

# Prevalence of Hypertension and Assessment of its Risk Factors among Traders in Rukuba-Road Satellite Market in Jos, North Central Nigeria

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## Abstract

**Background:** Hypertension has continued to remain a global public health challenge, contributing to increased cardiovascular morbidity and mortality, and economic cost. Modifiable and nonmodifiable risk factors have been linked to hypertension. **Aim:** The study aimed at assessing the prevalence of hypertension and its risk factors among traders in the Rukuba-road Satellite market in Jos-North LGA, Jos, Plateau State. **Materials and Methods:** A cross-sectional descriptive survey was used. Three hundred and fifty participants (traders) were drawn from 3017 static shops using the Cochran analysis formula of sample size calculation between June and July 2019. Participants were selected using a multi-stage sampling technique. Demographic characteristics and the knowledge, attitude, and practice of risk factors for hypertension were gotten using a structured interviewer-administered questionnaire. Anthropometric measurements were also obtained. The analysis was performed using SPSS version 23.0. Descriptive and inferential statistics were used with  $P < 0.05$  considered statistically significant. Ethical clearance and informed consent were obtained before the commencement of the study. **Results:** Three hundred and twenty-three traders comprising 190 (58.8%) females and 133 (41.2%) males participated in the study. The majority of the traders (40.9%) had average knowledge, 78.6% had a good attitude and 75.6% had average practice on proper lifestyle for prevention of hypertension and its risk factors. The mean systolic and diastolic blood pressures (BP) were  $127 \pm 19$  mmHg and  $79 \pm 11$  mmHg, respectively. The prevalence of hypertension among the participants was 32.2% (104 participants) of which 58 (55.8%) were unaware of their hypertensive status. Nonmodifiable risk factors of age ( $P = 0.000$ ) and tribe ( $P = 0.006$ ) and modifiable risk factors of body mass index (BMI) ( $P = 0.000$ ) were statistically significant for hypertension. Predictors of hypertension using logistic regression were age (18–45 years) and BMI (18.5–34.9 kg/m<sup>2</sup>). **Conclusion:** Present findings of the risk factors of hypertension remain a major public health problem in our society and more efforts are needed for its screening, prevention, early diagnosis, and proper management.

**Keywords:** Hypertension, risk factors, Rukuba-road satellite market, static shops, traders

## INTRODUCTION

Cardiovascular diseases (CVD) are a group of diseases affecting the heart and blood vessels with manifestations in many organ systems.<sup>[1]</sup> CVDs are a leading cause of death globally with about three-quarters of this death occurring in low- and middle-income countries.<sup>[1]</sup> It accounts for more than 17.3 million deaths per year, a number that is expected to grow to more than 23.6 million by 2030.<sup>[2]</sup> They develop from the presence of high cardiovascular risk factors such as diabetes, hyperlipidemia, and/or hypertension.<sup>[1,3-5]</sup> A common manifestation of the effect of these behavioral risk factors is elevated BP (hypertension).<sup>[1,6]</sup>

“Hypertension is defined as a systolic BP (SBP) and/or diastolic BP (DBP) more than or equal to 140/90 mmHg in adults aged 18 years and over on at least two occasions or one occasion with signs and symptoms of complication (s) (end-organ damage)

