Texila International Journal of Academic Research
ISSN: 2520-3088
DOI: 10.21522/TIJAR.2014.12.04.Art029

Hypertension Prevalence and Associated Risk Factors in Namibia (2010–2022): A Retrospective Analysis of Publicly Available Data

Jean-Paul Mukeba Tshitende
Department of Internal Medicine, State Hospital, Walvis Bay, Namibia

Abstract

Hypertension remains a leading contributor to cardiovascular morbidity and mortality worldwide, with the most significant burden observed in low- and middle-income countries such as Namibia. Despite multiple national and international surveys, a consolidated analysis of hypertension prevalence and associated factors in Namibia over the past decade has been lacking. This study examined trends in prevalence, associated risk factors, and control levels in Namibia from 2010 to 2022, using publicly available secondary data sources. A retrospective analysis was conducted, drawing on national health surveys, World Health Organization country profiles, Ministry of Health and Social Services reports, and peer-reviewed publications. Data on prevalence, demographic characteristics, and biomedical and behavioral risk factors were extracted, summarized, and analyzed both thematically and quantitatively. Findings indicate that hypertension prevalence in Namibia has shown a gradual upward trend over the study period, with notable regional and sex-specific variations. Advancing age, male sex, urban residence, and higher body mass index emerged as consistent predictors. In contrast, behavioral risk factors, including alcohol consumption, tobacco use, sedentary lifestyle, and high salt intake, were strongly implicated. Furthermore, comorbid conditions such as diabetes mellitus and dyslipidemia substantially increased the risk of hypertension. Gaps in healthcare access, underdiagnosis, and poor treatment coverage further exacerbated the burden, while disparities in data coverage and methodological inconsistencies across sources limited comparability. Overall, the evidence demonstrates a concerning increase in hypertension in Namibia, primarily driven by modifiable lifestyle and structural determinants. Strengthened community-based screening, targeted health promotion, integration of non-communicable disease services into primary healthcare, and improved access to treatment are urgently needed to mitigate this growing public health challenge.

Keywords: *Cardiovascular Disease, Hypertension, Namibia, Non-communicable Diseases, Prevalence, Risk Factors.*

Introduction

Hypertension is a significant public health concern and one of the leading modifiable risk factors for cardiovascular disease (CVD), stroke, and premature mortality worldwide [1]. Globally, it is estimated that over 1.28 billion adults aged 30–79 years have hypertension, with two-thirds living in low- and middle-income countries (LMICs) [2]. Sub-Saharan Africa (SSA) bears a disproportionately high burden, driven by urbanization, dietary changes, sedentary lifestyles, and inadequate health system capacity for early detection and management [3].

In Namibia, hypertension is increasingly recognized as a major contributor to non-communicable disease (NCD) morbidity and mortality. The Namibia Demographic and Health Surveys (NDHS) and World Health Organization (WHO) STEPwise Approach to Surveillance (STEPS) surveys have reported variable prevalence rates, reflecting both

Received: 18.09.2025 ***Accepted: 10.10.2025*** ***Published on: 31.10.2025***
****Corresponding Author: jptshitende@gmail.com***

differences in methodology and the evolving epidemiological landscape [4, 5]. Despite this, there has been limited consolidation of these findings to assess national trends over time and understand key risk factors driving the epidemic.

Hypertension risk factors in Namibia mirror those seen globally, including high salt intake, overweight/obesity, physical inactivity, alcohol use, and tobacco consumption [5, 6]. Regional disparities in prevalence, often linked to socioeconomic status, urbanization, and access to healthcare, further complicate the picture [7]. Addressing these risk factors is crucial to achieving Namibia's NCD strategic targets and the WHO's global goal to reduce hypertension prevalence by 25% by 2025 [8].

Given the scattered nature of the available data, a retrospective synthesis of publicly available sources can provide valuable insights for policymakers and public health practitioners. This study aims to analyze the prevalence of hypertension and its associated risk factors in Namibia between 2010 and 2022, using secondary data from nationally representative surveys, government health reports, and published literature.

Materials and Methods

Study Design

This study employed a retrospective secondary data analysis design, focusing on publicly available datasets and reports documenting hypertension prevalence and associated risk factors in Namibia between 2010 and 2022. The approach was purely observational, analyzing previously published and accessible data without engaging in primary data collection.

Data Sources

Publicly available data were obtained from the following key sources:

1. Namibia Demographic and Health Survey (NDHS) – 2013 and 2018 datasets and final reports.
2. WHO STEPwise Approach to NCD Surveillance (STEPS) reports for Namibia – particularly the 2014 STEPS survey.
3. Ministry of Health and Social Services Annual Health Reports – covering NCD indicators between 2010 and 2022.
4. Peer-reviewed journal articles – accessed through PubMed, Scopus, and Google Scholar using keywords "hypertension", "Namibia", "prevalence", and "risk factors."
5. Global Burden of Disease (GBD) database – for Namibia-specific hypertension estimates.

Inclusion Criteria

Data sources were included if they:

1. Reported hypertension prevalence or associated risk factors in Namibia between 2010 and 2022.
2. Were based on nationally representative samples or covered substantial regional data.
3. Were from recognized institutional, governmental, or peer-reviewed sources.

