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Gender disparities in hypertension prevalence, awareness and healthcare seeking behaviour among young adults in Nigeria

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Abstract

Background The burden of hypertension and healthcare seeking behaviour can be driven by gender-related inequalities in access to care. Low hypertension awareness often originates in early adulthood, determining gender patterns in hypertension. The factors that contribute to these patterns in this life stage are critical for improving hypertension control and reducing cardiovascular disease risk. This study was conducted to assess the gender disparities in hypertension prevalence, awareness and healthcare seeking behaviour among young adults in three selected states in Nigeria.

Methods Using a cross-sectional design, we assessed gender differences in prevalence, awareness and healthcare seeking behaviour for hypertension among 924 young adults aged 18 – 40 years in three states of Nigeria (Abia, Oyo and Kano States). Pearson's Chi-square was used to test associations between variables. Predictors of gender disparities were assessed with binary logistic regression at 5% level of statistical significance.

Results Of these, 416 (45.0%) were less than 30 years old while 508 (55.0%) of the respondents were ≥ 30 years of age with a mean age ± SD of 29.6 ± 6.8 and 29.8 ± 6.8 for male and female respondents respectively. Overall, the prevalence of hypertension among young adults in the three states was 169 (18.2%); higher among females 107 (19.2%) compared to males 61 (16.7%). Awareness of high blood pressure (BP) was higher among female respondents 333 (59.7%) compared to their male counterparts 192 (52.5%) and the difference was statistically significant ($p = 0.03$). Visits to a health care provider was higher among females (16.0%) than males (8.7%). Age, marital status, ethnicity, education and occupation were significantly associated ($p < 0.005$) with elevated BP among female hypertensives while age, marital status and ethnicity were significantly associated with elevated BP among male hypertensives.

Conclusions The study showed gender specific differences with regards to the burden, awareness and health seeking behaviour for hypertension among young adults in Nigeria. There is need for gender specific interventions to control the increasing burden of hypertension in Nigeria.

Keywords Hypertension, Young adults, Prevalence, Gender, Awareness, Nigeria

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Introduction

Hypertension or high or raised blood pressure (BP) is a condition in which the blood vessels have persistently raised pressure (BP ≥ 140/90 mmHg) [1, 2]. Hypertension is a serious medical condition present in more than a quarter of the adult world population [2, 3]. According to the World Health Organization (WHO), the prevalence of hypertension is highest in the African Region at 46% of adults aged 25 years and above while the lowest was found in the American region [4]. While hypertension prevalence is highest in older populations, almost 20% of young adults are hypertensive [5]. Hypertension in childhood could be a harbinger for adult hypertension; this and the linear increase of incidence of hypertension with increasing age calls for life course approach to hypertension control [6]. Young adulthood is one of the stages of life course and life course epidemiology was built on the premise that various biological and social factors throughout life, independently, cumulatively and interactively influence health and disease in adult life [7]. It provides a perspective on explanations for secular disease trends and for gender, ethnic and geographical equalities in health [7–9]. Black populations, whether residing in Africa, the Caribbean, United States, or Europe, appear to develop hypertension earlier than other groups [10]. Additionally, the 2020 International Society of Hypertension (ISH) guidelines report blacks incur organ damage at younger ages, with a higher frequency of resistance and nocturnal hypertension [10].

The prevalence of hypertension continues to rise in Nigeria with early onset and the epidemic of premature cardiovascular mortality. Data synthesis of surveys carried out between 1995 and 2020 in Nigeria documented an overall prevalence of 30.6% representing a 540% increase among individuals aged ≥ 20 years from 8.6% to 32.5% respectively [11]. The prevalence of hypertension in Nigeria forms a substantial portion of the total burden in Africa because of the large population of the country currently estimated to be over 170 million, majority of which are young people [2]. A systematic review reported an overall crude prevalence of hypertension among Nigerian adults ranged from 2.1% (95%CI: 1.4 to 2.8) to 47.2% (95%CI: 43.6 to 50.8); crude prevalence of hypertension ranged from 2.8% to 13.9% and 0.5% to 12.7% for males and females respectively [12]. Few studies, however, have examined gender differences in hypertension or hypertension awareness among young adults and the determinants of these differences. Meanwhile, a study in the United State of America showed gender disparities in hypertension status among men and women in their twenties: women were far less likely to be hypertensive compared to men (12% vs. 27%) [13].

