Knowledge of hypertension and other risk factors for heart disease among Yoruba Rural Southwestern Nigerian Population

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Abstract

40 **Background and objectives**: There is paucity of reliable information on knowledge about hypertension and cardiovascular disease (CVD) risk factors in rural southwestern Nigeria. This study assessed the level of awareness, basic knowledge and management of hypertension and CV risk factors among people living in rural south western Nigeria.
47 **Methods:** A population based cross-sectional survey was conducted in Egbeda local government area of Oyo State, Nigeria. A structured questionnaire was used to interview 2000 subjects in order to assess knowledge of various aspects of modifiable CV risk factors.
51 **Results**: The commonest source of medical information was the family/friend/opinion leaders of trusted groups in 1198(59.9%), the media (including radio, public enlightenment programmes, and newspapers) in 492(24.6%), and the doctor/nurse/health worker in 183(9.1%) of the respondents. The overall knowledge of CVD and its risk factors was poor. About 56% of the respondents could not identify a single risk factor. Of those who were able to, only a few could correctly identify the relationship between CV risk factors and CVD with some misconceptions. . We found that subjects who had more years of formal education, a positive family history of CVD, and self reported history of diabetes mellitus were more likely to have a good level of knowledge of hypertension and other CV risks when adjusted for age, gender and marital status.
69 **Conclusion:** Our study confirms a limited knowledge and misconceptions of CVD and its risk factors in this population. Early detection and preventive practices were significantly lacking due to these gaps in knowledge. There is an urgent need to design and implement culturally appropriate public awareness, health educational and health promotional programmes about CV risk factors and CVD for this community which can be adapted for other rural population in the country.

76 **Key words**
77 Cardiovascular disease, cardiovascular risk factors, hypertension, knowledge, community-based study, Nigeria.

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Background and objectives

90 Cardiovascular disease (CVD) and hypertension are examples of non-communicable diseases (NCD) considered the next epidemic in Nigeria, due to the rapid epidemiological transition taking place.[1] In a national survey of NCD, only about a third of hypertensives were aware of their condition. [2] Of those aware, only half were on any form of treatment, and of those that were on treatment, less than one third were effectively controlled. The level of awareness, treatment and control of hypertension is relatively low world-wide.[3, 4] Apart from poor adherence to treatment, other factors may be contributory, such as, lack of access to health care and non-adherence to therapeutic guidelines by the health care giver/provider. [5,6] Among the reasons for lack of recognition and control of hypertension in Nigeria may be the lack of knowledge about hypertension and other cardiovascular (CV) risk factors with their complications. Many hypertensives are unaware of the risks associated with allowing asymptomatic conditions to remain untreated and often lack motivation to change their lifestyle and comply with treatment. Also, primary care physicians may fail to recognize the importance of early and aggressive treatment to targets. Lack of knowledge of appropriate target BP has been shown to be associated with poor BP control.[7] Better knowledge has been shown to improve adherence to lifestyle changes and medication.[8]
103
104 Studies on knowledge about hypertension and CVD risk factors amongst health workers[9] and patients in hospital based settings[10-12] have been documented in Nigeria, but there is little information about this in the general population. Such knowledge is important in policy formulation for prevention and management of CVD. The present study was conducted to assess the knowledge and understanding of hypertension and CV risk factors among people living in rural south western Nigeria. The level of awareness and management of CV risk factors and CVD in this population was also assessed. Identification of gaps in knowledge can aid in the development of health education and health promotion materials that can be utilized in the community to address the deficiencies. These will increase the knowledge of the public locally about hypertension and other CV risk factors.

112 Methods

113 This work was part of a community-based descriptive, non-interventional, cross-sectional survey of cardiometabolic risk factors conducted from December 2002 to November 2005 in Egbeda Local Government Area (ELGA), a rural community in southwestern Nigeria. A complete description of the design and scope of this study is presented elsewhere. [13] The study protocol was evaluated and approved by the Ethics of Human Research Committee of the Oyo State Ministry of Health. A systematic random sample of dwellings was selected from lists drawn up by field enumerators. Consecutive eligible adults were selected as respondents. A maximum of three respondents were chosen per household. Community health extension workers (CHEWs) collected the data for the study after being trained in basic interviewing techniques and standard methods of obtaining physical measurements. Individual consent was obtained verbally and where possible by written consent.

