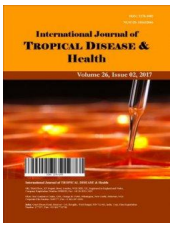

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Prevalence of Hypertension and Knowledge of Its Risk Behaviors among Residents of Rural and Urban Communities in Rivers State, Nigeria

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Background: Hypertension is the most common cardiovascular disease among blacks anywhere and a major threat to health and wellbeing. Hypertension has been known to vary among countries and even sub-populations within a country. Geographical variations in behavioral risk factors for hypertension have also been noted. Despite the high prevalence of hypertension among residents of developing nations, the level of knowledge of its risk behaviors in most parts of these nations is low compared with that of the developed world

Objectives: This study aimed to compare the prevalence of hypertension and level of knowledge of its risk behaviors among residents of rural and urban communities in Rivers State, a crude oil bearing state in the South-South region of Nigeria.

Materials and Methods: A community-based cross-sectional study design was used to survey 400 residents age ranged 15-84 years, 200 each from rural Elele-Alimini and urban Rumuekini areas in Rivers State. The multistage sampling technique was used to recruit residents of the communities into the study. Data was collected using structured interviewer administered questionnaire, after which blood pressure was measured using the mercury sphygmomanometer. Respondents with

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blood pressure measurement of ≥140/≥90mmHg, or already on anti-hypertensive medication were classified as having hypertension.
Results: The mean age of respondents from rural and urban communities was 43.3±17.9 and 37.9±15.1 years respectively (p<0.001), and there were more of females than male from both sites (p=0.269). The prevalence of hypertension was 27.0% rural (n=44) and 29.0% (n=58) for urban respondents (p=0.656). Overall, knowledge of hypertension and its risk behaviors was 63.8% and 70.2% for the rural and urban respondents respectively (p=0.210).
Conclusion: The prevalence of hypertension was high among residents of rural and urban communities in Rivers State. The level of knowledge of its risk behaviors was high. In this study knowledge of hypertension and its risk behaviors did not translate into good hypertension control. There is therefore need to mount comprehensive and robust hypertension preventive and control programme in both rural and urban communities in the state.

Keywords: Hypertension; prevalence; knowledge; risk behaviors; rural/urban; Nigeria.

1. INTRODUCTION

Hypertension is one of the commonest chronic non-communicable diseases that is posing a real threat to health in developing countries. It is the highest risk factor for cardiovascular diseases, growing in prevalence and poorly controlled virtually everywhere. Diseases such as stroke, heart failure, renal failure, myocardial infarction, retinal damage, are complications of hypertension [1]. Excessive alcohol intake, diet high in saturated fats, diabetes mellitus, physical inactivity, overweight and excessive salt intake among others have however been identified as aggravating blood pressure rise. Some reports have identified additional risk factors in developing countries like Nigeria to include very low and very high socio-economic status [2,3].

Hypertension prevalence have been known to vary among countries and even sub-populations within a country. Such variations as rural-urban, sea level-high altitude and regional differences have been demonstrated by several researchers. A look at earliest surveys in Africa showed that the prevalence of hypertension was low in Africa especially rural Africa. Cooper et al. [4] established that a clear gradient exists in the prevalence of hypertension in rural-urban West Africa including Nigeria. This compared to previously described gradients in East and Southern Africa [5]. Akinkugbe and Ojo [6], had earlier shown that blood pressure prevalence among urban dwellers in Nigeria were higher than for rural dwellers of comparative age groups. They made this conclusion as they studied blood pressure pattern of 2,000 rural and 2,000 urban Nigerians. Other studies include those of Bursztyn [7] and colleagues from Ethiopia, Shaper et al. [8] in Kenya and Pobee et al. [9] in Ghana. They all confirmed the rural-urban differences in their respective studies. The Ghana study was further stretched to show that the effect of urban life style on a migrant blood pressure was demonstrable only after ten years of residence in the new environment.

In like manner, geographical variations in behavioral risk factors prevalence for hypertension have also been identified. Hahn et al in their work with the American Behavioral Risk Factor Surveillance System identified geographical clustering of risk behaviors such as smoking and physical inactivity in the United States. They were able to show that risk behaviors for developing hypertension were generally more prevalent in West compared to the Eastern part of United States [10].