Undiagnosed hypertension and uncontrolled hypertension despite anti-hypertensive treatment are a serious global public health challenge. Most recommendations suggest lowering the systolic BP and diastolic BP to values within the 130–139 and 80–85 mmHg range, in all hypertensive patients, to prevent associated complications and mortality [14]. Hypertension is a complex disorder and affects multiple organ systems. It is the primarily modifiable risk factor for heart disease, which is the leading cause of death among both men and women [15]. Pre-hypertension (≥ 120–139/80–89 mmHg) has also been associated with the development of diabetes mellitus, risk of myocardial infarction, stroke and cardiovascular diseases [16]. About 54% of stroke, 47% of ischaemic heart disease and 25% of other cardiovascular diseases (CVDs) worldwide were attributable to high BP and hypertension often coexists with chronic kidney disease in 67–92% of cases [14, 17]. Majority of hypertensive patients are, however, unaware that they have hypertension, receive poor or no treatment and have poor control of their blood pressure.

Awareness of blood pressure status and compliance with prescribed treatment for hypertension are crucial for prevention of hypertension and the complications among both men and women worldwide. Awareness, treatment seeking behaviour and control of hypertension in lower income countries (LICs) are low; 41%, 32% and 40%, respectively [18].

A systematic review found hypertension awareness, treatment and control in India ranged from 12 to 54%, 8 to 47% and 7.5 to 25%, respectively [19]. In rural Bangladesh, hypertension prevalence was as high as 40% but hypertension awareness was only 18% [20]. In the USA, a study revealed very low levels of hypertension awareness among young women (32% of hypertensive women were aware of their status) and even lower levels among men (25%) [13]. In Nigeria, the rates of awareness, health seeking behaviour, treatment and control of hypertension are abysmally low and age-adjusted prevalence of hypertension increased to 32.5% (27.5 million individuals) in 2020, of these, only 29.0% were aware of their hypertension [11]. The American College of Cardiology (ACC)/American Heart Association (AHA) guideline suggested that the optimal management strategy for hypertension may not depend on only age, obesity and diabetes mellitus, but also gender [21]. Research has shown disparity in the prevalence of hypertension and the awareness by gender among older adults, but it remains unclear if these differences emerge among young adults including those in Nigeria. This study therefore seeks to explore gender disparities in high blood pressure prevalence, awareness and healthcare seeking behaviour for hypertension

among young adults at the community level across three states in Nigeria (Oyo, Abia and Kano).

Material and methods

Study sites and design

The study was conducted in three states selected from the six geopolitical zones in Nigeria comprising of Abia (South East), Kano (North West) and Oyo (South West) states. A cross-sectional survey was done, which collected baseline information for a larger clinical trial entitled—Development and Evaluation of a Package to Improve Hypertension Control in Nigeria [DEPIHCON]: a cluster randomized controlled trial. Detailed information has been published in the trial protocol [22].

Study population

For this paper, data from young adults (men and women) aged 18 – 40 years in the selected communities were analysed. We excluded community members who were severely ill or had existing medical conditions like diabetes, stroke and chronic kidney disease.

Sample size, sampling technique and blood pressure measurement

The sample size, technique design and detailed description of data collection and blood pressure measurement has been published in the trial protocol [22]. In summary, a multistage cluster sampling technique was used to select participants from Abia, Kano and Oyo States in Nigeria. Data was collected between 3rd January to 28th of February 2021. Participants information on the socio-demographic characteristics of the respondents, the prevalence, awareness and healthcare seeking behaviour for hypertension were utilized for this analysis. We extracted data for 924 participants who were young adults aged 18 – 40 years. Blood pressure was measured using a fully automated digital device, the OMRON® digital sphygmomanometer using recommended methods and categories from the World Health Organization-International Society of Hypertension Guidelines for the Management of Hypertension [13]. In this study, three BP readings were taken, and hypertension was defined as an average of two measurements of systolic and/or diastolic BP (2nd and 3rd readings) that is ≥ 140/90 mmHg [22].