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or being on antihypertensive medication.”<sup>[4,7]</sup> It has continued to remain a global public health challenge, contributing significantly to increased cardiovascular morbidity and mortality and economic cost to society.<sup>[3,4]</sup> It is the most common condition seen in primary care and remains one of the most important preventable contributors to death from cardiovascular causes.<sup>[8]</sup> The etiology of most adult (essential or primary) cases of hypertension is still unknown, however, several risk factors have been linked to hypertension and have been broadly classified as modifiable and nonmodifiable factors.<sup>[9]</sup> The modifiable risk factors include; unhealthy diets, for example, eating more fats and fewer fruits and vegetables, excess salt intake, obesity, smoking, physical inactivity, excess alcohol intake, and poor stress control, while nonmodifiable factors are; age, race (more among blacks), sex (more among males), and genetic make-up or family history of hypertension.<sup>[6,10,11]</sup> The signs and symptoms of hypertension could be overt or covert with the former manifesting as symptoms of complications.<sup>[1,4,6]</sup> Its covert nature has made it to be, regarded as a “silent killer” because it most often remains undiagnosed until screening when seeking healthcare for an unrelated ailment or onset of complication (s).<sup>[5,11]</sup> The JNC 7 report noted that approximately 30% of adults were unaware of their hypertensive status<sup>[4]</sup> while the national Republic of Ireland data reported that there are approximately five adults aged 45 and above with undiagnosed (covert) hypertension for every three adults aged 45 and above with clinically diagnosed hypertension.<sup>[6]</sup> According to the World Health Organization (WHO), the poorest people in low- and middle-income countries are affected most and at the household level, hypertensive-related diseases, and complications contribute to poverty due to catastrophic out-of-pocket health expenditure.<sup>[1]</sup> All these indices affect certain occupations more such as traders and are worsened by their poor health-seeking behavior, poor achievement of Universal Health Coverage, lack of accessibility to a health facility for screening, early diagnosis, and prompt treatment.<sup>[12-14]</sup>

Based on the United Nations estimates, Nigeria is the seventh (7) most populated country with about 197 million people and a fertility rate of 5.67,<sup>[15]</sup> thus a large number of her population are faced with and would continue to face the risk of premature death due to hypertensive complications. This problem is compounded by the fact that the disease runs a covert course and symptoms develop with the onset of complications. Clinical experience has shown that most people are too busy meeting daily needs, not aware they have the condition, and present late to health-care facilities. This has highlighted the need for targeted case finding and screening to help estimate the prevalence of hypertension<sup>[6]</sup> and proffer recommendations to help curb its increase.

## MATERIALS AND METHODS

### Study area

The study was conducted in Plateau State, North-Central Nigeria. It covers a total area of 30,913 km<sup>2</sup> with a 2016 projected population of 4,200,400. It has a male to a female proportion of 49.9% and 50.9%, respectively. The majority of the population is within the age bracket of 15–64 years.<sup>[16]</sup>

The state capital, Jos, has three local governments, Jos-North, Jos-South, and Jos-East. Jos-North covers a total area of 291 km<sup>2</sup> with a projected population of 572,700.<sup>[17]</sup> Information obtained from the Jos Metropolitan Development Board and Jos-North LGA indicates that there are seven organized major markets (a market in which  $\geq 500$  static shops are built and allocated to traders by the government) in Jos-North LGA which are Terminus-Abuja market, Terminus-Bayan Banki market, Farin Gada market, Rukuba-road satellite market, Katako market, Kabong/Gada-biu market and Kwararafa market.

The Rukuba-road satellite market is located along Rukuba-road after Gada-biu in Jos-North LGA and was commissioned in 2011. It has a heterogeneous collection of traders from different social identity groups who are mostly involved in retailing and petty trading<sup>[18]</sup> and has a total of approximately 4245 static shops (permanent structure/demarcation/location/part of a building allocated to a person for trading purposes) organized under the leadership of the chairman of the local branch of the Nigerian Traders Market association.

### Study population

The population of the study consisted of adults traders (aged 18 and above) in the Rukuba-road satellite market in Jos, Jos North LGA of Plateau State.

### Inclusion criteria

Traders aged 18 and above who have worked in the market for six months and above and who gave consent to participate in the study through the signing of an informed consent form and those having a static shop.

### Exclusion criteria

Women with obvious pregnancy because of hemodynamic changes during pregnancy and those with bony abnormalities such as Scoliosis, Kyphosis, due to bias in the measurement of physical characteristics (height).

### Study design

This was a descriptive cross-sectional study.