Despite the high prevalence of hypertension among residents of developing nations, the level of knowledge of its risk behaviors in most parts of these nations is low compared with that of the developed world [11]. In a study in Southern Nigeria, Familoni et al. [12] were able to show that inadequate knowledge of hypertension and its risk behaviors in Nigeria especially in patients with already established hypertension is a deterrent to the fight to drive down prevalence of hypertension. They advocated concerted efforts by individuals and health workers aimed at improving access to health information to all. Equipping the public with useful information is likely to enable people adopt preventive health behaviors such as smoking cessation, increased exercise and healthier eating habits among others.

Although, some risk behaviors for hypertension in developing countries are less common relative to those in developed countries, these behaviors still constitute important factors driving the

incidence of hypertension when combined with poor knowledge of the risks associated with hypertension among Nigerians [2,3,12].

Evidence indicated that rural population may have lower propensity for developing hypertension compared to urban population, who are more affluent, sedentary and with westernized lifestyles [13]. Based on this background, the study sought to compare the prevalence of hypertension and knowledge of risk behaviors of hypertension among residents of rural and urban communities in Rivers State, an oil producing state in the South-South region of Nigeria.

2. MATERIALS AND METHODS

2.1 Study Design

This is a community based cross-sectional study.

2.2 Study Area

The study was conducted in Elele-Alimini (as the rural Community) in Emohua LGA and in Rumuekini (as the urban area) in Obio/Akpor LGA, both in Rivers State. Rivers State is one of the thirty-six states that make up the Federal Republic of Nigeria, located in the oil-rich region of the Niger Delta, in Southern Nigeria.

2.3 Study Population

The study was conducted among residents of the two sampled communities, aged 15 years and above. Temporary residents and visitors were excluded.

2.4 Sample Size and Sampling Technique

A sample size was estimated using the statistical sample size formula estimating 'n' in comparison of two proportions [14]. After accommodating for 10% non response rate, a sample size of 384 was obtained. This was rounded up to 400; i.e 200 respondents per group. The multistage sampling technique was used to recruit residents of the communities into the study. The sampling technique consisted of four stages. In the first stage, a list of the 23 Local government areas (LGAs) that make up Rivers State was prepared, and stratified into rural and urban LGAs. The LGA is the third tier of government in Nigeria. An LGA is like a district or a municipal in some countries. One LGA each was selected from the rural and urban strata by simple random sampling technique. The selected LGAs were Emohua LGA for rural and Obio/Akpor LGA for urban. In the second stage, a list of all the communities in each of the selected LGA was prepared and one community was selected from each LGA. The selected communities were Elele-Alimini in Emohua LGA and Rumuekini in Obio/Akpor LGA. In the third stage, all the streets in the urban community were properly delineated according to the official street naming and house numbering. Each street was regarded as a cluster. The cluster sampling method was used to select the streets included in the study. The clusters were selected using the basket method of simple random sampling. In the rural community, the setting is such that households were well delineated according to blood lines, thus it was easy to identify clusters of households that formed a sampling frame for the study. The basket method of simple random sampling was used to decide on the clusters that were included into the study. The final stage of the sampling involved selection of individuals into the study. All eligible individuals found in the selected household who gave their consent for the study were selected. A total of 400 residents were interviewed, 200 from the rural community and 200 from the urban community.

2.5 Study Instruments and Method of Data Collection

The data collection tools were the structured interviewer administered questionnaires and Mercury sphygmomanometer (Adult cuff). The questionnaire consisted of information about the respondents' socio-demographics, including age, gender, place of residence, educational level achieved, marital status, occupation. It also assessed level of knowledge of hypertension and its risk behaviors. After administering the questionnaire, the blood pressure was measured using mercury sphygmomanometer. The respondent was asked to sit erect and the cuff was fixed on the right arm at the heart level. Only those with elevated blood pressure were assessed twice to confirm the reading. Respondents with systolic blood pressure (SBP) of ≥140 and/or diastolic blood pressure (DBP) of ≥90mmHg or already on hypertension medication were considered hypertensive.

2.6 Data Analysis

Retrieved data was entered into the Statistical Package for Social Sciences (SPSS) statistical

software (version 20.0) for analysis. Descriptive statistics was conducted and reported as means and standard deviation for continuous variables, and as frequencies and percentages for categorical variables. The Chi-Square test of independence was used to compare frequencies (percentages) between rural and urban areas. The probability level was set at 5% at 95% confidence interval, hence, all the Chi-Square tests with p-value of <0.05 were considered to be statistically significant.