Statistical methods and ethical consideration

Data analysis was carried out using Stata MP version 14 based on the CONSORT 2010 guideline. The dependent variables were hypertension prevalence and awareness (awareness of hypertension in this context means participants have ever heard of or are aware about the condition called "high blood pressure"), healthcare seeking hypertension, systolic and diastolic blood pressure values. Continuous variables were presented as mean and standard deviations (SDs) or medians with their 25th and 75th percentiles when not normally distributed while categorical variables were presented as frequencies and proportions with corresponding 95% confidence intervals. Pearson's Chi-square was used to test the association between socio-demographic factors, prevalence, awareness and gender disparities. Binary logistic regression model was used to assess the predictor of gender disparities in hypertension prevalence, awareness and healthcare seeking behaviour among young adults in three selected states in Nigeria. Details of ethical approval and consent to participate has been documented in the published trial protocol [22].

Results

A total of 924 young adults were analysed. Of these, two thirds were females ($n=558$; 60.3%), 416 (45.0%) were less than 30 years old. The mean age of respondents was 29.6 ± 6.8 and 29.8 ± 6.8 for male and female respectively. Those currently married were ($n=612$; 66.2%), living in urban areas ($n=566$; 61.3%), unemployed ($n=235$; 25.4%) and from Oyo state ($n=408$; 44.2%). More than half 638 (69.1%) of the respondents earn below the national minimum wage of N30,000 ($64.7) per month, with female constituting higher proportion of this group 410 (73.5%). (Table 1).

Overall, the prevalence of hypertension among young adults in the three states was 168 (18.2%); higher among females 107 (19.2%) compared to males 61 (16.7%) respondents ($X^2=23.1$, P value = < 0.001) Table 2**.**

Five hundred and twenty-five (56.8%) of the study respondents had ever heard of hypertension prior to the survey and awareness of high blood pressure was higher among female respondents 333 (59.7%) compared to male respondents 192 (52.5%) and the difference was statistically significant ($X^2=4.69$, p value = 0.03). Table 3 revealed frequency of visits to a health care provider was higher among females (16.0%) than males (8.7%). Furthermore, about half of the respondents often resort to home management of illnesses when they are sick instead of visiting any health care facility. Female hypertensives were more likely to be aware of their own high blood pressure status than male hypertensives (21% vs 11%).

Male hypertensives aged ≥ 30 years were three times more likely to have raised blood pressure (OR = 2.94, 95% CI = 1.59—5.44) and male hypertensive who were single were less likely to have raised BP (OR = 0.41, 95% CI = 0.22—0.74). Female hypertensives who were ≥ 30 years were 3.5 more times likely to be hypertensive (OR = 3.51, 95% CI = 2.14—5.77). Similarly, female hypertensives who were single (OR = 0.33, 95% CI = 0.16

Table 1 Socio-demographic characteristics of respondents (young adults) in selected three states in Nigeria

	Male (*n* = 366) n (%)	Female (*n* = 558) n (%)	Total (*n* = 924) n (%)
Age group (years)			
< 30	172 (47.0)	244 (43.7)	416 (45.0)
30–40	194 (54.0)	314 (56.3)	508 (55.0)
Marital Status			
Currently Married	180 (49.2)	432 (77.4)	612 (66.2)
Never Married	181 (49.5)	117 (21.0)	298 (32.3)
Divorced/Separated/ Widowed	5 (1.4)	9 (1.6)	14 (1.5)
Education			
No formal education	42 (11.5)	79 (14.2)	121 (13.1)
Primary	34 (9.3)	73 (13.1)	107 (11.6)
Secondary	201 (54.9)	311 (55.7)	512 (55.4)
Tertiary	89 (24.3)	95 (17.0)	184 (19.9)
Monthly income (Naira)			
< 30,000	228 (62.3)	410 (73.5)	638 (69.1)
> 30,000	138 (37.7)	148 (26.5)	286 (30.9)
Residence			
Rural	157 (42.9)	201 (36.0)	358 (38.7)
Urban	209 (57.1)	357 (64.0)	566 (61.3)
Religion			
Christianity	159 (43.4)	306 (54.8)	465 (50.3)
Islam	207 (56.6)	252 (45.2)	459 (49.7)
Ethnicity			
Hausa	127 (34.7)	152 (27.2)	279 (30.2)
Igbo	91 (24.9)	196 (35.1)	287 (31.1)
Yoruba	148 (40.4)	210 (37.6)	358 (38.7)
Occupation			
Trading	77 (21.0)	259 (46.4)	336 (36.4)
Farming	50 (13.7)	21 (3.8)	71 (7.7)
Unemployed	78 (21.3)	157 (28.1)	235 (25.4)
Artisan	100 (27.3)	88 (15.8)	188 (20.4)
Civil Servant/Professional	61 (16.7)	33 (5.9)	94 (10.2)
State			
Abia	66(18.0)	173(31.0)	239(25.9)
Oyo	175(47.8)	233(41.8)	408(44.2)
Kano	125(34.2)	152(27.2)	277(29.9)

