Original Research Article

COMPARATIVE ANALYSIS OF CLINICAL HISTORY, SOCIODEMOGRAPHIC, BEHAVIOURAL FACTORS AND CARDIOVASCULAR RISK FACTORS AMONG HYPERTENSIVE IN AWKA, NIGERIA

ABSTRACT

Background: Hypertension is a major modifiable risk factor for cardiovascular diseases and research studies done in Nigeria observed prevalence rate of hypertension to range from 26.4% to 36.9%.

AIM: This study aimed to evaluate the sociodemographic, clinical, behavioral and cardiovascular risk factors associated with hypertension in Awka, South East, Nigeria.

Methods: Cross-sectional study was used.391 participants aged from 18 years above were recruited for this study. Structured questionnaires were constructed in line with World Health Organization Step approach were utilized for data collection. Hypertension was defined as systolic blood pressure ≥ 140mmHg and Diastolic blood pressure ≥ 90mmHg. Data was presented descriptively in frequency tables and figures, chi-square and independent sample T test were used to test comparison between two groups.

Results: The mean age of the subjects was 45.87±17. 49.33.7% of retired subjects has the highest prevalence was statistically associated with hypertension in occupational status of the subjects, marital status was statically significant with hypertension and prevalence of hypertension among the subjects were 81.1%, 8.5%, 8.6% for married, single and divorcee respectively, (P<0.001) and also no association was observed between hypertension and subjects that occasionally use high salt often(x^2=0.341,P>0.001).

Conclusion: The study showed that age, family history of hypertension, heart rate, consistent increase in blood pressure, occupational and marital status are associated risk factors of hypertension in Awka, South East, Nigeria. There is need to create awareness on the risk factors and encourage changes in sedentary life style.

Keywords

Hypertension, Risk Factors, Prevalence, Blood pressure.

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INTRODUCTION

Hypertension is a major public healthcare problem with increasing level of cardiovascular mortality and morbidity both in developed and developing countries(1,2). Hypertension is a consistent elevated blood pressure in the arteries to pump blood harder than normal through the blood vessels (3,4). Africa has the highest prevalence of hypertension and so described as a disease for Africa (4). About 90% of diagnosed hypertension are primary hypertension and 10% are secondary hypertension (2). Several risk factors are associated with primary hypertension although the cause is yet unknown (4). These factors are characterized into modifiable and non-modifiable risk factors (6). The modifiable risk factors of hypertension are those attributes of an individual that can be adjusted or changed (7, 8).These includes: obesity, alcohol consumption, tobacco use, lack of exercise etc. The non-modifiable risk are attributes of an individual that cannot be changed. This includes sex, family history, genetic composition race (9, 10 and11). Hypertension if not properly controlled and managed may lead to cardiovascular complications which include coronary heart disease, heart failure, renal damage, ischemic heart disease, strokes (14, 13). Previous studies showed a positive relationship of cardiovascular risk factor and hypertension and suggested implementation management of cardiovascular disease and prevention policy; this includes management of obesity, blood pressure, lipid and glucose metabolism, increase physical activity, strictly compliance of drug complication (27). In Nigeria, complications of hypertension attributes to 25% of all emergency admission in health institutions (14). This has been proven to be associated to individuals who are unaware of their health condition or poorly controlled hypertension (2).

Few research studies have been done in south-south and south-east Nigeria and have shown prevalence rate of hypertension and its complications ranges from 21% and 21.3% respectively (15). However, there is need to explore more on associated risk factors with hypertension. This study aimed to evaluate the sociodemographic, clinical and behavioral factors which are associated with hypertension in Awka, South east, Nigeria.

METHODS.

STUDY POPULATION:

A total of three hundred and ninety-one subjects (n=391) were recruited for this research study and comprises of Male (n=181) and female (n=210). This research study was carried out in Chukwuemeka Odimegwu Ojukwu University Teaching Hospital, Awka at General Outpatient Department (GOPD). A cross-sectional design study was used. The research study participants were adults aged from 18years and above. This study was carried out between November 2018 to April 2019.

ASSESSMENT OF ASSOCIATED RISK FACTORS:

Structured questionnaires were constructed in line with WHO Steps Instrument 1 and 2 (16). Informed consents were obtained from each participant and also explained what it is being used for and its importance. The questionnaire consists of two steps parts.

Step 1; the first part consisted of socio-demographic, clinical history and behavioral life styles variables of each participant. These variables includes; age, smoking habit, alcohol consumption, dietary habit, physical activity, duration of being hypertensive, diabetes mellitus status, used medication, stress strain, and family history of being hypertensive. Smoking habit variable were grouped into two groups; smokers and non smokers. Alcohol consumption was grouped into two; alcohol drinkers and non alcoholic drinkers. Physical activity was assessed using IPAQ. Job stress, financial instability, Family distress, sleep inadequacy were all grouped under stress strain (17).