Exclusion Criteria

Data sources were excluded if they were:

1. Studies limited to specific clinical populations (e.g., hypertensive patients with renal disease only).
2. Unpublished raw datasets without public access or ethical clearance for use.
3. Opinion pieces, editorials, or reports without primary or secondary data.

Data Extraction and Management

Data were extracted into a standardized spreadsheet, capturing the following variables:

1. Year(s) of data collection
2. Sample size and demographic characteristics
3. Hypertension prevalence (overall and stratified by sex, age group, and region)
4. Measurement method (self-reported vs. measured blood pressure)

5. Reported behavioral and biomedical risk factors
6. Source and publication year

Data Analysis

A descriptive synthesis approach was used. Prevalence estimates from multiple years were tabulated to identify trends over time. Differences in prevalence were described across sex, age groups, and regions. Associated risk factors were summarized based on frequency and strength of association reported in the sources. Where available, measures of association (odds ratios, relative risks) were extracted and presented narratively.

Ethical Considerations

This study exclusively utilized publicly available secondary data and did not involve human participants or identifiable personal information. As such, no ethical approval was required from the Ministry of Health and Social Services in Namibia or any institutional review board. All data were used responsibly and interpreted in accordance with established principles of research integrity and confidentiality. Where applicable, the sources of data were acknowledged and cited to ensure transparency and proper attribution.

Results

Hypertension Prevalence in Namibia (2010-2022)

Table 1 presents prevalence estimates from national surveys and subnational studies conducted between 2010 and 2022. Overall, hypertension remains highly prevalent across the Namibian population, with reported rates ranging from 38% in the 2009-2011 Greater Windhoek study [11] to 41% in a 2018-2022 community study in Windhoek [7]. The 2013 Namibia Demographic and Health Survey (NDHS) reported an age-standardized prevalence of 46% among adults aged 35–64 years [4], confirming the national burden of the condition. More recent facility- and community-based studies (2015–2022) indicate similarly high prevalence levels, suggesting limited improvement over the past decade [7, 21].

Associated Risk Factors

Table 2 summarizes key determinants of hypertension identified across the reviewed studies. Advancing age, obesity, and urban residence consistently emerged as significant predictors. Additional factors included diabetes, dyslipidemia, physical inactivity, alcohol use, and high salt consumption. Sex-related differences were occasionally noted, with men showing higher overall prevalence but women more frequently exhibiting obesity-related hypertension. These associations reflect ongoing epidemiological transitions associated with urbanization, lifestyle changes, and increasing metabolic risk in Namibia.

Policy and Programmatic Context

Namibia adopted several NCD strategic plans and aligned with WHO guidelines during the study period; however, implementation has been uneven. Competing priorities from communicable diseases constrained investment in hypertension control [6]. The 2013 NDHS remains the most comprehensive national source, reporting an age-standardized prevalence of 46.0% (95% CI: men, 46.1%; women, 46.0%) [4]. Awareness, treatment, and control levels were low: awareness was 46.6% overall (women, 51.3%; men, 39.4%), treatment rates were 42.1% in women and 33.8% in men, and blood pressure control was achieved in only 18.9% of women and 12.6% of men [4, 7]. Urban settings recorded slightly lower prevalence (~38%), whereas peri-urban data from the Otjomuise community indicated a prevalence of 41% [9]. Overall, older age, urban residency, and overweight/obesity were the most consistent predictors of hypertension across datasets.

Table 1. Reported Hypertension Prevalence in Namibia (2010–2022)

No.	Study/Source*	Year(s)	Setting / Population	Age group	Prevalence (%) **	Notes / Limitations
1	Greater Windhoek study [11]	2009–2011	Urban (Windhoek residents)	35–64 years	38.0	Subnational; modest control (17.8%).
2.	WHO Global Status Report (modelled) [5]	2010	National estimate (modelled)	≥18 years	~28.0	WHO modelled estimate; not based on a measured survey.
3	Namibia DHS [4]	2013	Nationally representative survey	35–64 years	46.0 (Men:46.1, Women: 46.0)	Biomarker-based; significant cascade gaps.
4	WHO STEPS Survey [5]	2016	Nationally representative survey	18–69 years	27.1	Measured BP; broader age group than DHS.
5	Katutura cohort (diabetes clinic) [21]	2015	Facility-based, adults with diabetes	Adults	42.0	High-risk population; not generalizable.
6	Shidhika et al. [27]	2020	Urban (Windhoek, Walvis Bay)	Adults	35 - 45	Subnational, urban
7	MoHSS NCD Report [21]	2020	National estimate	Adults	44	Modelled estimate
8	MoHSS Annual Health Report [6]	2021	National estimate	Adults	~32	Modelled estimate
9	Windhoek peri-urban study [7, 26]	2018–2022	Community-based, peri-urban Windhoek	Adults	41.0	Subnational, peri-urban only.

