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*Research Article*

## **Prevalence of Uncontrolled Hypertension at a Secondary Health Care Center in South-Western Nigeria**

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### **ABSTRACT**

There has been an upsurge in prevalence of hypertension worldwide and a drift towards poor control despite the development of new guidelines for treatment. The objective of this study was to determine the prevalence of uncontrolled hypertension at the State hospital Oyo. The study was a cross-sectional one and was conducted over a period of three months at the Medical Outpatient Clinic of the State Hospital, Oyo. The study population was composed of 403 adults aged between 18 years and 70 years. There were 321 females (79.7%) and 82 males (20.3%). The mean age of the consenting patients was 59.3 years (SD± 9.44). One hundred and sixty-four (40.7%) respondents had systolic blood pressure of less than 140 mmHg. The prevalence of uncontrolled systolic blood pressure was 59.3%. Two hundred and ninety-seven (73.7%) respondents had diastolic blood pressure of less than 90 mmHg. The prevalence of uncontrolled diastolic blood pressure was 26.3%. The prevalence of uncontrolled blood pressure was  $245/403 = 60.8\%$ . The majority of hypertensive patients assessed in this study had poor control of hypertension hence they might have been exposed to development of heart disease, renal failure and stroke.

**Keywords:** *prevalence, uncontrolled hypertension, secondary health care, Nigeria*

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### **INTRODUCTION**

Hypertension is defined as a persistent systolic blood pressure (SBP) reading of 140 mmHg or greater and or a diastolic blood pressure (DBP) reading of 90 mmHg or greater (JAMA 2003, Kate OO 2013). Hypertension is divided into two main categories: essential (primary) hypertension and secondary hypertension. Essential hypertension occurs in about 90% to 95% of the cases and is of unknown cause, while secondary hypertension occurs in the remaining 5% to 10% of the cases and are of known causes (Ibekwe, 2014 and Kurnal, 2015).

Uncontrolled blood pressure is a blood pressure of greater than 140/90 mmHg in hypertensives and greater than 130/80 mmHg in hypertensive diabetics and patients with chronic renal failure. Factors associated with blood pressure control were found to be type of insurance, nonsmoker status, and increased number of medications used (DeVore AD *et al*, 2012). Worldwide, uncontrolled hypertension is a serious risk factor for renal and cardiovascular diseases (Iyalomhe GBS,

Iyalomhe, 2015, Erhiano *et al* 2015). The African region of the world is experiencing a double epidemic of both communicable and non-communicable diseases. The results of a study conducted in Eastern Nigeria showed a poor detection, treatment and control of hypertension (Kayima *et al*, 2013). The global burden of hypertension is rapidly increasing and Nigeria being the biggest country in Africa is mostly affected (Akinlua *et al* 2015). Systematic reviews also showed poor control of hypertension and low awareness in the African continent (Ekwunife *et al* 2010, Fahey *et al* 2006). It is a common finding that hypertensive patients in the community fail to meet treatment goals according to the reports of a study conducted by Fahey *et al*. It is projected that only 25 to 40 percent of treated hypertensives achieve blood pressure goals (William, 2015). Banegas *et al* (2014) reported a raised Out of office Blood Pressure measured by ambulatory blood pressure monitoring in their study.

In a study conducted in South East Nigeria, 32.9% had controlled blood pressure which was due to poor knowledge

regarding hypertension, unrealistic expectations of treatment, poor adherence to medication and lifestyle modifications (Okwuonu *et al* 2014 ). Suleiman *et al* however reported 7.3% control in hypertension in a Niger Delta community in Nigeria(Suleiman *et al* 2013). Diabetes mellitus was reported to be the most common co-morbid condition found in hypertensive patients.(Ogaji *et al*,2016, Tamuno and Babashani, 2012 ). Patients with diabetes mellitus have a much higher prevalence of hypertension than would be expected in the general population. It was reported in a systematic review that there were low levels of awareness and treatment of hypertension and even poor control of hypertension (Kayima *et al* 2013).