2.7 Ethical Consideration

Written approval was obtained from the Ethics Committee of the University of Port Harcourt Teaching Hospital. Written permission was also obtained from the Chairman Council of Chiefs and the LGA Chairmen. The study was explained to the participants and informed consent obtained from individual respondent before the study commenced.

3. RESULTS

3.1 Socio-demographic Characteristics

The socio-demographic distribution of the respondents showed that the two study populations were similar and comparable. In the rural community, 84 (42.0%) were males and 116 (58.0%) were females, giving a male to female ratio of 1:1.4, in the urban community 95 (47.5%) were males and 105 (52.5%) were females, giving a ratio of 1:1.1. The age range was 15 to 84 years. Mean age recorded was 43.3±17.9 years for rural respondents and 37.9±15.1 years for respondents from urban area. The Independent t-test revealed that respondents from rural settlements were significantly older (t=3.286; p<0.001). Married respondents were of majority in both groups. There were more respondents with no formal education in the rural area than in the urban area; 44 (22.0%) and 14 (7.0%) respectively, and this was statistically significant ($\chi 2$=38.600; p<0.001). Generally, the urban respondents were more educated than the rural respondents as about 60% of the urban respondents had at least secondary education. The predominant occupation of the rural dwellers was farming (21.5%, n=43), while the predominant occupation of the urban dwellers was trading/business (43.5%, n=87). There were also more retired persons in the rural area than in the urban area; 33 (16.5%) and 1 (0.5%) respectively. Over all, the two study groups showed significant difference in the occupation ($\chi 2$=2.800; p<0.001) (See Table 1).

Hypertension status was assessed using measured blood pressure (BP) readings of the respondents or history of hypertension medication. Fifty-four (27.0%) of respondents from the rural community had BP measurement of ≥140/≥90 and were classified as been hypertensive. Similarly from the urban area, 58 (29.0%) were found to be hypertensive. There was no statistically significant difference between hypertensives and non-hypertensives in the two settings (See Table 2).

Among the respondents who were hypertensive, majority were between the ages of 55-64 years in both the rural and urban communities; 17 (31.5%) and 17 (29.3%) respectively. A statistically significant difference was however observed between hypertensives in rural and urban area when compared across their age distribution ($\chi 2$=13.950; p=0.030). There was no statistically significant difference across gender and marital status of respondents classified as hypertensives in the two settings. However, educational status was significantly related to having hypertension in rural and urban areas (See Table 3).

3.2 Knowledge of Risk Behavior of Hypertension

Among the respondents surveyed, 177 (88.5%) of those from the rural community have heard about hypertension as against 171 (85.5%) of those from the urban community, but this difference was not statistically significant. Among the respondents who had heard about hypertension, 102 (57.6%) of those in rural community as against 98 (57.3%) of those in the urban community were aware that smoking is a risk factor for hypertension, 103 (58.1%) of those in rural community as against 99 (57.8%) of those in the urban community were aware that alcohol consumption is a risk factor for hypertension, 75 (42.3%) of those in rural community as against 68 (39.7%) of those in the urban community were aware that high intake of fatty or oily food is a risk factor for hypertension, and 54 (30.5%) of those in rural community as against 68 (39.7%) of those in the urban community were aware that not doing physical activities or not exercising regularly is a risk factor for hypertension. The overall knowledge score was higher among respondents from urban community (60.0%, n=120) as compared with those from rural community (56.5%, n=113).

