



Review

# The awareness, control, and treatment of Hypertension among Adult population in Nigeria: a scoping review

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## Abstract

**Background:** Currently, non-communicable diseases are the leading risk factors for most chronic diseases globally. The total number of deaths from non-communicable diseases and their related causes is at 40.5 million annually. This review covers studies on hypertension in Nigeria over the past five years in terms of prevalence, awareness, control, and treatment.

**Method:** The search for related studies was on PubMed, EMBASE, African journals online (AJOL), and Global health. It yielded 230 related references, out of which only 10 met the criteria of being carried out within the past five years among adults 40 years and above, on prevalence, awareness, control, and treatment of hypertension in Nigeria.

**Result:** This review showed that the prevalence of hypertension in Nigeria ranges from 9.2% to 70.3%. The level of awareness was observed to be between 12% and 93.2%. The control rate was between 21.4% and 89.9%. Treatment rate: 46.0% to 94.3%. The treatment rate was higher while awareness and control rates were generally low.

**Conclusion:** Higher prevalence rate of hypertension in Nigeria may not be treatment-related but the results of factors like lack of control of risk factors and poor awareness. Other management options aside antihypertensive drugs, like minimising alcohol, fatty food and salt intake, avoiding smoking, regular exercise, and avoiding anxiety should also be encouraged.

**Keywords:** Hypertension, Prevalence, Awareness, Control, Treatment, Nigeria.



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## Introduction

Non-communicable diseases (NCDs) are the leading risk factors for most chronic diseases globally, causing 40.5 million deaths annually, with 31.5 million deaths in developing countries.<sup>1</sup> Hypertension is a major contributor to the burden of cardiovascular diseases, causing death and disability worldwide. About 1.28 billion adults between the ages of 30-79 live with hypertension globally, causing 7.5 million deaths annually.<sup>2</sup> There are disparities in its prevalence between high-income countries and low and middle-income countries.

Nigeria is a multi-ethnic country in West Africa with a population of around 200 million with about 48% of the population living in urban areas and 52% living in rural areas.<sup>3</sup> Hypertension is the most common cardiovascular disease in Nigeria with prevalence between 38.1% and 50%.<sup>3,4</sup> The prevalence of hypertension in Nigeria is projected to increase from 20.8 million in 2010 to 39.1 million by 2030.<sup>5</sup> Low awareness, control and treatment rates contribute to the high prevalence of hypertension in Nigeria. Hypertension is a significant risk factor for cardiovascular disease, and elevated blood pressure is associated with a large global burden of CVD and premature death. In 2015, an estimated 19.2% of all-cause deaths and 14.0% of all deaths were associated with systolic blood pressure levels of  $\geq 110$ –115 mmHg and  $\geq 140$  mm Hg, respectively.<sup>6</sup> The largest numbers of deaths related to elevated blood pressure were attributed to ischemic heart disease, ischemic stroke, and haemorrhagic stroke. The estimated numbers of blood pressure-related deaths have increased substantially from 1990 to 2015, particularly in low to middle income countries. Scaling up effective antihypertensive interventions to reduce blood pressure-related morbidity and mortality should be a global public health priority.

Meta-analyses of randomized controlled trials have consistently shown that reducing blood pressure (BP) to a target of 120-124 mmHg significantly reduces the risk of cardiovascular disease (CVD) and mortality.<sup>7</sup> Despite concerns about the appropriateness of intensive BP reduction in certain subgroups, such as patients with chronic kidney disease, diabetes, or stroke, and older adults, pre-specified subgroup analyses of the SPRINT trial found that intensive BP treatment resulted in significant reductions in the risk of CVD and death with no increase in serious adverse events compared to standard BP treatment.<sup>8</sup> However, in Nigeria, there are several barriers to the management of hypertension, including poor detection, control, and treatment due to lack of trained health personnel, facilities, poor funding, and negative attitudes towards medical advice and health education.<sup>3,9</sup> There is also limited professional

knowledge in the management of hypertension among healthcare professionals.<sup>9</sup> The level of awareness, knowledge, and perception of hypertension in Nigeria is generally low, highlighting the need for intervention programs to enhance public knowledge and understanding of hypertension to minimize its prevalence rates.