Step 2; captured the anthropometric measurements and Body Mass Index (BMI). BMI was determined as weight/height^2 (Kg/M^2). Height and weight was measured using a stadiometer. In measuring height, participants were made to remove their shoes, stand on top of the stadiometer scale, standing erect, facing forward and height measured from the meter rule. Also, weight was measured during the procedure. BMI were classified according to WHO standard; in four groups. They are underweight (<18.5kg/m^2), normal weight (18.5 -24.9kg/m^2), overweight (25-29.9kg/m^2) and obesity (>30kg/m^2). Blood pressure measurements were taken using sphygmomanometer. Participants were asked to sit on a chair with their feet flat on the floor and left arm made to rest on the upper arm and participants assured to be calm. Auscultation was done over the brachial artery with a stethoscope. The first appearance of korotkoff sounds as the cuff swings was taken as systolic and the disappearance of the sounds taken as diastolic (17). Blood pressure measurements were recorded in mmHg. This procedure was measured for three times over a period of 3 minutes. Subjects were classified hypertensive if their blood pressure were greater or equal to 140mmHg (systolic) and 90mmHg (Diastolic) (18). Pulse rate was also gotten from participants using a Pulse oximeter. The Right thumb is placed inside the pulse oximeter and the participant assured to be calm when the pulse rate is taken.

Socio-economic status was also taken. Their occupational status was grouped into civil servants, public servants, Business, Applicant, and Retired. Marital status was also grouped into; Married, Single, Divorced, Widowed. Participants were assured of Oath of secrecy and well explained that it is voluntary and has the right to withdraw from the study if need be. Participants that were found to be hypertensive through BP readings were informed, counseled and urged to commence treatment as soon as possible. Data generated we analyzed using statistical package for social sciences version 21 software. The results presented descriptively in frequency tables and figures. Chi square test was used to test comparison between the two groups and independent sample T test for normally distributed data and also for comparison, value <0.001 was taken as to be statistically significant.

RESULTS

A total of three hundred and ninety one subjects comprising of 181(46.3%) Male and 210(53.7%) females participated in this study. The mean (SD) age of all subjects was 45.87± 17.

STUDY POPULATION ACCORDING TO THEIR DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

Table 1 shows the result of frequency distribution of clinical variables. Respondents who had family history of hypertension were 101(25.8%) compared to 290(74.2%) of respondents who had no traits of hypertension. 317(81.1%) of the subject study presented with a normal heart rhythm while 68(17.4%) presented with heart rhythm greater than 100 beats per/minute. 285(72.9%) of the participants had their systolic blood pressure ≤140mmHg compared with 106(27.1%) of the participants had their systolic pressure ≥140mmHg. Likewise, 274(70.1%) of the subjects had their diastolic blood pressure ≤90mmHg compared to 117(29.9%) of the subjects with diastolic blood pressure ≥90mmkHg. 90(23.0%) of the subjects had their age range between 28-37 compared to other age range.

135 **Table 1: Study Population according to their Demographic and Clinical characteristics**

Clinical Variables	N(391)	%
Family History of hypertension	101	25.8
No with Family History	90	74.2
Heart Rate		
Bradycardia	6	1.15
Normal Heart Rhythm	317	81.1
Tachycardia	68	17.4
Systolic		
≤140mmHg	285	72.9
≥140mmHg	106	27.1
Diastolic		
≤90mmHg	274	70.1
≥90mmHg	117	29.9
Sex		
Male	181	46.3
Female	210	53.7
Age		
18-27	67	17.1
28-37	90	23.0
38-47	70	17.9
48-57	47	12.0
58-67	57	14.6
68-77	44	11.3

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139 RELATIONSHIP BETWEEN SOCIODEMOGRAPHIC CHARACTERISTICS AND
140 PREVALENCE OF HYPERTENSION.