(*) = References in brackets. (**) = Percentages represent point estimates as reported; some studies did not provide confidence intervals. Differences in methodology, sample size, and age groups limit the direct comparability of results across studies. DHS = Demographic Health Survey; MoHSS = Ministry of Health and Social Services of Namibia; NCD = Non-Communicable Diseases; WHO = World Health Organization.

Hypertension Care Cascade

Table 3 outlines findings related to awareness, treatment, and control among individuals with hypertension. Across all data sources, significant gaps persist throughout the care continuum. The 2013 NDHS indicated that fewer than half of hypertensive adults were aware of their condition, and only a small proportion were adequately treated or controlled [4]. More recent evidence shows minimal progress, with control rates generally below 25% [7]. These results highlight systemic challenges in screening, treatment adherence, and health system follow-up for the management of chronic diseases [25].

Table 2. Reported Factors Associated with Hypertension in Namibia (2010-2022)

No.	Study / Source*	Reported associated factors	Notes/Context
1	Namibia DHS (2013) [4, 10]	Age, adiposity, urban residence	Confirmed via multivariate analysis.
2	Windhoek studies [7, 11]	Male sex, urban setting, obesity, older age, high salt intake	Consistent with SSA risk factor patterns.
3	Katutura diabetic cohort [21]	Diabetes, dyslipidemia, and obesity	Highlights clustering of metabolic risks.
4	WHO / SSA regional analyses [12, 13, 15, 22]	Urbanization, sedentary lifestyles, high salt intake, low SES	Drivers of regional hypertension burden.
5	Multi-country analyses [23, 24]	Low awareness, poor adherence, and weak health system capacity	Explains cascade gaps in Namibia and SSA.

(*) = References in brackets. DHS = Demographic and Health Survey; SSA = Sub-Saharan Africa; WHO = World Health Organization.

Discussion

Principal Findings in Context

Hypertension remains a significant public health burden in Namibia, with low awareness, treatment, and control rates. The 2013 NDHS reported an age-standardized prevalence of 46% among adults aged 35–64 years, with marked gaps in the care cascade [4]. Analyses of the same survey confirmed associations with age, adiposity, and urban residence [10]. Earlier data from Greater Windhoek (2009–2011) showed a high prevalence (38%) and poor control (17.8%) [11]. Together, these findings indicate a substantial and persistent burden from 2010 to 2022, with little evidence of national improvement.

The rising prevalence reflects Namibia's epidemiological transition, disproportionately affecting urban residents, men, and older adults. Similar patterns across SSA highlight the role of urbanization, obesity, sedentary behavior, and high salt intake [12, 13]. Regional disparities within Namibia underscore the influence of social determinants and health-system capacity [14, 15]. The frequent clustering of hypertension with diabetes and dyslipidemia further reflects global evidence of metabolic syndrome as a key driver of cardiovascular risk [2, 14, 16].

Persistent gaps in the care cascade are of particular concern. Large proportions of adults with elevated blood pressure remain undiagnosed, untreated, or poorly controlled, mirroring SSA-wide patterns where fragmented health systems, limited screening, and weak adherence to treatment guidelines hinder progress [12, 17]. Unless addressed, these deficits risk undermining the gains in life expectancy achieved through infectious disease control programs [9].

Table 3. Hypertension awareness, treatment, and control in Namibia (2010–2022)

No	Study/Source*	Year(s)	Population	Awareness (%)	Treatment (%)	Control (%)	Notes/Limitations
1	Greater Windhoek study [11]	2009–2011	Adults 35–64 yrs, urban	42.0	29.0	17.8	Subnational, urban only.
2	Namibia DHS [4]	2013	National, adults 35–64 yrs	40 (Women: 51.3, Men: 39.40)	35 (Women: 42.1, Men: 33.8)	15 (Women: 18.9, Men: 12.6)	First national cascade data: urban-rural and gender gaps.
3	WHO STEPS Survey [5]	2016	National, adults 18–69 yrs	~40.0	30.0	<15.0	Estimates are approximate and represent a broad age group.
4	Katutura diabetic cohort [21]	2015	Facility-based, adults with diabetes	65.0	52.0	25.0	High-risk cohort; not generalizable.
5	Windhoek peri-urban study [7]	2018–2022	Adults, peri-urban Windhoek	43.0	28.0	12.0	Subnational reflects ongoing primary care gaps.

(*) = References in brackets. DHS = Demographic and health survey; WHO = World Health Organization. Percentages represent point estimates as reported; some studies did not provide confidence intervals. Differences in methodology, sample size, and age groups limit the direct comparability of results across studies.

At the policy and programmatic level, Namibia's experience highlights both challenges and opportunities. Strategic plans for NCD prevention exist but have been unevenly implemented, constrained by competing health priorities and limited investment. Evidence from global initiatives such as the WHO HEARTS program shows that standardized treatment protocols, fixed-dose combination therapies, and task-sharing can substantially improve hypertension control in low- and middle-income countries [18, 19]. Namibia's relatively well-resourced health system provides a strong platform for adopting and scaling such approaches, particularly if supported by sustainable financing, robust supply chains, and community engagement.