Table 2 Prevalence of hypertension by gender among young adults in Nigeria

	Male		Female		Total
Hypertension	**n(%)**	**95% CI**	**n(%)**	**95% CI**	**n(%)**
Yes	61(16.7)	13.2–20.8	107(19.2)	16.1–22.6	168(18.2)
No	305(83.3)	79.0–86.8	225(80.8)	77.3–83.8	756(81.1)

$X^2 = 23.1$, *P* value = < 0.001

– 0.65) and artisans (OR = 0.41, 95% CI = 0.20—0.87) were less likely to have raised blood pressure (Table 4).

Only age remained a significant predictor of hypertension in both females and males when adjusted by other variables. Though the odds were higher among females (aOR:—3.57, 95% CI: 2.01 – 6.36) as compared to the Males (aOR: 2.35 95% CI: 1.06 – 4.97 (Table 5).

Discussion

To lower the risks of complications and mortality associated with hypertension, awareness of blood pressure status and early healthcare seeking leading to detection and prompt treatment are critical. Awareness of diseases and early treatment seeking is poor among the young people and these also vary by gender. This study assessed gender differences in prevalence, awareness and healthcare seeking behaviour for hypertension among young adults in three selected states in Nigeria.

We found that almost one in five young adults had raised blood pressure. Hitherto, raised blood pressure is often considered to be essentially a disease of the elderly, however; this finding showed that prevalence of hypertension is high in this phase of life course (young adults) and will subsequently contribute to the increasing prevalence as age increases [23]. This calls for a more concerted effort at controlling disease in all age groups as envisioned in the sustainable development goals agenda (SDG 3)—good health for all, at all ages. The prevalence of hypertension in this study (about 20%) is higher than those reported for those aged 18 to 39 years in the United States (7.3%) [24] and India (11.2%) [25] but about the same as found among young adults in a university in south south Nigeria (21%) [26], but lower than that found in rural southeast Nigeria (29.2%) [27]. The increasing trend of early onset of hypertension is a major concern in the development of Nigeria as the young and active workforce population are being incapacitated and worst still depleted [22].

The prevalence of hypertension was statistically significantly higher among females compared to male respondents. This is similar to findings in a study in southern Nigeria and Ghana [26, 28]. However, the higher prevalence reported among female participants contrasted with other studies in many developing countries that showed hypertension is commoner among males [13, 29–31]. Similarly other studies in Nigeria showed a higher prevalence among young adult males compared with females [6, 11, 32]. However, this may be because we had more female respondents in this study as females constituted up to sixty percent of our respondents. The observed gender difference in hypertension may be partly due to differences in risk factors, such as genetics, body mass index, stress, poor

Table 3 Awareness and health seeking behaviour for hypertension by gender in three selected states in Nigeria

