transparent editorial independence and rigorous methodological reporting.

Conclusion: International hypertension guidelines share common foundational principles but differ in clinically meaningful ways that may influence diagnosis, treatment intensity, and patient outcomes in primary care. Harmonisation of guideline development processes, improved contextual adaptation for LMICs, and greater emphasis on implementation feasibility are essential to reducing global hypertension-related disparities and improving long-term cardiovascular outcomes.

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Keywords: Hypertension; Primary care; International guidelines; Blood pressure classification; Global health disparities; Systematic review

1. Introduction

Hypertension, commonly known as high blood pressure, is a chronic medical condition in which the force of blood against the walls of the arteries is consistently too high. It is a major risk factor for cardiovascular diseases, stroke, kidney failure, and other serious health complications.

Hypertension is the largest single contributor to the global burden of disease, affecting an estimated 1.39 billion people worldwide and accounting for 10.4 million premature deaths per year. [1] Despite the trajectory suggesting a continuing increase in hypertension prevalence globally, there are large numbers of undiagnosed and inadequately controlled hypertensive patients, Philip, R et al. (2021).

Internationally, several organizations have developed guidelines to standardize the diagnosis and management of hypertension. Notable guidelines include those from the American College of Cardiology/American Heart Association (ACC/AHA), European Society of Cardiology/European Society of Hypertension (ESC/ESH), National Institute for Health and Care Excellence (NICE), World Health Organization (WHO), and the Japanese Society of Hypertension (JSH). While these guidelines share a common goal of optimizing hypertension control, they often differ in classification thresholds, treatment initiation criteria, and target blood pressure goals.

Disparities in hypertension prevalence, awareness, management and control exist between country income settings. The age-standardized prevalence of hypertension fell by 2.6% from 2000 to 2010 in high-income countries (HICs) and rose by 7.7% in low- and middle-income countries (LMICs) over the same period. As of 2015, most hypertensive patients live in LMICs.

2. Method

The databases were used because they are medical databases. [2] The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement was developed to facilitate transparent and complete reporting of systematic reviews and has been updated (to PRISMA 2020) to reflect recent advances in systematic review methodology and terminology, Page et al., 2021). [3] According to Lisy et al. (2016), narrative synthesis was employed to extract data. This chapter offers comprehensive supporting data for the review's tools, strategies, and methods. [4] The CASP program according to CASP (2023) was used to analyze a selection of the literature, and Microsoft Excel was used to retrieve the data for each article.

2.1. Search strategy & inclusion & exclusion criteria

This systematic review employed the PICO (population, intervention, comparison and outcome) framework. For all reviews, it is important to define criteria such as the population, intervention, comparison and outcomes, and to identify potential risks of bias. [5] Reviews of the effect of rehabilitation interventions or reviews of data from observational studies, diagnostic test accuracy, or qualitative data may be more methodologically challenging than reviews of effectiveness (Pollock A, Berge E, 2018).

Population: The search words used for this component determine population that will be investigated. The location, group, and other characteristics of this population may or may not be present. The cohorts being investigated in this study are Adults diagnosed with hypertension in primary care settings.

Intervention is the phrase used to define the treatments or strategies that work best to improve outcomes and make a difference. It was thus claimed that with a PICO-based research question, one can only generate study designs that detect correlations between a treatment and a desired outcome (Andreas Nishikawa-Pacher, 2022). The intervention in this study is Hypertension management guidelines from different international organizations (e.g., ACC/AHA, ESC/ESH, NICE, WHO, JSH, etc.).

Comparison refers to the alternative interventions or exposures compared with the one being Investigated. The comparison is Differences in recommendations between various guidelines regarding diagnosis, treatment targets, pharmacological and non-pharmacological management, and follow-up strategies.

The Outcome results should be visible, measurable, or detectable in the population under observation. In this study, the outcome are Differences in clinical outcomes, adherence to guidelines, impact on blood pressure control, and overall patient health outcomes.
Based on the research perspective that this systematic review gave the framework for primary articles was used (Pollock and Berge, 2018). In this systematic review, a predetermined database query strategy was created using the PICO framework to find and obtain literature from the chosen databases. The database query procedure was uniform, systematic, and repeatable because of the PICO-driven predetermined search strategy. The criteria for including and excluding the retrieved articles were created using the PICO framework, search keywords, and phrases.