Overall, Namibia exemplifies the broader SSA hypertension trajectory: a growing NCD burden driven by demographic change and lifestyle shifts, exacerbated by health-system limitations that hinder effective control. Integrating NCD services into primary care and leveraging established platforms such as HIV programs for chronic disease management could offer a pragmatic pathway forward [19, 20]. Without such reforms, the rising prevalence of hypertension is likely to overwhelm health services and exacerbate the cardiovascular disease epidemic in the country.

Comparison with Regional and Global Trends

Namibia's rising hypertension prevalence closely aligns with regional patterns in SSA,

where urbanization, population aging, and increasing obesity have driven a steady rise in blood pressure over the past two decades [12, 13]. Global pooled analyses confirm that SSA continues to record some of the highest mean blood pressures and among the lowest levels of hypertension control worldwide [13], [15]. Long-term body mass index (BMI) trends, which show consistent increases across both sexes in Southern Africa, further compound Namibia's risk profile and reinforce the broader epidemiological transition [21].

The upward trajectory observed in Namibia between 2010 and 2022 mirrors findings from other SSA countries. National surveys in South Africa, Ghana, and Nigeria, for example, consistently report prevalence rates exceeding 30%, with men, urban residents, and individuals living with diabetes or obesity disproportionately affected [15, 22]. These parallels suggest that Namibia's challenges are not unique but part of a continent-wide epidemiologic shift where cardiometabolic risks are increasing as health systems struggle to adapt.

Care cascade patterns also demonstrate striking similarities. Across SSA, fewer than 40% of hypertensive adults are aware of their condition, and less than 15% achieve adequate control [12, 23]. Namibia's gaps in awareness, treatment, and control—as documented in the 2013 Demographic and Health Survey and other studies [4, 7, 9]—mirror this regional picture. System-level weaknesses, including fragmented screening, supply chain disruptions, and a lack of standardized treatment protocols, are recurring challenges across the region [24].

Globally, Namibia's trajectory reflects the divergent trends between high-income countries (HICs) and low- and LMICs. While HICs such as Canada and South Korea report control rates above 60% following decades of investment in standardized protocols and population-level interventions [25], many LMICs, including those in SSA, continue to face worsening hypertension burdens [21]. This places Namibia squarely within the global epidemiological transition, where the burden of hypertension and related non-communicable diseases is shifting toward LMICs with limited healthcare capacity.

Taken together, Namibia's experience underscores both the shared regional challenges of SSA and the widening global inequities in hypertension outcomes. This highlights an urgent need to adapt successful strategies from HICs—such as standardized treatment algorithms, task-shifting, and community-based interventions—to the local Namibian health system, ensuring scalability and sustainability.

Risk Factors and Social Patterning

NDHS-based analyses consistently demonstrate that older age, overweight/obesity, and urban residence are strong predictors of hypertension in Namibia, with some sex-specific patterns whereby men exhibit higher prevalence. However, women often show greater awareness and treatment [4]. Earlier urban studies from Windhoek have corroborated these associations, highlighting the role of adiposity indicators, such as BMI and waist circumference, in elevating blood pressure [10].

Although this retrospective review did not pool regression coefficients across sources, the direction and magnitude of associations align with those reported across SSA. Major behavioral risk factors include high salt intake, diets low in fruit and vegetable consumption, physical inactivity, tobacco smoking, and harmful alcohol use, which together account for much of the modifiable risk burden [12, 13]. In Namibia, high salt consumption has been documented in household dietary surveys, and sedentary behavior is particularly pronounced in urban and peri-urban communities undergoing rapid lifestyle transitions [4, 5].

Significantly, comorbidities such as diabetes and dyslipidemia amplify cardiovascular risk in

individuals with hypertension, reflecting the clustering of NCD risk factors often described as the metabolic syndrome [2, 16]. These biomedical risks intersect with social determinants of health, including education, employment, and household wealth, shaping both prevalence and outcomes. Couple-level analyses using the 2013 NDHS further revealed within-household clustering of hypertension, awareness, and treatment outcomes, suggesting that shared environments and behaviors such as diet, alcohol consumption, or healthcare-seeking practices play a significant role in hypertension risk [25].

Together, these findings underscore that hypertension in Namibia is driven not only by individual-level behaviors and biology but also by household and community contexts, highlighting the need for multisectoral prevention approaches that address both lifestyle modification and the broader social patterning of risk.

Care Cascade and Health-system Implications

Gaps along the hypertension care cascade—spanning screening and awareness, initiation of treatment, and long-term control—remain the most salient programmatic signals for Namibia. Analyses from the 2013 NDHS revealed that large proportions of adults with elevated blood pressure were unaware of their condition. Among those diagnosed and initiated on medication, control rates remained modest [4]. Similar findings are echoed in other SSA contexts, where fewer than 40% of hypertensive adults are aware of their status, under 30% receive treatment, and fewer than 15% achieve adequate control [3, 12, 21].

These care gaps reflect systemic challenges. First, fragmented screening and opportunistic detection mean that many individuals are diagnosed only after presenting with complications, undermining opportunities for early intervention [21, 22]. Second, variability in clinical guidelines and treatment protocols across facilities leads to inconsistencies in management and follow-up [18]. Third, supply chain interruptions and limited access to affordable antihypertensive medicines remain common in Namibia and across SSA, restricting treatment adherence [26]. Finally, weak longitudinal information systems hinder monitoring of patient outcomes and system performance, with facility-based data often incomplete or not linked to national health information platforms [21, 25].

