ORIGINAL ARTICLE

Prevalence of Hypertension and its Risk Factors Among Adult Residents in Imoru Community, Ose Local Government Area, Ondo State

Timothy A Ehwarieme[1] and Anwuli Emina[2]

ABSTRACT

Background: Hypertension is a public health challenge that has been increasing alarmingly in both low and high-income countries. This study aims to determine the prevalence of hypertension and its associated factors among adult residents in Imoru community. **Methods:** A descriptive cross-sectional design was used to surveysample size of 316 randomly selected participants. A well-structured questionnaire, blood pressure apparatus, weighing scale, and calibrated meter rule were used to collect data. Data were analyzed using descriptive statistics and hypothesis tested using multiple logistic regression at a 5% level of significance. **Result:** Of the 316(100%) participants, 177(56%) were males with M: F ratio of 1:0.79. The prevalence of hypertension was found to be 37.7%. The level of knowledge of Hypertension is evenly distributed with 83(26.3%) having poor knowledge, 152(48.1%) having fair knowledge, and 81(25.6%) having good knowledge. Risk factors identified are consumption of fatty food, adding table salt to meals, performing stressful activities, consumption of red meat, consumption of processed and canned foods, and addition of condiments to foods (average mean >2.5). Factors influencing these practices are affordability, availability, culture, and ignorance. There is a positive significant correlation of SBP (R^2 = 0.1854, p =0.021; p =0.002) /DBP (R^2 = 0.0458, p =0.002) and BMI. Females are two times (OR: 1.86; CI = 0.343-2.159) more likely to have good knowledge than males.
Conclusion: There is a high prevalence of hypertension in the study population. There is a need for concerted efforts by health policymakers and all stakeholders towards putting in place effective primary and secondary preventive strategies.

Keywords: Knowledge, risk factors, hypertension, Prevalence, Practices associated with risk

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Introduction

Hypertension is a major public health challenge worldwide, it is a leading cause of death in the world and the most common cause of outpatient visits to the physician[1]. Hypertension is also a major contributor to the growing global pandemic of cardiovascular disease and stroke[1]. According to Singh et al, hypertension is one of the main public health challenges because of its high frequency and associated risks of cardiovascular and kidney diseases such as myocardial infarctions, strokes, and renal failures[2]. It is not only an important public health problem; but also has a big economic impact. Hypertension is a chronic medical condition in which the blood pressure in the arteries is elevated. Normal levels of both systolic and diastolic blood pressure are particularly important for the efficient function of vital organs such as the heart, brain, and kidneys and overall health and wellbeing. However, higher blood pressure in the vessels increases the

workload of the heart, which can subsequently lead to complications.[3]

Several factors increase the risk of hypertension. Gender, age, race, and heredity are non-modifiable risk factors, while modifiable risk factors include lifestyles such as body weight status and health behaviour, and psychosocial stress and support. Higher body mass index (BMI) is positively associated with hypertension.[4] Also, various dietary behaviours such as insufficient fruit and vegetable intake, consumption of fatty foods, sugar, and soft drink have been associated with hypertension.[4] Several studies found an association between physical inactivity, smoking, and hypertension, also, studies have found that psychosocial factors play an important role in the development of hypertension [5,6]. Previous studies have identified the key psychosocial risk factors to include psychological stress, occupational stress, personality, mental health, housing instability, social support/isolation sleep quality, and low quality of life[5,6,7,8].

Globally, nearly one billion adults had hypertension in 2000 and this is estimated to increase to 1.56 billion by 2025.[9] According to the WHO's Global Health Observers Report, hypertension would cause 7.5 million deaths, about 12.8% of the total of all deaths worldwide. Also, about 54% of strokes and 47% of ischaemic heart disease worldwide were attributable to high blood pressure[3]. The prevalence of hypertension is highest in the African Region at 46% of adults aged 25 and above, and this proportion is increasing[3]. About three-quarters of people with hypertension are from low- and middle-income countries, as the access to healthcare, as well as the awareness of the disease, are inadequate[3].

