



## Factors in Adherence to Antihypertensive Regimen in Imo State South Eastern Nigeria

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### Authors' contributions

This work was carried out in collaboration among all authors. Author DWU conceived the study, supervised the study, designed the study and drafted the manuscript. Author AOO Study design, data analysis and data collection. Authors EJC and OOM study design and revisited the manuscript writing and author INSD participated in the drafting of manuscript and critically evaluated the intellectual contents. All authors read and signed the final version of paper.

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### ABSTRACT

**Aim:** To determine the level of adherence and identify factors that prevent adherence to antihypertensive treatment.

**Study Design:** The study employed the survey method.

**Methods:** Descriptive study was employed and a simple random sampling were used to collect data from 200 randomly consenting respondents.

**Results:** Results showed that the majority of the respondents (65.0%) were females, a large proportion (48.5%) were in the age bracket of 51 – 60 years, the majority (93.5%) were educated and 45.5% were civil servants. A majority (57.5%) of the respondents agreed that lack of income family support was a factor that could lead to non-adherence and only 40% adhered strictly to the doctor's prescription.

**Conclusion:** Based on the findings, the level of adherence to antihypertensive regimen among the respondents is satisfactory. However, several factors hindered their adherence to medication

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among which were financial stress, access to drugs and availability of health facilities. It is therefore recommended that the cost of medication be subsidized and health facilities brought closer to people to enhance adherence to regimen.

*Keywords: Adherence; antihypertensive regimen; factors; hypertension; South Western Nigeria.*

## 1. INTRODUCTION

Hypertension also known as high or raised blood pressure (BP) is a public health challenge worldwide [1]. Hypertension is the leading risk factor for death worldwide and affects both men and women [2]. High blood pressure or hypertension is defined by two levels by 2017 America college of cardiology/America Heart Association (ACC/AHA) [3]: (1) elevated BP with systolic pressure between (SBP) 120 and 129mmhg and diastolic pressure (DBP) less than 80mmhg and (2) stage 1 hypertension with SBP of 130 to 139mmhg or a DBP of 80 to 89mmhg. Arterial hypertension is the most important modifiable cardiovascular risk factor [4] and it is also the first modifiable risk factor accounting for 10.4 million deaths and 218 million attributable disability-adjusted life-years worldwide [5].

The highest prevalence of hypertension in the world occurs in sub-Saharan Africa [6]. Previous studies in sub Saharan Africa had shown a higher prevalence of urban centres than in rural communities but recent studies show a growing trend in prevalence of hypertension in rural communities compared to that of urban community. Prevalence of hypertension in Nigeria has progressively increased from 10.1%-13.3% and 8.9% in the late sixties between 38.8% to 44.5% and 34.8% recently in rural and urban communities respectively [7].

Considering the availability of effective medications and the attitude of hypertensive patients towards the control of hypertension, assessing adherence to medication could be a way of managing the disease. In other words, medication adherence although a complex issue with various associated factors is a very critical component in controlling blood pressure of patients within normal range and consequently achieving good health outcome in long term and also holding up the cardiovascular complication [8]. Adherence to antihypertensive regimen is an effective step for controlling blood pressure and preventing complications. However, certain factors affect a hypertensive patients' behaviour regarding adherence to antihypertensive treatments. These factors can support or hinder adherence behaviour. Such factors influencing

hypertensive patients' adherence behaviour to antihypertensive medication include patient-related factors (e.g., socio-demographic factors and the individual's knowledge and skills), health system-related factors (such as treatment cost and patients' resources), and provider-related factors (such as patient-provider relationships and communication [9].

Therefore, this study was designed to investigate the factors in adherence to antihypertensive regimen in Imo State South Eastern Nigeria.

## 2. MATERIALS AND METHODS

The study employed a descriptive study design. A sample of 200 hypertensives from Eziobodo Community in Owerri West local government area of Imo State participated in the study. The participants were selected using simple random sampling technique. Data were collected using structured questionnaire and interview schedule. The instruments were validated using face and content validity and tested for reliability using test-retest method. Verbal informed consent was obtained from each respondent and inclusion criterion was age 21 years and 70 years in Owerri West Local Government Area, Imo State. Three trained research assistants were involved in the collection of data from respondents. The SPSS (version 21.0) was used for data analysis. The statistical tools used were Chi-square test which was used to test the hypotheses.

