Hypertension: Predictors of Knowledge among Market Women in the Sub-Urban Town of Sagamu, South West Nigeria

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Summary

INTRODUCTION

Hypertension is a major public health problem. Based on prevalence of hypertension in Nigeria, only 1/3 of Nigerians are aware that they are hypertensive and of this, only two-third is on treatment for the hypertension. This may be because of inadequate provision of proper education and counseling by health care providers on the risks associated with high blood pressure. This study was to assess the knowledge of hypertension and the determinants among market women in Sagamu, South West Nigeria.

MATERIALS AND METHODS

The study was a cross sectional study conducted among women in the four major markets in Sagamu. The participants were recruited using multistage technique, thereafter a pretested questionnaire was administered to obtained relevant information. Data obtained were entered and analyzed using IBM SPSS 21.

RESULTS

All the participants had heard of hypertension. Regarding overall knowledge scores, two hundred and fifty-two (60%) had good knowledge, 128(30%) fair/average knowledge while 40(10%) had poor knowledge. Two hundred and fourteen (51%) of the respondents had been diagnosed of hypertension. Those with normal weight, those who were overweight, those who had spent less than 10 years in the market (less time spent in a sedentary occupation) and those with co-morbidities were more likely to have good knowledge of hypertension. Those with informal/primary education, family history of hypertension and co-morbidities had a higher likelihood of reporting a previous diagnosis of hypertension.

CONCLUSION AND RECOMMENDATION

This study revealed that women in Sagamu are aware of hypertension. About two-thirds of them have good knowledge of hypertension. Determinants of knowledge of hypertension include educational status, number of years spent in market business (sedentary occupation), BMI, family history of hypertension and presence of comorbidities. There remains a need for continued community education about hypertension.

Introduction

Hypertension is defined as a condition in which the systolic blood pressure (SBP) is equal to or greater than 140 mmHg and/or diastolic blood pressure (DBP) equal to or greater than 90 mmHg.[1] Hypertension can also be defined as a persistent elevation in office systolic BP ≥140 and/or diastolic BP ≥90 mmHg, which is equivalent to a 24-hr ambulatory blood pressure monitoring average of ≥130/80 mmHg or a home blood pressure monitoring average of ≥135/85 mmHg or patient taking antihypertensives[1]. Globally, the overall prevalence of hypertension in adults aged 25 years and over was around 40% in 2008. The number of people with hypertension rose from 600 million in 1980 to 1 billion in 2008[1] and 1.13 billion in 2019[2]. The increasing prevalence of hypertension is attributed to population growth, ageing and behavioral risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and exposure to persistent stress.[3]

Hypertension is a major public health problem and is a major risk factor for other Non-Communicable Diseases (NCDs) like stroke, cardiovascular disease and chronic kidney disease. Complications of hypertension account for 9.4 million deaths worldwide every year[4]. Hypertension is responsible for 45% of deaths due to heart disease and 51% of deaths due to stroke. The relationship between blood pressure (BP) and risk of cardiovascular events is continuous, consistent, and independent of other risk factors. The higher the BP, the greater the chance of heart attack, heart failure, stroke, and kidney diseases[5]. Hypertension is the third killer disease worldwide, accounting for one in every eight deaths. In Nigeria, the age-adjusted prevalence of hypertension according to International Collaborative Study of Hypertension in Blacks (ICSHIB) was recorded to be 14.5%[6]. Although, with the current definition of hypertension based on JNC VIII guidelines, 38.1% were said to be hypertensive[6]. In India, 23.1% of men and 22.6% of women over 25 years suffer from hypertension[4].

Based on prevalence of hypertension in Nigeria, only 1/3 of Nigerians are aware that they are hypertensive and of this, only two-third are on treatment for the hypertension. Most Nigerians do not see reasons for regular monitoring of their blood pressure and this may be because of inadequate provision of proper education and counseling by health care provider on the risks associated with high blood pressure. Lack of interest or busy schedule on the part of individuals has also been identified as a possible cause[7].