Table 1. Socio-demographic characteristics of respondents

Variable	Rural (n=200)	Urban (n=200)	χ2	df	p-value
	Frequency (%)	Frequency (%)			
Gender					
Male	84 (42.0)	95 (47.5)	1.220	1	0.269
Female	116 (58.0)	105 (52.5)			
Age group					
15-24	45 (22.5)	47 (23.5)	20.100	6	**0.002***
25-34	29 (15.5)	48 (24.0)			
35-44	21 (10.5)	35 (17.5)			
45-54	42 (21.0)	38 (19.0)			
55-64	40 (20.0)	24 (12.0)			
65-74	15 (7.5)	4 (2.0)			
75-84	8 (4.0)	4 (2.0)			
Mean age (SD)	43.3 (17.9)	37.9 (15.1)	t=3.286		**<0.001***
Marital status					
Single	57 (28.5)	70 (35.0)	3.660	3	0.300
Married	116 (58.0)	106 (53.0)			
Divorced/separated	10 (5.0)	5 (2.5)			
Widowed	17 (8.5)	19 (9.5)			
Educational status					
No formal education	44 (22.0)	14 (7.0)	38.600	3	**<0.001***
Primary	92 (46.0)	67 (33.5)			
Secondary	57 (28.5)	94 (47.0)			
Tertiary	7 (3.5)	25 (12.5)			
Occupation					
Senior civil servant	5 (2.5)	33 (16.5)	22.800	9	**<0.001***
Farming	43 (21.5)	17 (8.5)			
House wife	8 (4.0)	8 (4.0)			
Company worker	6 (3.0)	6 (3.0)			
Schooling	40 (20.0)	47 (23.5)			
Trading/business	38 (19.0)	87 (43.5)			
Labourer	2 (1.0)	0 (0.0)			
Fishing	16 (8.0)	0 (0.0)			
Retired	33 (16.5)	1 (0.5)			
Transporter	9 (4.5)	1 (0.5)			

*SD=Standard deviation; χ2=Chi-Square; df=Degree of freedom; *=Statistically significant*

Table 2. Prevalence of hypertension

Variable	Rural (n=200)	Urban (n=200)	χ2	df	p-value
	Frequency (%)	Frequency (%)			
Hypertension status by BP measurement					
Non-hypertensive	146 (73.0)	142 (71.0)	0.203	1	0.656
Hypertensive	54 (27.0)	58 (29.0)			

BP=Blood Pressure; χ2=Chi-Square; df=Degree of freedom

However, neither the knowledge of the risk factors assessed nor the overall knowledge of hypertension showed statistically significant difference between rural and urban respondents (p>0.05) (See Table 4). Among the respondents who had good knowledge about hypertension and its risk factors, majority (44.2%) of those from the rural setting had primary education while majority (45%) of those from the urban setting had secondary education, and this was statistically significant (χ2=19.520; p<0.001) (See Table 5).

4. DISCUSSION

The prevalence of hypertension in this study was high among rural (27.0%) and urban (29.0%) respondents. The difference was not significant.

Table 3. Prevalence of hypertension by socio-demographic characteristics

Variable	Rural (n=54)	Urban (n=58)	χ2	df	p-value
	Frequency (%)	Frequency (%)			
Age group (years)					
15-24	3 (5.6)	3 (5.2)	13.950	6	**0.030***
25-34	2 (3.7)	9 (15.5)			
35-44	1 (1.9)	8 (13.8)			
45-54	14 (25.9)	15 (25.9)			
55-64	17 (31.5)	17 (29.3)			
65-74	10 (18.5)	4 (6.9)			
75-84	7 (13.0)	2 (3.4)			
Gender					
Male	23 (42.6)	28 (48.3)	0.194	1	0.664
Female	31 (57.4)	30 (51.7)			
Marital status					
Single	5 (9.3)	10 (17.2)	1.662	3	0.646
Married	39 (72.2)	37 (63.8)			
Divorced/Separated	4 (7.4)	4 (6.9)			
Widowed	6 (11.1)	7 (12.1)			
Educational status					
No formal education	23 (42.6)	7 (12.1)	23.941	3	**<0.001***
Primary	24 (44.4)	21 (36.2)			
Secondary	7 (13.0)	24 (41.4)			
Tertiary	0 (0.0)	6 (10.3)			