### Sample size determination

The minimum sample size was determined using Cochran's formula for determining the sample size for a cross-sectional study.

$$n = \frac{Z_{\alpha}^2 \times pq}{d^2}$$

where  $n$  = minimum sample size

$Z_{\alpha}$  = Coefficient of standard normal deviate (usually expressed as 1.96 when the confidence interval is 95%, i.e.,  $\alpha = 0.05$ )

$pq$  = Variance

$p$  = Sample proportion of hypertension in a similar study (traders in Sokoto central market, Sokoto, Nigeria).<sup>[19]</sup>

$q = 1 - p$

$d$  = Absolute precision or accuracy, normally set at 0.05

therefore:

$$n = \frac{Z_{\alpha}^2 \times p(1-p)}{d^2}$$

$$n = \frac{1.96^2 \times 0.291 \times (1-0.291)}{0.05^2}$$

$$n = \frac{3.8416 \times 0.291 \times 0.709}{0.0025}$$

$n \approx 317.0$

Allowing for a nonresponse rate of 10%, the sample size calculated would be 350.

### Sampling technique

A multistage sampling technique was used. Out of the seven organized major markets in Jos North LGA, the Rukuba-road satellite market was selected using a simple random sampling technique by balloting. The static shops in the Rukuba-road satellite market are numbered from 1 to 4245 of which 3017 have been allocated and are in use. Using a five-digit table of random numbers, a sample size of 350 static shops were selected. A static shop selected whose occupant was absent was replaced by the next occupied static shop until the minimum sample size was reached. For each of the static shops selected, the occupant of the shop was selected as the study participant. For static shops with multiple eligible participants, a simple random sampling technique by balloting was used to choose a single participant who was willing to participate in the research.

### Data collection technique

#### Study instruments

Two survey instruments were used in this study:-a structured interviewer-administered questionnaire adapted from similar studies<sup>[5,20]</sup> and anthropometric Pro-forma variables (Height, Weight, and body mass index [BMI]). The questionnaire comprised three sections: Socio-demographic data, information on the knowledge, attitude, and practice of hypertension and its risk factors, and information on exposure and presence of possible risk factors for hypertension. A stress measuring questionnaire (International Stress Management Association, Questionnaire<sup>[18]</sup>) was used to measure occupational stress while Framingham's Physical Activity Index<sup>[21]</sup> was adopted to assess the Physical Activity Level of participants. Instruments for anthropometric measurements were a mercury sphygmomanometer (Accoson) for measuring participant's BP in mmHg and a portable weighing scale and stadiometer ([Medilife England RGZ-120] calibrated from 0 to 120 kilograms for weight and 0–1.90 m for height) used to measure participant's body weight and height.

Measurement of two BP was taken using the left upper arm with at least two min in-between measurements.<sup>[20]</sup> The BP was recorded using a mercury sphygmomanometer after at least five to 10 min of rest. Participants were seated on a chair with back support, feet on the floor, and arm supported at heart level. The manometer was read at eye level and deflated to zero

before measurement and the proper size cuff was used. Two separate measurements in the left arm were taken. SBP and DBP were reported as the mean of both measurements taken.<sup>[20]</sup> SBP and DBP were noted by the first and fifth Korotkoff sounds respectively.<sup>[22]</sup> Participants were asked to remove their shoes and drop all weights such as phones, keys, etc., Two bodyweights and heights readings were each measured using a weighing balance with a stadiometer and the BMI was calculated using the average weight (in kilograms) divided by the square of the average heights in meters of the two readings taken. The WHO classification of BMI was used to categorize participants as being normal weight (18.5–24.9 kg/m<sup>2</sup>), overweight (25–29.9 kg/m<sup>2</sup>), class I obesity (30–34.9 kg/m<sup>2</sup>), class II obesity (35–39.9 kg/m<sup>2</sup>) and, class III obesity (>40 kg/m<sup>2</sup>). Those newly diagnosed were counseled and referred for further care.

### Ethical consideration

Ethical clearance was obtained from the Health and Research Ethics Committee of the Jos University Teaching Hospital (JUTH) dated May 23, 2019, with the reference number-JUTH/DCS/ADM/127/XXIX/1600. Permission was also obtained from the leadership of the market traders. Informed written consent was obtained from respondents.

