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# Healthcare practitioners' Knowledge and Awareness on current guideline for management of hypertension in Nigeria: A cross-sectional web-based survey

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## Abstract

**Background:** Hypertension is the most common cardiovascular disease in Nigeria. Adequate knowledge of healthcare practitioners on current guidelines management of hypertension have been associated with a reduction in its morbidity and mortality.
**Objective:** This study aimed to determine the knowledge and awareness of health workers on current guideline in management of hypertension.
**Methods:** This was a descriptive cross-sectional web-based survey of 396 Nigerian health workers. An adopted self-administered e-questionnaire was used to collect data related to health workers' characteristics. SPSS version 22.0 was used to determine awareness, knowledge scores/grades and descriptive statistics.
**Results:** Data analyzed showed 54.7% were male and predominant age group 38.5% was 40-49 years. A proportion of 50.8% were specialists and 60.1% practice in tertiary hospitals. Only 41.2% were very familiar with current guidelines though majority 76.7% of the participants were very confident that patients should continue taking their drugs when blood pressure is controlled. The median knowledge score was 2/6 and very few 6.8% had good knowledge grade(5-6/6). No association was found between knowledge grade and studied factors.
**Conclusions:** The knowledge of the current guidelines is not optimal, even though both international and national hypertension guidelines are available to health workers. There is urgent need for comprehensive nationwide increased awareness and advocacy for its use among healthcare practitioners for effective improvement in the care of patients with hypertension in Nigeria.

Key words: Hypertension, guideline, health workers, knowledge and awareness

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## Introduction

An estimated 29–38% adult Nigerians are hypertensive. This makes hypertension the most common cardiovascular disease in Nigeria.[1,2,3] In Nigerian urban hospitals, around 25% of emergency medical admissions are due to hypertension and associated consequences.[4] It is the most prevalent risk factor for dementia, heart failure, stroke, and chronic renal disease.[4] Maintaining blood pressure control and managing all recognised risk factors for cardiovascular disease, such as lipid disorders, diabetes or glucose intolerance, obesity, and smoking, are the objectives of treating hypertension with therapeutic interventions.[5]

It is then imperative that efforts be kick-started to reduce the morbidity and mortality related to hypertension. Some of these programs aimed at reducing the menace of hypertension in Nigeria include education and awareness campaigns, early diagnosis, adequate treatment and follow up. The National hypertension Control Initiative is a collaboration between Nigeria and the World Health Organization aimed at reducing the prevalence of hypertension by creating awareness, proper and early diagnosis and instituting adequate treatment and control.[6] The most recent nationally representative data show that the prevalence of age-standardized hypertension in Nigeria is 38%. Additionally, poor rates of hypertension awareness (60%), treatment (34%), and control (12%) were also recently reported.[7] These figures need to change positively for the improved health of the citizens.

Several hypertension treatment guidelines have been designed and made available globally for a better hypertension control. These guidelines have the potential to enhance the control of hypertension. Nevertheless, there is a significant disparity between the knowledge proposed guidelines and the actual clinical practices.[8,9]

Kadiri, et al in 2020 published the "Guidelines for the management of Hypertension in Nigeria.[10] This and other guideline are easily accessible to the healthcare practitioner.[5] To ensure adequate awareness, treatment, prevention, and management of hypertension in sub-Saharan Africa, a comprehensive strategy involving patients, physicians, and the government is essential.[11] The healthcare practitioner is the person at the center of the plan to reduce the impact of hypertension in Nigerian. Guidelines are followed to decide: whether to start therapy, when to start therapy, what kind of therapy to start, and the positive impact of changing one's lifestyle. He is the person that patients consult to make diagnosis of ailments. Thus, healthcare practitioners play a central role in diagnosis and management of hypertension. We therefore aim to determine the knowledge and awareness of health practitioners on current guideline in management of hypertension.