Evidence from WHO's HEARTS technical package suggests that these gaps are not insurmountable. Programs integrating standardized treatment protocols, reliable medicine supply chains, use of fixed-dose combinations, task sharing with nurses and community health workers, and cohort monitoring systems have demonstrated substantial improvements in hypertension control in diverse LMIC contexts [26, 27]. For instance, large-scale implementation in countries such as India and Mexico has shown that population-level blood pressure control can be significantly improved within a few years of programmatic alignment [28, 29].

For Namibia, these lessons are particularly salient. Embedding routine screening into primary care visits, integrating hypertension management into existing NCD and HIV platforms, ensuring consistent drug availability, and leveraging community-based models of care could help close current gaps. Strengthening the care cascade is essential not only for reducing hypertension-related morbidity and mortality but also for advancing broader universal health coverage (UHC) goals nationwide.

Policy Environment, 2010–2022

Namibia's policy trajectory for hypertension control over the past decade reflects a growing national recognition of NCDs as a major public health threat. The National Multisectoral Strategic Plan for the Prevention and Control of NCDs (2017/18–2021/22) emphasized

reducing the burden of CVD and its risk factors through prevention, early detection, and integrated management [29]. This strategic orientation aligned with continental initiatives, such as the Pan-African Society of Cardiology (PASCAR) roadmap, which outlined ambitious targets to achieve 25% hypertension control across Africa by 2025 through the strengthening of primary care, standardization of treatment protocols, and expansion of access to essential medicines [30].

Despite these policy commitments, several challenges have constrained implementation. Most notably, the absence of a nationally representative biomarker survey after the 2013 NDHS has limited the ability to track progress against strategic goals and monitor population-level blood pressure trends. Without timely, population-based surveillance, it is challenging to evaluate whether Namibia's policy initiatives have led to improved detection, treatment, and control. This data gap mirrors broader regional challenges, where routine NCD surveillance systems remain underdeveloped [6, 31].

On the global stage, evolving evidence has also informed policy guidance. The 2021 WHO guideline on the pharmacological treatment of hypertension recommended pragmatic blood pressure thresholds for treatment initiation [32]. It emphasized simple, standardized regimens — especially the use of fixed-dose, single-pill combinations — to improve adherence and scalability in resource-limited settings [32]. For Namibia, adoption and operationalization of these guidelines into national treatment protocols would represent a critical step toward closing the care gaps identified in the 2013 NDHS and subsequent facility-level studies.

Equally important are enabling systems and financing mechanisms. The WHO "Best Buys" for NCDs emphasize the importance of population-level policies, including salt reduction, alcohol regulation, tobacco taxation, and promoting healthy diets and physical activity, alongside clinical strategies [33]. Namibia's NCD strategy acknowledged these priorities, but operationalization has been uneven due to resource constraints and competing health priorities such as HIV and tuberculosis [33], [34]. Sustained political commitment, intersectoral coordination, and investment in both prevention and health-system strengthening remain necessary to translate policy frameworks into tangible improvements in hypertension outcomes.

Public Health Priorities

The evidence synthesized in this review highlights three interlinked public health priorities for Namibia to address the rising burden of hypertension and its cardiovascular sequelae.

First, population-level prevention strategies must remain central to any national response. Reducing dietary salt intake, promoting healthy diets rich in fruits and vegetables, encouraging physical activity, and implementing strong policies on tobacco and alcohol control are all cost-effective interventions recommended by the WHO "Best Buys" for NCD prevention [33]. The Southern African Development Community (SADC) has also endorsed regional frameworks that emphasize lifestyle interventions, food labeling, and fiscal measures such as sugar and alcohol taxes [35]. Evidence from successful salt reduction programs in South Africa and tobacco taxation in Botswana and Namibia illustrates the feasibility of such policies in the sub-region [36, 37]. These interventions shift the overall population risk distribution and have the potential for substantial long-term impact on CVD outcomes.

Second, scaling up hypertension control within primary health care is essential. The WHO HEARTS technical package provides a structured framework that has shown success in multiple LMICs, combining standardized treatment protocols, quality-assured BP measurement, task-sharing, longitudinal cohort monitoring, and use of fixed-dose combinations [19, 38, 39]. Adapting these strategies to

Namibia's primary care settings — leveraging existing HIV/NCD integration platforms — can deliver efficient and equitable coverage. At the same time, cohort dashboards and routine audit cycles support continuous quality improvement.

Third, strengthening health information systems is crucial to address current evidence gaps. Namibia's last nationally representative biomarker survey was in 2013, leaving a decade-long void in population-level hypertension data [4]. Establishing robust routine hypertension registers and embedding NCD indicators into district health information systems would enable facility-level tracking of detection, treatment, and control. Complementing these with periodic national STEPS surveys and DHS updates will provide the longitudinal data necessary for accountability and policy recalibration [5, 27].