It is a common belief that hypertension is more common among men. The truth however, is that nearly half of all adults with high BP are women. Women with high BP have a significantly higher risk for vascular disease than men who have the same elevated BP

levels[7]. Cardiovascular diseases remain a major killer of women[8]. Worldwide, over eight million women die each year from heart disease or stroke, almost eighteen times the number who die of breast cancer and six times more than the number who die of HIV/AIDS[9]. This study was therefore conducted to assess the knowledge of hypertension among market women in Sagamu Local Government and also to identify factors associated with the knowledge of hypertension among these women.

Materials and Methods

Study area

The study was conducted in Sagamu, the local government headquarters of Sagamu Local Government Area, Ogun State, South West Nigeria, where the Yoruba people are the ethnic majority. Sagamu is one of the major towns in Ogun state, home to over 250,000 residents, as at the last population census and projected to have a population of over 350,000 by 2016[10].

Study design

This study was a cross sectional survey conducted among women in four major markets in Sagamu, Ogun State, including Falawo market, Awolowo market, Oja Oba and Sabo Market.

Sample size determination

The sample size of 284 was calculated using Cochran's formula, assuming a confidence level of 95%, 5% absolute precision and prevalence of 24.4% as obtained from a previous study[11]. However, to increase the power of the study and allow for non-responders, the total sample size used was 420.

Sampling technique

Multistage sampling technique was used in the selection of study participants. The first stage involved random selection of four major markets in Sagamu, i.e. Sabo, Awolowo, Falawo

and Oja oba markets. The second stage involved the proportionate allocation of the sample size according to estimated density of the four markets. Sabo market, being the market with highest density, was allocated with 32%; Awolowo market, 28%; Falawo market, 22%; and Oja oba, 18%. Therefore a total of 134 participants were allocated to Sabo market, 118 to Awolowo market, 92 to Falawo market and 76 was allocated to Oja Oba market. The third stage involved cluster sampling selection of the market women.

Study instrument

A pretested, self-administered questionnaire was used to collect information on the socio- demographic characteristics of the market women, their knowledge, attitude and the prevalence of hypertension and its risk factors among them. Knowledge was graded into good, fair and poor based on assigned scores in percentage, good being 60% and above, fair being 40-59%, while <40% was regarded as poor.

Data analysis and presentation

Data obtained were entered and analyzed using IBM SPSS for Windows Version 21 (IBM Corp, Armonk, NY, USA). Data were presented in tables. Categorical variables were summarized using frequency and percentages. Continuous variables were summarized using means and standard deviations. Chi-square was used to determine relationships between categorical variables. Multivariate logistic regression was used to determine the determinants of knowledge of hypertension, as well as determinants of previous diagnosis of hypertension among the study participants. A p-value less than 0.05 was considered as statistical significance.

Ethical considerations

Letter of introduction/identification was collected from the hospital management to the market head of each market. Informed consent was obtained from each respondent and the content of the questionnaire was explained to each of them. Ethical approval for the study was obtained from the Health Research Ethics Committee of Olabisi Onabanjo University Teaching Hospital (NHREC/28/11/2017). The research was conducted in adherence with the Revised World Medical Association Declaration of Helsinki. The study participants were assured of the confidentiality of data obtained from them, and no identifying information was collected.

Results

Socio-demographics

Table 1 shows the socio-demographic characteristics of the respondents. The mean age of the respondents was 44.6±17.3years. Majority of the respondents (154, 36.7%), were in the 40 - 49 years age group, 188 (44.8%) had primary school education, 220 (52.4%) were of Islamic religion, 161 (38.3%) were divorced and 142 (33.8) had spent 6 to 10 years selling in the market.