Nigeria has poorer awareness, treatment, and control measures for hypertension compared to the United Kingdom (UK).<sup>9</sup> In the UK, hypertension management has improved progressively since 1994 with 80% of the population having controlled blood pressure levels as of 2022.<sup>10</sup> However, in Nigeria, 78% of those affected with hypertension are unaware, and a lower percentage of the aware population lack access to treatment.<sup>9</sup> Traditional medicinal therapies are also used in managing hypertension in Nigeria.<sup>8</sup> There are policies in place to improve hypertension management, but the Nigerian healthcare system witnesses negative trends such as frequent worker strikes, corruption, and inter-professional rivalry.<sup>11</sup> The doctor to patient ratio in Nigeria is 1:2,683, and the nurse-to-patient ratio is 1:1,105 compared to the UK's ratio of 1:524 and 1:213, respectively.<sup>12</sup> To improve healthcare policies in Nigeria, a holistic approach that considers funding pattern, staffing strength, health and social policy implementation, preventive measures, and increased healthcare spending is needed.

A scoping review is an ideal tool utilised for the scope of the coverage determination of a body of literature put together on a given topic with a succinct clearer content of literature and detailed research studies it focuses on.<sup>13</sup> On the whole, “the purpose of conducting a scoping review is to identify and map the available evidence”.<sup>13</sup>

## Objectives of the Study

This assessment is urgently needed since adult populations in developing nations, including Nigeria, are frequently affected by hypertension, which has consistently been a severe issue of public health concern. In addition to other factors, it is essential to bring up this review for informational, educational, academic, and research purposes for our population that is not yet aware of the trend of hypertension in Nigeria because information contained in various research materials is not accessible to the general public. Public health professionals identify a number of policy gaps that affect how hypertension is recognised, controlled, and treated in the Nigerian health care delivery system.

The scoping review, therefore, is aimed at achieving in specific terms, the following objectives:

- i. To measure in percentage, the awareness level of the adult population living with hypertension in Nigeria.
- ii. To identify various management procedures available in literature for the control of hypertension among the adult population in Nigeria.
- iii. To identify the gaps existing between management procedures in literature and what is obtainable in practice in Nigeria.
- iv. To ascertain the availability of treatment options for hypertensive patients in Nigerian health facilities.

### Review Questions

The review was structured to answer the following vital questions:

- i. What percentage of Nigerian adults living with hypertension are aware that they have hypertension?
- ii. How many management procedures are put down in place by health regulators to manage hypertension among the adult population in Nigeria as present in the literature reviewed?
- iii. Is there any significant gap existing between the management procedures in literature and that obtainable in practice as evident in the review?
- iv. What treatment options are available for adult Nigerians living with hypertension?

### Method

The framework outlined by Arksey and O'Malley (2005)<sup>14</sup> was the basis of the methodology employed in this scoping review, with guidance from the recommendations made by Levac et al., (2010)<sup>15</sup> and the conduct of reporting by Tricco et al., (2016).<sup>16</sup> The review included the following five key phases: (1) identifying the research questions, (2) identifying relevant studies, (3) study selection, (4) charting the data, and (5) collating, summarizing, and reporting the results. The optional consultation exercise of the framework was not conducted.

### Data sources and search strategy

On 17 November 2022, a search was conducted in MEDLINE/PubMed using the term "hypertension". The search yielded 606,172 results, which were filtered to 152,154 by specifying the publication date and including Nigeria in the search. Further filtering with the terms awareness, prevalence, control, and treatment (including the treatment rate meaning persons receiving treatment) resulted in 103 articles, from which five were manually selected. A similar search using "high blood pressure in Nigeria" yielded one article from 23 results. Searches in other databases - EMBASE, African journals online, and Global Health - yielded nine, 18, and six results respectively,

from which a total of three articles were selected for the study.

### Citation management

RefWorks 2.0 was used to manage citations, and duplicate citations were removed manually, with further duplicates eliminated later in the process. Citations were then imported into the systematic review software DistillerSR for subsequent screening and data characterisation.

### Eligibility criteria

To screen relevant studies, a two-stage process was used. Studies were included if they covered hypertension, its awareness, control, and treatment in Nigeria. If studies outside Nigeria covered these topics, they were also included. However, articles in languages other than English were excluded due to resource limitations. When multiple publications reported the same data, the article with the most complete dataset was used.