123 Each subject was taken through a structured questionnaire and physical assessment using hypertension as an entry point. Hypertension was defined as blood pressure ≥ 140/90 mmHg or on treatment for hypertension. Information obtained included demographic and socioeconomic profiles, history of self-reported cardiac risk factors and pre-existing cardiovascular conditions and complications. Where applicable, we went through the medical records of subjects who utilized the primary health centres in ELGA. Knowledge of hypertension and other CV risk factors were determined using a set of multiple responses and *" yes/no"* type of questions. They were also asked about their sources of such information. The
questionnaire was initially developed in English, translated to Yoruba and back-translated to English to check for consistency. Some of the conditions such as hypertension, diabetes, kidney failure, and stroke have local terminologies. Where this was absent, we used lengthy descriptions to convey the meaning and sometimes relied on a third party to clarify the questions where necessary. Equivalents of an orange or a banana was used to describe helpings of fruits and vegetables.

The data obtained were analyzed using SPSS version 13.0 software (SPSS Inc. Chicago, Illinois, USA). Descriptive analysis of the variables was performed to process the data as tables. Continuous variables were described by calculating the means and SD. Categorical variables were described using frequency tables. Multivariate analysis was done using Mantel-Hanzel test for trend.

Results

The characteristics of the 2,000 people who responded to the survey, stratified by BP groups are shown in Table 1. The literacy level was more than average as 67.0% of the subjects had primary level education whilst 8.0% had above primary level education. The remaining 25% had no formal education. Three hundred and eight respondents (15.4%) had a family member suffering from hypertension or other CVD. The commonest source of medical care was the primary health centre/health post in 360(18.0%), the hospital in 31(1.5%), the patent medicine store in 284 (14.2%), and traditional medicine in 277(13.8%) of the respondents. The commonest source of medical information was the family/friend/opinion leaders (OL) of trusted groups in 1198(59.9%), the media (including radio, public enlightenment programmes, and newspapers) in 492(24.6%), and the doctor/nurse/health worker in 183(9.1%) of the respondents.

Except for the overall knowledge for clinical features of stroke which was 21.9% and poor vision, 21.8%, the knowledge of the clinical features of other conditions including heart failure and kidney failure was not as high (Table 2). Although about 44% of the respondents could identify modifiable risk factors for CVD, only a few could correctly identify the relationship between the two. The common CV risk factors known in decreasing order of frequency among respondents were stress (42.7%), tobacco use (36.2%), hypertension (16.2%), diabetes (5.4%), excessive salt intake (2.8%), low consumption of fruits and vegetables (1.7%), obesity (1.6%), lack of exercise (1.2%), and dietary fat (1.1%). More than 99% of the subjects were unaware that excess weight around the waistline increased the risk of CVD. One thousand one hundred and twenty one (56%) could not identify a single risk factor. Only 10.5% of the respondents considered hypertension to be a potentially life threatening condition, 5.8% knew that it is mostly a silent disease, whilst 2.7% knew that treatment is for life. Less than 1.5% knew that BP is high when ≥ 140/90mmHg and 0.8% had an idea of what their BP was at the time of the study.

Table 3 shows the use of health facilities by the participants. More than half (59.7%) of the study population had never had their BP measured before the study. About 10.0% had their BP measured during their last 1-4 visits to a health facility. None of them had had a cholesterol check before and 92.9% of them had never had their electrolytes and urea tested. Among the reasons identified for not taking advantage of the free health care available to the community were: the working hours at their farms and trade coincided with that of the primary health clinics; the health care providers and the care seekers advocated only intermittent, symptom-led treatment; and many subjects associated high BP with physical symptoms, taking medication only when they feel unwell.

The current interventions in the management of self reported hypertensive subjects are as shown in Table 4. Of the fifty nine subjects, only 18.6% of them were on BP lowering medications and 6.7% had access to home monitoring devices. Except for low dietary salt intake in 50.8% of self reported hypertensives, the use of non-pharmacological interventions was generally low in their management. None of them was enrolled in a smoking cessation programme, neither was anyone on statins since blood cholesterol had never been measured in any of them.

Table 5 shows the predictors of good knowledge of hypertension and other CV risks. We found that subjects who had more years of formal education, a positive family history of CVD, and self reported history of diabetes mellitus were more likely to have a good level of knowledge when adjusted for age, gender and marital status.

Discussion

Our study is novel because we looked at the knowledge of hypertension and other CVD risk factors in the general population and not in hypertensive patients alone as in other studies. [9-12] The main health problems identified within the population studied were maternal and infant welfare, malaria and diarrhea. Family, friends and OL of trusted groups were the major sources of information regarding general health information including CVD. Although we did not look into respondent's satisfaction with the information provided, we saw the need to conduct regular health education and health promotion sessions on how to

provide relevant information about CVD using faith based organizations and age/social groups. There was also the need to direct their attention to doctors and nurses as more reliable and accurate sources of information. Health care providers should also be encouraged to disclose absolute values of measurements to their patients such that both can work towards a set target during the course of management.