Table 1: Socio-Demographic of Respondents

Socio-Demographics	Frequency	Percentage
Age		
20-29	44	10.5
30-39	87	20.7
40-49	154	36.7
50-59	105	25.0
≥60	30	7.1
Educational status		
None	43	10.2
Primary	188	44.8
Secondary	131	31.2
Tertiary	58	13.8
Religion		
Christianity	108	25.7
Islam	220	52.4
Traditional	86	20.5
Others	6	1.4
Marital status		
Single	72	17.1
Married	137	32.6
Divorced	161	38.3
Widowed	34	8.1
Separated	16	3.8
Years in market		
<1	94	22.4
1-5	99	23.6
6-10	142	33.8
11-15	59	14.0
16-20	12	2.9
>20	14	33

Table 2: Participants' Awareness and Knowledge of Hypertension

Variables	YES (%)	NO (%)
Awareness		
Have you heard of hypertension before	420(100)	0(0.0)
Knowledge		
Hypertension is high blood pressure	352(83.8)	68(16.2)
Hypertension can be caused by excessive thinking, worries or stress	359(85.5)	61(14.5)
Hypertension is caused by witches, wizards and attack from enemy	185(44.0)	235(56.0)
Hypertension can be hereditary	188(44.8)	232(55.2)
Hypertension is caused by food poisoning	179(42.6)	241(57.4)
Hypertension has dangerous complications like stroke, heart failure, kidney failure and blindness	310(73.8)	110(26.2)
Risk factors of hypertension includes obesity, alcoholism, diabetes, smoking	279(66.4)	141(33.6)
Hypertension is detected by blood pressure measurement	330(78.6)	90(21.4)
Hypertension may not have symptoms	131(31.2)	289(68.8)
Symptoms of hypertension includes headache, restlessness, palpitation	334(79.5)	86(20.5)
High salt diet, high fat diet can predispose to hypertension	309(73.6)	111(26.4)
Hypertension is cured once and for all	108(25.7)	312(74.3)

Knowledge of hypertension

All the participants had heard of hypertension before; One hundred and seventy-eight (42.4%) heard about hypertension from hospital, 57(13.6%) from television and 16(3.8%) from newspaper. Three hundred and fifty-two (83.8%) respondents knew that hypertension is also known as high blood pressure; 359 (85.5%) felt hypertension can be caused by excessive thinking, worries or stress.

Surprisingly, 185(44.0%) felt that hypertension is caused by witches, wizards and attack from enemy; 188(44.8%) were of the opinion that hypertension could be inherited; 179 (42.6%) thought that hypertension may result from food poisoning. Nonetheless, 310 (73.8%) affirmed that hypertension has dangerous complications; 279 (66.4%) were aware of risk factors of hypertension, including obesity, alcohol consumption, cigarette smoking, diabetes and obesity (Table 2).

Table 3: Participant Risks for Hypertension

Variable	Yes (%)	No (%)
Do you smoke cigarette	8(1.9)	412(98.1)
Do you snuff tobacco	34(8.1)	290(91.1)
Do you drink alcohol	195(46.4)	225(53.6)
Do you have family history of hypertension	294(70.0)	126(30.0)
Do you eat fatty food	219(52.1)	201(47.9)
Have you been diagnosed of other medical conditions (co-morbid)	147(35.0)	273(65.0)
Previous diagnosis of hypertension	159(37.9)	261(62.1)
Are you on treatment for hypertension	159(37.9)	261(62.1)

Three hundred and thirty (78.6%) knew that hypertension could be detected by blood pressure measurement; 131(31.2%) opined that hypertension may not have symptoms whereas 334(79.5) of the participants believed headache, restlessness and palpitation were symptoms of hypertension. Three hundred and nine respondents (73.6%) perceived high salt diet and high fatty diet as the predisposing factors; 108(25.7%) thought that hypertension could be cured at once and for all. Regarding overall knowledge scores, two hundred and fifty-two (60%) had good knowledge, 128(30%) fair/average knowledge while 40 (10%) had poor knowledge.