	Male (*n* = 366) n (%)	Female (*n* = 558) n (%)	Total (*n* = 924) n (%)
Awareness of hypertension	192 (52.5)	333 (59.7)	525 (56.8)
Hypertension is curable	127 (66.1)	193 (58.0)	320 (60.9)
Hypertension is preventable	166 (86.5)	289 (86.8)	455 (86.7)
Frequency of visiting a healthcare provider			
Monthly	8 (2.2)	18 (3.2)	26 (2.8)
At least once in six months	32 (8.7)	89 (16.0)	121 (13.1)
Once in the last one year	65 (17.8)	91 (16.3)	156 (16.9)
Never in the last one year	261 (71.3)	360 (64.5)	621 (67.2)
First step when sick			
Never fall sick	71 (19.4)	80 (14.3)	151 (16.3)
Treat at home with drugs bought	176 (48.1)	262 (47.0)	438 (47.4)
Visit nearest PHC	27 (7.4)	63 (11.3)	90 (9.7)
Consult PPMVs/Pharmacy	23 (6.3)	63 (11.3)	86 (9.3)
Visit other health facility	9 (2.5)	34 (6.1)	43 (4.7)
Consult health worker in Community	10 (2.7)	24 (4.3)	34 (3.7)
Use Herbs	27 (7.4)	6 (1.1)	33 (3.6)
Religious houses for prayers/practice to cure illness	1 (0.3)	2 (0.4)	3 (0.3)
Visit the traditional	3 (0.8)	1 (0.2)	4 (0.4)
Others	19 (5.19)	23 (4.1)	42 (4.6)
History of hypertension	14(3.8)	52(9.3)	66(7.1)
Place hypertension was diagnosed (n = 65)			
Hospital	6(42.9)	42(82.4)	48(73.9)
Research/Outreach	6(42.9)	2(3.9)	8(12.3)
PMV/Medicine Seller	2(14.2)	7(13.7)	9(13.8)

diet, smoking and lack of physical activity; more so, a sex-specific analyses demonstrated that blood pressure increases more rapidly in females than males from the third decade of life [12, 32, 33].

About two thirds of the study participants had ever heard of hypertension prior to the survey and awareness of high blood pressure was higher among female respondents compared to male respondents. Its essential to recognize that individuals who are aware of hypertension and exhibit pro-active healthcare seeking behaviours are more likely to avail themselves for screening; and this often leads to a higher detection rate. This finding revealed that level of awareness for hypertension is suboptimal among young adults in Nigeria and its worrisome since high blood pressure is an important and very common non-communicable disease across the globe and more so in developing countries like Nigeria. Awareness about a particular disease entity is necessary to enable healthcare seeking and ensure proper adherence to management especially for chronic disease conditions including hypertension. Similar level of awareness for hypertension was reported in previous studies in Nigeria and India [34–36]. Again, female respondents had higher awareness of hypertension than male respondents as reported previously in Nigeria [34]. A systematic analysis of current evidence in Nigeria (2020) reported that only 29.0% of hypertensives were aware of their hypertension [6] while another study in 2 states of Nigeria by Ayanti and colleagues found awareness of hypertension to be 99.4% and 87.8% among residents of Imo and Kaduna states respectively [37]. The high level of awareness reported by Ayanti and colleagues could be attributed to susceptibility perceived to hypertension among the participants who were mainly older adults.

Generally, we found poor health seeking behaviour from healthcare facilities and healthcare professionals among the respondents, as only 1 in 10 respondents visited the nearest health facility when they were ill. Prior to the study, the frequency of visits to a health care provider was higher among females than males. Furthermore, about half of the respondents often resort to home management of illnesses when they are sick instead of visiting any health care facility. Regular monitoring of blood pressure at home or in the health facility was not a common practice among both male and female respondents. Evidence has shown that patients with chronic diseases

Table 4 Selected characteristics and relationship with hypertension among young adults by sex