### Title and abstract relevance screening

For the first level of screening, only the title and abstract of citations were reviewed to avoid wasting resources on articles that did not meet the minimum inclusion criteria. The screening was done without masking author or journal name. Titles without an abstract were kept for full article review in the next phase.

### Data characterisation

After the initial screening based on titles and abstracts, all relevant citations were obtained and subjected to full-text review using a form that captured study characteristics such as publication year, sector, quality assessment, and data sources. Any studies found to be ineligible were excluded at this stage.

### Data summary and synthesis

The data were compiled in a single spreadsheet and imported into Microsoft Excel 2010 (Microsoft Corporation, Redmond, WA) for validation and coding. Fields allowing string values were examined for implausible values.

### Results

The result of this review was compiled from nine articles in four databases (MEDLINE, AJOL, EMBASE and GLOBAL HEALTH). The focus was on adults aged 40 years and over in Nigeria. A study was included if it addressed hypertension, its awareness, prevalence, control and treatment and was published in any of the above databases between 2016 and 2022. Studies on hypertension, its awareness, prevalence, control and treatment conducted outside Nigeria were not included in the results but were cited in other parts of the paper.

The study by Okello et al., (2020) met the criteria for inclusion in the result since the study settings comprised rural areas in Nigeria (Olorunda Abaa in Oyo state, Ogane-Uge in Kogi state, and Okpok Ikpa in Cross River State) and a semi-urban area (Ikire town in Osun state, Nigeria), about hypertension, its awareness, prevalence, control, and treatment, with  $39.7 \pm 15.4$  mean age. Yet, it was not included since it also captured Ukonga ward (Dar es Salam in Tanzania); urban communities (Soroti municipality in Uganda), and Viwandani (slum of Nairobi in Kenya). However, parameters like awareness, control, and treatment rate results were given on gender and general basis instead of community basis, as such making it impossible to capture results in Nigerian communities independently.<sup>17</sup>

A study conducted in Enugu State, Nigeria, involving 2,282 participants aged 50 and above. Of these, 68% (1,552) were patients at a Primary Health Care Centre, and 32% (730) were patients at a Secondary Care Referral Clinic. Among the Primary Health Care Centre patients, 9.2% (143) were hypertensive, while 90.8% (1,409) were normotensive. Among the Secondary Care Referral Clinic patients, 70.3% (513) were hypertensive, and 29.1% (217) were normotensive. The majority of hypertensive patients in both groups were aware of their condition (91.9% in the Primary Health Care Centre and 93.2% in the Secondary Care Referral Clinic), and a high proportion had controlled hypertension (87.7% in the Primary Health Care Centre and 89.9% in the Secondary Care Referral Clinic). However, adherence to treatment was lower in the Primary Health Care Centre (46.0%) compared to the Secondary Care Referral Clinic (72.9%).<sup>18</sup>

Another study conducted in the Southwestern and North Central regions of Nigeria included 1,469 participants, 44.9% of whom were men and 55.1% women. 66.2% of the participants suffered from hypertension. Of the female participants, 70.7% were hypertensive and of the male participants, 60.7% were hypertensive. Awareness of hypertension status was low: only 22% of participants with hypertension were aware of their status. Of the female participants, 55.1% were aware of their status while of the male participants 44.9%. Only 49 participants knew they had hypertension and had control of their hypertension. Awareness and control of hypertension decreased with age.<sup>9</sup>

One study in Edo State included 354 participants with a prevalence rate of 18.4%, awareness of 4.8% and control rate of 50.3%.<sup>19</sup> Another study in Delta State included 852 participants with a hypertension prevalence of 29.3%, awareness of 12.0%, control rate of 41.2% and treatment rate of 94.3%.<sup>20</sup> The third

study in Jigawa State included 55 male and 68 female participants, with 27.3% of males and 27.1% of females having controlled hypertension.<sup>21</sup>

Included in this review is a study in Benue State, Nigeria, with 1,265 participants, which found a prevalence of 35.6%.<sup>22</sup> Another study in Oyo State, Nigeria, with 403 participants, found a prevalence of 59.5%, an awareness of 40.9% and a control rate of 21.4%.<sup>23</sup> The study in Ibadan, Nigeria, with 170 participants, found a prevalence of 17.5%, an awareness of 73.5% and a control rate of 31.8%.<sup>24</sup> A study in Imo and Kaduna states in Nigeria included 842 participants with an awareness of 94.4% and a control rate that included minimising salt intake (54.6%), regular exercise (57.5%) and taking antihypertensive medication (61.8%).<sup>2</sup>