Risk of developing hypertension

Two hundred and fourteen (51%) of respondents had been diagnosed of hypertension. Out of the 214 who had been diagnosed with hypertension, 178 (83.2%) of the respondents were diagnosed in the hospital, 16(7.5%) in health centre, 4(1.9%) by private health personnel 4 (1.9%) at traditional centre, while 12(5.5%) were diagnosed in other facilities. Table 3 .Eight (1.9%) of respondents smoked cigarette, 34(8.1%) snuffed tobacco, while 195(46.4%) drank alcohol; 294(70.0%) had family history of hypertension and 147(35.0%) had been diagnosed of diabetes or other co-morbid medical conditions.

Table 4: Predictors of Knowledge among the Participants

Variables	Knowledge (%)			Chi Square (p value)	AOR	CI	p value for AOR
	Good (n=252)	Fair (n=128)	Poor (n=40)				
Age							
≤50	163(57.2)	94(33.0)	28(9.8)	3.076	1.138	0.647-2.001	0.654
>50*	89(65.9)	34(25.2)	12(8.9)	(0.215)			
Educational status							
Informal/Primary	117(50.6)	84(36.4)	30(13.0)	**19.784**	0.424	0.263-0.682	**<0.001**
Secondary/Tertiary*	135(71.4)	44(23.3)	10(5.3)	**(<0.001)**			
BMI							
Normal	80(65.0)	21(17.1)	22(17.9)	**44.666**	2.037	1.164-3.567	**0.013**
Overweight	116(64.4)	64(35.6)	0 (0.0)	**(<0.001)**	2.482	1.515-4.065	**<0.001**
Obese*	56(47.9)	107(36.0)	18(6.1)				
Years spent in market (years)							
≤10	209(62.4)	100(29.9)	26(7.8)	**7.186**	1.775	1.047-3.007	**0.033**
>10*	43(50.6)	28(32.9)	14(16.5)	**(0.028)**			
Family Hx of HTN							
Yes	162(55.1)	110(37.4)	22(7.5)	**23.686**	0.513	0.308-0.855	**0.010**
No*	90(71.4)	18(14.3)	18(14.3)	**(<0.001)**			
Comorbidity							
Present	103(70.1)	32(21.8)	12(8.2)	**9.887**	2.594	1.574-4.276	**<0.001**
Absent*	149(54.6)	96(35.2)	28(10.3)	**(0.007)**			

N.B – The multiple logistic regression model predicts the likelihood of a category of the independent variable having higher knowledge of hypertension (from poor to good knowledge), in comparison to the reference category.

Years spent in market was added to the model as a surrogate for sedentary lifestyle (occupation)

Reference category *

Level of significance < 0.05 ;CI – Confidence Interval;AOR – Adjusted Odds Ratio

Correlates of knowledge of hypertension

Table 4 shows that educational status, number of years spent in market business (sedentary occupation), body mass index, family history of hypertension and presence of comorbidities were significantly associated with knowledge of hypertension. Further analysis using multivariate logistic regression showed that those with informal/primary education, as well as those with a family history of hypertension were less likely to have good knowledge of hypertension in comparison to their counterparts with secondary/tertiary education and those who did not have a family history of hypertension, respectively. The model also showed that those with normal weight, those who were overweight, those who had spent less than 10 years in the market (less time spent in a sedentary occupation) and those with co-morbidities were more likely to have good knowledge of hypertension, compared to those who were obese, those who had spent 10 or more years in the market (more time spent in a sedentary occupation), and those who did not have co-morbidities, respectively.