Table 1 Inclusion/Exclusion Criteria

S/N	PICO	Inclusion Criteria	Exclusion Criteria
Population (P):	Adults diagnosed with hypertension in primary care settings.	Studies comparing two or more international hypertension management guidelines.	Studies focusing only on secondary/tertiary care settings.
Intervention (I):	Hypertension management guidelines from different international organizations (e.g., ACC/AHA, ESC/ESH, NICE, WHO, JSH, etc.).	Guidelines or studies focused on primary care settings.	Articles that do not compare multiple international guidelines.
Comparison (C):	Differences in recommendations between various guidelines regarding diagnosis, treatment targets, pharmacological and non-pharmacological management, and follow-up strategies.	Studies evaluating between various guidelines regarding diagnosis, treatment targets, pharmacological and non-pharmacological management, and follow-up strategies.	Studies that do not evaluate between various guidelines regarding diagnosis, treatment targets, pharmacological and non-pharmacological management
Outcome (O):	Differences in clinical outcomes, adherence to guidelines, impact on blood pressure control, and overall patient health outcomes.	Studies evaluating patient outcomes, guideline adherence, or effectiveness	Outcomes unrelated to guidelines and hypertension management
Time (T):	While not always included, you may also consider specifying a time frame for the intervention and outcome	Publication Language and Date: Studies published in the English language. Human clinical trials (RCTs, cohort studies, case-control studies). Studies published within 2017 to 2025	Publication Language and Date: Studies published in languages other than English. Studies with insufficient data (e.g., conference abstracts without full results).

As described in the next section of this study, database result filters were also employed to further limit the search results in addition to the inclusions/exclusions.

During the screening process, the titles and abstracts of the articles were reviewed. The screening and selection process was utilized once the record was collected to make sure that only studies that matched the inclusion/exclusion criteria were included. [6] In order to make sure that the studies were pertinent to the research issue, the PICO framework was employed in conjunction with the screening and selection process (Page et al., 2021). [6] This reduced reviewer bias and made it possible to include those papers that had a direct bearing on the research issue (Page et al., 2021). [6] PRISMA, the preferred reporting item for systematic reviews and meta-analyses, served as the basis for the article screening and selection procedure (Page et al., 2021).

Table 2 Summary of Database Query Strategy

S/N	PICO	Research Definition	Search Terminology
#1	Population	Adults diagnosed with hypertension in primary care settings.	"Adults diagnosed with hypertension in primary care settings"
#2	Intervention	Hypertension management guidelines from different international organizations (e.g., ACC/AHA, ESC/ESH, NICE, WHO, JSH, etc.).	"Hypertension management guidelines from different international organizations"
#3	Comparison	Differences in recommendations between various guidelines regarding diagnosis, treatment targets, pharmacological and non-pharmacological management, and follow-up strategies.	" Differences in recommendations between various guidelines"
#4	Outcome	Differences in clinical outcomes, adherence to guidelines, impact on blood pressure control, and overall patient health outcomes.	"Hypertension management outcomes, adherence to guidelines, medication adherence" "Impact on blood pressure control", overall patient health outcomes.
	PICO		

2.2. Critical Appraisal

[7] In this systematic review (Chen, 2017), a critical evaluation and quality assessment of selected papers were conducted to ensure methodological rigor. The Critical Appraisal Skills Programme (CASP) tool was used for this assessment, as it systematically evaluates research quality using ten key questions. CASP was chosen for its ability to organize large volumes of literature, streamline data analysis, and identify patterns, trends, and gaps in existing research. However, its limitations include the potential oversimplification of complex methodological issues, subjective interpretations, and the omission of certain quality aspects. Additionally, its application can be time-consuming.

[4] Each question in the CASP tool was answered with "yes," "no," or "can't tell" (CASP, 2023). The overall methodological quality was then determined based on these responses. [4] Studies scoring 0–4 out of 10 were classified as low quality, those scoring 5–7 as medium quality, and those scoring 8–10 as high quality (CASP, 2023).

2.3. Data Extraction and Analysis

[8] Relevant data from selected studies were extracted using Microsoft Excel, following a structured approach (Aromataris & Pearson, 2014). The extracted information included basic details (author, year, title), study characteristics (methodology, aim, design), population and sampling (sample size, selection criteria), data collection methods, and key findings, including analysis, limitations, and recommendations for further research.

2.4. Ethical Considerations

[9] Despite the shift toward evidence-based decision-making in clinical care and public health, ethical considerations often still rely on expert opinion (Mertz et al., 2016). Since this study is a systematic review, it exclusively uses secondary data from previously published research in scholarly journals, minimizing ethical concerns typically associated with primary research. [7] However, ethical considerations were still addressed by ensuring that each included study had obtained the necessary ethical approvals and had appropriately managed any ethical challenges (Chen, 2017).

3. Results

The literature search was conducted using multiple databases, including Cochrane, ResearchGate, MEDLINE, Web of Science, PubMed, EBSCO, PubMed Central, and Google Scholar. The search strategy outlined in Chapter 3 was applied during the database queries, leading to the retrieval of relevant articles.