*2=Chi-Square; df=Degree of freedom; *=Statistically significant*

Table 4. Knowledge about hypertension and risk factors of hypertension

Variable	Rural	Urban	χ2	df	p-value
	Frequency (%)	Frequency (%)			
	N=200	**N=200**			
Heard about hypertension					
Yes	177 (88.5)	171 (85.5)	0.796	1	0.374
No	23 (11.5)	29 (14.5)			
	N=177	**N=171**			
Smoking is a risk factor					
Yes	102 (57.6)	98 (57.3)	0.000	1	0.952
No	75 (42.4)	73 (42.7)			
Alcohol consumption is a risk factor					
Yes	103 (58.1)	99 (57.8)	0.000	1	0.955
No	74 (41.9)	72 (42.2)			
Fatty/oily food consumption is a risk factor					
Yes	75 (42.3)	68 (39.7)	0.240	1	0.621
No	102 (57.7)	103 (60.3)			
Physical inactivity is a risk factor					
Yes	54 (30.5)	68 (39.7)	3.260	1	0.070
No	123 (69.5)	103 (60.3)			
Knowledge score					
Good knowledge	113 (63.8)	120 (70.2)	1.576	1	0.210
Poor knowledge	64 (36.2)	51 (29.8)			

χ2=Chi-Square; df=Degree of freedom

Table 5. Association of good knowledge score with gender and educational status

Variable	Rural	Urban	χ2	df	p-value
	Frequency (%)	Frequency (%)			
	N=113	N=120			
Gender					
Male	41 (36.3)	57 (47.5)	3.000	1	0.083
Female	72 (63.7)	63 (52.5)			
Educational status					
No formal education	24 (21.2)	6 (5.0)	19.502	3	**<0.001***
Primary	50 (44.2)	46 (38.3)			
Secondary	34 (30.1)	54 (45.0)			
Tertiary	5 (4.5)	14 (11.7)			

*χ2=Chi-Square; df=Degree of freedom; *=Statistically significant*

Varying prevalence have been reported by various studies conducted in rural or urban communities, ranging from prevalence as high as 38.2% reported in a study conducted among urban slum dwellers in Lagos, Nigeria [15], to prevalence as low as 10.3% reported from another urban community in Nigeria [16]. In a study conducted in a semi-urban community in Nigeria, the prevalence was 36.6% [17], while in another most recent study conducted in Ibadan, Nigeria, the prevalence was 33.1% [18]. Findings from other studies conducted in rural communities were not far from findings of our study. A prevalence of 32.8% which was higher than that of this study was observed in a study conducted in a rural community in Nigeria [19], while in another rural community in South-South Nigeria, a prevalence of 23.6%, which was lower than that of our study was reported [20]. A much lower prevalence of 18.3% was noted in another study conducted in South-South Nigeria [21]. These differences tend to point to subtle variations even within same region. Hypertension prevalence of 27.0% rural Vs 29.0% urban obtained by us is consistent with records from most parts of Africa whereby urban residents show higher prevalence of hypertension compared to the rural residents [22].

Hypertension prevalence was also found by this present study to be higher among females from both settings with age group 55-64 year predominance. There have been conflicting reports on gender differences in hypertension prevalence. Although, finding of this study corroborated findings of a South African study conducted among older adults which reported a higher prevalence among females than males [23]. In African populations, the average systolic pressure has been found to be higher for men than for women during adulthood with the age related rate of rise steeper for females as they get older beyond 45 years of age. This has been attributed in part to hormonal changes as women approach menopause [24,25]. Differences in prevalence will also depend on the age of the population being studied and setting such that if it is a hospital based study it is likely to have a pool of elderly people.

An inverse relationship existed between prevalence of hypertension and level of education for rural and urban dwellers. Adults who had more than secondary school education had lower rate than those with less than secondary school education. The acquisition of formal education has been consistently shown to be positively correlated to an individual's health seeking behavior. The prevalence of hypertension by marital status showed similar trend for the rural and urban respondents, with the divorced/separated respondents showing higher prevalence. This was similar to reports of studies conducted in a rural and an urban community in Edo State, Nigeria [21]. This higher prevalence among the respondents who are divorced or separated could be as a result of the psycho-social stress associated with divorce, separation and perhaps raising a family alone. They also lack the synergy often enjoyed by couples in our setting in managing economic and psycho-social matters.

A large proportion of the respondents had heard about hypertension after it was translated into the local dialects, and the proportion was similar for the rural and urban communities. More than half of the respondents who had heard about hypertension could give an acceptable definition or explanation or description of hypertension. This is a huge improvement on studies conducted among same population in the Niger Delta earlier [19,21]. The high level of knowledge about hypertension and its risk behaviors observed in this study may be because local expressions and definitions where employed.