## 3. RESULTS

Table 1 shows that most (65%) of the respondents were female, a greater proportion (48%) were in the age bracket of 51 – 60 years, the majority (69.5%) had secondary school education and a greater proportion (45.0%) were civil servants. This implies that the respondents are educated, aging and under government employ.

### 3.1 Non Adherence to Antihypertensive Regimen

Table 2 shows that the majority (57.5%) of the respondents identified family support (57.5%) as the major factor that could hinder adherence to

antihypertensive regimen. Furthermore, 60.5% of the respondents strongly agreed that financial stress was a hindrance to antihypertensive regimen, 39.0% strongly agreed that daily activities hindered adherence to antihypertensive regimen, 58.0% agreed that accessibility of drug in keeping with prescription hindered adherence to antihypertensive regimen while 57% strongly agreed that accessibility of healthcare facility was an encumbrance to antihypertensive regimen.

Also, 29.5% of the respondents strongly agreed that lack of family and friends hindered antihypertensive regimen. On their view on lack of social support as hindrance, 43.5% strongly disagreed that it hindered antihypertensive regimen while 30.5% were indifferent. Regarding the role of health workers in compliance with standards, most (76.5%) agreed that it was a hindrance to antihypertensive regimen while 11.0% were indifferent.

**Table 1. Distribution of respondents according to socio-demographic characteristics**

Socio-demographic variables	Frequency (200)	Percentage (%)
<b>Sex</b>		
Female	130	65.0
Male	70	35.0
<b>Age distribution</b>		
21-30	8	4.0
31-40	15	7.5
41-50	48	24.0
51-60	96	48.0
61-70	33	16.5
<b>Education</b>		
Primary	9	4.5
Secondary	139	69.5
Degree	39	19.5
No response	13	6.5
<b>Occupation</b>		
Civil servant	90	45.0
Trader	65	32.5
Businesses	5	2.5
Farmer	19	9.5
Artisans	4	2.0
Others	12	6.0
No response	5	2.5

**Table 2. Non adherence to antihypertensive regimen**

Variables	Frequency (n=200)	(%)
<b>Factors That Could Lead to Non Adherence</b>		
Family support	115	57.5
Social support	11	5.5
Drug accessibility	17	8.5
Level of relationship with health care provider	5	2.5
Others	8	4.0
Non response	44	22.0
<b>Financial Stress as Hindrances</b>		
Strongly agree	121	60.5
Disagree	53	26.5
agree	5	2.5
indifferent	21	10.5
<b>Daily Activities Hindrance</b>		
Strongly agree	78	39.0
Strongly disagree	59	29.5
Agree	20	10.0
Disagree	7	3.5
Indifferent	36	18.0

Variables	Frequency (n=200)	(%)
<b>Accessibility of Drug in Keeping to Prescription</b>		
Agree	116	58.0
Disagree	38	19.0
Indifferent	46	23.0
<b>Accessibility of Healthcare Facility as Hindrance</b>		
Strongly agree	114	57.0
Disagree	23	11.5
Agree	32	16.0
Indifferent	31	15.5
<b>Lack of Family and Friends</b>		
Strongly agree	59	29.5
Strongly disagree	63	31.5
Disagree	13	6.5
Agree	29	14.5
Indifferent	36	18.0
<b>Lack of Social Support as Hindrance</b>		
Strongly agree	15	7.5
Strongly disagree	87	43.5
Agree	26	13.0
Disagree	11	5.5
Indifferent	61	30.5
<b>Role of Healthcare Workers in Compliance</b>		
Agree	153	76.5
Disagree	22	11.0
Indifferent	25	12.5

### 3.2 Level of Adherence to Antihypertensive Regimen

Table 3 shows that a large proportion of the respondents (40.0%) kept to doctors' appointment while 6.0% were unresponsive. It also shows that 43.5% of the patients sometimes took the drugs as prescribed, 34.5% always took the drug and 2.0% did not take it. Furthermore, the result shows that 40.5% of the patients sometimes kept to prescribed diet, 25.8% always did while 4.0% did not take any.

### 3.3 Hypothesis Testing

#### 3.3.1 Relationship between educational level and level of adherence

From the table, it can be deduced that adherence to prescribed regimen was significantly associated with educational level of respondents ( $X^2 = 25.496$ , P-value = .000,  $p \leq 0.05$ ).

#### 3.3.2 Relationship between occupation and level of adherence of respondents

Table 5 shows that adherence to prescribed regimen is significantly associated with the occupation of the respondents ( $X^2 = 48.306$ , Pvalue = .000,  $p \leq 0.05$ ).