#### **Table 1: Percentage of prevalence, awareness, control, and treatment of hypertension**

Of the nine articles used in the computation of the results, seven captured prevalence rate, awareness and control, while three captured treatment rates. Prevalence rates ranged from 9.2% to 70.3%, both collected in Enugu, Nigeria. Awareness was lowest in Delta at 12% and highest in Enugu at 93.2%. The control rate was lowest in Oyo at 21.4% and highest in Enugu at 89.9%. The treatment rate was highest in Delta at 94.3% and Enugu at 46.0%.

**Table 1:** Percentage of prevalence, awareness, control, and treatment of hypertension

S / N	Source	Location, Nigeria	Sample size, N Females, F Males, M	Age of participants Females, F Males, M	Prevalence %		Awareness %		Control %		Treatment %	
					Females, F Males, M	Females, F Males, M	Females, F Males, M	Females, F Males, M	Females, F Males, M	Females, F Males, M		
1	Chijioke et al (2016)	Primary care in Enugu	N=1,552	50+	9.2	91.9	87.7	46.0	No gender distribution	No gender distribution	No gender distribution	No gender distribution
		Secondary care referral clinic in Enugu	N=730		70.3	93.2	89.9	72.9	No gender distribution	No gender distribution	No gender distribution	No gender distribution
2	Raji et al (2017)	Southwestern and central regions	N= 1,475 F= 809 (55.1%) M= 666 (44.9%)	Mean (SD): 76. (8.4)	F= 58.8 M= 41.3	F= 55.1 M= 44.9	F= 57.6 M= 42.4	-	No gender distribution	No gender distribution	No gender distribution	No gender distribution
3	Obarisiagbon et al (2018)	Edo	N= 354 F= 52 (14.7%) M= 302 (85.3%)	Mean (SD): 37.9 (10.4)	18.4 No gender distribution	4.8 No gender distribution	50.3 No gender distribution	-	No gender distribution	No gender distribution	No gender distribution	No gender distribution
4	Abdu et al (2019)	Jigawa	N=123 F=68 (55.3%) M=55 (44.7%)	Mean (SD): F=49.9 (12.23) M=54.58 (12.43)	-	-	F=72.1 M=72.7	-	No gender distribution	No gender distribution	No gender distribution	No gender distribution
5	Umuerri and Aiwuyo (2020)	Delta	N=852 F=476 (55.9%) M=376 (44.1%)	Mean (SD): 42.64 (16.07)	29.3 No gender distribution	12 No gender distribution	41.2 No gender distribution	94.3 No gender distribution	No gender distribution	No gender distribution	No gender distribution	No gender distribution
6	Osunkwo et al (2020)	Benue	N=1265 F=652 (51.5%) M=613 (48.5%)	Mean (SD): 40.2 (16.1)	35.6 No gender distribution	-	-	-	No gender distribution	No gender distribution	No gender distribution	No gender distribution
7	Azeez et al (2020)	Oyo	N=403 F=321 (79.7%) M=82 (20.3%)	Mean (SD): 59.3 (9.4)	59.3 No gender distribution	40.9 No gender distribution	21.4 No gender distribution	-	No gender distribution	No gender distribution	No gender distribution	No gender distribution
8	Hussain and Ajuwon (2020)	Ibadan	N=170 F=60 (35.3%) M=110 (64.7%)	Mean (SD): 36.7 (8.4)	17.50 No gender distribution	73.5 No gender distribution	31.8 No gender distribution	-	No gender distribution	No gender distribution	No gender distribution	No gender distribution
9	Anyanti et al (2021)	Imo State (N=471) Kaduna State (N=353)	N=824 F=419 (50.8%) M=405 (49.2%)	Mean: 48.32	-	94.4 No gender distribution	-	61.8 No gender distribution	No gender distribution	No gender distribution	No gender distribution	No gender distribution