141 In occupational status of subjects, 31(33.7%) of retired subject had the highest prevalence and was
142 statistically associated with hypertension, (P<0.001) (Table 2). Male subjects had high prevalence
143 51(54.3%) compared to female subjects 43(45.7%), the difference was statically significant(x^2=3.151,
144 P>0.001). Prevalence of hypertension was slightly different from 58(53.4%) subjects who responded
145 to pass through stress compared to 36(38.3%) subjects that responded not to have pass through
146 stress, thus the difference was statistically insignificant(x^2=6.490, P>0.001). Marital status was
147 significantly associated with hypertension, (P<0.001) and prevalence of hypertension was highest
148 among married participants 77(81.9%) followed by widowed 9(8.6%) and single participants 8(8.5%).
149 Prevalence of hypertension were higher with participants admitted to be involved in physical activities
150 64(68.1%) than those participants that are not involved in physical activity 30(31.9%), the difference
151 between hypertension and physical activity was statically insignificant(X^2 =11.917, df=2, P>0.001)

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157 **Table 2: Relationship between Sociodemographic Characteristics and Prevalence of**
158 **Hypertension.**

Sociodemographic variables	Hypertension		Total	df	x^2	P
(N=391)	NO	YES				
Sex						
Male	130(43.8)	51(54.3)	94(100.0)	1	3.151	0.076
Female	167(56.2)	43(45.7)	297(100.0)			
Marital Status						
Married	186(62.6)	77(81.9)	263(67.3)	2	34.458	0.000*
Single	106(35.7)	8(8.5)	114(29.2)			
Widowed	5(1.7)	9(8.6)	14(3.6)			
Occupation						
Civil servant	59(20.3)	11(12.0)	70(18.3)	6	33.476	0.000*
Public servant	117(40.2)	25(27.2)	142(37.1)			
Business	70(24.1)	25(27.2)	95(24.8)			
Applicant	10(3.4)	0(0.0)	10(2.6)			
Retired	31(10.7)	31(33.7)	62(16.2)			
Student	2(0.7)	0(0.0)	2(0.5)			
Housewife	2(0.7)	0(0.0)	2(0.5)			
Age						
18 – 37	67(22.6)	0(0.0)	67(17.1)	6	83.317	0.000*
28-37	82(27.6)	8(8.5)	90(23.0)			
38-47	58(19.5)	12(12.8)	58(19.5)			
48-57	33(11.1)	14(14.9)	47(12.0)			
58-67	27(9.1)	30(31.9)	57(14.6)			
68-77	23(7.7)	21(22.3)	44(11.3)			
78 - >	9(9.6)	7(2.4)	16(14.1)			
Stress						
Stress	138(46.6)	58(61.7)	196(50.3)	1	6.490	0.011
No stress	158(53.4)	36(38.3)	194(49.7)			
Physical Activity						
Physical Activity	249(83.8)	64(68.1)	313(80.1)	2	11.917	0.003
No Physical Activity	47(15.8)	30(31.9)	77(19.7)			

159 *P<0.001 is considered statistically significant.

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161 **ASSOCIATION BETWEEN BEHAVIORAL RISK FACTORS AND HYPERTENSION**

162 No significant association was observed between hypertension and Subjects that are strong addicts
163 to alcohol (df =1, x^2=1.527, P>0.001) and subjects that are strong addicts to smoking (df=1, x^2=0.256,
164 P>0.001). (Table 3) There was also no positive association between hypertension and subjects that
165 takes high vegetable (df=2, x^2=0.6999, P>0.001) and subjects that occasionally use salt often (df=1,
166 x^2=0.341, P>0.001).

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170 **Table 3: Association between behavioral risk factors and hypertension**

Behavioural Factors	Hypertension		Total	df	X^2	P
	No	Yes				
Alcohol Addicts						
Yes	61(20.5)	25(26.6)	86(22.0)	1	1.527	0.217
No	236(79.5)	69(73.4)	305(78.0)			
Smoke Addicts						
Yes	13(4.4)	3(3.2)	16(4.1)	1	0.256	0.613
N0	284(95.6)	91(96.8)	375(95.9)			
Vegetable Intake						
high	155(52.2)	48(51.1)	203(51.9)	2	0.699	0.705
low	140(47.1)	46(48.9)	18(47.6)			
Salt Intake						
High	107(36.0)	37(39.4)	144(36.8)	1	0.341	0.559
Low	109(64.0)	57(60.6)	247(63.2)			

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174 **COMPARATIVE ANALYSIS OF CLINICAL FACTORS, BETWEEN HYPERTENSION AND THEIR**
175 **CONTROL.**
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177 Table 4 shows the comparison between hypertension and clinical risk factors. The mean (SD) systolic
178 pressure of hypertensive subjects (143.02±33.484) were increased compared to Normotensive
179 subjects (117.62±25.570) and the difference were statistically significant (P<0.001). The mean (SD)
180 diastolic pressure of hypertensive subjects (84.93±20.069) of normotensive subjects, there was
181 significant association with hypertension, (P<0.001). Also, the relationship between subjects that
182 have family history of hypertension and hypertension was statistically significant, P<0.001.
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184 **Table 4: Comparative analysis of Clinical Factors, between Hypertension and their control.**
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Clinical Factors Mean/STD	Hypertensive Mean /STD	Nomotensive	P value
Heart Rate	91.66± 19.905	85.26±16.063	0.002
Systolic	43.02±33.484	117.62±25.570	0.000*
Diastolic	84.93±20.069	78.26±14.172	0.000*
Family History	1.48±0.502	1.82±0.382	0.000*
B.M.I	2.96±0.802	2.95±0.729	0.959

186 *P<0.001 is considered statistically significant.