The use of local languages in scientific research improves access to information to local people and also increases local input into scientific research [26]. The other reasons for the high level of knowledge about hypertension in this study may be due to high literacy rate in the areas, free medical care programme for the elderly, and/or several medical outreach programmes that were often organized for the people by several organizations, including the Niger Delta Development Commission (NDDC), Oil Companies, Religious Missions, as well as other Non-governmental Organizations (NGOs). Females in both areas were observed to have better knowledge of hypertension than males, although, this did not reach a statistical significance. This result stands to reason as it is a reflection of the known higher utilization of health care by women. The study also revealed that knowledge about hypertension and its risk behaviors was significantly associated with high level of education. Knowledge of hypertension and its risk behaviors increased with level of education especially among respondents in the urban community. In the rural community however, it was higher among respondents with non-formal education. It was previously noted that most of the respondents with non-formal education were of the older age group. Thus, it appears like long-life experience rather than knowledge acquired through formal education may have aided their knowledge about hypertension and its risk factors.

Knowledge about risk behaviors for hypertension was generally high and similarly distributed among respondents from both communities. However, knowledge of physical inactivity as a risk behavior for hypertension was low among respondents from the two communities. Culturally, smoking and excessive alcohol consumption are generally considered as bad habits and correlates of anti-social behaviors that could possibly lead to hypertension. The low level of knowledge of physical inactivity as a risk behavior for hypertension may be due to the fact that rest is generally considered desirable for good health and usually recommended rather than regarded as a risk behavior that may contribute to ill health. This also is in agreement with a previous study conducted in Southern Nigeria [12].

5. CONCLUSION

The prevalence of hypertension was high among residents of rural and urban communities in Rivers State. The level of knowledge of hypertension and its risk behaviors was also high. In this study knowledge of hypertension and its risk behaviors did not translate into good hypertension control. However, none of the differences in prevalence and knowledge of hypertension and its risk behaviors observed among the rural and urban residents was significant. This study therefore failed to establish any rural-urban variations in hypertension prevalence and knowledge of its risk behaviors. There is therefore need to mount comprehensive and robust hypertension preventive and control programme in both rural and urban communities in the state.

6. LIMITATION OF THE STUDY

Findings in this study must be considered within the contents of the study's limitations. Specifically;

1) According to the World Health Organization and the Nigerian Society for Hypertension guidelines, hypertension should be defined based on the average of two or more blood pressure readings taken at least on two or more visits after an initial screening but in this study, estimates were made based on one visit.
2) Using blood pressure readings taken only once to ascertain hypertension status can yield a highly false result and may over estimate prevalence.
3) KAP assessment from population surveys invariably poses the problem of social desirability whereby respondents are reluctant to admit, poorly acceptable KAP to avoid giving a negative impression. This may result in over or under-reporting of facts as respondent may want to meet up with what he or she feels is expected of him or her by the interviewer or the society.

