Patient compliance and barriers to antihypertensives in a teaching hospital in southern Nigeria

***Nsikan Emmanuel[1,3] Idongesit Umoh[2,3] Christie Akwaowo[1,3] Oyedele Temitomi Jane[4] Onubogu Nwamaka Chizaram[5] Chimezie Ekeomah Ejiogu [6] Enyi Etta[7] Joseph Miracle Odey[8] Henry Eziefule Nwankwo[9] Nlia Sunday[10] Ntuen Talent[11] Nsikan-Abasi Alfred[11] Ubong Jerome[11] Aniekeme Essien[11] Dumebi Ofili[11] Abasifreke Archibong[11] Udom Ubonn Udom[11] Chukwuocha Chigozie[12] Ifeagwazi Paul-Alex Chukwuma[13]**

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ABSTRACT

Background: Hypertension, a major global health concern, affects a significant proportion of the population and is a leading cause of cardiovascular diseases, stroke, and renal failure. The control of hypertension requires the long-term use of pharmacotherapy, with a need for strict compliance to medications to avert life-threatening complications. This study aimed to assess patient knowledge of hypertension and its management, level of compliance to antihypertensives, barriers to medication adherence, and explore strategies to overcome these barriers in a teaching hospital in southern Nigeria, with the goal of improving patient outcomes and reducing the prevalence of hypertension related complications. **Methodology:** A cross-sectional comparative study was used to assess 349 patients, recruited via a systematic random sampling technique from University of Uyo Teaching Hospital, Uyo, Akwa-Ibom state. Data was collected using semi-structured, interviewer-administered questionnaires and analyzed using a statistical package for social science (SPSS) software version 28. A p-value of <0.05 was considered statistically significant. **Results**: The findings showed that 10.9% of the respondents diagnosed 10 years and above were 40 years or younger, while 89.1% were aged 41years and above, with males making up to 43.6% while females were 56.4%. Only 73.9% of patients had good knowledge of hypertension and its management, and 23.2% had fair, while 2.9% had poor knowledge. The proportion of patients that stopped taking their antihypertensives when they felt better was 42.7%. 61.89% agreed that their medications were too expensive. Patients taking Valsartan were the least compliant with their medications. **Conclusions**: The study proves that the level of knowledge about hypertension and its management, along with socio-economic factors played a pivotal role in patient compliance with antihypertensives. We recommend that the Federal Ministry of Health collaborate with Health professionals in addressing this knowledge gap through health education. We also recommend the use of effective social support systems and health insurance to reduce out of pocket spending on medications.

Keywords: Hypertension, Antihypertensives, Patient compliance

INTRODUCTION

Hypertension, often called the silent killer due to its symptomless nature, affects approximately 1.39 billion individuals worldwide (1). WHO estimates that approximately 1.28 billion adults aged 30-79 years worldwide have hypertension (2). In Sub Saharan Africa, the overall prevalence of hypertension was estimated to be about 16.4% (95%CI 14.2 to 20.3%) with an estimated number of hypertensive individuals to be 17.4m (3). In Nigeria, hypertension is estimated to affect 20.8m people aged 20 years and above with a prevalence of 28.0% (24.6, 31.9) in both sexes (4)). In Nigeria, hypertension is a leading cause of morbidity and mortality, with a substantial portion of the population either undiagnosed or inadequately managed (4).

Department of Community Medicine, University of Uyo Teaching Hospital[1]
Department of Internal Medicine, University of Uyo Teaching Hospital[2]
Institute of Health Research and Development, University of Uyo Teaching Hospital[3]
Bowen University Teaching Hospital[4]
Abia state University[5]
Afe Babalola University[6]
University of Calabar[7]
University of Calabar Teaching Hospital[8]
Health Compass Initiative[9]
Ebonyi State University[10]
University of Uyo[11]
Department of internal medicine, Federal Teaching Hospital, Owerri[12]
Nnamdi Azikiwe University Teaching Hospital, Nnewi[13]

***Corresponding Author**
Nsikan Emmanuel
Institute of Health Research and Development, University of Uyo Teaching Hospital, Uyo, Nigeria[1,3]
Email: nsikarito20@gmail.com

The diagnosis of hypertension is made when the average of two or more diastolic blood pressure measurements on at least two subsequent visits is 90mmhg or above, or when the average of multiple systolic blood pressure readings on 2 or more subsequent visits is consistently 140mmhg or more (5). Hypertension requires ongoing management to prevent severe health complications. Successful management of hypertension requires long-term use of pharmacotherapy and lifestyle modifications to control the blood pressure. Combination therapy plays a crucial role in successfully managing hypertension by providing a more comprehensive approach, often improving blood pressure control and reducing the likelihood of treatment resistance, ultimately lowering the risks associated with uncontrolled hypertension. There is the need for compliance to avert long-term complications and other risks (including: increased cardiovascular risk, morbidity and mortality).