Irrespective of the antihypertensive medications used, a decrease in blood pressure helps to avert diabetic complications. If there are no contraindications, angiotensin-converting enzyme inhibitors are considered first-line therapy in patients with diabetes and hypertension because of their cardio-renal protective effects (Konzem *et al* 2002 and Unadike *et al* 2011). However, Chinedu and colleague reported that the prevalence of hypertension among the diabetic patients in their study was 57.4% (Chinedu and Nicholas, 2015)

In a study conducted in South East Nigeria, the results showed poor detection, treatment and control of hypertension. Blood pressure was also found to increase with age in both men and women (Ekwunife *et al* 2010). Another study was conducted in Nigeria to find out the relationship between obesity and blood pressure control and it was found that obesity was not necessarily associated with poor blood pressure control. However obesity was associated with poor control of hypertension according to Lloyd-Sherlock *et al*(Lloyd-Sherlock, 2014). Poor blood pressure control has been associated with poverty, lack of proper education of patients, proliferation of untested alternative treatments, poly-pharmacy and taking medications for long periods of time for an apparently benign condition(Abiodun *et al* 2014). Frequent screening for nephropathy is important in hypertensive patients to treat them early. According to Ogbu *et al*, 22% prevalence rate of microalbuminuria was recorded in their study on prevalence of nephropathy in patients with hypertension (Ogbu *et al* 2014 )

## MATERIALS AND METHODS

A cross-sectional study was conducted from 1st of February 2016 to 31st of March 2016 at the Medical Outpatient Clinic of the State Hospital Oyo, Oyo State. Four hundred and three adults between the ages of 18 and 70 years with an established diagnosis of hypertension and already on treatment and follow up for a year were recruited for the study. A total sampling technique was used to recruit consecutive patients until the calculated sample size of 403 was achieved.

Inclusion criteria include patients who were 18-70 years with uncontrolled arterial hypertension.

Office blood pressure of  $\geq 140/90$  mm Hg.

Exclusion criteria include patients with severe hypertension, systolic  $>180$  mm Hg, diastolic  $> 110$  mm Hg who would need immediate adjustment of treatment, renal insufficiency,

pregnant and lactating women and patients with Diabetics mellitus.

**Data collection:** A structured questionnaire was administered to consenting subjects.

**Measurement of blood pressure:** A standard mercury sphygmomanometer (Accosson, London) provided with an armband for adult of 12 cm large was used, and SBP and DBP were taken as Korotkoff sound phases I and V respectively. The display of the sphygmomanometer was positioned away from the patient to assure blinding to the Blood Pressure readings. The measurements were taken with the patient in a seated position with their arms supported at heart level, after five minutes of rest, after abstinence from food, nutritional supplements, caffeinated beverages and smoking for a minimum of two hours before the appointment at approximately the same time and day of the week. The cuff of appropriate size was applied to the exposed upper arm and was rapidly inflated to 30 mm Hg above the level at which the pulse disappeared and then deflated gradually. Blood pressure was measured as two serial measurements at intervals of two minutes using auscultatory methods. The mean of two measurements was calculated for SBP and DBP separately. Blood pressure was considered to be well controlled if it was less than 140/90 mm Hg and uncontrolled if higher than 140/90 mm Hg.

**Data Analysis:** Data was analyzed using Statistical Package for Social Sciences software version 20. Frequency tables and diagrams were used for relevant variables. Chi-square test was used for bivariate analyses to test the significance of the association between categorical variables. A p-value of  $\leq 0.05$  was considered to indicate statistical significance.

**Ethical Consideration:** Approval of the Ethical Review Committee of Oyo State Ministry of health, Ibadan was obtained. Informed consent was obtained from eligible patients before administration of the questionnaires and examinations. Privacy and confidentiality of the respondents was guaranteed by anonymity of respondents.

## RESULTS

### Prevalence of uncontrolled hypertension:

One hundred and sixty four (40.7%) respondents had systolic blood pressure of less than 140mmHg that is they are controlled whereas 239(59.3%) had systolic blood pressure of 140 and above. The prevalence of uncontrolled systolic blood pressure was 59.3%.