761 from MEDLINE, **12258** from PMC, 8 from PubMed, 4 from Cochrane, 1841 from ResearchGate, 3427 from Web of Science, 0 from EBSCO, 20,200 from Google Scholar, and 0 articles from CINAHL. The retrieved articles then underwent

a rigorous selection process involving multiple stages to ensure that only the most relevant studies were included in the review.

A preliminary process was conducted using automated tools and filters in each of the databases for the purpose of eliminating duplicates and sorting the articles that needed to meet the inclusion criteria at generic level. The process eliminated 35495 articles, with 3000 articles left. Afterwards, the articles left were screened for title and abstract conformity to the study objectives by reading through each article's title and abstract to ensure it is relevant to this review. This process produced 234 articles; eliminating 2766 articles with titles or abstracts did not meet the inclusion criteria.

Thorough text screening was then carried out on the remaining articles. At this stage, the full text of each article was read through to determine suitability for inclusion, after which the non-suitable ones were eliminated. At this stage, articles were excluded due to payment restriction (i.e. a journal subscription amount of article fee was required before these articles could be accessed). Hence, they were removed from the selected articles; while other grey literature, as well as articles with studies designs that do not conform with the inclusion criteria, such as articles that focused on non-screening methods of cancer; studies above 5yrs since publication etc. Likewise, articles which did not fulfill any of the inclusion criteria regarding period of publication, study design and region of interest were excluded four articles, which meet the inclusion criteria for this review, were finally selected and included in this review. A graphical illustration of the screening and selection procedure is shown in the PRISMA flow diagram (Figure 4.1). The flow chart shows the selection process, as well as the retrieved number of articles, articles excluded at each stage and the number finally selected.

In addition, the details of extracted data are presented in Table 3, which represents a summary from the selected article.