In Nigeria, hypertension and its complications such as stroke, and heart failure constitute approximately 25% of emergency medical admissions in urban hospitals. It is the most frequently diagnosed cardiovascular disorder in Nigeria[8]. The estimated prevalence of hypertension in Nigeria from a metanalysis of cross-sectional population and/or community-based studies published between 1980 and 2013, (using a cut-off definition of ≥140/90 mmHg) is 28.9%[8]. In developing countries like Nigeria, where urbanization is expanding, lifestyles are changing, the literacy rate is low, and people are still living in poverty, hypertension and its impact on development and health is particularly critical especially among rural dwellers that may not be aware of having hypertension or at risk of hypertension. Though there are empirical studies on the prevalence of hypertension and its associated factors in various health care facilities across the country, such is lacking in the rural communities, especially in Ondo State. Reliable information about the prevalence of hypertension and its risk factors is essential in the development of national and local health policies for the prevention and control of hypertension. Determining the prevalence of hypertension will help estimate its magnitude in the community. It will also help to create awareness of the risk factors associated with hypertension in the community and sensitize the community on the cultural and behavioural practices contributing to the risk of hypertension. This study, therefore, assesses the prevalence of hypertension and its associated factors in the Imoru community, Ose local government area of Ondo state.

Methods

Research Design: A descriptive cross-sectional design was used for this study. This study was carried out in the Imoru community located in the southwestern part of Ose local government area of Ondo state Nigeria[10].

Target population/sample size:

The target populations were adults males and females who were residents of Imoru community, According to CIESIN, the total population of people residing in Imoru community is 1,252.[11] The projected population of Imoru community for 2020 is 1,411. The population of adults ≥ 15 years (2015) is 798. Using a 10-year average yearly growth rate of 28.6 %, the projected population is 1,026 adults11. A sample size of 316 was used, this was estimated using the Taro Yamane formula with a 95% confidence level[12].

Inclusion criteria

1. Age 15 years and above.
2. Participants must be residents of Imoru community.

Exclusion criteria

1. Individuals with debilitating illnesses
2. Participants with psychiatric illnesses

Sampling technique

A simple random technique was used to recruit participants to the study.

The instruments for data collection

1. A digital sphygmomanometer

2. A calibrated meter rule

3. An analogue weighing scale

4. A Self-constructed questionnaire is divided into 4 (four) sections; Section A: contains the demographical data of the respondents. Section B: contains fifteen multiple-choice questions assessing the knowledge of hypertension and its associated risk factors. Section C: contains twelve items assessing the practices associated with risk factors of hypertension Section D: contains tee items assessing the perceived factors influencing the risk of hypertension.

Reliability: The reliability of this study was tested by conducting a pilot study in Ijagba, a neighbouring village. A total of thirty-two (32) questionnaires representing 10% of the sample size were administered to the participants. The reliability of the instrument was confirmed using the split-half reliability test and the Cronbach alpha score of 0.810 0.770 and 0.844 for sections B C and D respectively was obtained thus indicating that the research instrument was reliable.

Method of data collection

Three (3) trained research assistants were recruited. Study participants were given a detailed explanation of the study and how the data will be collected from them before giving their consent and those who objected were not included. For participants who cannot read and write, the questionnaires were interpreted for them in Pidgin English and Yoruba. Then, measurements of their blood pressure, weight, and height were done. Data collection was done in the evenings between 3:00 pm to 6:00 pm.

Data analysis: Data was analyzed using descriptive statistics and hypothesis tested using linear regression and multiple logistic regression at a P-value of ≤0.05 level of significance. All analyses were done using SPSS version 23.

Ethical Consideration

A letter of ethical clearance with reference no *PHCDA/011/23* was obtained from Ose local government research committee before the collection of data commenced. Confidentiality was maintained, no participant's history was used as part of the research, participation of respondents was voluntary, and none of the respondents was forced or coerced to participate in the study.

RESULTS

Demographic characteristics of respondents

Findings from the study showed that 177(56.0%) are males, 88(27.8%) are in the age cohort 31-40years, 141(44.6%) are married, 108(34.2%) have a secondary level of education, 115(36.4%) are into farming, 247(78.2%) are Christians, while 247(78.2%) are Yorubas.