### 3.3.3 Relationship between depression and adherence to hypertension medication

Table 6 reveals that depression in respondents is significantly associated with adherence to hypertension treatment ( $X^2 = 53.982$ , P-value = .000,  $p \leq 0.05$ ).

#### 3.3.4 Relationship between unrest and adherence

Table 7 contains information on the relationship between personal factors (family unrest) and adherence to prescribed regimen. The table shows that there is a statistically significant association between adherence to prescribed regimen and occupation of the respondents ( $X^2 = 11.676$ , P value = 0.020,  $p \leq 0.05$ ).

## 4. DISCUSSION

Education could improve patients' health literacy thereby enhancing their awareness and knowledge of the illness and chances of adherence to control measures. It could also enhance their communication with providers. [10] stated that adults are more likely to adhere to hypertensive control measures. Non-adherence according to [11] decreases with age and is more likely among women than men.

Non-adherence to antihypertensive regimen according to the findings was attributed to several factors which include family income support, financial stress, accessibility of drugs and healthcare facility and the roles of health workers. Financial hardship is an important barrier to compliance with treatment for hypertension [12]. According to [13] women in middle-/low-income countries, across all ages had a higher prevalence of hypertension compared with high-income countries. [14] reported that patients who had healthcare insurance (provided by their employers) got more hypertension medications than those uninsured. This implies that availability of finance influenced adherence to antihypertensives. [14] found that in low income countries, the proportion of low adherence increased progressively and considerably with decreasing level of individual patient wealth. They further stated that many patients discontinued their treatment due to financial reasons. Social support networks are important in the long-term management of hypertension since those who have support from friends and family members had better compliance than those do not [12]. Access to medications, role of healthcare workers and proximity to healthcare facilities have been found to determine adherence to hypertension treatment. [15,16] contend that quality of relationship between the patient and the clinician, the communication style of the clinician and access to healthcare facilities impact adherence. Very expensive drugs might be unaffordable to the patients and hence discourage them from its

use. Similarly, rural residents might not find it easy accessing healthcare facilities at urban centres and this might hinder their adherence. Non-adherence could worsen the health situation of patients leading to more adverse effects. Knowledge of factors that interfere with patients' adherence to treatment will encourage actions that will enhance adherence.

Based on the findings, the level of adherence to antihypertensive regimen among the respondents was satisfactory. Compliance with treatment is characterized by the individual's behaviour regarding the use of medication, recommended changes in lifestyle and attendance to medical appointments [17]. Poor compliance or adherence accounts for inadequate treatment, thus leading to uncontrolled blood pressure [18].

Adherence to antihypertensive regimen was found to be influenced by the respondents' sociodemographic characteristics (educational level and occupation) and also some personal factors (depression and family unrest). Highly educated patients are likely to know more about hypertension and its treatment and would show more compliance than uneducated people. Education would increase the likelihood of the patients seeking information from various sources. It would also enhance communication between patients and clinicians. On the other hand, occupation plays a significant role in determining the patients' level of adherence to treatment. Patients that are gainfully employed

**Table 3. Level of adherence to antihypertensive regimen**

<b>Variables</b>	<b>Frequency (n=200)</b>	<b>Percentage (%)</b>
<b>In keeping to doctor's appointment</b>		
Always	80	40.0
Missed only a few times	39	19.5
Sometimes	52	26.0
None	17	8.5
Unresponsive	12	6.0
<b>Taking drugs as prescribed</b>		
Always	69	34.5
Missed only a few times	28	14.0
Sometimes	87	43.5
None	4	2.0
Unresponsive	12	6.0
<b>Keep to prescribed diet</b>		
Always	57	28.5
Missed only a few times	38	19.0
Sometimes	81	40.5
None	8	4.0
Unresponsive	16	8.0

**Table 4. Relationship between socio-demographic characteristics (educational level) and adherence to prescribed regimen**

		Do you take your drugs as prescribed				X <sup>2</sup> Value	P Value		
		Always	Missed only a few times	Sometimes	None				
Educational level of Respondents	Primary	1 <sub>a</sub>	0 <sub>a</sub>	8 <sub>a</sub>	0 <sub>a</sub>	9	25.496 <sup>a</sup>	.000	
	Secondary	48 <sub>a</sub>	13 <sub>b</sub>	62 <sub>a</sub>	4 <sub>a, b</sub>				127
	Degree	12 <sub>a</sub>	15 <sub>b</sub>	12 <sub>a</sub>	0 <sub>a, b</sub>				39