## Methods

**Study Design and setting:** This was a descriptive cross-sectional web-based survey conducted from 16th May to 13th August 2023 among health workers in Nigeria. Nigeria is the most populous country in Africa.[12] It is a sovereign nation in West Africa, the Gulf of Guinea borders it in the South, the Republic of Benin borders the nation on the west, the Republic of Cameroon borders it on the east, likewise the Republics of Chad and Niger border it on the north.[12]

Life expectancy in Nigeria and healthy life expectancy increased by 18% to 64·3 years between 1998 and 2019, mortality decreased for both males and females across all age categories, with large gains for children younger than 5 years (more than 50% reductions for both boys and girls), those aged 5–9 years, and women aged 15–34 years, had reductions in mortality of more than 40% and by 2018, the country's health expenditure per person had risen from the 11th to the third highest in west Africa.[13]

Mortality rates decreased for all ages in Nigeria between 1998 and 2019, One of the numerous challenges in the healthcare system in the country is the maldistribution of skilled health professional.[14]

Study procedure: The adopted self-administered e-questionnaire from Ahmad et al tool[8] as shown in appendix 1 was used to collect information regarding sociodemographic and professional profile of health workers as well as their knowledge and awareness of current guidelines in hypertension management.

The e-questionnaire was designed in a Google form and the link was sent to approximately 1000 Nigerian health workers via their Whatsapp address. The selection of health workers to participate in the

survey was done randomly. The participants were asked to click on the consent box before proceeding to answer the procedure. All questions asked were scored 1 for correct option and 0 for all incorrect option. A pilot study was carried out by test running the questionnaire among 5 resident doctors in our tertiary hospital.

**Data analysis:** Data were captured in Microsoft Excel, cleaned and exported to SPSS 22.0 for analysis. After the initial descriptive statistics of the demographic and professional characteristics of respondents and presented in appropriate frequency tables. Responses from 27 non-clinical health workers were excluded from subsequent analysis, only data from 369 clinical health workers were included in final analysis. Non-clinical health workers comprise of health administrators/manager, dietician, engineer, laboratory pathologist and scientist, physiotherapist, administrative and health information officers.

Categorical variables were summarized as frequencies and percentages and continuous variables were summarized as means ± SD. The score derived from the knowledge section was categorized into 3 grades: good grade (5 or 6), fair grade (3 or 4) or poor grade (less than 3). The level of awareness of health workers with the current guidelines and how confident they are in following the guidelines were also evaluated. Correlation between knowledge grades and sociodemographic/professional profiles of participants were tested. Statistical significance level was set at a p-value less than 0.05 (using alpha error 5%).

## Results

A total of 396 health workers filled the e-questionnaire, this gave a response rate of 39.6% which was lower to the average online survey response rate of 44.1% from a meta-analysis by Wu et al,[15] but higher than the response rate of 18.2% reported by Mailu et al.[16] The predominant (38.4%) age group was 40-49 years and 54.5% were males, which was comparable after excluding the non-clinical health workers, the predominant (37.4%) age-group was still 40-49 years and 53.4% were male. A proportion of 50.8% of participants were specialist and 60.1% practice in teaching hospitals.

Table 1: Sociodemographic Characteristics and Professional Profile of 396 studied health workers

| Variable | Freq (%) |
|---|---|
| Gender | |
| Male | 216(54.5) |
| Female | 176(44.5) |
| Missing | 4(1.0) |
| Age group (years) | |
| 20-29 | 18(4.5) |
| 30-39 | 121(30.6) |
| 40-49 | 152(38.4) |
| 50-59 | 75(19.9) |
| 60-69 | 18(4.5) |
| >=70 | 7(1.8) |
| Missing | 5(1.3) |
| Institution of Practice | |
| General hospital | 87(22.0) |
| Non-clinical | 13(3.3) |
| Private hospital | 23(5.8) |
| Primary health care | 2(0.5) |
| Specialist/teaching hospital | 238(60.1) |
| Missing | 33(8.3) |
| Location | |
| Rural | 39(9.8) |
| Suburban | 62(15.7) |
| Urban | 289(73.0) |
| Missing | 6(1.5) |
| Profession | |
| Community health extension worker | 3(0.8) |
| Medical officer | 60(15.2) |
| Residents | 40(10.1) |
| Nurse | 52(13.1) |
| Pharmacist | 7(1.8) |
| Clinical Specialist | 195(49.2) |
| Non-clinical Specialist | 6(1.4) |
| Non-clinical health worker | 26(6.6) |
| Missing | 7(1.8) |
| Years of practice | |
| <1 | 6(1.5) |
| 1-4 | 49(12.4) |
| 5-10 | 93(23.5) |
| >10 | 245(61.9) |
| Missing | 3(0.7) |
| Institution of practice | |
| Government organization | 305(77.1) |
| Non-governmental organization | 10(2.5) |
| Private organization | 74(18.7) |
| Retire | 1(0.2) |
| Missing | 6(1.5) |
| Specialist Status | |
| Internal med/Fam physician | 95(24.0) |
| Surgeon/Dental/Anaesthesio | 44(11.1) |
| Obstretric and Gynecology | 15(3.8) |
| Public health physician | 22(5.5) |
| Paediatrician | 19(4.8) |
| Non-Clinical Specialist | 6(1.5) |
| Non-specialist clin healthworker | 162(40.9) |
| Non-clinical health worker | 26(6.6) |
| Missing | 7(1.8) |