Descriptive statistics of BMI of respondents

The findings from the study show that none of the participants is underweight, 131(41.5%) are within the range of normal weight, 147(46.5%) are overweight and 38(12.0%) are obese. The mean (±) BMI (kg/m^2) was 25.78±3.00

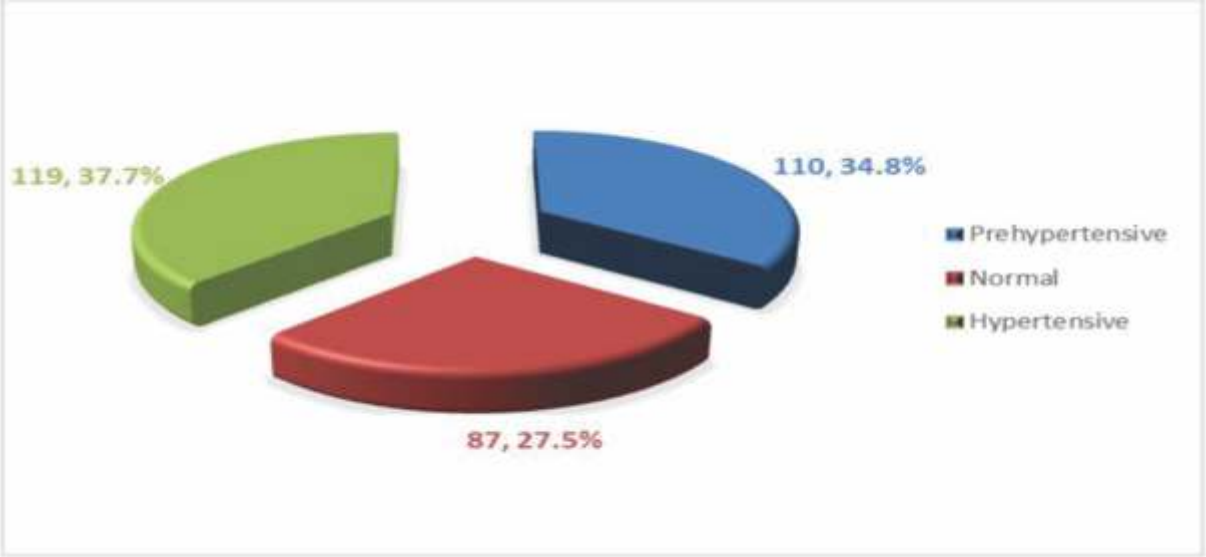

Figure 1: Prevalence rate of hypertension among adult residents

Table 1: Knowledge of hypertension and its associated risk factors among adult residents in Imoru community

	Frequency (Percentage)	
	Wrong	**Correct**
Blood pressure of 150/100mmHg is regarded as hypertension	252(79.7)	64(20.3)
Hypertension can be cured	316(100.0)	0(0.0)
Hypertension can be managed	105(33.2)	211(66.8)
Which of the following is a risk factor of hypertension	104(32.9)	212(67.1)
Hypertension can lead to which of the following	67(21.2)	249(78.8)
Which of the following is a risk factor of hypertension	95(30.1)	221(69.9)
The following are lifestyle practices that increase the risk of hypertension except	90(28.5)	226(71.5)
Which of the following reduces the risk of hypertension	86(27.2)	230(72.8)
Adding table salt to an already cooked meal is a risk factor for hypertension	126(39.9)	190(60.1)
Obesity can increase the risk of hypertension	108(34.2)	208(65.8)
Which of the following lifestyle modifications help in the management of hypertension	58(18.4)	258(81.6)
Psychological factors such as stress can increase the risk of hypertension	144(45.6)	172(54.4)
Which of the following is correct	95(30.1)	221(69.9)

Level of knowledge

Classification	Range of score (%)	Frequency (f)	Percentage (%)
Poor	0-49.9	83	26.3
Average	50-69.9	152	48.1
Good	70-100	81	25.6
Total		316	100

The table showed that 83(26.3%) have a poor level of knowledge, 152(48.1%) have fair knowledge, and 81(25.6%) have a good level of knowledge.