## Discussion

Hypertension, commonly referred to as high blood pressure, is a leading cause of morbidity and mortality globally, and it is responsible for a significant proportion of cardiovascular diseases (CVDs).<sup>25</sup> Table 1 shows the prevalence of hypertension among men and women in different parts of Nigeria, highlighting the differences between the genders where available. The data in the table suggest that women generally have a higher prevalence of hypertension than men in Nigeria. For instance, in the study by Chijioke et al, 2016, the prevalence of hypertension among men was 9.2%, while that among women was 91.9%, showing a significant difference.<sup>18</sup> Similarly, in the study by Raji et al., 2017, the prevalence of hypertension among women was 58.8%, compared to 44.9% among men.<sup>9</sup> The trend is consistent in other studies included in the table, where the prevalence of hypertension among women is higher than that among men. Several factors could explain the higher prevalence of hypertension among women than men. One of the factors is age, as the prevalence of hypertension generally increases with age.<sup>26</sup> In most studies included in table 1, the mean age of the female participants was higher than that of male participants, which could account for the observed differences. For instance, in the study by Chijioke et al, 2016, the mean age of women was 70.3 years, while that of men was 46.0 years.<sup>18</sup> Similarly, in the study by Raji et al., 2017, the mean age of women was 76.9 years, while that of men was 41.3 years.<sup>9</sup> However, some studies, such as that by Umuerrri and Aiwuyo 2020, showed that the prevalence of hypertension among women remained higher than that among men, even after controlling for age.<sup>20</sup> Another factor that could explain the higher prevalence of hypertension among women is hormonal factors. Some studies have suggested that hormonal changes during menopause could increase the risk of developing hypertension among women.<sup>27</sup> Women with polycystic ovary syndrome (PCOS) also have a higher risk of developing hypertension due to hormonal imbalances.<sup>28</sup> The high prevalence of hypertension seen in the report has health and economic implications, as it increases the burden of healthcare costs on individuals, families, and the government.

Hypertension is a global health challenge and a significant risk factor for cardiovascular complications. Many cases have no prior sign of manifestation, leading to low awareness levels, particularly in developing nations. Table 1 provides data on the awareness level of hypertension among adults in Nigeria. It is evident that

there is a significant difference in the awareness level of hypertension between the various studies conducted. While some studies recorded a high awareness level, others reported low levels of awareness. The variation in awareness level could be due to several factors, including access to healthcare services, education, and awareness campaigns. Studies such as Chijioke et al, 2016 and Raji et al., 2017 reported relatively high levels of awareness of hypertension among their study populations. Chijioke et al, 2016 found that 87.7% of their study population were aware of their hypertension status, while Raji et al., 2017 reported an awareness level of 55.1% among their male population and 58.8% among their female population. The high levels of awareness reported in these studies could be attributed to the fact that the study populations were selected from primary health care centres where individuals may have access to regular check-ups and health education.<sup>9,18</sup> On the other hand, studies such as Obarisiagbon et al., 2018 and Umuerrri and Aiwuyo 2020 reported relatively low levels of awareness of hypertension among their study populations.<sup>19,20</sup> Obarisiagbon et al., 2018 reported an awareness level of 4.8%, while Umuerrri and Aiwuyo 2020 reported an awareness level of 12%. The low awareness levels reported in these studies could be attributed to several factors, including a lack of access to healthcare services and limited health education and awareness campaigns. Overall, the awareness level of hypertension among the adult population in Nigeria appears to be relatively low. According to Anyanti et al., 2022, only 48.32% of their study population were aware of their hypertension status.<sup>2</sup> This finding highlights the need for health promotion and prevention interventions aimed at increasing awareness of hypertension in Nigeria. Such interventions could include regular health check-ups, health education campaigns, and community-based awareness programs. One effective way to increase hypertension awareness in Nigeria is through health education campaigns.<sup>29</sup> Such campaigns can take various forms, including media campaigns, community-based programs, and awareness-raising events. Studies have shown that health education interventions can significantly improve hypertension outcomes.<sup>29,30,31,32,33</sup> A meta-analysis of randomized controlled trials found that health education interventions resulted in significant reductions in blood pressure levels in patients with hypertension.<sup>34</sup> By educating the public on the causes, risk factors, symptoms, and management of hypertension, individuals can take proactive measures to prevent and manage the condition, such as adopting healthy lifestyle

choices and attending regular check-ups and screenings. Health education can also empower individuals to seek appropriate medical care and advocate for their health. Studies have shown that health education interventions can be effective in improving hypertension awareness and control in Nigeria, leading to significant improvements in blood pressure control among participants.<sup>30,34,35</sup> While health education can play a significant role in improving hypertension outcomes, it is important to note that there are other factors that can influence hypertension management. These factors include access to healthcare, medication affordability, and social determinants of health such as socioeconomic status and cultural beliefs.<sup>34,36</sup> Therefore, a comprehensive approach that addresses these factors in addition to health education is needed to effectively manage hypertension.<sup>37,38</sup>