## RESULTS

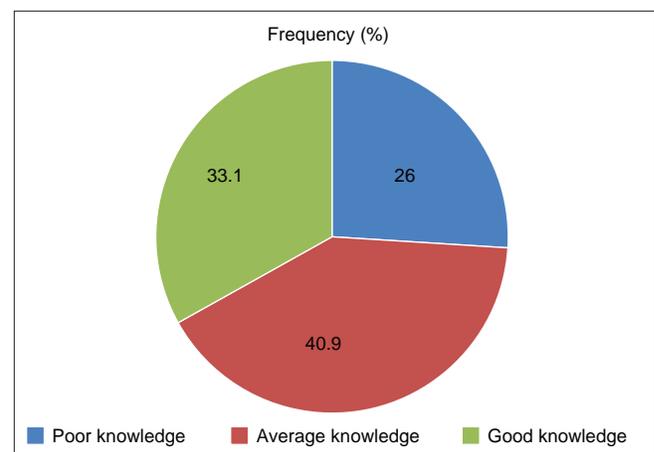
Out of the 350 questionnaires administered, only 323 were analyzed. Twenty-seven could not be analyzed because of incomplete data giving a response rate of 92.3%.

### Socio-demographic characteristics

The majority (58.8%) of the participants were females, Christians (92.0%), married (71.8%), Igbo by tribe (58.5%), and had secondary level education (58.5%), respectively, as shown in Table 1.

### Knowledge of hypertension and its risk factors

The majority of the traders had average knowledge of hypertension and its risk factors (40.9%), while 26% had poor knowledge, as shown in Figure 1.



**Figure 1:** Pie chart showing knowledge of hypertension and its risk factors

### Attitude toward hypertension and its risk factors

The majority of traders had a good attitude toward hypertension and its risk factors (78.6%), as shown in Figure 2.

### Practices related to hypertension and its risk factors

The majority of the traders had average knowledge on the proper practices to prevent/avoid hypertension and its risk factors (75.6%) with only 4.3% having poor practices as shown in Figure 3.

### Presence of risk factors among the study participants

The majority of the study participants (70.6%) did not use table salt on prepared meals, did not consume alcohol (86.7%), never smoked (89.5%), were unaware nor had a family history of hypertension (73.4%), experienced moderate levels of stress (57.9%), had sedentary physical activity (42.4%) and had a BMI greater than 25 kg/m<sup>2</sup> (65.6%), as shown in Table 2. The mean BMI was 28.5 ± 6.2 kg/m<sup>2</sup>.

### Prevalence of hypertension

The mean SBP and DBP were 127 ± 19 mmHg and 79 ± 11 mmHg, respectively. The prevalence of hypertension among the participants was 32.2% (104 participants) of which 46 (44.2%) knew they had hypertension and 58 (55.8%) were unaware of their hypertensive status, as shown in Figure 4.

Table 1: Sociodemographic characteristics of the study participants (n=323)	
Variable	Frequency (%)
Sex	
Male	133 (41.2)
Female	190 (58.8)
Age group (years)	
18-31	71 (22.0)
32-45	137 (42.4)
46-59	91 (28.2)
60 and above	24 (7.4)
Religion	
Christianity	297 (92.0)
Islam	15 (4.6)
Others (none, traditional, etc.)	11 (3.4)
Marital status	
Single	73 (22.6)
Married	232 (71.8)
Divorced	13 (4.0)
Separated	5 (1.6)
Educational level	
No education	4 (1.2)
Primary	47 (14.6)
Secondary	189 (58.5)
Tertiary	83 (25.7)
Tribe	
Igbo	189 (58.5)
Hausa	17 (5.3)
Yoruba	32 (9.9)
Others	85 (26.3)

### Sociodemographic factors associated with hypertension

There is a statistical significance (using Pearson Chi-square) for age and tribe and the presence of hypertension.