Table 2: Practices associated with risk for hypertension

	Never (1) F(%)	**Sometimes (2) F(%)**	**Always(3) F(%)**	**Mean**	**St.D**	**Remark**
1. Fatty food consumption	39(12.3)	179(56.6)	98(31.0)	2.19	0.63	PAH
2. Alcohol consumption	104(32.9)	117(37.0)	95(30.1)	1.97	0.79	PNAH
3. Addition of salt to food while eating	64(20.3)	134(42.4)	118(37.3)	2.17	0.74	PAH
4. Sugar consumption	94(29.7)	134(42.4)	88(27.8)	1.98	0.76	PNAH
5. Sedentary lifestyle	130(41.1)	156(49.4)	30(9.5)	**1.68**	0.64	PNAH
6. Smoke cigarettes	206(65.2)	49(15.5)	61(19.3)	1.54	0.79	PNAH
7. Tobacco inhalation	201(63.6)	75(23.7)	40(12.7)	1.49	0.71	PNAH
8. Perform stressful activities	15(4.7)	171(54.1)	130(41.1)	2.36	0.57	PAH
9. Red meat consumption	3(0.9)	133(42.1)	180(57.0)	2.56	0.52	PAH
10.Take caffeinated drink	127(40.2)	132(41.8)	57(18.0)	1.78	0.73	PNAH
11. Processed and canned foods consumption	48(15.2)	204(64.6)	64(20.3)	2.05	0.59	PAH
12. Addition of condiments to foods	92(29.1)	102(32.3)	122(38.6)	2.09	0.82	PAH

Mean *cut-off > 2.0, PAH (practices associated with risk for hypertension; < 2.0 PNAH (practices not associated with risk for hypertension. St.D(standard deviation)*

Table 2 shows that the participants are involved in practices that can lead to developing hypertension. These practices include; the consumption of fatty foods, adding salt to meals while eating, being involved in stressful activities, consumption of canned foods, and addition of condiments to foods with a mean >2.0. Generally, 224(70.9%) of the participants are involved in practices associated with the risk of developing hypertension.

Table 3. Perceived factors influencing the practices associated with risk for hypertension

	D F(%)	SD F(%)	A F(%)	SA F(%)	Mean	St.D	Remark
Smoking helps me to think well	65(20.6)	144(45.6)	83(26.3)	24(7.6)	2.21	0.86	NPF
Taking alcohol helps me cope with depression	81(25.6)	105(33.2)	112(35.4)	18(5.7)	2.21	0.89	NPF
I take tobacco because it increases my self esteem	102(32.3)	141(44.6)	64(20.3)	9(2.8)	1.94	0.80	NPF
I take caffeinated drinks because it keeps me alert	93(29.4)	78(24.7)	77(24.4)	68(21.5)	2.38	1.12	NPF
I learnt tobacco inhalation by watching my parent	65(20.6)	218(69.0)	24(7.6)	9(2.8)	1.93	0.63	NPF
I was exposed to drinking by my friends	54(17.1)	109(34.5)	107(33.9)	46(14.6)	2.46	0.94	NPF
I eat everything available to me because I believe fat people are well-to-do (ignorance)	41(13.0)	70(22.2)	128(40.5)	77(24.4)	2.76	0.97	PF
I add salt to food while eating because it's a norm in my community (culture)	50(15.8)	86(27.2)	97(30.7)	83(26.3)	2.67	1.03	PF
I consume red meat because they are affordable	3(0.9)	47(14.9)	126(39.9)	140(44.3)	3.28	0.75	PF
I add condiments to my food because they are less expensive	10(3.2)	82(25.9)	126(39.9)	98(31.0)	2.99	0.84	PF
I consume fatty foods because they are affordable	6(1.9)	30(9.5)	131(41.5)	149(47.2)	3.34	0.73	PF

Mean cut-off >2.50 indicates a perceived factor (PF); while cut off < 2.50 indicates Not perceived factor (NPF). D (disagree=1), SD (strongly disagree=2), A (agree=3), SA (strongly agree=4) St.D(standard deviation)

Table 3 showed that affordability, availability, culture and ignorance were the major factors influencing the practices associated with risk for hypertension among the participants (average mean >2.5)

Table 4: Relationship between the knowledge of hypertension and practices associated with risk of hypertension in the Community

	PNAH	PAH	χ^2	P
Level of knowledge				
Poor	61(73.5)	22(26.5)	37.228	0.006
Fair	149(98.0)	3(2.0)		
Good	75(92.5)	6(7.4)		

PAH (practices associated with hypertension, PNAH (practices not associated with hypertension.

Table 4 shows that there is a significant association between level of knowledge and level of practice. We, therefore, rejected the null hypothesis.