**Table 5. Relationship between sociodemographic factor (occupation) and adherence to prescribed regimen**

		Do you take your drugs as prescribed				X <sup>2</sup> Value	P Value	
		Always	Missed only a few times	Sometimes	None			
Occupation of Respondents	Civil Servant	26 <sub>a</sub>	15 <sub>a</sub>	45 <sub>a</sub>	4 <sub>a</sub>	90	48.306 <sup>a</sup>	.000
	Trader	20 <sub>a</sub>	4 <sub>a</sub>	29 <sub>a</sub>	0 <sub>a</sub>	53		
	Businesses	0 <sub>a</sub>	0 <sub>a</sub>	5 <sub>a</sub>	0 <sub>a</sub>	5		
	Farmer	15 <sub>a</sub>	4 <sub>a</sub>	0 <sub>b</sub>	0 <sub>a, b</sub>	19		
	Artisans	4 <sub>a</sub>	0 <sub>a</sub>	0 <sub>a</sub>	0 <sub>a</sub>	4		
	Others	0 <sub>a</sub>	4 <sub>b</sub>	8 <sub>a, b</sub>	0 <sub>a, b</sub>	12		

**Table 6. Relationship between personal factors (depression) and adherence to prescribed regimen**

			Do you take your drugs as prescribed				X <sup>2</sup> Value	P- value	
			Always	Missed only a few times	Sometimes	None			
Can depression limit adherence	a little	Count	11 <sub>a</sub>	1 <sub>b, c</sub>	28 <sub>a, c</sub>	0 <sub>b</sub>	40	53.982 <sup>a</sup>	.000
		% within Do you take your drugs as prescribed	73.3%	20.0%	53.8%	0.0%	52.6%		
	Strongly yes	Count	4 <sub>a</sub>	0 <sub>a</sub>	22 <sub>a</sub>	0 <sub>a</sub>	26		
		% within Do you take your drugs as prescribed	26.7%	0.0%	42.3%	0.0%	34.2%		
	No	Count	0 <sub>a</sub>	4 <sub>b</sub>	2 <sub>a</sub>	4 <sub>b</sub>	10		
		% within Do you take your drugs as prescribed	0.0%	80.0%	3.8%	100.0%	13.2%		
Total	Count	15	5	52	4	76			
	% within Do you take your drugs as prescribed	100.0%	100.0%	100.0%	100.0%	100.0%			

**Table 7. Relationship between personal factors (Family unrest) and adherence to prescribed regimen**

			Do you take your drugs as prescribed				X <sup>2</sup> Value	P Value
			Always	Missed only a few times	Sometimes			
Family unrest on level of adherence	Yes	Count	29 <sub>a</sub>	10 <sub>a</sub>	57 <sub>b</sub>	96	11.676 <sup>a</sup>	.020
		% within Do you take your drugs as prescribed	50.9%	41.7%	71.2%	59.6%		
	No	Count	13 <sub>a, b</sub>	9 <sub>b</sub>	10 <sub>a</sub>	32		
		% within Do you take your drugs as prescribed	22.8%	37.5%	12.5%	19.9%		
	Sometimes	Count	15 <sub>a</sub>	5 <sub>a</sub>	13 <sub>a</sub>	33		
		% within Do you take your drugs as prescribed	26.3%	20.8%	16.2%	20.5%		
Total	Count	57	24	80	161			
	% within Do you take your drugs as prescribed	100.0%	100.0%	100.0%	100.0%			

can afford the cost of the treatment more than unemployed ones. Some employers have health insurance packages that relieve them of some financial burdens.

Stress and anxiety which are related to family unrest have been reported as common causes of hypertension. According to [12] patients who held these beliefs did not show better compliance to treatments. The result also highlighted the importance of family support in adherence to treatment. Patients with high social support will show more adherence than those who do not. Patients who have friends and family members concerned about their illness, giving reminders about medication had better compliance [19].

## 5. CONCLUSION

The respondents had a satisfactory level of compliance with antihypertensive regimen. This indicates their willingness to take measures that will control the epidemic. However, some factors hindered their adherence to the medications. The major factors relate to access to drugs and availability of healthcare facilities. Furthermore, sociodemographic and personal factors of the patients were found to influence their adherence to treatments. This implies that in designing any intervention aimed at treating this epidemic, patient-related factors in addition to others should be put into consideration. Furthermore, cost of the treatment should be subsidized to encourage adherence. Healthcare facilities should be situated close to rural residents to increase their access to the treatments.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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