Other socio-demographic characteristics and professional profile of the study participants are shown in Table 1.

### *Hypertension Knowledge and familiarity of Participants with Hypertension guidelines*

Out of the 369 clinical health workers that participated, the predominant (median) knowledge score of the participants was 2/6 and only 6.8% had good knowledge grade. The percentage of health workers for each knowledge score and each knowledge grade are presented in figure 1 and

figure 2 respectively. However, 41.2% were very familiar with current guidelines in hypertension management and the majority (76.7%) of the participants were very confident that patients should continue taking their drugs when blood pressure is controlled. Table 2 below shows how participants fare in relation to level of confidence of practice, familiarity with current Hypertension management guidelines and frequency of encounters with patients that stopped their antihypertensives without consulting health professional. Response of participants to questions on hypertension guidelines are shown in Table 3 below.

In Table 4, we compared knowledge grade of participants with their gender, years of practice, specialty and employer statuses, while figure 3a-d depicted relationship between knowledge grade and different age-groups, health facilities, health professions as well as locations of practice. The sociodemographic/professional profile of participants were found not to be statistically significant with their Knowledge grade.

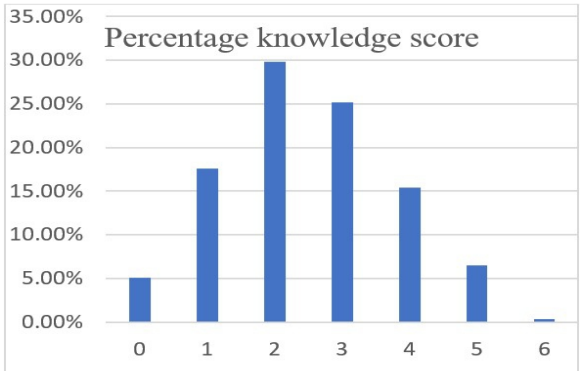


Figure 1: Hypertension guideline knowledge scores among the 369 health workers

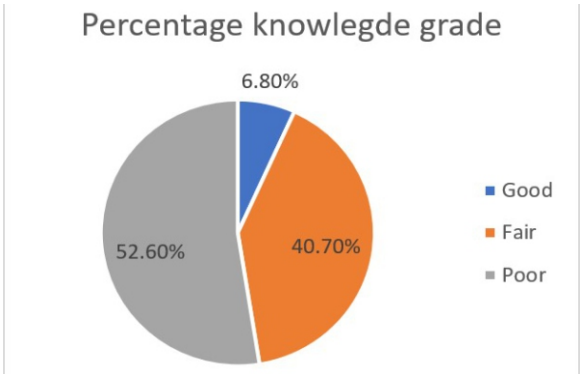


Figure 2: Hypertension guideline knowledge grade among the 369 health workers

Table 2: Responses to questions regarding confidence of practice and familiarity with hypertension management guidelines among the 369 health workers

| Questions | Freq(%) |
|---|---|
| 1. How confident are you that it is right for patients to continue BP lowering drugs after achieving normal BP control? | |
| Don't know | 2(0.5) |
| Not confident | 8(2.2) |
| Somewhat confident | 73(19.8) |
| Very confident | 283(76.7) |
| Missing | 3(0.8) |
| 2. How familiar are you about the current hypertension guideline? | |
| Not sure | 12(3.3) |
| Not familiar | 34(9.2) |
| Somewhat familiar | 163(44.2) |
| Very familiar | 152(41.2) |
| Missing | 8(2.2) |
| 3. How often do you encounter patients who stopped taking their antihypertensive medication without consulting a healthcare professional: | |
| Frequently | 293(79.4) |
| Occasionally | 63(17.1) |
| Rarely | 6(1.6) |
| Never | 2(0.5) |
| Missing | 5(1.4) |