Our study demonstrates a general lack of knowledge about modifiable CVD risk factors in this sample of adults living in rural southwestern Nigeria. Our findings are consistent with the study in a cohort of Nigerian hypertensives whose knowledge was found to be particularly poor[14]. Another study reported that 18% knew some risk factors. [12] However, this is considerably different from what has been reported in Western countries where the knowledge base is high[15]. About 56% of our respondents were unable to identify a single risk factor. Those who identified stress and tobacco use did so only on the basis of social issues and cultural norms, admitting that these factors were bad in themselves not necessarily knowing them as CVD risk factors. The most correctly identified CVD risk factor was hypertension (16.2%) possibly because of the prevalence of the condition[13]. More than half (59.7%) of the study population had never had their BP measured before the study. Our finding is similar to a study conducted in hypertensive patients seen in a tertiary hospital in the middle belt of Nigeria where about 61% were diagnosed for the first time to be hypertensive in the teaching hospital. [10] A situation such as this calls for increased identification of cases by regular screening at the primary health care level before complications set in. Although 324 (16.2%) respondents correctly identified hypertension as a risk factor for CVD, only 28 (1.4%) actually knew what blood pressure levels constituted hypertension. This may be due to the fact that the absolute values were not disclosed to them most of the time when their blood pressure is measured. They were only told that it was normal or high. We discovered that this practice did not encourage treatment to target. Knowledge about other CVD risk factors was generally poor including diabetes. A major problem with diabetes care in sub-Saharan African region is the inadequate training of health care workers, leading to insufficient knowledge of diabetes and other chronic diseases. A large number of health care workers in southwest Nigeria do not seem to be familiar with the current practice guidelines for the management of diabetes.[9] It is interesting to note from our study [13] that other than hypertension and stroke, this is a low risk, physically active population with a low prevalence of obesity, smoking and good lipid profile. With the rapid epidemiologic transition in the sub region, this risk profile can change with adverse effects. This is why it is pertinent to determine their knowledge of CV risk factors with the aim of reinforcing appropriate healthy lifestyle. There is an urgent need for public enlightenment program by way of health education and promotion which will focus on preventing this population from acquiring adverse risk profile.

A relatively poor knowledge of modifiable risk factors for coronary heart disease was found in studies in Asians [16]. A study conducted in the US also reported that only 15% of the subjects recognized lack of exercise as a cause of heart disease [17].

In our study the knowledge about symptoms of CVD was generally poor as only 21.9% of the respondents could identify stroke and thus promptly seek medical help. Stroke was found to be the most familiar disorder in this population and this was attributed to the fact that some had seen this disorder occurring before in family and friends and could easily recognize its features. Only about 1% or less of the population studied knew the symptoms of heart attack, heart failure or kidney failure. Inability to recognize these symptoms may be associated with delay in seeking medical care with worse clinical outcome. Knowledge of the clinical features of hypertension is particularly poor as less than 6% considered it to be mostly a silent disease. This finding is similar to that obtained in a study carried out in Nigerian hypertensives who demonstrated inadequate knowledge about hypertension[14]. Less than 3% of our study population believed that treatment of hypertension is throughout life and this proportion is a far cry from that obtained in a previous study amongst Nigerians where one third was aware that treatment should be life-long[2]. Previous studies in developed countries such as Canada and Australia also noted a lack of public awareness and misconceptions about hypertension and hypertensive complications [18, 19]. In our study, only 1.4% of the respondents were able to define hypertension and only 0.8% had an idea of what their BP is. These proportions are abysmally low, meaning that hypertension education appears grossly inadequate in this respect.

The current interventions in self reported hypertensives showed that less than a fifth (18.6%) of our study population was on BP lowering medications. The free health care available to the community appeared to be geared towards symptom-led treatment especially of communicable diseases. Not much was being offered in the area of NCDs by the health care providers. Our finding is lower than a third that were found

to be on treatment in a similar survey carried out in Nigeria[2]. We found that the hypertensives were not only inadequately treated with medications; the use of non-pharmacological interventions such as weight reduction and increased physical activity was generally low in their management. None of them was enrolled in a smoking cessation programme, neither was anyone on statins since blood cholesterol had never been measured in any of them. The restriction of salt in the diet in 50.8% of the self reported hypertensives was however encouraging and we believe that this type of behavior should be encouraged for the rest of their families and friends. A poor level of perception of hypertension and awareness of the lifestyle-modification measures was found in adult Nigerians attending a tertiary hospital. [20] However, a high level of willingness to adopt the lifestyle measures through health personnel and mass media was shown in the study.