Table 5: Multivariate logistic regression of association between knowledge of hypertension and its associated factors and the socio-demographic characteristics of the respondents in the community

	P-value	OR	95% Cl for OR
Sex			
Male		1.00	
Female	0.749	1.86	0.343-2.159
Age			
15-20	0.001	0.06	0.000-0.114
21 – 30	0.476	0.553	0.108-2.822
31 – 40	0.191	0.423	0.117-1.535
41 – 50	0.237	2.466	0.132-1.651
>50		1.00	
Marital status			
Single	0.004	2.89	2.702-49.673
Married	0.034	5.34	1.135 -25.135
Divorced	0.518	0.513	0.068-3.879
Widowed		1.00	
Level of education			
No formal	0.001	0.71	0.118-154
Primary	0.000	1.03	2.664-49.673
Secondary	0.000	4.94	3.330-46.882
Tertiary	0.000	8.00	24.401-1168.674
Occupation			
Farming	0.854	1.31	0.304-4.209
Trading	0.376	7.89	0.494-6.484
Others		1.00	
Ethnicity			
Yoruba	0.326	0.31	0.031-3.177
Igbo	0.851	7.96	0.074-8.599
Hausa		3.92	12.392-12.392
Others		1.00	0(0.0)

OR: Odds ratio. CI: Confidence interval.

Table 5 shows the multivariate logistic regression associated with socio-demographic characteristics and level of knowledge. The result shows that females are two times (odds ratio [OR] = 1.86, confidence interval [CI] = 0.343-2.159) more likely to have good Knowledge than males. Respondents between the age range of 41- 50 years are twice more (OR 2.466; CI: 0.132-1.651 p0.237) likely to have good knowledge of hypertension than those respondents between the age range 15 – 40, and 51 years and above. Respondents that are married are five times more likely to have good knowledge than those single. Those with Tertiary Education are eight times more likely to have good knowledge than others. Respondents who are Igbos are seven times more likely to have a good knowledge than other Ethnic groups. Level of Education, age, and marital status show a significant difference ($p<0.05$).

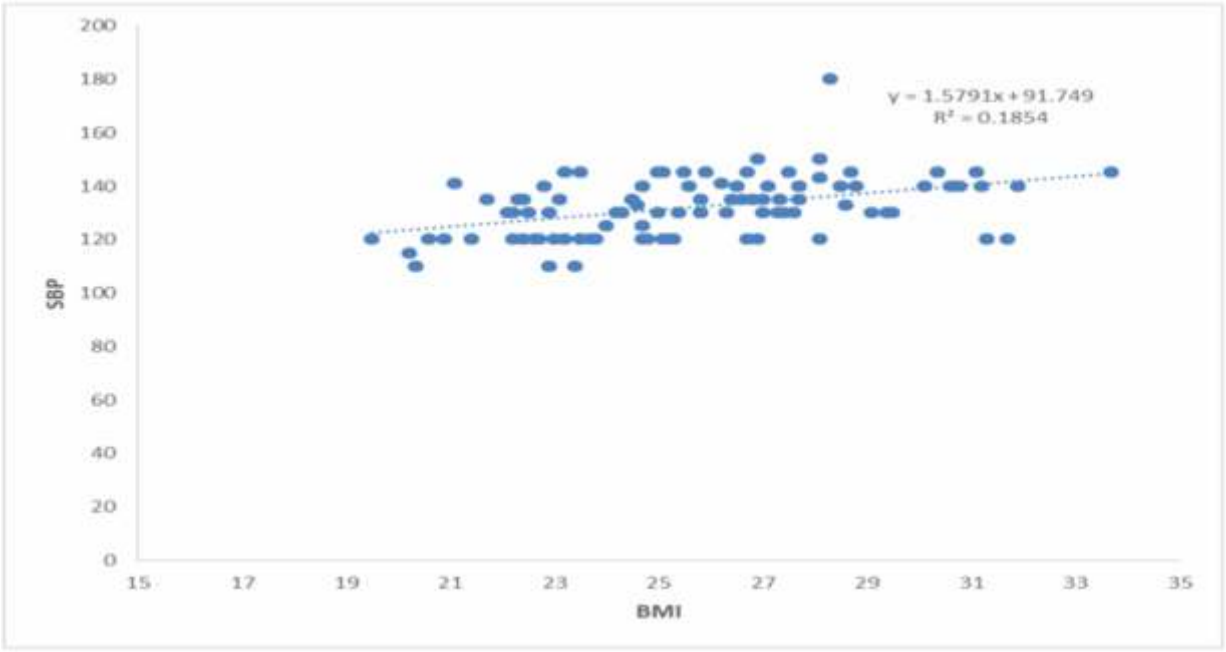

Figure 2a: shows that there is a positive significant correlation between systolic blood pressure and BMI