	Male				Female			
	Hypertension		OR	95% CI	Hypertension		OR	95% CI
	No n (%)	Yes n (%)			No n (%)	Yes n (%)		
Age (years)								
< 30	156 (90.7)	16 (9.3)	1		221 (90.6)	23 (9.4)	1	
≥ 30	149 (76.8)	45 (23.2)	2.94	1.59 – 5.44[a]	230 (73.2)	84 (26.8)	3.51	2.14 – 5.77[a]
Marital Status								
Married	140 (77.8)	40 (22.2)	1		336 (77.8)	96 (22.2)	1	
Single	162 (89.5)	19 (10.5)	0.41	0.22 – 0.74[a]	107 (91.4)	10 (8.6)	0.33	0.16 – 0.65[a]
Divorced/Separated	3 (60.0)	2 (40.0)	2.33	0.38 – 14.45	8 (88.9)	1 (11.1)	0.44	0.05 – 3.54
Education								
No formal education	36 (85.8)	6 (14.3)	1		55 (69.6)	24 (30.4)	1	
Primary	28 (82.3)	6 (17.7)	1.29	0.37 – 4.42	57 (78.1)	16 (21.9)	0.64	0.31 – 1.34
Secondary	168 (83.6)	33 (16.4)	1.18	0.46 – 3.02	264 (84.9)	47 (15.1)	0.41	0.23 – 0.72[a]
Tertiary	73 (82.0)	16 (18.0)	1.32	0.47 – 3.65	75 (79.0)	20 (21.0)	0.61	0.31 – 1.22
Religion								
Christianity	138 (86.8)	21 (13.2)	1		254 (83.0)	52 (17.0)	1	
Islam	167 (80.7)	40 (19.3)	1.57	0.89 – 2.80	197 (78.2)	55 (21.8)	1.36	0.89 – 2.08
Ethnicity								
Hausa	99 (78.0)	28 (22.0)	1		107 (70.4)	45 (29.6)	1	
Igbo	75 (82.4)	16 (17.6)	0.75	0.38 – 1.49	158 (80.6)	38 (19.4)	0.57	0.35 – 0.94[a]
Yoruba	131 (88.5)	17 (11.5)	0.45	0.23 – 0.88[a]	186 (88.6)	24 (11.4)	0.31	0.18 – 0.53[a]
Occupation								
Trading	65 (84.4)	12 (15.6)	1		203 (78.4)	56 (21.6)	1	
Farming	41 (82.0)	9 (18.0)	1.19	0.46 – 3.07	16 (76.2)	5 (23.8)	1.13	0.40 – 3.23
Unemployed	72 (92.3)	6 (7.7)	0.45	0.16 – 1.27	125 (79.6)	32 (20.4)	0.93	0.57 – 1.51
Artisan	80 (80.0)	20 (20.0)	1.35	0.62 – 2.97	79 (89.8)	9 (10.2)	0.41	0.20 – 0.87[a]
Civil Servant/Professional	47 (77.1)	14 (22.9)	1.61	0.68 – 3.80	28 (84.9)	5 (15.1)	0.65	0.24 – 1.75
Smoking								
No	241 (83.7)	47 (16.3)	1		443 (81.0)	104 (19.0)	1	
Yes	64 (82.1)	14 (17.9)	1.12	0.58 – 2.16	8 (72.7)	3 (27.3)	1.60	0.42 – 6.12
Alcohol Use								
No	182 (82.7)	38 (17.3)	1		349 (79.7)	89 (20.3)	1	
Yes	123 (84.3)	23 (15.8)	0.90	0.51 – 1.58	102 (85.0)	18 (15.0)	0.69	0.40 – 1.20
Salt Use								
No	269 (83.5)	53 (16.5)	1		394 (80.9)	93 (19.1)	1	
Yes	36 (81.8)	8 (18.2)	1.13	0.50 – 2.56	57 (80.8)	14 (19.7)	1.04	0.56 – 1.95

[a] Statistically significant

like hypertension often seek care from different channels. Use of anti-hypertensive drugs with or without prescription were common as well as use of non-orthodox remedies.

Factors influencing healthcare seeking behaviour were related to health systems, the patient socioeconomic and structural environment; and other individual factors related to awareness, perceived severity, adverse effects and perceived fears of lifelong dependence on medicines [38]. It was also reported that many young women regularly interact with health care professionals to access birth control, child health and for gynecological health, young men are not faced with similar reasons to visit health care providers and studies have demonstrated that men use health care services at a much lower rate than women [13]. In addition, women are more likely to choose hospitals or clinics as their preferred source of healthcare while men prefer self-medications.