Table 3: Responses of 369 health workers with regards questions on knowledge of hypertension management guidelines

| Questions | No (%) |
|---|---|
| 1. What is the range of normal Systolic blood pressure(mmHg)? | |
| a. Less than 120 | 105(28.5) |
| b. 90-139 | 178(48.2) |
| c. Less than 140 | 70(19.0) |
| d. Less than 150 | 0(0) |
| e. Less than 160 | 0(0) |
| f. Others (Please specify ----------) | 9(2.4) |
| g. Missing | 7(1.9) |
| 2. What is the range of normal Diastolic blood pressure(mmHg)? | |
| a. Less 80 | 88(23.8) |
| b. 60-89 | 185(50.1) |
| c. Less than 90 | 80(21.7) |
| d. Less than 100 | 4(1.1) |
| e. Less than 110 | 2(0.5) |
| f. Others (Please specify ----------) | 6(1.7) |
| g. Missing | 4(1.1) |
| 3. What is the primary goal of antihypertensive treatment? | |
| a. Achieving normal blood pressure levels | 181(49.1) |
| b. Maintaining blood pressure within an acceptable range, if not completely normal | 176(47.7) |
| c. Lowering blood pressure as much as possible, regardless achieving normal level | 6(1.6) |
| d. Maintaining blood pressure at acceptable target for age and comorbidities | 1(0.3) |
| e. Other (Please specify:_____) | 1(0.3) |
| f. Missing | 4(1.1) |
| 4. What will be your response to patient insisting on discontinuing antihypertensive medication after achieving normal blood pressure? | |
| a. Persuade the patient to continue medication, provide education on risks of discontinuation | 288(78.0) |
| b. Respect the patient's decision and monitor their blood pressure closely | 44(11.9) |
| c. Consult with a colleague or specialist for a second opinion | 29(7.9) |
| d. Other (Please specify: _____) | 3(0.9) |
| e. Missing | 5(1.4) |
| 5. Is there need for further research or evidence to support the decision of continuing antihypertensive medication after achieving normal blood pressure control? | |
| a. Yes, more research is needed | 296(80.2) |
| b. No, current evidence is sufficient | 55(14.9) |
| c. I'm not sure | 11(3.0) |
| d. I don't know | 2(0.5) |
| e. Missing | 5(1.4) |
| 6. What factors do you consider when deciding whether a patient should continue antihypertensive medication after achieving normal blood pressure control (Select all that apply)* | |
| a.Those participants that their choosen options included Clinical guideline | 281(76.1) |
| b. Those that their choosen options did not include clinical guideline | 81(22.0) |
| c. Missing | 7(1.9) |
| d. Don't know | 0(0) |

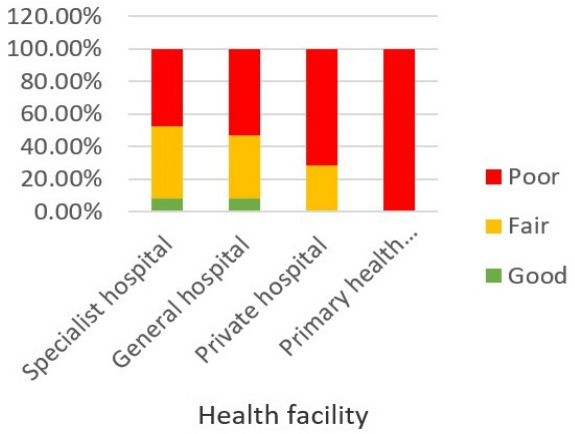


Figure 3a: Comparison of knowledge grade across health facility. Primary health……: Primay health centre