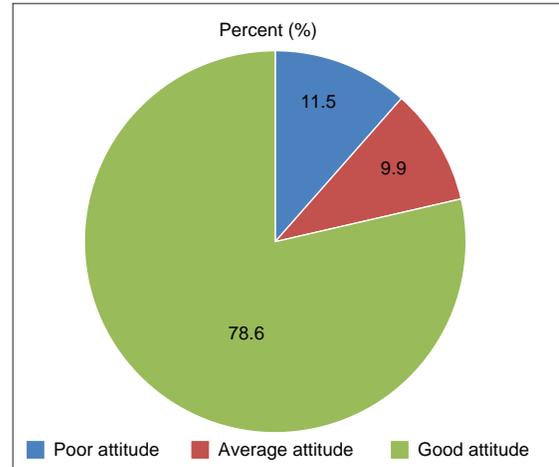


Figure 2: Pie chart showing Attitudes of participants towards Hypertension and its risk factors

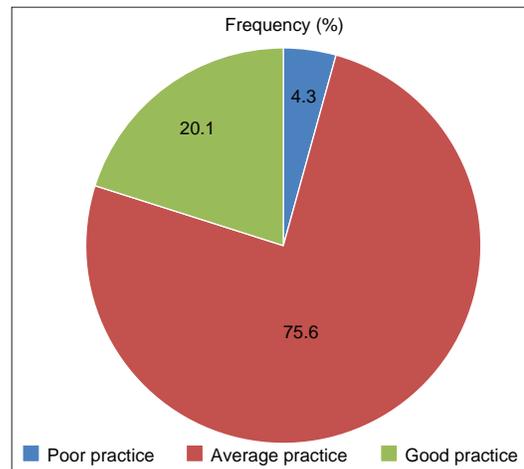


Figure 3: Pie chart showing the practices related to hypertension and its risk factors

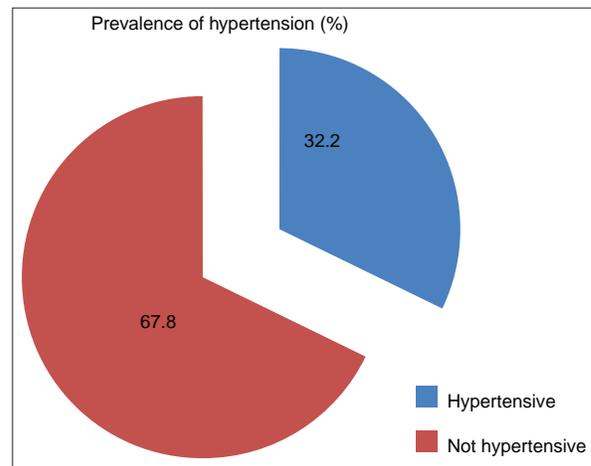


Figure 4: Pie chart showing the prevalence of hypertension among the traders

Hypertension was seen to be increasing with increasing age with percentage frequencies of 16.9, 28.5, 45.1, and 50 among participants in their 20s, 30s-mid 40s, mid-40s-50s, and 60s, respectively ( $\chi^2 = 18.868$ ,  $P < 0.001$ ), as shown in Table 3.

### Risk factors associated with hypertension

Among the participants who had hypertension, 29 (27.9%) used table salt, 18 (17.3%) consumed alcohol, 10 (9.6%) were currently smoking or had smoked cigarettes at one time or the other but claimed to have quit as at the time of this research. Thirty-four participants (32.7%) who were hypertensive claimed to have family members who were hypertensive or died from hypertension. Sixty-one (58.7%) out of the hypertensive participants were experiencing moderate stress, while 47 (45.2%) of them engaged in a sedentary lifestyle. A majority of the hypertensive participants (34.6%) were obese (class I obesity). Results from Table 4 showed statistical significance (using Pearson Chi-square) for BMI and the presence of hypertension among the participants surveyed.