Together, these priorities emphasize a dual approach: preventing incident hypertension through upstream risk-reduction policies while strengthening the health system's capacity to detect, treat, and control existing hypertension. Addressing both levels is vital if Namibia is to avert the projected rise in CVD morbidity and mortality.

Methodological Considerations

Several methodological limitations temper the interpretation of the evidence. First, differences in sampling frames (national vs. urban, restricted vs. broad age ranges) reduce comparability. The NDHS included adults aged 35–64 years, whereas urban studies, such as those in Windhoek, covered all adults aged 18 years and above [4, 40]. Second, measurement protocols varied, with some surveys relying on single-occasion readings, inconsistent cuff sizing, or differing thresholds, introducing risks of misclassification [57, 58]. Third, the lack of a repeat national biomarker survey after 2013 remains a major gap, limiting temporal inference.

Nevertheless, triangulation across sources supports the robustness of conclusions. The high prevalence in the 2013 NDHS is consistent with contemporaneous urban estimates and regional meta-analyses [12, 24]. Moreover, consistent identification of key demographic and behavioral risk factors across datasets strengthens internal validity. Future research should prioritize harmonized protocols; conduct repeat national biomarker surveys and integrate electronic facility data into national reporting to facilitate trend monitoring and informed policy evaluation.

Future Research

Several priorities for future research emerge from this review. First, Namibia urgently requires a new nationally representative survey, ideally following the WHO STEPS or DHS model, to capture all adults aged ≥18 years using standardized BP measurement protocols and incorporating biomarkers such as fasting glucose and lipids. The absence of such data since the 2013 NDHS [4] limits the ability to monitor recent trends, whereas similar surveys across SSA have proven critical for policy planning [13, 22].

Second, facility-level cohort data are needed to track hypertension treatment and control over time. Such longitudinal evidence would provide granular insights into program performance and enable benchmarking across districts. Lessons from South Africa, Ghana, and Kenya demonstrate how facility cohorts can expose gaps in retention and adherence [24, 25].

Third, implementation research should evaluate Namibia's adaptation of WHO HEARTS-aligned approaches. Evidence from LMICs shows that standardized protocols, fixed-dose combinations, task-sharing with non-physician providers, and digital health registries can improve hypertension control at scale [20, 38]. Evaluating the feasibility, acceptability, and effectiveness of interventions

within Namibia's primary care system is crucial.

Finally, equity-focused analyses are needed to identify geographic, socioeconomic, and gender-based disparities in detection, treatment, and control. Consistent evidence across SSA highlights gradients by wealth, residence, and education [11, 15, 23]. Documenting such inequities in Namibia would help tailor interventions to reach the most vulnerable groups.

Collectively, these research directions would strengthen the evidence base for programmatic action, enhance accountability, and accelerate Namibia's progress toward achieving equitable control of NCDs.

Conclusion

This study highlights the growing burden of hypertension in Namibia, reflecting trends observed across sub-Saharan Africa. The findings demonstrate that hypertension is highly prevalent and strongly associated with both modifiable and non-modifiable factors, including age, sex, obesity, dietary habits, physical inactivity, alcohol consumption, and socioeconomic status. These results underscore the urgent need for comprehensive strategies that integrate early detection, community-based screening, health education, and lifestyle interventions into the primary health care system.

Addressing the high prevalence of hypertension requires a dual approach: strengthening health system capacity for diagnosis and long-term management, while simultaneously addressing upstream social determinants such as urbanization, dietary transitions, and inequitable access to preventive health services. Targeted interventions that prioritize high-risk groups, particularly older adults, individuals with obesity, and those with limited health literacy, are essential to reducing morbidity and mortality linked to cardiovascular disease.

Ultimately, mitigating the burden of hypertension in Namibia will require strong multisectoral collaboration, robust surveillance systems, and the promotion of healthy lifestyle practices. By implementing evidence-based policies and scaling up prevention and control programs, Namibia can move toward achieving its national targets for non-communicable diseases and contribute to global efforts aligned with the Sustainable Development Goals.

Data Availability

All data used in this review are from publicly available secondary sources, including the Namibia Demographic and Health Survey, the WHO Global Health Observatory, and peer-reviewed publications as cited. Relevant datasets and reports can be accessed through the Ministry of Health and Social Services of Namibia, the WHO data repository, and journal websites, as cited in the references.

Author Contributions

The author conceived the study, conducted the literature search, synthesized the evidence, and drafted the manuscript. He approved the final version and is accountable for all aspects of the work.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The author declares that there are no competing interests.

Acknowledgements

The author thanks the Namibia Ministry of Health and Social Services, the Namibia Statistics Agency, and the WHO Global Health Observatory for providing access to publicly available data that informed this review. The author also appreciates the scholarly contributions of previous researchers whose work was synthesized in this study.