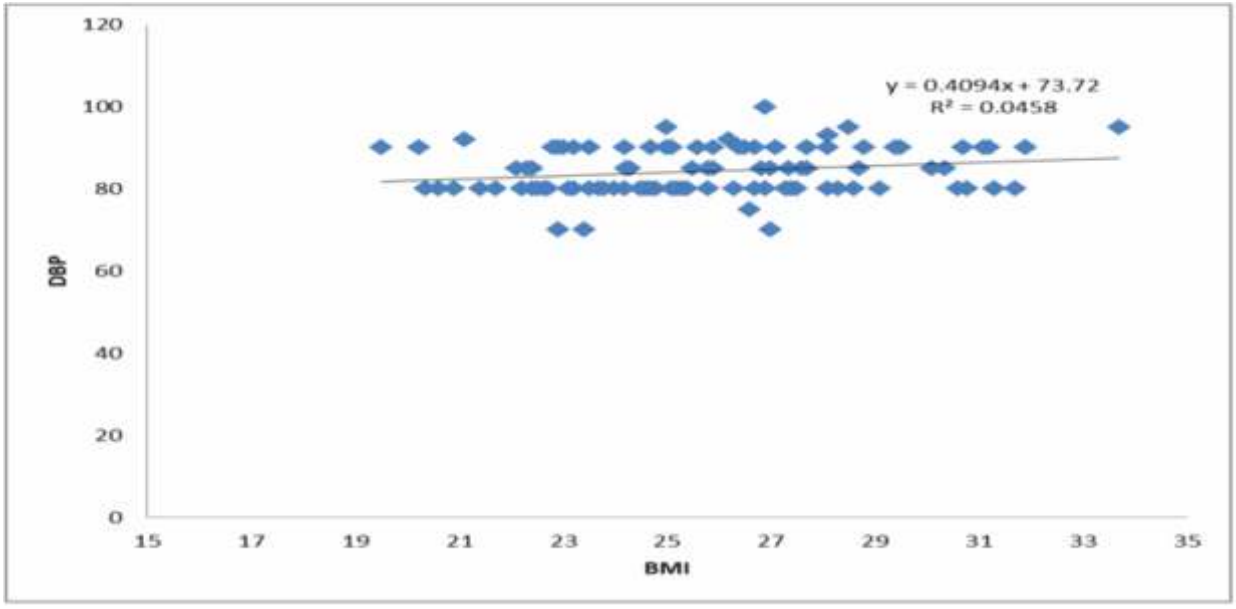

Figure 2b: shows that there is a positive significant correlation between diastolic blood and BMI

Discussion

The study showed that the prevalence of hypertension is 37.7%, this finding is similar to the findings in Ibadan Nigeria where the overall prevalence of hypertension was 31.3%.[1] Further corroborating this finding is the study in Varanasi, where the prevalence of hypertension was 32.9%.[2] The prevalence in the present study is lower than 47.7% reported in Oka community Ikpoba-Okha local government.[13] However, the finding of this study is far higher than 17.3% reported in Iran,[14] 14.1% reported in Delhi[15], and 19.8% reported in Cameroon[4]. The relatively higher prevalence reported in the present study as against the previous studies could be attributed to the rural settlement in which the respondents reside, where little or no awareness about hypertension is available.

We found that the prevalence of hypertension is slightly higher in men than in women (39% and 36% respectively). A study in Delta state also reported similar findings (36.8% and 31.1% respectively)[16].