CONSENT AND ETHICAL DISCLAIMER

Written approval was obtained from the Ethics Committee of the University of Port Harcourt Teaching Hospital. Written permission was also obtained from the Chairman Council of Chiefs and the LGA Chairmen. The study was explained to the participants and informed consent obtained from individual respondent before the study commenced.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Zhao X, Li S, Ba S, He F, Li N, Ke L. Prevalence, awareness, treatment, and control of hypertension among herdsmen living at 4,300 m in Tibet. Am J Hypertens. 2012;25:583-9.
2. Akintunde AA, Salawu AA, Opadijo OG. Prevalence of traditional cardiovascular risk factors among staff of Ladoke Akintola University of Technology, Ogbomoso, Nigeria. Niger J Clin Pract. 2014;17:750-5.
3. Akinkugbe OO (ed). Non-communicable diseases in Nigeria, series 4 final report of a National Survey Federal Ministry of Health Services, Lagos. 1997;12-41.
4. Cooper R, Rotimi C, Ataman, S, McGee D, Osotmehin B, Kadin S, Muna W, Kingne S, Traser H, Forrester T. The prevalence of hypertension in seven populations of West African origin. AM J. Public Health. 1997;87:160-168.
5. Katsivo MN, Apeagyie F. Hypertension in Kitui district: A comparative study between urban and rural populations. E Afr Med J. 1991;68(7:531).
6. Akinkugbe OO, Ojo OA. Arterial pressure in rural and urban population in Nigeria. Br Med J. 1969;2:222.
7. Bursztyn M, Raz I. Blood pressure, glucose, insulin and lipids of young Ethiopian recent immigrants to Israel and in those residents for 2 years. J Hypertens. 1993;I:455-459.
8. Sharper AG, Leonard PK, Jones KW, Jones M. Environmental effects on the body build, blood pressure and blood chemistry on nomadic warriors serving in the army in Kenya. E Afr Med J. 1969;46:282-289.
9. Pobee JOM, Larbi EB, Belcher DW, Wurapa FK, Dodu SA. Blood pressure distribution in a rural population. Trans Roy Soc Trop Med & HYG. 1977;71:66.
10. Hahn RA, Health GW. Cardiovascular disease risk factors practice among adults United States. A behaviour Risk Factor Atlas. 1994; 11 1998/47 (SS-5),35-69.
11. Ulasi II, Ijoma CK, Onwubere BJC, Arodiwe E, Onodugo O, Okafor C. High prevalence and low awareness of hypertension in a market population in Enugu, Nigeria. Int J Hypertens. 2011; 2011:869675.
12. Familoni OB. Knowledge and awareness of hypertension among patients with systemic hypertension. Journal of the National Medical Association. 2004;96(5): 620-624.
13. Cheng TO. Effects of fast foods, rising blood pressure and increasing serum cholesterol on cardiovascular disease in china. Am J Cardiol. 2006;97(11):1676–1678.
14. Kirkwood B. Essentials of medical statistics. Blackwell Scientific Publications. Oxford United Kingdom. 1988;213-216.
15. Daniel OJ, Adejumo OA, Adejumo EN, Owolabi RS, Braimoh RW. Prevalence of hypertension among urban slum dwellers in Lagos, Nigeria. J Urban Health. 2013;90:1016-25.
16. Olatunbosun ST, Kaufman JS, Cooper RS, Bella AF. Hypertension in a black population: Prevalence and biosocial determinants of high blood pressure in a group of urban Nigerians. J Hum Hypertens. 2000;14:249-57.
17. Adedoyin RA, Mbada CE, Balogun MO, Martins T, Adebayo RA, Akintomide A. Prevalence and pattern of hypertension in a semiurban community in Nigeria. Eur J Cardiovasc Prev Rehabil. 2008;15:683-7.
18. Ajayi IO, Sowemimo IO, Akpa OM, Ossai NE. Prevalence of hypertension and associated factors among residents of Ibadan-North Local Government Area of Nigeria. Nig J Cardiol. 2016;13:67-75.
19. Andy JJ, Peters EJ, Ekrikpo UE, Akpan NA, Unadike BC, Ekott JU. Prevalence and correlates of hypertension among the Ibibio/Annangs, Efiks and Obolos: A cross sectional community survey in rural South-South Nigeria. Ethn Dis. 2012;22:335-9.
20. Onwuchekwa AC, Mezie-Okoye MM, Babatunde S. Prevalence of hypertension in Kegbara-Dere, a rural community in the Niger Delta region, Nigeria. Ethn Dis. 2012;22:340-6.
21. Omuemu VO, Okojie OH, Omuemu CE. Socio-demographic correlates of modifiable risk factors of hypertension in a rural community in Edo State, Nigeria. Journal of Community Medicine & Primary Health Care. 2008;20(1):25-34.
22. Steven van de Vijver, Hilda Akinyi, Samuel Oti, Ademola Olajide, Charles Agyemang, Isabella Aboderin, and Catherine Kyobutungi Status report on hypertension

in Africa - Consultative review for the 6th Session of the African Union Conference of Ministers of Health on NCD's Pan Afr Med J. 2013;16:38.
23. Peltzer K, Phaswana-Mafuya N. Hypertension and associated factors in older adults in South Africa. Cardiovasc J Afr. 2013;24:67-71.
24. Lewington S, Clarke R, Qizilbash N. Age-specific relevance of unusual blood pressure to vascular mortality. A multi-analysis of individual data from one million adult in 61 prospective studies. Lancet. 2002;360:1903.
25. Addo J, Smeeth L, Leon DA. Hypertension in Sub-Saharan Africa: A systematic review. Hypertension. 2007;50(6):1012-8.
26. McClatehey W, Winter K. Publication of ethnobotanical research in local languages. A Journal of Plants, People and Applied Biology. 2005;3:279-82.

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