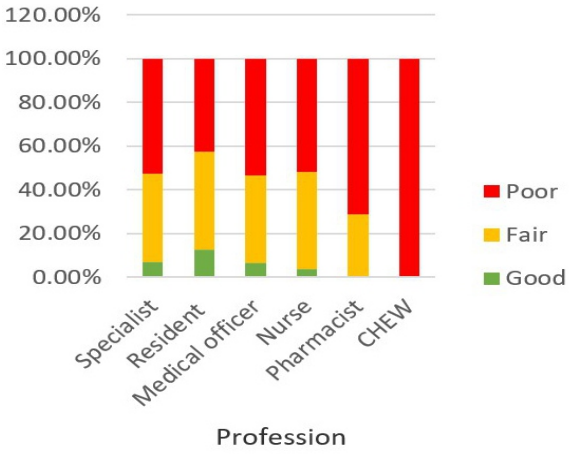


Figure 3b: Comparison of knowledge grade across profession. CHEW: community health extension worker

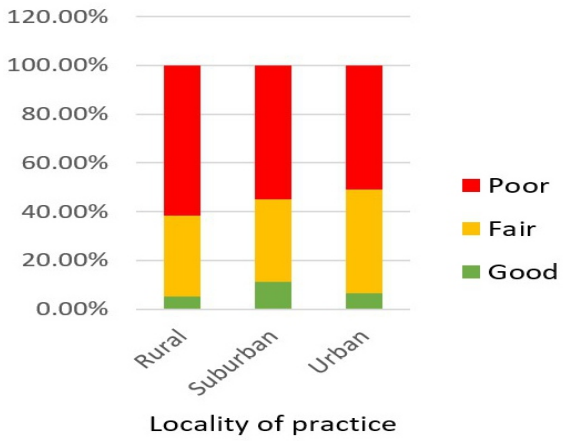


Figure 3c: Comparison of knowledge grade across locality

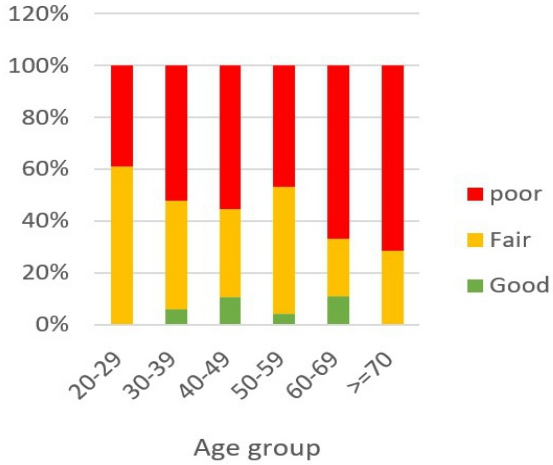


Figure 3d: Comparison of knowledge grade with age groups

Table 4: Comparison of Hypertension Knowledge grade with 369 participants' gender and professional Profile

| Variables | Good grade No (%) | Fair grade No (%) | Poor grade No (%) | Chi Square | P-value |
|---|---|---|---|---|---|
| Gender: | | | | | |
| Male | 16(8.1) | 85(43.1) | 96(48.7) | | |
| Female | 9(5.3) | 65(38.5) | 95(56.2) | 5.238 | 0.264 |
| Missing | 0(0) | 0(0) | 3(100) | | |
| Years of practice: | | | | | |
| <1 | 0(0) | 2(40.0) | 3(60.0) | | |
| 1-4 | 4(9.1) | 22(50.0) | 18(40.9) | | |
| 5-10 | 5(5.7) | 34(39.1) | 48(55.2) | 4.996 | 0.758 |
| >10 | 16(6.9) | 92(39.8) | 123(53.2) | | |
| Missing | 0(0) | 0(0) | 2(100) | | |
| Specialist status | | | | | |
| Obs & Gyn | 0(0) | 9(60.0) | 6(40.0) | | |
| Peadiatrician | 1(5.3) | 9(47.4) | 9(47.4) | | |
| Physician | 8(8.4) | 31(32.6) | 56(58.9) | 7.501 | 0.823 |
| Public health physician | 2(9.5) | 8(38.1) | 11(52.4) | | |
| Radiologist | 0(0) | 2(40.0) | 3(60.0) | | |
| Surgeon /dental surgeon | 3(6.8) | 21(47.7) | 20(45.5) | | |
| Non-Specialist | 11(6.5) | 70(41.2) | 89(52.4) | | |
| Employer status | | | | | |
| Government - owned | 22(7.7%) | 125(43.6%) | 140(48.8) | | |
| Non-government organization | 0(0) | 3(37.5%) | 5(62.5%) | 8.476 | 0.205 |
| Private | 3(4.3%) | 21(30.4%) | 45(65.2%) | | |
| Missing | 0(0) | 1(20.0%) | 4(80.0%) | | |