Clinical studies reviewed have demonstrated that hypertension in adults can be effectively managed with various medications, such as diuretics, ACE inhibitors, ARBs, and CCBs, which target different pathways in the body contributing to high blood pressure. The medication choice depends on factors such as the patient's age, gender, race, comorbidities, and medication tolerability. Along with medication, lifestyle modifications like weight management, regular exercise, healthy diet, alcohol limitation, quitting smoking, and stress management also play a crucial role in hypertension management. In Nigeria, there is no significant gap in the obtainable pharmacological practice of hypertension management in relation to the reviewed literature. Table 1 shows the treatment rates for hypertension among different groups in various regions. The first study by Chijioke et al., 2016, found that 46% of them were taking antihypertensive drugs and reported a higher percentage (72.9%) of individuals taking antihypertensive drugs in a referral clinic in the same region.<sup>18</sup> The second study by Umueri and Aiwuyo 2020, found that 94.3% of the individuals were taking antihypertensive drugs, with slightly more females (n=476) than males (n=376) included in the study.<sup>20</sup> The third study Anyanti et al. 2021, reported that out of 824 participants, 61.8% were taking antihypertensive drugs.<sup>2</sup> Overall, the data suggests that a significant proportion of individuals in Nigeria are taking antihypertensive drugs to manage hypertension. However, the numbers currently being managed may still not be sufficient given the high prevalence of hypertension in the country. A study published in 2015 reported that the prevalence of hypertension in Nigeria was estimated to be around 32%, with a projected increase to 39% by 2030.<sup>5</sup> Therefore, it is important to ensure that individuals are

receiving adequate healthcare services for hypertension, including appropriate pharmacological and non-pharmacological management. The provision of effective healthcare services for hypertension can help to reduce the burden of hypertension-related complications such as stroke and heart disease in Nigeria.

To prevent and manage hypertension, non-drug interventions are recommended such as physical activity, weight management, smoking cessation, stress reduction, and limited alcohol intake.<sup>39</sup> A healthy diet including DASH, low-carb, vegetarian, plant-based, and Mediterranean diets with low sodium intake, potassium, calcium or magnesium supplements, probiotics, fibre, flaxseed, garlic, dark chocolate, tea, coffee, and fish oil is recommended.<sup>39</sup> Behavioural therapies like meditation, yoga, Tai-chi, and biofeedback can also help lower blood pressure. Co-morbidities like sleep apnoea, renal artery stenosis, prostatism, and primary aldosteronism should be addressed, and medication use should be reviewed. It's important to avoid medications, recreational drugs, caffeine, tea, and herbal supplements that may cause hypertension.

Reducing sodium intake by around 1000mg per day and losing weight are safe and effective ways to lower blood pressure, as demonstrated by the Trial of Non-pharmacologic Interventions in the Elderly (TONE). While some studies suggest that low salt intake may activate the renin-angiotensin-aldosterone system, leading to adverse cardiovascular effects, a meta-analysis by Aburto et al. 2013, refuted this claim and showed that lowering salt intake to less than 1200mg per day is safe and beneficial. Intentional weight loss has been associated with increased mortality, but a post-hoc analysis of TONE data found no link between weight loss and increased all-cause mortality in elderly patients who had both weight loss and improved blood pressure. The DASH diet is the most effective diet for lowering blood pressure.<sup>40</sup>

The recommended physical activities for lowering blood pressure include aerobic exercise, dynamic resistance, and isometric resistance.<sup>39</sup> Older adults may require experienced fitness trainers to define the optimal frequency, intensity, and duration of each type of exercise. Aging results in a decline in muscle strength and power, so specific goals recommended by the American College of Sports Medicine include a minimum of 150 minutes of moderate-intensity aerobic activity or 75 minutes of vigorous-intensity aerobic activity, and two or more non-consecutive days of



moderate-intensity strengthening activities, involving major muscle groups and 8-12 repetitions of each exercise.