Medication compliance refers to the extent or degree of conformity to the recommendations about day-to-day treatment by the provider with respect to the timing, dosage and frequency (6). Noncompliance can lead to poor clinical outcomes, increased healthcare costs, and a higher risk of cardiovascular events (7).

Patient compliance to antihypertensives is a critical aspect in managing hypertension. A study by US Ekanem et al. (2018) reported the adherence rate to antihypertensives among hypertensive patients in University of Uyo Teaching Hospital was 85.2%, but only 14.2% showed good adherence. This suggests that a significant proportion were poorly compliant (11). Another study by Olalemi et al. (2020) reported that the adherence rate among hypertensive patients in University College Hospital Ibadan was 42.6%, indicating below average compliance (12). This suggests that more than half of hypertensive patients were not compliant.

Numerous barriers to medication adherence have been identified among hypertensive patients in Nigeria. The cost of antihypertensive medications remains a significant barrier to adherence, particularly among low-income patients (13). A study done by Ipinnimo et al. (2022) highlighted that high cost of medications and the need for long term treatment often result in patients discontinuing their prescription, especially when they experience financial difficulties (13).

In Nigeria, hypertension has reached epidemic levels, with studies indicating that a significant proportion of the population is either undiagnosed or inadequately treated (14). Compliance to antihypertensives is crucial in preventing complications and improving the quality of life of hypertensive patients. However, poor adherence to prescribed antihypertensives remains a widespread challenge. This study is necessary to understand the factors that affect patient compliance and to develop strategies to address them, thus contributing to better health outcomes and reduced disease burden. This study aims to assess the knowledge of hypertension and its management, the level of compliance and the barriers to antihypertensives among hypertensive patients in a Teaching Hospital in Southern Nigeria.

METHODOLOGY

Study Design and Population

This cross-sectional study was conducted at the University of Uyo Teaching Hospital (UUTH) in Akwa-Ibom state from September to October 2022. UUTH. The hospital offers both primary, secondary and tertiary-level services, with patients also referred from primary and secondary health facilities. It provides daily services obtained in the general outpatient department and a 24-hour emergency service through the accident and emergency unit and the Children's emergency unit for paediatric cases.

The study population were patients receiving treatment for hypertension at the Cardiology

Clinic of the University of Uyo Teaching Hospital, Uyo. All patients in the cardiology clinic aged 18 and above, who were treated with anti-hypertensives for at least 6 months were invited for the study. Patients who did not give consent, and who were newly diagnosed hypertensives and had not been on antihypertensives for at least 6 months were excluded.

SAMPLE SIZE ESTIMATION AND SAMPLING TECHNIQUE

Sample size was determined using the Fisher's formula for a cross-sectional study; n=z2pq/d2
Where n= minimum sample size. z= standard normal deviant at 95% confidence level i.e. 1.96
d= tolerable margin of error of 5%. p = the proportion of the population that had knowledge on patients' compliance with hypertension (based on a previous study of 29.5 = 0.295) (1). Sample size was 352.

A systematic random sampling method was used to draw the required sample size from the population. There are two cardiology clinics per week, with an average of 48 patients seen per cardiology clinic day. From the calculated sample size of 352 patients, our sampling ratio was 1/4. Therefore, the questionnaire was administered to every 4th patient after a random selection of the index patient in the clinic and an average of 12 patients was seen each cardiology clinic day. Data collection lasted for an average of 15 clinic days (about 8 weeks).

Patients who gave consent were enrolled using systematic random sampling technique as explained above. A semi structured interviewer administered questionnaire was used to obtain data on patients sociodemographic characteristics, knowledge of hypertension, level of compliance to antihypertensives, and barriers to adherence.

A 23-item questionnaire adapted from previously validated tools was used to assess the objectives. The knowledge of hypertension was modified and adapted from validated questionnaires— 12 questions from the Hypertension Knowledge Test (HKT) (15) and the Hill-Bone Questionnaire for compliance (16).