Table 5 Predictors of hypertension among young adults in selected three states in Nigeria

	Male		Female	
	aOR	95% CI	aOR	95% CI
Age group (years)				
< 30	1		1	
≥ 30	2.30	1.06 – 4.97*	3.57	2.01 – 6.36*
Marital status				
Married	1		1	
Single	0.65	0.31 – 1.39	0.57	0.25 – 1.30
Divorced/Separated/Widowed	6.15	0.81 – 47.0	0.34	0.04 – 3.03
Religion				
Christianity	1		1	
Islam	1.71	0.60 – 4.93	0.72	0.32 – 1.63
Education				
No formal education	1		1	
Primary	1.60	0.40 – 6.43	1.00	0.45 – 2.23
Secondary	2.43	0.75 – 7.88	1.02	0.49 – 2.13
Tertiary	3.06	0.82 – 11.37	2.28	0.89 – 5.83
Ethnicity				
Hausa	1		1	
Igbo	0.79	0.20 – 3.12	0.36	0.13 – 1.00
Yoruba	0.33	0.12 – 0.91	0.23	0.10 – 0.55
Occupation				
Trading	1		1	
Farming	1.03	0.34 – 3.09	1.14	0.36 – 3.54
Unemployed	0.67	0.21 – 2.11	1.10	0.60 – 2.00
Artisan	1.73	0.75 – 4.00	0.77	0.34 – 1.73
Civil Servant/Professional	1.09	0.42 – 2.81	0.38	0.12 – 1.19
Alcohol use				
No	1		1	
Yes	1.62	0.70 – 3.73	1.13	0.60 – 2.13

Age, marital status, ethnicity was associated with elevated blood pressure among both female and male respondents while education and occupation was associated with elevated blood pressure among only male respondents. Male and female hypertensives aged ≥ 30 years were more likely to have raised blood pressure.. Male and female respondents who were single were less likely to have raised blood pressure and females who were artisans were less likely to have raised blood pressure. The only modifiable risk factors identified in this study were socioeconomic status and education among female respondents.

Previous study has shown that regular medical visits are critical for improving hypertension awareness among young adults and reducing gender disparities in cardiovascular health [13]. The relationship between socio-economic status, education and hypertension can be explained by several factors. Firstly, individuals with lower socio-economic status may have limited access to healthcare services including hypertension screening and treatment, leading to a higher risk of hypertension. Secondly, low-income jobs may be associated with poor working conditions, high-stress levels and physical strains, which can contribute to the development of hypertension.

Study limitations

Our findings were based on cross-sectional data which established gender-related disparities in burden, awareness and healthcare seeking behaviour among young adults in three different states in Nigeria, for a very common non-communicable disease – hypertension, and a leading cause of death among both men and women worldwide. However, we couldn't explore the effect of high level of awareness and better health seeking behaviour seen among female respondents on blood pressure control among the studied population. Lopsided recruitment may have affected the findings as women were more likely to be met at home when the visits were made compared to men. In addition, future studies could improve on their design and explore the obstetric history of women, including the use of antihypertensive medications and access to regular healthcare for those with elevated blood pressure, which is crucial for understanding maternal health outcomes.

Conclusion

The study demonstrated gender specific differences with regards to the burden, awareness and health seeking behaviour for hypertension among young adults in Nigeria. The awareness, prevalence and health seeking for hypertension was higher among females. This evidence requires immediate implementation of actions and preventive measures for gender specific interventions to control the increasing burden of hypertension in Nigeria.

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Clinical trial number

Not applicable.

Authors' contributions

RIJ, EAB, MMS, JOA, OSO, OEO, MUS and IOA were involved in the conceptualization, interpretation and writing of the manuscript. UU, OS were involved in data collection and validation. JOA and EAB were involved in data analysis and interpretation of results. All authors reviewed and approved the manuscript for publication.

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Availability of data and materials
Data materials are available upon a reasonable request from the authors.

Declarations

Ethics approval and consent to participate
Ethical approval for the study was obtained from the University of Ibadan/University College Hospital Ethics Committee (Approval Ref No is UI/EC/19/0448). Informed consent was obtained from all participants before interview was conducted.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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