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189 **DISCUSSION**
190 In this cross-sectional study, the prevalence of hypertension was 24.0 % (Male 46.3% and Female
191 53.7%).Associated risk factors of hypertension were compared between normotensive and
192 hypertensive subject groups.

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Sociodemographic Factors
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The results data demonstrated a strong significant association between age and hypertension.
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Increase in age has been found to be a risk predictor of hypertension (22). This findings are
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consistent with the study results on prevalence of hypertension and associated factors among
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residents in Ibadan, Nigeria(19) and prevalence of hypertension in Akwa Ibom, South-South,
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Nigeria(1). Stress and hypertension showed no linear relationship as P value is >0. 001. Exposure to
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chronic stress has been stated as risk factors/biomarker of hypertension. Chronic stress stimulates
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the release of cortisol which increases cardiovascular reactivity in the body. This results finding are
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contrary with a study that observed a positive association between stress and hypertension in their
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study of sociodemographic correlates of hypertension in a rural setting of Oyo state, Nigeria. (17)
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Also, results data expressed a significant relationship between hypertension and economic status.
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Prevalence of hypertension were seen more among retired (33.7%), followed by public servants and
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business people with the same percentage rate (27.2%). This study findings agreed with the study
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carried out by (2), however noted a slight difference in prevalence rate of hypertension to had been
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more among minor retailers (60.7%).This may be attributed to the study population. Prevalence of
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hypertension were higher among married subjects(81.9%) when compared to other status;
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widowed(8.5%),single(8.5%) and also observed a significant association between hypertension and
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marital status. These results are similar with the findings on a survey of hypertension and its socio-
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economic factors in a market population, Awka, Nigeria (2). This study observed no positive
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association observed between hypertension and Gender. In females, cardiac output is less than in
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males because of less blood volume and so cardiac index is more than in males, because of less
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body surface area. Increased in cardiac output has been noted to be strongly associated with
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hypertension. This results are consistent with a study carried out by (2), the study observed
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hypertension was more prevalent in females (68.9%) than in males (31.1%) and P<0.001.
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Behavioral Factors
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This study observed insignificant association between increased salt intake and hypertension.
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Increased salt intake had been positively associated with progression of cardiovascular disorders. A
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study had a contrary study that observed high salt intake to be associated with progression of
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cardiovascular and renal dysfunction, suggesting high salt intake to be a potential risk factor of
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hypertension. Increased vegetable consumption and hypertension showed no statistically significant
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association. This findings is contrary with a meta-analysis study carried out and six other research
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studies. One of the studies revealed an inverse association while the other five research studies were
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not statistically significant(26). Vegetables are high in potassium, magnesium, vitamin, folic acid and
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carotenoid. Research studies reported it to lower blood pressure through vasodilatation, improve
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endothelial function and increase antioxidant activity (24, 25).
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Clinical Factors
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Heart rate was not statistically significant with hypertension in this study, P value is >0.001. This result
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is contrary to a research findings that suggest heart rate is strongly associated with peripheral and
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central blood pressures(20). Heart rate is an independent risk factor of cardiovascular disease with
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high mortality rate among hypertensive subjects (20).Clinical studies has observed patients with
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increase heart rate are more likely to develop atherosclerosis and acute coronary syndromes (21).
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Also recent studies analyzed an increased heart rate is frequently associated with high blood
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pressure, obesity, dyslipidemia and increase haematocrit. However, this finding is in contrast with (21)
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that explains heart rate greater than 80 beats per minute has a positive association with hypertension.
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This study demonstrated a strong positive association between participants that has family history of
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hypertension and hypertension, P<0.001. This findings are consistent with a study that reported a
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statistically significant association between hypertension and family history (17, 2).
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CONCLUSION
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This study observed that family history of hypertension, marital status, and occupational status, are
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associated to increase in blood pressure and increase in age may be positively associated with
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hypertension and can also be a cardiovascular risk factor in Awka, Nigeria. This calls for an increase
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awareness program and improved health policy on these risks
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CONFLICT OF INTEREST
There was no conflict of interest

ETHICAL STATEMENT
This research study was reviewed and approved by the Ethical committee of Chukwuemeka Odumegwu Ojukwu University Teaching Hospital, Amaku Awka with Ref No: COOUTH/AA/Vol.1.001.

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