DATA ANALYSIS

Data generated was collated and verified for completeness. Microsoft Excel and SPSS (statistical package for social sciences) software version 28.0 was employed for data entry and data analysis, respectively. Categorical data collected was presented using tables, frequency distributions and percentages that were generated for each variable. Descriptive statistics of frequencies and percentage were used on discrete variables like age at last birthday and age at menarche etc. Fisher's exact test was used to test for association between the categorical variables (socio-demographic variable and knowledge of hypertension), while Analysis of Variance (ANOVA) was used to test for association between compliance to antihypertensive therapy and participant characteristics. Level of significance was taken at $p< 0.05$.

ETHICAL CONSIDERATIONS

Ethical approval for the study was obtained from the Institutional Research Ethics Committee of the University of Uyo Teaching Hospital, and all ethical standards were adhered to. Written informed consent was obtained from each patient.

RESULTS

Sociodemographic Characteristics of Respondents

A total of 352 respondents were approached out of which 349 questionnaires were completely filled out and thus used in the study. The age of the patients varied widely. A smaller proportion were aged 40 years or younger (10.9%). The majority, however, were 41 years and above (89.1%) and earned less than N100,000 (80.2%). The study had a relatively balanced distribution, with females constituting the larger population (56.4). Majority of the patients were married (70.2%). Majority of the patients attained a tertiary level of education and reside in an urban setting (57%, 67%) (Table1).

Table 1: Sociodemographic characteristics of respondents

Sociodemographic characteristics	Frequency n=349	Percentage
Age (years)		
≤ 40	38	10.9
41- 60	151	43.3
>60	160	45.8
Gender		
Male	152	43.6
Female	197	56.4
Marital status		
Single	19	5.4
Married	245	70.2
Divorced/separated	10	2.9
Widowed	75	21.5
Occupation		
Employed	145	41.6
Unemployed	53	15.2
Retired	151	43.3
Household income (₦)		
≤50,000	176	50.4
51 – 100,000	104	29.8
101 – 150,000	36	10.3
>150,000	33	9.5
Educational status		
No formal education	10	2.9
Primary	62	17.8
Secondary	78	22.3
Tertiary	199	57.0
Place of residence		
Rural	115	33.0
Urban	234	67.0

MEDICAL HISTORY OF RESPONDENTS

The study also gathered important data on medical history, comorbidities, and medication use of the respondents. The duration of the patient's diagnosis varied, with the majority living with the diagnosis for more than a year (86.5%). Majority of the patients had no additional health conditions (54.5%), while the rest had comorbidities (45.5%). Majority of the patients were on common antihypertensive medications like lisinopril, valsartan, and bisoprolol (71%) (Table2).

Table 2: Medical history of respondents

	Frequency n=349	Percentage
Duration of morbidity (years)*		
<1	47	13.5
>1 to 5	138	39.7
>5 to 10	71	20.4
>10	92	26.4
Co-morbidities (multiple answers)		
None	197	54.5
Diabetes	82	22.7
Asthma	12	3.3
HIV/AIDs	5	1.4
Others	64	17.7

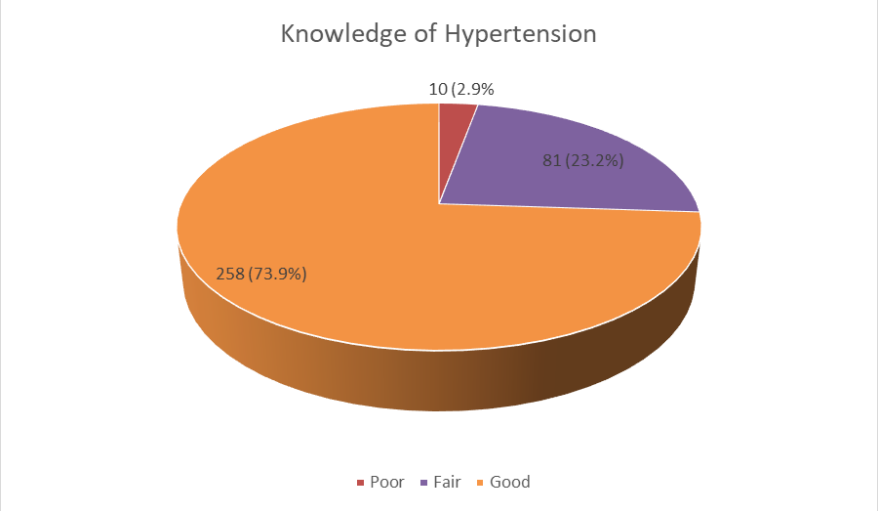
Current medications		
Lisinopril	136	37.7
Valsartan	32	8.9
Bisoprolol	88	24.4
Clopidogrel	79	21.9
Atorvastatin	15	4.2
Others/ I don't know	61	16.9