## Discussion

### Hypertension Knowledge and familiarity with Hypertensive guidelines

This study sought to assess the knowledge and awareness of the current guidelines for the management of hypertension among healthcare practitioners in Nigeria. In this study, despite the majority being very confident that patients should continue taking their drugs when blood pressure is

controlled (table 2), there is wide variation in the knowledge base and confidence level of participants (table 3). These findings corroborate the report of Ale et al, where it was discovered that there is a gap between guideline recommendations and hypertension care, further widened by primary care physician unawareness of the guidelines.[17] The guidelines for the Management of Hypertension In Nigeria highlight the role of secondary and tertiary prevention which involves the management of hypertension and its complications.[10] The findings from this current study thus suggest that there is room for improvement in understanding hypertension management among healthcare practitioners in Nigeria.

Similarly, studies have reported a poor knowledge of practitioners regarding hypertension guidelines which could be the reason for the sub-optimal management of hypertension by healthcare providers.[18] In South Africa, Parker et al reported that primary healthcare providers had inadequate knowledge about hypertension and how to manage it, as well as a lack of familiarity with the country's hypertension standards and guidelines.[19] Contrary to findings by Parker et al, this current study found that 41.% of participants reported being very familiar with current hypertension management guidelines. This indicates that a significant portion of health workers are aware of the guidelines.

## Adherence to Hypertension Management Guidelines

Physicians' awareness of guidelines is reflected in their practice.[8] Huat et al demonstrated in their study that there is still an opportunity for physicians to enhance their adherence to the most recent hypertension clinical practice guidelines.[20] A study in Saudi Arabia showed that most physicians were aware of hypertension as a common health issue and agreed on the importance of involving families in patient management.[18] The majority followed JNC-7 guidelines for hypertension measurement, with an overall adherence rate of 80%. The overall adherence to guidelines observed in the study in Saudi Arabia could be attributed to the availability of facilities, physician qualifications, training and education of professionals.[18] In this current study, there seems to be a gap between guideline reconmmendations and actual practice among healthcare professionals which could be due to the varied knowledge base and different confidence levels of participants.

Theodorou et al found that while most physicians reported awareness and implementation of guidelines, there was a significant discrepancy between their practice and European guidelines.[21] Their findings also corroborate the results of this current study. The reasons for the observed disconnection between physicians' practice and European guidelines in hypertension management could be a lack of awareness, time Constraints, clinical inertia, resource constraints and guideline Complexity.[21] Among the reasons for non-adherence to Hypertension Management Guidelines was the inadequate duration of each consultation[19]. Clinic overcrowding and patient ignorance are the other reasons why doctors may not follow the recommended practice guidelines for treating hypertension.[22] In this current study, the reasons for non-adherence to Hypertension Management Guideline were not investigated.

## Clinical Implications

The clinical implications of knowledge and awareness of current guidelines in hypertension management among health workers are significant, but often not fully realized. Effective hypertension management requires that care providers be aware of the current guidelines and adhere to them.[17] By following guidelines, the significant risk of cardiovascular morbidity and mortality from hypertension's potentially avoidable complications—heart failure, renal disease, and stroke will be reduced.[19] Studies have shown that while awareness of guidelines is generally high, agreement and adoption of the guidelines and recommendations can be lacking.[19,23,24] This can lead to suboptimal patient care. In this current study, the majority of the participants were Doctors as well as specialists from different disciplines (Table 1). These are the category of professionals who attend to patients more frequently and thus failure to fully adhere to the guideline could lead to sub-optimal care of patients. There is a positive correlation between doctors' knowledge of guidelines and their adherence to them in practice.[25] Therefore, encouraging Doctors and other health workers to engage in continuous learning and peer discussions

on hypertension guidelines can improve their confidence and knowledge as well as adherence to the guidelines.