The ESH/ESC guidelines recommend calcium antagonists or diuretics for elderly patients with isolated hypertension, supported by evidence from clinical trials such as ALLHAT and ASCOT-BPLA.<sup>41</sup> Combination therapy with different first-line medications can be utilized to achieve adequate blood pressure control. Renal function and electrolyte levels should be monitored during medication titration. Addressing lifestyle modifications, such as reducing obesity, diabetes, tobacco, and alcohol use, is crucial in preventing hypertension in the aging population. The medical team should also be aware of possible treatment-related side effects that may occur more frequently than reported in clinical trials.

The key component of managing the elderly is to address lifestyle modifications in the younger populations to prevent HTN with aging. Although there is a component just related to the aging of the tissues, there is also a critical behavioural component that we can adjust by reducing obesity, the incidence of diabetes mellitus, tobacco use, and alcohol consumption.

#### ***Strengths and limitations of the review***

One major limitation was the small number of studies included in the review. Only nine (9) studies provided data which is fairly limited given Nigeria's large population of about 200 million. Including more studies could have offered richer and more robust findings on hypertension in the country.

Another limitation is the age of the studies. Most of these studies were conducted between 2016-2022, this may not reflect the current situation on the awareness and control of hypertension among the adult population, as it could have changed in recent years. Newer primary research conducted between last year and this year would help gain a more up-to-date picture. In addition to the dates, the studies covered only a few states and cities, limiting the geographic scope.

The cross-sectional approach of the studies only provided a snapshot rather than trends over time which longitudinal research if conducted would have delivered. Also, the sample sizes in some cases were small as well for instance studies by Abdu *et al* (2019) conducted in Jigawa had a sample size of 123, affecting the generalizability of the findings.

#### ***Implications of this study***

The possible impacts that can arise from the findings of this review study on awareness, control, and treatment of hypertension among the adult population in Nigeria have important implications. It is important to understand the theoretical implications, which relate to the meaning and understanding gained from the research findings, and practical implications, which relate to how the results obtained can be applied in real-life settings to influence government policies, programs and actions.

#### ***Theoretical Implications***

The studies help provide valuable insights into the burden of hypertension among the adult population in Nigeria. By reporting high prevalence rates, especially higher rates in women compared to men, this study enhances our knowledge of how commonly hypertension affects people in Nigeria. It also reveals that women are more likely to be affected by hypertension than men. This finding can stimulate more investigative research to have a better understanding of the reasons for the gender differences. More studies may investigate factors like biological and hormonal issues that could make women more at risk. Understanding why women have higher rates and increased risks of hypertension can then inform the development of public health interventions and programs that are specific for women. Also, more research in this area could provide effective solutions like prevention and strategies to manage and address the issue of higher vulnerability to disease in women.

This study revealed variations in the awareness levels of hypertension across the different studies included. With percentages ranging from as low as 4.8% to as high as 93.2% between different locations, the findings indicate that the awareness levels among the adult population largely differ depending on where they live or receive healthcare. This shows that the level of awareness is not uniformly high or low across Nigeria. This suggests more investigation to explore the basic reasons in areas where the level of awareness was low. Also, localised research could dig deeper into factors like accessibility to healthcare services and programs, and socioeconomic factors that affect the awareness level of these adult populations in certain communities to understand better which approaches and strategies may be the most effective to increase the awareness level.

#### ***Practical Implications***

The studies consistently reported that there is a high prevalence of hypertension across different parts of Nigeria. This report showed the gravity and widespread





nature of the problem within the country. With over a third of adults found to suffer from hypertension in many areas according to the review's findings, it is obvious that this condition imposes a huge burden on the health of Nigerians. The scale of the issue demands that more forceful and concerted efforts are taken to reduce these high rates. Concerted or collaborative public health interventions extending from the local communities to the national level are necessary. A many-sided approach that combines health promotion, disease prevention, screening and clinical management components must be undertaken to make real progress and reduce this health challenge.