Similarly, in Varanasi, a prevalence rate of 40.9% in males and 26.0% in females was reported[2]. The slightly higher prevalence rate among men could be because women are more interested in health care services as they frequently visit the hospital for antennal and other health services which could accord them the opportunity to engage in health talk with the health care provider. Also, while seeking health services, early diagnosis and treatment can easily be instituted. It could be inferred also, that because men are faced with the responsibilities of providing for the family, in a bit to meet up with this duty are involved in various tasks which subject them to stress making them prone to developing hypertension. They are also involved in practices associated with risk for hypertension contrary to the findings of the present study, Wada et al reported a higher prevalence of (30.0%) for women than the men (20.8%)[5]. In most cases, the prevalence among females compared to males may be due to increased body mass index, physiological changes due to female hormones during pregnancy, and contraceptive usage.[17]

The level of knowledge of hypertension and its associated risk factors in this study is low, as only 25.6% of the participants have good knowledge. This is in line with a study carried out in southern Zimbabwe, where knowledge of hypertension and its associated risk factors was poor.[18] This could be because more than half of the participants (51%) were not educated beyond primary school and 11% had no formal education and a poor community health education on hypertension. Findings of good knowledge from the present study are slightly higher than 8.5% reported in Oka community, Ikpoba Okha local government area in Edo State.[13]

However, Studies done in Shanghai, China reported that 75% of the study population had perfect knowledge.[19] This difference in the level of knowledge could be due to differences in the study area and educational level of respondents as China is a developed country with advanced technologies in health care and other areas of the economy. Similarly, another study carried out in China reported a good level of knowledge (94%)[20]. The higher level of good knowledge reported in the latter study as against the present study may be attributed to the fact that the study of Kongarasan[20], was carried out in an urban area medical Centre whose participants are well educated and could access information by themselves, coupled with the availability of the medical Centre where they seek health care. This underscores the importance of community-based health education that should be driven by trained health professionals such as nurses and physicians in our rural communities where the level of ignorance and illiteracy is very high.

Our study revealed a couple of practices associated with hypertension which include consumption of fatty food, the addition of salt to food while eating, performing stressful activities, consumption of red meat, consumption of processed and canned foods, and addition of condiments to foods. These findings were also reported in Oka community, Ikpoba-Okha local government area in Edo State.[13] A possible explanation for these practices in the rural area could be due to the poor socioeconomic status of the rural dwellers coupled with a high level of illiteracy. Other studies in Nigeria and Ghana also reported practices such as smoking, drinking alcohol and sniffing tobacco.[1,16,21] It is known that fruits and vegetables are high in potassium, magnesium, and fibre, in addition, they are low in sodium contents.

The perceived factors influencing the practices associated with the risk of hypertension in this study were, ignorance of eating everything eatable, culture or norms, and affordability of those items. These factors put together could be regarded as socio-cultural/economic factors. These findings corroborated that of Oka community, Edo State where lifestyle lack of knowledge, cultural belief, and peer group influences are reported as some of the factors which influence practices that increase the risk for hypertension among the respondents.[13]

Our findings confirmed the finding from previous studies[22,23], that BMI and diabetes were associated with a high risk of hypertension as findings from the study showed that there is a positive significant correlation (R^2 = 0.1854, p =0.021; p =0.002) between systolic blood pressure and BMI, and between diastolic blood pressure (R^2 = 0.0458, p =0.002) and BMI. A study conducted by Papathanasiou et al. suggest greater BMI was significantly and directly related to increased resting blood pressure in both gender.[24] BMI is associated with hypertension due to an increase in body weight (BMI) which may increase body fluid volume, peripheral resistance, and cardiac output.[25]

The academic level was shown as a protective factor as those with tertiary education are eight times more likely to have good knowledge than others, this result was similar to a study in a Nigeria community, China,

and Malaysia[5,26,27]. Better knowledge of a healthy lifestyle and being well informed about blood pressure management may contribute to a lower risk of hypertension among those with higher education levels[24].

Conclusion

There was a high prevalence of hypertension in the study population, there was also a poor knowledge of hypertension and its risk factors, with extended practices associated with the risk of hypertension. Predictive factors were age, BMI, and other behavioural lifestyles. There is a need for concerted efforts by health policymakers and all stakeholders towards putting in place effective primary and secondary preventive strategies. Modifiable risk factors such as obesity, alcoholism smoking, and unhealthy eating habit among the community dwellers need to be reduced through appropriate public health promotion measures, especially in rural communities.

Conflict of interest

The researchers declare no conflict of interest.

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