**Limitations of the study**

The results of the present study must be interpreted in light of the following limitations. First of all, the sample size of healthcare workers who participated in the study was small and this may explain the absence of statistically significant associations between Sociodemographic/Professional Profile and Hypertension Knowledge. Secondly, in the present study, the selection of participants was based on non-probability sampling.

**Conclusion**

The knowledge and awareness of the current guidelines for hypertension management among healthcare practitioners in Nigeria is not optimal, even though both international and national hypertension guidelines are available to health workers in Nigeria. There is a need for comprehensive nationwide increased awareness and advocacy for its use among healthcare practitioners to improve the care of patients with hypertension in Nigeria.

**Recommendation**

There is a need for regular workshops and webinars to educate practitioners on the updated guidelines, emphasizing key recommendations and treatment pathways. Such can be incorporated into continuous medical programs that have relevant case studies and interactive sessions on applying the guidelines in practice. Furthermore, professional bodies releasing clinical guidelines for hypertension should create simplified versions of the guidelines with clear algorithms and decision-making tools for easy implementation in busy clinical settings. They should also institute audit and feedback programs to track adherence to the guidelines and provide practitioners with personalized feedback on areas for improvement.

**Conflict of interest:** None Declared

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**References**

1. Baldridge A, Omitiran K, Orji I, Shedul G, Ojo T, Eze H et al. Hypertension Treatment in Nigeria ( HTN ) Program : rationale and design for a type 2 hybrid , effectiveness , and implementation interrupted time series trial. *Implement Sci Commun*. Published online 2022. doi:10.1186/s43058-022-00328-9
2. Adeloye D, Owolabi E, Ojji D, Auta A, Dewan M, Olanrewaju TO et al. Prevalence, awareness, treatment, and control of hypertension in Nigeria in 1995 and 2020: a systematic analysis of current evidence. *J Clin Hypertens*. 2021;23(5):963-977. doi:doi: 10.1111/jch.14220
3. Nelson I. Management of hypertension in Nigeria: the barriers and challenges. *J Cardiol Cardiovasc Med*. 2021;6(1):023-025. doi:10.29328/journal.jccm.1001112
4. Ogah O, Arije A, Xia X, Beaney T, Adebiyi A, Sani M et al. May Measurement Month 2017 : screening for hypertension in Nigeria — Sub-Saharan Africa. 2019;21:86-88. doi:10.1093/eurheartj/suz064
5. Basopo V, Mujasi PN. To what extent do prescribing practices for hypertension in the private sector in Zimbabwe follow the national treatment guidelines ? An analysis of insurance medical claims. *J Pharm Policy Pract*. 2017;10:37-48. doi:10.1186/s40545-017-0125-7
6. World Health Organization. Nigeria collaborates with WHO to curb hypertension, introduces control initiative | WHO | Regional Office for Africa. Presented at: 2020.
7. Odili A, Chori B, Danladi B, Nwakile P, Okoye I, Abdullahi U et al. Prevalence, Awareness, Treatment and Control of Hypertension in Nigeria: Data from a Nationwide Survey 2017. *Glob Hear*. 2020;15(1):47-52. doi:10.5334/gh.848
8. Ahmad N, Khan A, Khan I, Khan A, Atif M. Doctors ' Knowledge of Hypertension Guidelines Recommendations Reflected in Their Practice. *Int J Hypertens*. 2018;1:1-13. doi:org/10.1016/S0140-6736(21)02722-7
9. Huat T, Rahman R, Daud N, Suhaila S, Yusoff