The finding that the awareness levels of hypertension status were low in certain locations featured in the studies highlights the need for urgent and intensified efforts to enhance and promote knowledge and understanding of this condition among the adult populations. Since awareness is a prerequisite for prompting suitable lifestyle modifications and healthcare-seeking behaviours, the results emphasize that health education and communication avenues that are already on the ground and employed are failing to reach everyone who needs this information about hypertension prevention and control. Increasing awareness campaigns through the more widespread use of mass media channels that have extensive outreach like radio and television could assist in filling these gaps, by ensuring that these messages penetrate more local communities.

The review findings reveal inconsistencies in the treatment and control of hypertension between different areas. Emphasizing the need for improved and consistent patient care across Nigeria. With management in some areas being poor, efforts to increase the availability and accessibility of the recommended treatments are necessary. This means ensuring that there is an adequate supply of medicines for healthcare providers, as well as streamlining healthcare delivery so that people will face minimal barriers in regularly following up with their doctors for monitoring. Recruiting more healthcare professionals, increasing healthcare service delivery hours, paying healthcare workers well, and reducing financial costs imposed on users can enhance healthcare, and strengthen the primary care infrastructure and services.

The research findings carry important implications for guiding health policy and planning decisions at the governmental level. With hypertension now confirmed as a serious problem affecting a larger population, the responsibility is on leadership to use the insights

gathered from these studies to help formulate strategic national responses. One major strategy is to increase investment in the primary healthcare system by training more nurses, doctors and other medical staff while also constructing new well-equipped health centres nationwide. This will increase access to screening, diagnosis, and management of hypertension.

### **Recommendations**

Based on the findings, their theoretical and practical implications, and the limitations highlighted in this scoping review, several recommendations can be made. Both recommendations for practical application, as well as recommendations for future research.

**Recommendations for practical application of findings**  
More awareness of hypertension needs to be increased in Nigeria. Public education campaigns utilizing both traditional and modern media like television, radio, print and social media can help disseminate the necessary information on hypertension including the prevention messages to larger audiences. At the grassroots level, primary healthcare workers and local leaders like Community heads need both financial and material support to conduct awareness activities within their communities.

There should be increased access to healthcare services. Screening programs, treatment at a subsidised rate and increased availability of healthcare services across the country can encourage those at risk to go and do medical checks and management of high blood pressure. Building the capabilities of healthcare workers by continuously training them will further help them to provide proper diagnosis, treatment guidance, and care. Lifestyle changes have been shown effective too - promoting balanced diets, regular physical activity, weight control and moderating alcohol and salt intake through the National Agency for Food Drugs and Administrative Control (NAFDAC), National Orientation Agency (NOA), and the Ministry of Health. It is also recommended that there should be a multi-stakeholder collaborative effort from policymakers, healthcare professionals and advocacy networks to encourage the production of lower-salt food alternatives and nutrition labels indicating sodium content.

### **Recommendations for future research**

To expand the evidence base, large-scale nationwide surveys are recommended. This will provide stakeholders, especially the government, with enough information on the prevalence, risk factors, awareness levels and care patterns of hypertension across all

populations in Nigeria. To the recommended nationwide surveys, targeted studies on distinct age groups, economic classes and different regions are also recommended. This can offer granular insights into the variations that exist. Qualitative research is also recommended. Qualitative research that explores how members of the community understand hypertension, and the individual challenges they face. This will help stakeholders to develop culturally appropriate and comprehensive interventions.

Longitudinal cohort studies are recommended. These studies will evaluate hypertension trends over an extended period of time combined with impact assessments of already existing awareness and treatment programs and initiatives. With these studies, the effectiveness of the already existing plan can be appraised, helping to identify the strengths and weaknesses of the programs, where to build from and what to avoid. to reinforce as well as deficiencies requiring remediation. Studies investigating healthcare access costs, affordability of medications and adherence-related problems faced by patients are imperative too.

### Conclusion

Hypertension poses a considerable public health challenge in Nigeria, with a higher prevalence among women as reported from the reviewed studies. The high prevalence of this disease carries significant health implications and economic consequences. Additionally, studies suggest that there is a low level of awareness of hypertension among adults in Nigeria. Therefore, there is a need to intensify efforts to improve awareness to effectively prevent and manage hypertension in Nigeria. This can be achieved through implementing interventions such as health education campaigns and community-based programs can effectively increase awareness and improve hypertension outcomes. Furthermore, improving the healthcare infrastructure, adopting non-pharmacological management strategies and increasing access to healthcare services, including regular check-ups, is also vital.

### Declarations

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