Table 5: Predictors of Hypertension Diagnosis

Variables	Diagnosed with Hypertension (%)		Chi Square (p value)	AOR	CI	P-value for AOR
	Yes n=159	No n=261				
Age						
>50	141(49.5)	144(50.5)	x^2=0.776	0.675	0.362-1.260	0.217
≤50*	73(54.1)	62(45.9)	(0.378)			
Educational status						
Informal/Primary	141(61.0)	90(39.0)	x^2=20.898	3.182	1.870-5.415	**<0.001**
Secondary/Tertiary*	73(38.6)	116(61.4)	**(<0.001)**			
BMI						
Normal	44(35.8)	79(64.2)	x^2=48.625	0.146	0.072-0.296	**<0.001**
Overweight	79(43.9)	101(56.1)	**(<0.001)**	0.225	0.121-0.418	**<0.001**
Obese*	91(77.8)	26(22.2)				
Years spent in market (years)						
>10	175(52.2)	160(47.8)	x^2=1.096	1.127	0.609-2.087	0.703
≤10*	39(45.9)	46(54.1)	(0.295)			
Family History of Hypertension						
Yes	186(63.3)	108(36.7)	x^2=59.452	5.681	3.148-10.252	**<0.001**
No*	28(22.2)	98(77.8)	**(<0.001)**			
Comorbidity						
Present	106(72.1)	41(27.9)	x^2=40.505	2.383	1.412-4.019	**0.001**
Absent*	108(39.6)	165(60.4)	**(<0.001)**			

N.B – The multiple logistic regression model predicts the likelihood of a category of the independent variable reporting a diagnosis of hypertension, in comparison to the reference category.
Years spent in market was added to the model as a surrogate for sedentary lifestyle (occupation)
Reference category *
Level of significance < 0.05 ;CI – Confidence Interval;AOR – Adjusted Odds Ratio

Correlates of previous diagnosis of hypertension

Table 5 illustrates factors associated with a previous diagnosis of hypertension amongst study participants. It shows that educational status, BMI, family history of hypertension and presence of co-morbidities were significantly associated with a diagnosis of hypertension. Further analysis using multivariate logistic regression also showed that the same variables were significant predictors of diagnosis of hypertension. While those with informal/primary education, family history of hypertension and co-morbidities had a higher likelihood of reporting a previous diagnosis of hypertension than their counterparts, those with normal weight and those who were overweight were less likely to have reported a previous diagnosis of hypertension than participants who were obese.

Discussion

This cross-sectional study was conducted among market women in 4 major markets in Sagamu, South-West Nigeria to determine their awareness, knowledge and antecedent risk factors of hypertension. The mean age of the respondents was 44.6±17.3 years with majority (36.7%) being in the 40-49 years age group. This was close to that obtained in a study carried out by Ajayi *et al* where the mean age was 38.8±15.6 years.[12] In Azubuike *et al*'s study, majority (50.2%) were within the age range of 35-54 years.[11] This can be attributed to the fact that majority of Nigerians in their productive years are middle aged, and most market women fall into this category.[13,14]

About half of our population had primary school education as highest level of education. In studies carried out by Ifeoma et. al. and Azubuike et. al., majority of the respondents also had primary school education as highest

level of education, 65.7% and 33.7% respectively.[11,15] Owing to the fact that the current study setting was a semi-rural area, this finding is not out of place.

All (100%) the respondents had heard of hypertension before. This shows good exposure of the respondents to information on hypertension. Previous studies have also shown similar good level of awareness of hypertension, especially among women[11,16,17]. This level of awareness in our study population also corresponded with a good level of knowledge of hypertension, as 60% of the respondents had good knowledge of hypertension. More work needs to be done however in the dissemination of knowledge on hypertension to the study population, as not all respondents had a comprehensive knowledge of the condition. This creates a window of opportunity for educational programs and public enlightenment that would have a direct impact on positive health behavior. The hospital was the major source of knowledge of hypertension in our study (42.4%), with television (13.6%) being the next. This is similar to Azubuike's study in which the greatest source of information was the hospital (44.05%), followed by women organization meeting (15.48%), ahead of television and radio (9.52%).[11] In addition to these means of propagating knowledge of hypertension, schools, churches, print media and possibly social media could be adopted as well, based on the age, educational status and level of exposure of the target population.