M. Patients ' blood pressure control and doctors ' adherence to hypertension clinical practice guideline in managing patients at health clinics in Kuala Muda district , Kedah Key WOrds : *Med J Malaysia*. 2017;72(1):18-25.
10. Kadiri S, Arogundade F, Arije A, Omotoso A, Onwubere B, Aderibigbe A et al. Guidelines for the Management of Hypertension in Nigeria 2020. *Trop J Nephrol*. 2020;15(1):65-85.
11. Shogade TT, Akpabio AA. Insufficient control of blood pressure in the population of Nigeria and Africa. *E-J Cardiol*. 2019;17(26):1-3.
12. Onah EI. Nigeria: A Country Profile. J Int Stud. 2020;10:151-162. doi:10.32890/jis.10.2014.7954
13. Angell BJ, Sanuade O, Adetifa I, Okeke I, Adamu AL, Aliyu MH et al. Population health outcomes in Nigeria compared with other west African countries , 1998 – 2019 : a systematic analysis for the Global Burden of Disease Study. *Lancet*. 2022;(March):1-13. doi:10.1016/S0140-6736(21)02722-7
14. Angell B, Sanuade O, Adetifa I, Okeke I., Adamu A, Aliyu M et al. Population health outcomes in Nigeria compared with other west African countries, 1998–2019: a systematic analysis for the Global Burden of Disease Study. *The Lancet*,. 2022;399(10330):1117-1129. doi:https://doi.org/10.1016/S0140-6736(21)02722-7
15. Wu M, Zhao K, Fils-aime F. Response Rates of Online Surveys in Published Research : A Meta-Analysis Computers in Human Behavior Reports.; 2022. doi:, http://dx.doi.org/10.1016/j.chbr.2022.100206 This
16. Mailu SK, Adem A, Mbugua DK, Gathuka P, Mwogoi T. Response Rate, Incentives and Timing of Online Surveys: A study of Agriculture Researchers in Kenya *. *Tanzania J Agric Sci*. 2021;20(1):82-93.
17. Ale OK, Braimoh RW. Cardiovascular Topics Awareness of hypertension guidelines and the diagnosis and evaluation of hypertension by primary care physicians in Nigeria. 2017;28(2):72-76. doi:10.5830/CVJA-2016-048
18. Al-gelban K, Khan M, Al-khaldi Y, Mahfouz A, Abdelmoneim I, Daffalla A et al. Adherence of Primary Health Care Physicians to Hypertension Management Guidelines in the Aseer Region of Saudi Arabia. *Saudi J Kidney Dis Transplant*. 2011;22(5):941-948.
19. Parker A, Nagar B, Thomas G, Badri M, Ntusi NBA. Health practitioners' state of knowledge and challenges to effective management of hypertension at primary level. *Cardiovasc J Afr*. 2011;22(4):186-190. doi:10.5830/CVJA-2010-066
20. Huat TS, Rahman RA, Daud N, et al. Patients' blood pressure control and doctors' adherence to hypertension clinical practice guideline in managing patients at health clinics in Kuala Muda district, Kedah. *Med J Malaysia*. 2017;72(1):18-25.
21. Theodorou M, Stafylas P, Kourlaba G, Kaitelidou D, Maniadakis N, Papademetriou V. Physicians' Perceptions and Adherence to Guidelines for the Management of Hypertension: A National, Multicentre, Prospective Study. 2012;2012. doi:10.1155/2012/503821
22. Suha SAA, Mona AS, Alaa EAS, Ali EI, Gamal M, Medhat KES. Are general practitioners in primary health care aware of hypertension treatment guidelines? *Greener J Med Sci*. 2012;2(5):099-106. doi:10.15580/gjms.2012.5.09191261
23. Al-ali KA, Al-ghanim FA, Al-furaih AM, Al-otaibi N, Makboul G, El-shazly MK. Awareness of hypertension guidelines among family physicians in primary health care. Published online 2013:81-87.
24. Heneghan C, Perera R, Mant D, Glasziou P. Hypertension guideline recommendations in general practice: awareness, agreement, adoption, and adherence. *Br J Gen Pract*. 2007;57(545):948. doi:10.3399/096016407782604965
25. Ahmad N, Khan AAHAAHA, Khan I, Khan AAHAAHA, Atif M. Doctors' Knowledge of Hypertension Guidelines Recommendations Reflected in Their Practice. *Int J Hypertens*. 2018;2018:11-13. doi:10.1155/2018/8524063