**Table 2: Presence of risk factors among the study participants ( $n=323$ )**

Risk factor	Frequency (%)
Use of table salt on prepared meals	
Yes	95 (29.4)
No	228 (70.6)
Consumption of alcohol	
Yes	43 (13.3)
No	280 (86.7)
Cigarette smoking	
Never smoked	289 (89.5)
Current smoker	13 (4.0)
Quit smoking	21 (6.5)
Family history of hypertension	
Yes	86 (26.6)
No/"I don't know"	237 (73.4)
Stress	
Low	50 (15.5)
Moderate	187 (57.9)
Severe	186 (26.6)
Physical activity level	
Extremely inactive	32 (9.9)
Sedentary	137 (42.4)
Moderate activity	118 (36.5)
Vigorous activity	32 (9.9)
Extreme activity	4 (1.3)
BMI	
Underweight	3 (0.9)
Normal weight	108 (33.4)
Overweight	85 (26.3)
Class I obesity	86 (26.5)
Class II obesity	24 (7.4)
Class III obesity	17 (5.4)

Source: Field survey June 2019 (multiple responses). BMI: Body mass index

### Logistic regression showing predictors of hypertension

Logistic regression analysis [Table 5] showed a statistically significant predictor for hypertension among participants whose ages fell between 18–31 and 32–45. The Igbos ( $P = 0.159$ ; odds ratio [OR] 0.835–3.015) are 1.5 times more likely to be hypertensive compared to the Hausas ( $P = 0.090$ ; OR 0.011–1.381) though this finding was not statistically significant. Overweight ( $P = 0.001$ ; OR 0.033–0.418) and Class I obesity ( $P = 0.033$ ; OR 0.076–0.900) were statistically significant predictors of hypertension among the traders who participated in the study.

### DISCUSSION

Several literature and research have linked several risk factors to the development of hypertension. The sex distribution of the study population showed more females (58.8%) compared to a similar study carried out among traders in Enugu which showed a male predominance of 51.5%<sup>[23]</sup> and another study carried out in Sokoto with a male predominance of 53%.<sup>[19]</sup> This may be explained by the fact that these previous studies had more males engaged in trading than women either due to religious reasons or culture. The majority of the traders were between ages 32 and 45 years which was similar to the finding in the study done in Sokoto with the majority of the traders aged between 30 and 39 years.<sup>[19]</sup> The majority of the participants were Christians (92%) which is much higher than 66% Christians among the traders in Sokoto.<sup>[19]</sup> The marital status among these participants is similar to other studies, a majority of them were married (71.8%) compared to 62.7% in Sokoto and 61.6% in Borno.<sup>[19,24]</sup> Most traders had secondary school education (58.5%) compared to the higher rate of no formal education (47.4%) in Borno and primary level education (65.7%) in Enugu.<sup>[12,23]</sup> This may be because the Northern part of the country has the lowest literacy rate compared to other parts.<sup>[25]</sup> In this study, the majority of the participants were Igbo (58.5%) who mostly are involved in one form of trade or the other as was found in Enugu.<sup>[23]</sup>

The knowledge, attitude, and practices on the lifestyle of participants towards hypertension were good (78.6%) for proper attitude and 75.6% for good practice on preventing hypertension. Knowledge on hypertension and its lifestyle was 40.9%. These are similar to a study done in Zambia with a good attitude (83.3%) and practice (70%) and average knowledge (60%).<sup>[5]</sup> This may be due to the minimum level of education (secondary) found among the traders which are likely to have created poor awareness of hypertension and its risk factors.