Two hundred and ninety seven(73.7%) respondents had diastolic blood pressure of less than 90mmHg that is they are controlled whereas 106(26.3%) had diastolic blood pressure of 90 and above. The prevalence of uncontrolled diastolic blood pressure was 26.3%. However the prevalence of uncontrolled blood pressure was  $245/403= 60.8\%$  and that of controlled blood pressure was 39.2%.

The prevalence of diabetes was 17% in this cohort of hypertensive patients, the prevalence of stroke was 3% and Kidney disease was 1.7%. 23% of the respondents had family history of hypertension.

### Socio-demographic characteristics of respondents

Table 1 shows socio-demographic characteristics of the respondents. Four hundred and three patients who met the criteria for recruitment were included in the study and interviewed. The mean age of the respondents was 59.3 (SD+9.44) years. Almost one third of the patients 115(28.5%) were between 25-54years and respondents who were 55 years and above were 288(71.5%). Male respondents were 82 constituting 20.3% while there were 321(79.7%) female respondents.

**Table 1**

Socio-demographic characteristics of respondents (n=403)

Variables	Frequency (n)	Percentage (%)
<b>Age group(years)</b>		
25-54	115	28.50
55 and above	288	71.50
<b>Sex</b>		
Male	82	20.3
Female	321	79.7
<b>Ethnic group</b>		
Hausa	2	0.5
Igbo	6	1.5
Yoruba	392	97.5
Others	2	0.5
<b>Marital status</b>		
Single	5	1.3
Married	264	66.2
Separated	8	2.0
Divorced	8	2.0
Widowed	114	28.5
<b>Family setting</b>		
Monogamous	176	44.0
Polygamous	227	56.0

### Association of different variables with grouped systolic blood pressure

Table 2 shows association of variables with grouped systolic blood pressure. Majority 90 (78.6%) of the respondents who were overweight had poor control of systolic blood pressure while a minority 36(21.4%) had good control of systolic blood pressure. Sixty seven (70.5%) of those respondents who were obese had poor control of systolic hypertension while 28 (29.5%) had good control of systolic blood pressure. However, the association was not statistically significant ( $\chi^2 = 4.773$ , p-value = 0.189)

A minority 47(40.9%) of the respondents who were between 25-54years had good control of systolic blood pressure while a majority 68(59.10%) had poor control of systolic hypertension. One hundred and seventeen(40.60%) of those respondents who were 55years and above had good control of systolic hypertension while 171(59.40%) had poor control of systolic blood pressure. However, the association was not statistically significant ( $\chi^2 = 0.002$ , p-value = 0.964).

**Table 2:**

Association of different variables with grouped systolic blood pressure

Variable	Good control	Poor control	$\chi^2$	p-value
<b>Education</b>				
No education	49(25.8%)	141(74.2%)	0.32	0.956
Primary	25(26.0%)	71(74.0%)		
Secondary	17(29.3%)	41(70.7%)		
Tertiary	15(25.4%)	44(74.6%)		
<b>BMI</b>				
<b>Normal weight and less</b>	40(24.0%)	129(76.0%)	4.77	0.189
<b>Overweight</b>	36(21.4%)	90(78.6%)		
<b>Obese</b>	28(29.5%)	67(70.5%)		
<b>Age (years)</b>				
25 to 54	47(40.90%)	68 (59.10%)	0.002	0.964
55 and above	117(40.60%)	171(59.40%)		
<b>Exercise</b>				
<b>Good</b>	41(34.70%)	77(65.30%)	2.447	0.118
<b>Low</b>	123(43.2%)	162(56.8%)		