Knowledge of cholesterol was virtually absent in our study and none of the subjects have had their cholesterol measured before and as such could not say what the levels should be. About 97% had never checked their electrolytes and urea before. Also about 60% had never measured their BP before the study. In a study in USA, knowledge of cholesterol levels and targets was poor and cholesterol education efforts appeared inadequate. [21]

Limitations of this study: We did not assess the barriers responsible for the low knowledge and lack of information on CVD. The strength of our study was the high response rate as the participants were conversant with community based studies.

Conclusions

Our study suggests a lack of public awareness and misconceptions about the nature, symptoms, risk factors and complications of CVD. Early detection and preventive practices were significantly lacking due to these gaps in knowledge. Part of our recommendation from this study is that health care providers should receive CV health related training and effectively communicate CVD prevention and treatment messages with care seekers. Results from this study can be utilized urgently in designing and implementing comprehensive public awareness, health educational and health promotional programmes about CVD for the community which can be adapted to other rural population in the country. Specific public health strategies should be developed to deliver these messages to people with low levels of education in mind in underserved communities. Efforts should be made to engage this community in prevention programmes that promote CV health which are adaptable to their cultural norms.

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Competing interests

The authors have declared that no competing interests exist.

Author's contributions

LS, OS, OOO, KS, AOF proposed the idea, designed the study, and monitored the whole process.OOO was responsible for the training of the health workers. OOO, KS supervised the health workers who applied the questionnaire, and collected the data.OOO conducted the clinical examination. OOO was the principal investigator of the study, led analysis of the data and write up of the manuscript and monitored the whole process from design to preparation of the manuscript.

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Table 1: Sociodemographic characteristics of study sample by blood pressure group

Characteristics	Blood Pressure Groups		
	NT	**IH**	**SRH**
	n=1585(%)	**n=356(%)**	**n=59(%)**
Age (yr) ±SD	37.4(±16.2)	39.9(±20.5)	48.9(±11.1)
Men (%)	689 (34.5)	163 (8.1)	21 (1.0)
Women (%)	896 (44.8)	193 (9.7)	38 (1.9)
Marital status (%)			
Single	14 (0.7)	47 (2.4)	15 (0.7)
Married	1569 (78.5)	293 (14.6)	42 (2.1)
Divorced/separated/widowed	2 (0.1)	16 (0.8)	2 (0.1)
Educational status (%)			
No formal education	412 (20.6)	66 (3.3)	21 (1.0)
Primary level	1103 (55.1)	207 (10.4)	30 (1.5)
Secondary level	67 (3.3)	69 (3.4)	5 (0.3)
Tertiary level	3 (0.2)	14 (0.7)	3 (0.2)
General health (self-reported) (%)			
Excellent/very good	200 (10.0)	76 (3.8)	1 (0.1)
Good	737 (36.8)	149 (7.4)	12 (0.6)
Fair	509 (25.4)	118 (5.9)	38 (1.9)
Poor	139 (6.9)	13 (0.6)	8 (0.4)
Source of regular medical care (%)			
PHC/Health post	291 (14.5)	52 (2.6)	17 (0.8)
Hospital	16 (0.8)	7 (0.3)	8 (0.4)
Patent medicine store	83 (41.7)	180 (9.0)	21 (1.0)
Traditional medicine	213 (10.6)	61 (3.0)	3 (0.1)
Source of medical information (%)			
Doctor/nurse	112 (5.6)	45 (2.2)	26 (1.3)
Family/friend/OL	971 (48.5)	206 (10.3)	21 (1.0)
Media	398 (19.9)	82 (4.1)	12 (0.6)
Family member suffering (%) from hypertension or cardiovascular disease	149 (7.5)	130 (6.5)	29 (1.5)

NT (Normotensives); IH (Incidental hypertensives); SRH (Self reported hypertensives); OL (Opinion Leader)

Table 2: Overall Knowledge of Symptoms of Complications of Hypertension and Cardiovascular Risk Factors in the study population