The demographic indices of age showed a similarity in the trend of hypertension in other studies carried out in Nigeria. In one of such studies, there was an increase from 5% in the age group younger than twenty (20%) to 80% in those >70 years.<sup>[12,13]</sup>

The prevalence of hypertension was found to be 32.2% among the participants surveyed. This is a lower prevalence compared

**Table 3: Sociodemographic factors associated with hypertension**

Variables	Frequency (%)		$\chi^2$	Df	P
	Not hypertensive (n=219)	Hypertensive (n=104)			
Sex					
Male	87 (65.4)	46 (34.6)	0.591	1	0.442
Female	132 (69.5.0)	58 (30.5)			
Age group (years)					
18-31	59 (83.1)	12 (16.9)	18.868	3	0.000
32-45	98 (71.5)	39 (28.5)			
46-59	50 (54.9)	41 (45.1)			
60 and above	12 (50)	12 (50)			
Religion					
Christianity	200 (67.3)	97 (32.7)	0.361	2	0.835
Islam	11 (73.3)	4 (26.7)			
Others	8 (72.7)	3 (27.3)			
Marital status					
Single	58 (79.5)	15 (20.5)	6.599	3	0.086
Married	148 (63.8)	84 (36.2)			
Divorced	9 (69.3)	4 (30.8)			
Separated	4 (80.0)	1 (20)			
Educational level					
No education	2 (50)	2 (50)	1.746	3	0.627
Primary	29 (61.7)	18 (38.3)			
Secondary	132 (69.8)	57 (30.2)			
Tertiary	56 (67.5)	27 (32.5)			
Tribe					
Igbo	115 (60.8)	74 (39.2)	12.526	3	0.006
Hausa	16 (94.1)	1 (5.9)			
Yoruba	24 (75)	8 (25)			
Other	64 (75.3)	21 (24.7)			

Df: Degree of freedom

to 40.2% reported in a study among adults in Gindiri district, Mangu LG, and 42.2% among traders surveyed in Enugu. But higher than 29.1% prevalence among traders surveyed in Sokoto.<sup>[19,23,26]</sup> Of the number diagnosed to have hypertensive, 55.8% were unaware of being hypertensive, which is a higher finding compared to 25% in newly diagnosed hypertensive traders in Borno.<sup>[24]</sup> More females were found to be hypertensive (55.8%) compared to 44.2% for males with the difference showing no statistical significance. This finding is contrary to the report of most regional and local studies<sup>[23,24,27]</sup> except for the study done among traders in Sokoto, which showed a higher female prevalence,<sup>[19]</sup> this is likely due to more women involvement in trading in this market. There was a statistically significant relationship between age and hypertension as it was found to be higher with increasing age. Fifty percent of the participants aged 60 years and above were found to be hypertensive which compares to studies in Borno (71% above 50 years), Enugu (80% above 70 years), and Sokoto (80% >60 years).<sup>[19,23,24]</sup> The vast majority of hypertensives were among the married traders (36.2%) and those with a primary level of education (38.3%) which correlates with a similar finding by Vincent-Onabajo *et al.* among traders in Borno 36% and 30%, respectively.<sup>[24]</sup> This may be due to the married traders being more occupied with family care with little attention to

their health and consumption of unhealthy diet, especially snacks (which are laden with salt for preservation) and soda. The highest prevalence of hypertension was among the Igbo traders (39.2%). Statistically, a significant relationship existed only among the total participant's age ( $\chi^2 = 18.868$ ,  $P < 0.001$ ) and tribe ( $\chi^2 = 12.526$ ,  $P = 0.006$ ) while Vincent-Onabajo *et al.* in a similar study done in Borno, had a statistically significant relationship between marital status ( $\chi^2 = 40.98$ ,  $P < 0.001$ ), age ( $\chi^2 = 105.9$ ,  $P < 0.001$ ) and hypertension.<sup>[24]</sup>

The low percentage frequencies seen among these traders may stem from the good knowledge of hypertension and its risk factors which reflected good attitude and practice. Other variables such as stress, sedentary activity, and obesity may be connected, because, sedentary activity increases the chances for obesity. Of all the risk factors analyzed, only BMI showed a statistically significant relationship with the presence of hypertension among these traders ( $\chi^2 = 35.501$ ,  $P < 0.001$ ), a finding that correlated with that of Vincent-Onabajo *et al.* among traders in Borno.<sup>[24]</sup>

## CONCLUSION

The study carried out among the participants showed that the knowledge of hypertension and its risk factors was below average (40.9%). A statistically significant risk factor of age