Over half (51%) of the respondents in our study had been diagnosed of hypertension in the past. As hypertension usually presents asymptomatically, individuals are unlikely to go for checkup. It is usually during routine checkups that individuals are diagnosed in a large number of cases. It is thus important to improve health seeking behavior so that despite

the absence of overt symptoms, individuals can still do routine testing and checkups.

Pertaining to participants' risk factors, 70.0% had family history of hypertension, 46.4% drank alcohol, 35.0% had been diagnosed with diabetes or other co-morbid medical conditions, 8.1% snuffed tobacco and 1.9% smoked cigarette. Another study reported similar findings, where slightly over 20% of the participants were obese, about 12% were current smokers, and 55% reported family history of hypertension.These findings suggest a very significant risk of the study population developing hypertension.

Ulasi *et al* identified obesity as a major risk factor to developing hypertension.[15] Addressing these risk factors will go a long way in preventing or delaying the onset of hypertension. More so, the nature of the work of market sellers tends to be sedentary, placing this category of people at similar risk of cardiovascular risk as those with white collar jobs. Hence, interventions centered on physical activity, in addition to dietary modification, stress reduction and other strategies would prove helpful in the control on hypertension in those already diagnosed, and prevention in those at risk.

In our study, educational status, family history of hypertension, body mass index and years in market business were found to significantly affect the knowledge of hypertension among the participants. Participants with lower levels of education on our sample, had lower odds of having good knowledge of hypertension. This could be because of a lack of exposure to educational materials on general health, including information on hypertension. This finding calls for knowledge-based interventions on the prevention of hypertension, using primary health care models to gain access to these individuals at

the grassroots level. While a similar study noted an association between family history of hypertension and level of knowledge of hypertension our findings specifically indicated that those with a family history of hypertension were less likely to have good knowledge of hypertension[18]. This would suggest that a positive family history of hypertension does not automatically translate to a good knowledge of the condition. This therefore highlights the need for individual drive for knowledge, to improve health outcomes.

Our study further affirms that individuals with lower levels of education (informal/primary), family history of hypertension and comorbidities (such as diabetes) had a higher likelihood of reporting a previous diagnosis of hypertension. The inverse relationship between level of education and arterial hypertension is well documented in literature[2,4,14]. Other studies have documented higher incidence of hypertension in those of lower socioeconomic class[19]. Of note is the study by Erceg *et al*, which noted that the five-year cumulative incidence of arterial hypertension was higher amongst individuals who had less than 12 years of education, compared with those who had more than 12 years of education.

These findings were particularly significant for women younger than 65 years of age. The body mass index of individuals with less than 12 years of education was also higher[20]. The relationship between family history of hypertension and comorbidities such as diabetes with hypertension are also well documented[21]. Age however, played no significant predictive role in both hypertension knowledge and previous diagnosis of hypertension, in our sample.

Limitation

There was a lack of actual blood pressure checks to objectively detect hypertension. However, the authors recognize the fact that checking the blood pressure of these market women while at their place of business could have been influenced by myriad factors to result in an inaccurate estimation of their blood pressure. Such factors could include noise pollution, distraction from market patrons, and the use of anti-hypertensive on the day of screening, to mention a few. Thus, researchers who may want to replicate this study in the future may consider identifying the study population, and inviting them to a conducive environment where their blood pressure reading can be obtained, and repeated at a different time to confirm the diagnosis of hypertension, while also controlling for other confounders.

Conclusion

This study revealed that market women in Sagamu were aware of hypertension, however only about two-thirds of them had good knowledge of hypertension. The risk factors for the development of hypertension, such as family history, alcohol intake and obesity, were also present among these women. Determinants of knowledge of hypertension include educational status, number of years spent in market business, BMI, family history of hypertension and presence of comorbidities, while determinants of previous diagnosis of hypertension include educational status, BMI, family history of hypertension and presence of co-morbidities. There remains a need for continued community education about hypertension and how to control these risk factors, to promote overall quality of health and reduce the burden of hypertension among women.

Institution and department the work should be attributed:

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