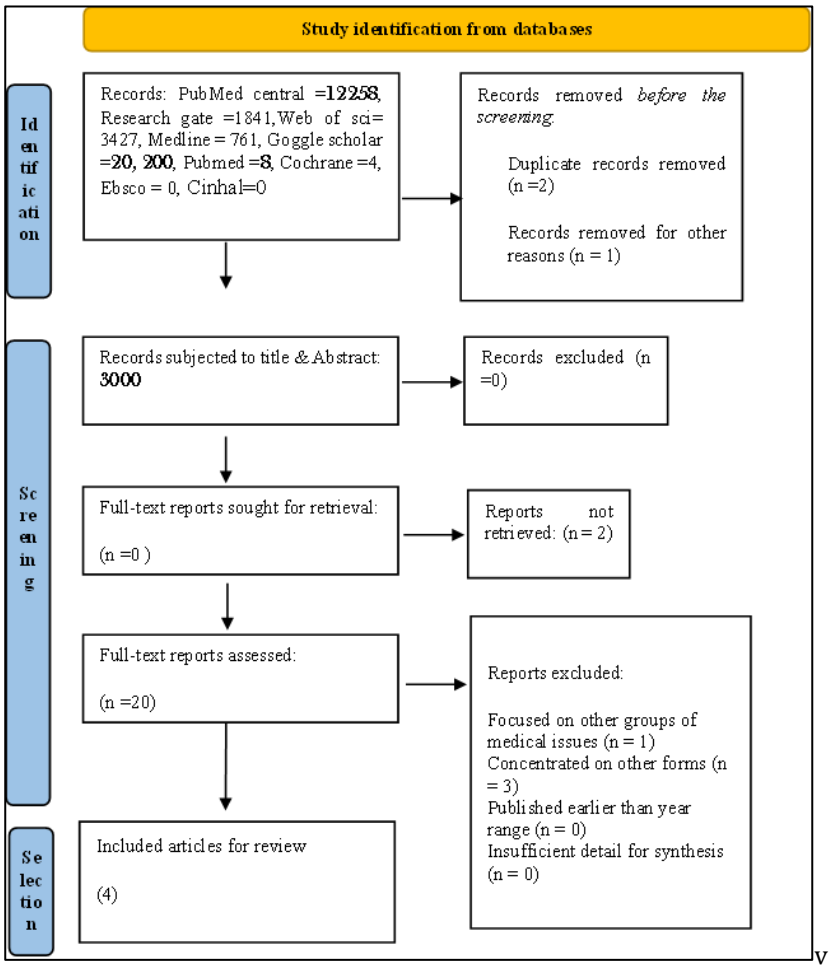

Figure 1 Prisma flow diagram

Table 3 Summary of Details from Selected Articles in Data Extraction Table

S/N	Names	Title	Aim	Study type	Findings
1	Nugroho, P., Andrew, H., Kohar, K., Noor, C. A., & Sutranto, A. L. (2022).	Comparison between the world health organization (WHO) and international society of hypertension (ISH) guidelines for hypertension.	evaluate general and specific comparisons between the recommendations supplied by both guidelines.	review	WHO and ISH guidelines have the potential to globally improve the control of hypertension.
2	Philip, R., Beaney, T., Appelbaum, N. *et al. (2021).*	Variation in hypertension clinical practice guidelines: a global comparison	to analyse the variation between hypertension CPGs globally. It aims to assess the variation in three areas	review	BP thresholds for the diagnosis and staging of hypertension, as well as BP target recommendations, were largely consistent across guidelines and across income settings.
3	Chia YC, Turana et al. (2021)	Comparison of guidelines for the management of hypertension: Similarities and differences between international and Asian countries; perspectives from HOPE-Asia Network	to compare the different guidelines and highlight differences and similarities between them.	review	the main differences between the guidelines are the new definition of hypertension where the United States is the only one recommending a lower diagnostic BP threshold of ≥130/80 mmHg
4	Philip R, Janssen C, Jose A, Beaney T, Clarke J (2024)	An assessment of variation in quality of hypertension guidelines across income settings using the AGREE II tool	to explore variation in the quality of hypertension CPGs, comparing low-, middle-, and high-income countries	review	Global efforts to improve the quality of hypertension guidelines should focus on the transparent statement of editorial independence of guideline committees and apply rigorous replicable methods in the authoring of guidelines.

4. Discussion

"How do international hypertension management guidelines in primary care settings compare in terms of treatment recommendations, risk stratification, and patient outcomes?"

Hypertension remains a major global public health concern, necessitating standardized guidelines to ensure effective management in primary care settings. Various international organizations, including the World Health Organization (WHO), the European Society of Cardiology (ESC), the American College of Cardiology (ACC), and the National Institute for Health and Care Excellence (NICE), have developed evidence-based guidelines for hypertension management.

4.1. Treatment Recommendations

A key aspect of hypertension management across international guidelines is the emphasis on lifestyle modifications as the first line of treatment. [10] The WHO (2021) and [11] ESC/ESH (2023) highlight the importance of dietary changes, regular physical activity, reduced sodium intake, and weight management in controlling blood pressure. Similarly, the ACC/AHA guidelines (2017) stress the need for non-pharmacological interventions before initiating antihypertensive

medication, particularly in patients with stage 1 hypertension and no additional cardiovascular risks. [12] However, when pharmacological therapy is required, all guidelines recommend a stepwise approach using first-line antihypertensive agents such as angiotensin-converting enzyme (ACE) inhibitors, calcium channel blockers (CCBs), and thiazide diuretics (Williams et al., 2018). [13] Despite minor differences in drug preferences, combination therapy is widely supported for patients with moderate to severe hypertension (Mancia et al., 2023).

4.2. Risk Stratification

International guidelines also emphasize risk stratification to tailor treatment based on individual patient characteristics. [1]] The ESC/ESH guidelines (2023) categorize patients according to blood pressure levels and associated cardiovascular risks, incorporating factors such as age, diabetes, chronic kidney disease, and prior cardiovascular events. [14] Similarly, the ACC/AHA (2017) guidelines use a risk-based approach, recommending antihypertensive treatment for individuals with a 10-year atherosclerotic cardiovascular disease (ASCVD) risk of 10% or higher. [15] The NICE guidelines (2022) focus on individualized care, advocating for ambulatory or home blood pressure monitoring to confirm diagnoses and assess treatment efficacy. While these frameworks differ in risk assessment models, they all aim to personalize treatment and optimize patient outcomes.

4.3. Patient Outcomes

The goal of hypertension guidelines is to improve patient outcomes by reducing morbidity and mortality. [16] Studies have shown that adherence to international guidelines significantly lowers the risk of stroke, heart failure, and other cardiovascular complications (Whelton et al., 2018). The WHO (2021) underscores the need for long-term blood pressure control to prevent end-organ damage, aligning with ESC and ACC recommendations that stress ongoing monitoring and patient education. [13] Furthermore, integrated care approaches, such as team-based management and digital health interventions, have been promoted across guidelines to enhance treatment adherence and long-term success (Mancia et al., 2023).

5. Conclusion

Despite regional variations, international hypertension guidelines in primary care settings share fundamental similarities in their emphasis on lifestyle modifications, risk-based treatment strategies, and the promotion of optimal patient outcomes. While differences exist in specific thresholds for treatment initiation and drug preferences, the overarching goal remains the same, reducing hypertension-related complications and improving global cardiovascular health. As research continues to evolve, future updates to these guidelines will likely incorporate emerging evidence and technological advancements to further enhance patient care.

Limitations of the study

Only the data available from the literature at the time of the study were used, as they were accessible and relevant. However, the data from these articles were not sufficiently comprehensive to allow for a more thorough assessment. Many other studies screened did not align with the objectives of this study and, as such, were excluded. This highlights the need for more consistent methodologies in future research on this topic, which limits the generalizability of our findings.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest

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