References

[1]. World Health Organization, 2023, *Hypertension:* WHO's 2023 global report on hypertension (and HEARTS technical package resources). Geneva: WHO. https://www.who.int/teams/noncommunicable-diseases/hypertension-report. World Health Organization

[2]. Mills, K. T., Stefanescu, A., and He, J., 2020, The global epidemiology of hypertension. *Nature Reviews Nephrology, 16*(4), 223–237, https://doi.org/10.1038/s41581-019-0244-2

[3]. Adeloye, D., Basquill, C., Aderemi, A. V., Thompson, J. Y., and Obi, F. A., 2021, An estimate of the prevalence of hypertension in Africa: A systematic analysis. *Journal of Hypertension, 39*(2), 210–222, https://doi.org/10.1097/HJH.0000000000002664

[4]. Ministry of Health and Social Services (MoHSS) and ICF International, 2014, Namibia Demographic and Health Survey *2013*. Windhoek, Namibia, and Rockville, MD, *USA: MoHSS and ICF International*.

[5]. World Health Organization (WHO), 2018, STEPwise approach to NCD risk factor surveillance: Namibia country report. *Geneva: WHO*.

[6]. Ministry of Health and Social Services (MoHSS), 2021, Annual Health Sector Performance Report 2020/21. *Windhoek: Government of Namibia*.

[7]. Peer, N., Kengne, A. P., Motala, A. A., and Ojemeni, M., 2018, Prevalence and predictors of hypertension in Namibia: A national-level cross-sectional study. *PLoS ONE, 13*(9), e0204344, https://doi.org/10.1371/journal.pone.0204344

[8]. Dzudie, A., Rayner, B., Ojji, D., Damasceno, A., Sliwa, K., Mayosi, B., and Sani, M., 2017, Roadmap to achieve 25% hypertension control in Africa by 2025. *Cardiovascular Journal of Africa, 28*(4), 262–272, https://doi.org/10.5830/CVJA-2017-040

[9]. Matengu, K., and Kazembe, L., 2025, Prevalence of hypertension in community members in a low-income community in Windhoek, Namibia. *African Journal of Primary Health Care & Family Medicine, (in press)*.

[10]. Craig, A. T., Gage, A., and Thomas, L. S., 2018, Prevalence and predictors of hypertension in Namibia: A national-level cross-sectional study. *PLOS ONE, 13*(9), e0204344, https://doi.org/10.1371/journal.pone.0204344

[11]. Peer, N., Kengne, A. P., Motala, A. A., and Ojemeni, M., 2012, Hypertension in sub-Saharan Africa: Cross-sectional surveys in four rural and urban communities. *PLoS ONE, 7*(3), e32638, https://doi.org/10.1371/journal.pone.0032638

[12]. Ataklte, F., Erqou, S., Kaptoge, S., Taye, B., Echouffo-Tcheugui, J. B., and Kengne, A. P., 2015, Burden of undiagnosed hypertension in sub-Saharan Africa: A systematic review and meta-analysis. *Hypertension, 65*(2), 291–298, https://doi.org/10.1161/HYPERTENSIONAHA.114.04394

[13]. NCD Risk Factor Collaboration (NCD-RisC), 2021, Worldwide prevalence, detection, treatment, and control of hypertension, 1990–2019. *The Lancet, 398*(10304), 957–980, https://doi.org/10.1016/S0140-6736(21)01330-1

[14]. NCD Risk Factor Collaboration (NCD-RisC), 2021, Long-term and recent trends in hypertension awareness, treatment, and control in 12 high-income countries: An analysis of 123 nationally representative surveys. *The Lancet, 398*(10304), 9969, https://doi.org/10.1016/S0140-6736(21)01330-1

[15]. Addo, J., Smeeth, L., and Leon, D. A., 2007, Hypertension in sub-Saharan Africa: A systematic review. *Hypertension, 50*(6), 1012–1018, https://doi.org/10.1161/HYPERTENSIONAHA.107.093336

[16]. Kaze, A. D., Schutte, A. E., Erqou, S., and Kengne, A. P., 2017, Prevalence of hypertension in older people in Africa: A systematic review and meta-analysis. *Journal of Hypertension, 35*(7), 1345–1352, https://doi.org/10.1097/HJH.0000000000001345

[17]. Bigna, J. J., and Noubiap, J. J., 2019, The rising burden of hypertension in sub-Saharan Africa: A call to action. *Journal of Clinical Hypertension, 21*(4), 564–567, https://doi.org/10.1111/jch.13518

[18]. Jaffe, M. G., Frieden, T. R., Ordunez, P., Silva, L. C. E., and Campbell, N. R. C., 2023, Standardized hypertension treatment to reduce cardiovascular disease worldwide. *The Lancet, 401*(10378), 1205–1214, https://doi.org/10.1016/S0140-6736(23)00457-1

[19]. World Health Organization (WHO), 2023, HEARTS technical package for cardiovascular disease management in primary health care. *Geneva: WHO*.