**Table 4: Risk factors associated with hypertension**

Variables	Frequency (%)		$\chi^2$	Df	P
	Not hypertensive (n=219)	Hypertensive (n=104)			
Table salt use					
Yes	66 (69.5)	29 (30.5)	0.172	1	0.678
No	153 (67.1)	75 (32.9)			
Alcohol consumption					
Yes	25 (58.1)	18 (41.9)	2.121	1	0.145
No	194 (69.3)	86 (30.7)			
Cigarette smoking					
Never smoked	195 (67.5)	94 (32.5)	0.522	2	0.770
Current smoker	10 (76.9)	3 (23.1)			
Quit smoking	14 (66.7)	7 (33.3)			
Family history					
Yes	52 (60.5)	34 (39.5)	2.890	1	0.089
No	167 (70.5)	70 (29.5)			
Stress					
Low	35 (70)	15 (30)	0.131	2	0.937
Moderate	126 (67.4)	61 (32.6)			
Severe	58 (67.4)	28 (32.6)			
Physical activity					
Extreme activity	24 (75)	8 (25)	4.621	3	0.328
Sedentary	90 (65.7)	47 (34.3)			
Moderate activity	77 (65.3)	41 (34.7)			
Vigorous activity	26 (81.3)	6 (18.8)			
Extreme activity	2 (50.0)	2 (50.0)			
BMI					
Underweight	1 (33.3)	2 (66.7)	35.501	5	0.000
Normal weight	88 (81.5)	20 (18.5)			
Overweight	64 (75.3)	21 (24.7)			
Class I obesity	50 (58.1)	36 (41.9)			
Class II obesity	12 (50)	12 (50)			
Class III obesity	4 (23.5)	13 (76.5)			

Multiple responses. Df: Degree of freedom, BMI: Body mass index

**Table 5: Logistic regression showing predictors of hypertension**

Variable	OR	95% CI	P
Age group (years)			
18-31	0.213	0.071-0.635	0.006
32-45	0.336	0.133-0.845	0.020
46-59	0.597	0.288-1.564	0.294
60 and above	1		
Tribe			
Igbo	1.587	0.835-3.015	0.159
Hausa	0.124	0.011-1.381	0.090
Yoruba	0.940	0.344-2.565	0.903
Other	1		
BMI			
Underweight	3.569	0.169-75.604	0.414
Normal weight	0.109	0.030-0.392	0.001
Overweight	0.118	0.033-0.418	0.001
Class I obesity	0.262	0.076-0.900	0.033
Class II obesity	0.404	0.095-1.719	0.220
Class III obesity	1		

OR: Odds ratio, CI: Confidence interval, BMI: Body mass index

and other findings contributed to the prevalence of hypertension of 32.2% observed among the participants. Of this number, 55.8% were unaware of their hypertensive status, buttressing its nature as a “silent killer.” Most risk factors were found to be present among the participants with an association seen more with increasing BMI. A high BMI is a risk factor strongly associated with hypertension and its complications which develop from a sedentary lifestyle. From the study, the risk factors which were predictors for hypertension among the study population included age, tribe, and BMI. These findings point to the fact that hypertension remains a major public health problem in our society and more efforts need to be channeled to tackle this menace from prevention to screening, early detection, and proper management.

### Recommendations

Based on the findings of the study, the following recommendations are made to improve knowledge and practices of hypertension and its risk factors among traders-

- a. Provision of universal health care coverage for the traders to encourage and improve health-seeking practices and attitudes

- b. Regular educational and enlightenment programs and jingles to inform the traders about the dangers involved in the practice of risky lifestyles for hypertension
- c. Trader engagement to reduce or eliminate some of these practices e.g., sedentary lifestyle
- d. Regular and well-organized screening programs should be organized by the market authorities to improve early diagnosis and management.

### Limitations of the study

Recall bias for the presence of risk factors which was overcome with the use of interviewer based questionnaires

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### Conflicts of interest

There are no conflicts of interest.

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