**Table 3:**

Association of variables with grouped diastolic blood pressure

Variable	Good control	Poor control	$\chi^2$	p-value
<b>Education</b>				
No education	76(40.0%)	114(60.0%)	0.118	0.990
Primary	39(40.6%)	57(59.4%)		
Secondary	24(41.4%)	34(58.6%)		
Tertiary	25(42.4%)	34(57.6%)		
<b>BMI</b>				
<b>Underweight/ Normal</b>	7(38.9%)	11(61.1%)	4.655	0.199
<b>Overweight</b>	74(46.2%)	86(53.8%)		
<b>Obese</b>	52(40.0%)	78(60.0%)		
	31(32.6%)	64(67.4%)		
<b>Age (years)</b>				
25 to 54	43(37.40%)	72(62.60%)	10.207	0.001*
55 and above	63(21.90%)	225(78.10%)		
<b>Exercise</b>				
<b>Good</b>	74(26.0%)	211(74.0%)	0.057	0.811
<b>Low</b>	86(43.2%)	32(56.8%)		
<b>Smoking</b>				
<b>High</b>	17(29.3%)	41(70.7%)	0.296	0.587
<b>Low</b>	75(25.9%)	215(74.1%)		

\*Significant at 5% level of significance

### Association of different variables with grouped diastolic blood pressure

Table 3 shows association of variables with grouped diastolic blood pressure. A minority 52(40.0%) of the respondents who were overweight had good control of blood pressure while a majority 78(60%) had poor control of diastolic blood pressure. Thirty one (32.6%) of those respondents who were obese had good control of diastolic hypertension while 64 (67.4%) had poor control of diastolic blood pressure. However, the association was not statistically significant ( $\chi^2 = 4.655$ , p-value = 0.199)

A majority 72(62.6%) of the respondents who were between 25-54years had poor control of diastolic blood pressure while a minority 43(37.40%) had good control of diastolic hypertension. Two hundred and twenty five(78.1%) of those respondents who were 55years and above had poor control of diastolic hypertension while 63(21.90%) had good control of diastolic blood pressure. However, the association was statistically significant ( $\chi^2 = 10.207$ , p-value = 0.001).

## DISCUSSION

The prevalence of controlled hypertension according to this study was 39.2%. This was higher than what was reported in a study conducted in South East Nigeria where the prevalence was 32.9% and another study conducted in Niger Delta region of Nigeria by Suleiman and colleagues which reported 7.3%( Suleiman *et al*, 2013). However, Musinguzi *et al*(2015) reported 20.20% of uncontrolled in a study conducted in Uganda but the Nigerian studies showed poor control of hypertension in the majority of hypertensive patients. In a systematic review, it was found that patients with better formal education and literacy levels had better control of their blood pressure, however the level of control is poor in most countries in Africa( Kayima *et al* 2013). Nansseu *et al* (2016) in a systematic review reported that the risk factors for poor control of hypertension were poor adherence to treatment, increasing age, male sex, dyslipidaemia, metabolic syndrome, previous cardiovascular events, sedentary life style and stress, but not excessive salt intake, alcohol and coffee ingestions. The blood pressure control does not depend on the level of education according to this study because there was no significant association between blood pressure control and level of education. In a study conducted to examine socio-demographic inequalities in the prevalence, diagnosis and management of hypertension in Indonesian adults, it was found that less than a third were aware of their hypertension and a quarter had their blood pressure controlled(Hussain *et al* 2016). However, the prevalence of blood pressure control was higher in this study compared with the Indonesian study described above.

Habitat, education and time of diagnosis of hypertension were related to its control in hypertensive patients according to Motlagh *et al* in a study conducted in Iran(Motlagh *et al*, 2015). The results of a South African study showed poorly controlled blood pressure in 58% of hypertensive patients despite high level of good adherence (Adebolu and Naidoo, 2014). The prevalence of controlled hypertension was higher in the South African study than what was found in this study. A study conducted in Port Harcourt showed prevalence of blood pressure control to be 24.2%. It was also reported that majority of the patients had hypercholesterolaemia and were overweight(Akpan *et al*, 2008). The results of this study were similar to the Port-Harcourt study described above as majority of the patients with poor Blood pressure control were overweight. Bharatia *et al*(2016) in an Indian study conducted on patients with hypertension also reported that most of their patients were overweight. This might be responsible for poor control of blood pressure in the majority of hypertensive patients assessed.

In conclusion, the majority of hypertensive patients assessed in this study had poor control of hypertension hence they might have been exposed to development of heart disease, renal failure and stroke. There is a need to educate hypertensive patients on life style modifications and improvement on adherence to medications so that they can have a better blood pressure control.

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