	Knowledge of Cardiovascular Disease and Risk Factors N=2000 (%)
Knowledge of clinical features of	
Stroke	439 (21.9)
Heart attack or angina	8 (0.4)
Heart failure	22 (1.1)
Kidney failure	11 (0.5)
Poor vision	435 (21.8)
Diabetes	57 (2.9)
Knowledge of modifiable risk factors	
Hypertension	324 (16.2)
Diabetes	109 (5.4)
Consumption of < 5 helpings of fruits and vegetables daily	35 (1.7)
Excessive salt intake	56 (2.8)
Dietary fat	22 (1.1)
Tobacco use	725 (36.2)
Lack of exercise	24 (1.2)
Obesity	32 (1.6)
Excess weight in waistline	3 (0.1)
Stress	854 (42.7)
Knowledge of hypertension	
Mostly a silent disease	116 (5.8)
Symptoms usually indicate TOD/ACC	39 (1.9)
It is a life threatening condition	211 (10.5)
BP is high when ≥ 140/90	28 (1.4)
What own BP is	16 (0.8)
Treatment is throughout life	55 (2.7)

Associated clinical condition (ACC); Blood pressure (BP); Target organ damage (TOD)

Table 3: Use of Health Facilities

Characteristics	n (%)			
	NT (n=1585)	IH (n=356)	SRH (n=59)	Total (n=2000)
Number of visits to any health facility in past one year				
0-1	1517(75.8)	263(13.1)	9(0.4)	1789(89.4)
2-4	67 (3.3)	93 (4.6)	50(2.5)	210(10.5)
≥5	1 (0.1)	0 (0.0)	0(0.0)	1 (0.1)
Individuals whose BP was measured in the last visit other than study				
Never checked before	984 (49.2)	210(10.5)	0(0.0)	1194(59.7)
1-2 visits	79 (3.9)	46 (2.3)	35(1.7)	160 (8.0)
3-4 visits	102 (5.1)	63 (3.1)	41(2.0)	206(10.3)
Individuals whose cholesterol has been measured in the past				
Never checked before	1585(79.2)	356(17.8)	58(2.9)	1999(99.9)
Individuals whose electrolytes and urea has been measured in the past				
Never checked before	1521(76.0)	305(15.2)	32(1.6)	1949(97.4)
3months-1 year	11(0.5)	15 (0.7)	9(0.4)	35 (1.7)
0-3months	6(0.3)	1 (0.1)	9(0.4)	16 (0.8)
Individuals whose blood/urine sugar has been measured in the past				
Never checked before	931(46.6)	197(9.8)	5(0.3)	1133(56.7)
3months-1 year	306(15.3)	115(5.8)	28(1.4)	449(22.5)
0-3 months	0 (0.0)	13(0.7)	1(0.1)	14 (0.7)

NT (Normotensives); IH (Incidental hypertensives); SRH (Self reported hypertensives)

Table 4: Current interventions in the self reported hypertensive subjects

Characteristic	Men n=21(%)	Women n=38(%)	All n=59(%)
BP medications	4 (6.8)	7(11.8)	11(18.6)
Home monitoring of BP	2 (3.3)	2 (3.3)	4 (6.7)
Prescribed exercise	3 (5.0)	4 (6.7)	7(11.9)
Weight reduction if overweight	2 (3.3)	5 (8.4)	7(11.9)
Diet low in saturated fat	0 (0.0)	2 (3.3)	2 (3.3)
Diet low in salt	13 (22.0)	17(28.8)	30(50.8)
Cholesterol medications	0 (0.0)	0 (0.0)	0 (0.0)
Low dose Aspirin	5 (8.4)	0 (0.0)	5 (8.4)
Smoking/tobacco cessation	0 (0.0)	0 (0.0)	0 (0.0)
Reduce stress	20(33.8)	18 (30.5)	38(64.4)

Table 5: Factors associated with good knowledge of risk factors for heart disease

Variable	*OR (95%CI)
Age	
<45y	1.00
>45y	0.64 (0.28-1.65)
Sex	
Male	1.00
Female	0.71 (0.35-1.42)
Educational status	
No formal education	1.00
Primary level	0.69 (0.15-1.56)
Secondary level	1.43 (0.74-5.28)
Tertiary level	3.11 (2.06-7.14)
Family history of CVD	
No	1.00
Yes	1.76(0.69-8.50)
Known hypertensive	
No	1.00
Yes	1.23(0.51-2.89)
Known diabetic	
No	1.00
Yes	1.52 (0.16-3.70)
History of stroke	
No	1.00
Yes	0.68 (0.49-4.01)

* Adjusted for age, sex, socioeconomic status