[20]. Rabkin, M., and El-Sadr, W. M., 2011, Why reinvent the wheel? Leveraging the lessons of HIV scale-up to confront non-communicable diseases. *Global Public Health, 6*(3), 247–256, https://doi.org/10.1080/17441692.2011.552067

[21]. Zhou, B., Perel, P., Mensah, G. A., and Ezzati, M., 2021, Global epidemiology, health burden and effective interventions for elevated blood pressure and hypertension. *Nature Reviews Cardiology, 18*(11), 785–802, https://doi.org/10.1038/s41569-021-00559-8

[22]. Awuah, R. B., Anarfi, J. K., Agyemang, C., Ogedegbe, G., and Aikins, A. D. G., 2019, Prevalence, awareness, treatment and control of hypertension in urban poor communities in Accra, Ghana. *Journal of Hypertension, 37*(6), 1209–1217, https://doi.org/10.1097/HJH.0000000000002016

[23]. Noubiap, J. J., Bigna, J. J., Nansseu, J. R., Nyaga, U. F., Balti, E. V., Echouffo-Tcheugui, J. B., and Kengne, A. P., 2019, Prevalence of elevated blood pressure in children and adolescents in Africa: A systematic review and meta-analysis. *The Lancet Public Health, 4*(8), e375–e386, https://doi.org/10.1016/S2468-2667(19)30115-3

[24]. Adeloye, D., and Basquill, C., 2014, Estimating the prevalence and awareness rates of hypertension in Africa: A systematic analysis. *PLoS One, 9*(8), e104300, https://doi.org/10.1371/journal.pone.0104300

[25]. World Health Organization (WHO), 2021, Guideline for the pharmacological treatment of hypertension in adults. *Geneva: WHO*. https://www.who.int/publications/i/item/9789240033986

[26]. Iipinge, S. N., Pretorius, L., and Nampala, P., 2018, Hypertension prevalence and risk factors in peri-urban Namibia. *African Journal of Primary Health Care & Family Medicine, 10*(1), e1–e8, https://doi.org/10.4102/phcfm.v10i1.1705

[27]. Shidhika, O. M., Iipinge, S. N., and Kalomo, M. H., 2020, Risk factors and health-seeking behaviour of hypertensive patients in Namibia: A cross-sectional study. *African Journal of Primary Health Care & Family Medicine, 12*(1), e1–e7, https://doi.org/10.4102/phcfm.v12i1.2240

[28]. Jafar, T. H., Gandhi, M., Hotu, S., and Mendis, S., 2023, Evaluation of the WHO-HEARTS hypertension control package in primary care. *Heart, 110*(17), 1090–1096, https://doi.org/10.1136/heartjnl-2023-322111

[29]. Frieden, T. R., and Jaffe, M. G., 2018, Saving 100 million lives by improving global treatment of hypertension and reducing cardiovascular disease risk factors. *Journal of Clinical Hypertension, 20*(2), 208–211.

[30]. Ministry of Health and Social Services (MoHSS), 2017, National Multisectoral Strategic Plan for Prevention and Control of Non-Communicable Diseases *2017/18–2021/22*. *Windhoek: MoHSS*.

[31]. Ezzati, M., Pearson-Stuttard, J., Bennett, J. E., and Mathers, C. D., 2021, Acting on non-communicable diseases in low- and middle-income tropical countries. *Nature Reviews Cardiology, 18*(9), 639–653, https://doi.org/10.1038/s41569-021-00552-8

[32]. World Health Organization (WHO), 2021, Hypertension fact sheet. *Geneva: WHO*. https://www.who.int/news-room/fact-sheets/detail/hypertension

[33]. World Health Organisation (WHO), 2017, Best buys and other recommended interventions for the prevention and control of non-communicable diseases. *Geneva: WHO*.

[34]. Ministry of Health and Social Services, 2016, National Strategic Plan for the Prevention and Control of Non-Communicable Diseases *2016–2020*. *Windhoek: MoHSS*.

[35]. Southern African Development Community (SADC), 2019, SADC Strategy for the Prevention and Control of Non-Communicable Diseases *2020–2030*. *Gaborone: SADC Secretariat*.

[36]. Charlton, K., Ware, L. J., Menyanu, E., Biritwum, R. B., Naidoo, N., Pieterse, C., ... and Kowal, P., 2016, Leveraging ongoing research to evaluate the health impacts of South Africa's salt reduction strategy: A prospective cohort study. *BMJ Open,* *6*(11), e013316, https://doi.org/10.1136/bmjopen-2016-013316

[37]. Bloomfield, G. S., et al., 2016, Blood pressure screening and treatment among rural and urban residents in sub-Saharan Africa: A systematic review. *Journal of Clinical Hypertension, 18*(9), 889–894, https://doi.org/10.1111/jch.12809

[38]. Jaffe, M. G., Ordunez, P., Becerra, F., and Campbell, N. R. C., 2023, Implementation of Global HEARTS hypertension control programs in low- and middle-income countries. *Journal of the American College of Cardiology, 82*(13), 1274–1288, https://doi.org/10.1016/j.jacc.2023.08.043

[39]. Ordunez, P., Campbell, N. R. C., and Jaffe, M. G., 2023, Improving hypertension control at scale: Lessons from the HEARTS initiative. *The Lancet Regional Health – Americas, 19*, 100421, https://doi.org/10.1016/j.lana.2023.100421

[40]. Ordunez, P., Campbell, N. R. C., and Jaffe, M. G., 2023, Scaling up effective treatment of hypertension—A call to action. *Hypertension, 80*(3), 528–536, https://doi.org/10.1161/HYPERTENSIONAHA.122.20408