KNOWLEDGE OF HYPERTENSION

The study results provide valuable insights into the general knowledge of hypertension among patients, highlighting their awareness of various aspects of the condition. The majority of patients demonstrated a strong understanding of key aspects of hypertension (72%). The patients were graded based on the knowledge of hypertension, with scores ranging from 0-12. Based on the grading, the majority of the patients had a good knowledge (73.9%) (Table 3).

Table 3: Knowledge of Hypertension

	Frequency n=349	**Percentage %**
If your mother or father has HBP, your chances of getting it is higher		
0 (No)	140	40.1
1 (Yes)	209	59.9
Young adults do not get HBP		
0 (No)	122	35.0
1 (Yes)	227	65.0
HBP always has symptoms		
0 (No)	221	63.3
1 (Yes)	128	36.7
HBP is not life threatening		
0 (No)	87	24.9
1 (Yes)	262	75.1
Blood pressure is high when it is at or over 140/90mmHg		
0 (No)	91	26.1
1 (Yes)	258	73.9
If you are overweight, you're more likely to develop HBP		
0 (No)	99	28.4
1 (Yes)	250	71.6
Regular exercise can help in reducing blood pressure		
0 (No)	36	10.3
1 (Yes)	313	89.7
Drinking alcohol lowers the blood pressure		
0 (No)	32	9.2
1 (Yes)	317	90.8
HBP is a men's problem		
0 (No)	29	8.3
1 (Yes)	320	91.7
Pregnancy-related HBP is temporary and does not require follow up after delivery		
0 (No)	81	23.2
1 (Yes)	268	76.8
Blood pressure gets lower in cold weather		
0 (No)	83	23.8
1 (Yes)	266	76.2
Can one have HBP without any signs or symptoms?		
0 (No)	147	42.1
1 (Yes)	202	57.9



ASSOCIATION BETWEEN KNOWLEDGE OF HYPERTENSION AND PATIENT CHARACTERISTICS

The study explored the impact of various demographic and socio-economic factors on patients' knowledge of hypertension. Majority of the patients with good knowledge were aged 41-60 (79.5%), while the majority of the patients with poor knowledge were over 60 years of age (50%). Females were more knowledgeable than males (75.6%), married patients were more knowledgeable than singles (77.1%), those with tertiary level of education showed the most good knowledge (80.9%), those residing in urban setting were more knowledgeable than those residing in rural setting (75.6%), those diagnosed with hypertension for 1-5 years had a better knowledge than those diagnosed for more than 10 years (76.1%). Educational status showed statistical significance at P<0.05)(Table 4).

Table 4: Association between knowledge of hypertension and patient characteristics

Variables	Poor knowledge n=10 (2.9%)	Fair knowledge n=81 (23.2%)	Good knowledge n=258 (73.9%)	Test statistic/ p value
Age (years)				
≤ 40	1 (2.6)	7 (18.4)	30 (78.9)	Fisher's exact;
41- 60	4 (2.6)	27 (17.9)	120 (79.5)	p= 0.142
>60	5 (3.1)	47 (29.4)	108 (67.5)	
Gender				
Male	7 (4.6)	36 (23.7)	109 (71.7)	Fisher's exact;
Female	3 (1.5)	45 (22.8)	149 (75.6)	p= 0.220
Marital status				
Single	0 (0.0)	5 (26.3)	14 (73.7)	Fisher's exact;
Married	4 (1.6)	52 (21.2)	189 (77.1)	p= 0.090
Divorced/separated	1 (10.0)	3 (30.0)	6 (60.0)	
Widowed	5 (6.7)	21 (28.0)	49 (65.3)	
Occupation				
Employed	3 (2.1)	32 (22.1)	110 (75.9)	Fisher's exact;
Unemployed	2 (3.8)	15 (28.3)	36 (67.9)	p= 0.768
Retired	5 (3.3)	34 (22.5)	112 (74.2)	
Household income (₦)				
≤50,000	8 (4.5)	47 (26.7)	121 (68.8)	Fisher's exact;
51 – 100,000	2 (1.9)	23 (22.1)	79 (76.0)	p= 0.234

101 – 150,000	0 (0.0)	4 (11.1)	32 (88.9)	
>150,000	0(0.0)	7 (21.2)	26 (78.8)	
Educational status				
No formal education	3 (30.0)	1 (10.0)	6 (60.0)	Fisher's exact; p<0.001*
Primary	3 (4.8)	22 (35.5)	37 (59.7)	
Secondary	2 (2.6)	22 (28.2)	54 (69.2)	
Tertiary	2 (1.0)	36 (18.1)	161 (80.9)	
Place of residence				
Rural	8 (7.0)	26 (22.8)	80 (70.2)	Fisher's exact; p= 0.007*
Urban	2 (0.9)	55 (23.5)	177 (75.6)	
Duration of morbidity (years)				
<1	2 (4.3)	13 (27.7)	32 (68.1)	Fisher's exact; p= 0.774
>1 to 5	2 (1.4)	31 (22.5)	105 (76.1)	
>5 to 10	2 (2.8)	17 (23.9)	52 (73.2)	
>10	4 (4.3)	20 (21.7)	68 (73.9)	

LEVEL OF COMPLIANCE TO ANTIHYPERTENSIVE THERAPY

The study provided insights into patients adherence to their blood pressure medication and lifestyle choices relating to managing hypertension. Majority of patients consistently remembered to take their blood pressure medications (57.3%) and made a conscious decision to always take their prescribed medications while ensuring that their next appointment is scheduled before leaving (63.3%,82.8%). Majority of the patients did not skip their medication for 1-3 days before their next clinic visit, and did not miss their medications when they felt better (70.5%, 57.3%). Many avoided eating fast food and food that contains salt (60.2%,57.9%) (Table5).

Table 5: Level of compliance to antihypertensive therapy (Hill-Bone Compliance to High Blood Pressure Therapy Scale)

	Never n (%)	**Sometimes n (%)**	**Most times n (%)**	**Always n (%)**
I forget to take my HBP medicine	200 (57.3)	134 (38.4)	15 (4.3)	0 (0)
I decide not to take my HBP medicine	221 (63.3)	120 (34.4)	7 (2.0)	1 (0.3)
I eat salty food	202 (57.9)	122 (35.0)	16 (4.6)	9 (2.6)
I shake salt on my food before I eat it	307 (88.0)	30 (8.6)	7 (2.0)	5 (1.4)
I eat extra salty foods such as pickles and salty grounded red pepper	302 (86.5)	43 (12.3)	3 (0.9)	1 (0.3)
I eat fast food (fat cook, chips, burgers)	210 (60.2)	130 (37.2)	3 (0.9)	6 (1.7)
I get the next appointment before I leave the clinic*	13 (3.7)	30 (8.6)	17 (4.9)	289 (82.8)
I miss scheduled appointments	190 (54.4)	131 (37.5)	11 (3.2)	17 (4.9)
I leave the dispensary without obtaining my prescribed pills. (Due to long line, closure of clinic, forgot)	179 (51.3)	109 (31.2)	24 (6.9)	37 (10.6)
I run out of my blood pressure pills	195 (55.9)	141 (40.4)	12 (3.4)	1 (0.3)
I skip my blood pressure medicine 1–3 days before I go to the clinic	246 (70.5)	92 (26.4)	9 (2.6)	2 (0.6)
I miss taking my blood pressure pills when you feel better	200 (57.3)	120 (34.4)	24 (6.9)	5 (1.4)

I miss taking my blood pressure pills when I feel sick	315 (90.3)	31 (8.9)	2 (0.6)	1 (0.3)
I take someone else's blood pressure pills	325 (93.1)	21 (6.0)	3 (0.9)	0 (0)
I miss taking my blood pressure pills when I care less	266 (76.2)	80 (22.9)	2 (0.6)	1 (0.3)

DOMAINS OF THE HILL-BONE COMPLIANCE TO HIGH BLOOD PRESSURE THERAPY SCALE

The study assessed various domains related to managing hypertension, including medication adherence, diet, and appointment keeping. Our findings revealed that the mean total score for medication adherence domain is 12.4 and standard deviation is 2.99. The mean total score for Diet domain is 5.3 and standard deviation is 1.43. The mean total score for Appointment keeping domain is 2.9 and standard deviation is 1.12 (Table 6).

Table 6: Domains of the Hill-Bone Compliance to High Blood Pressure Therapy Scale

	Number of items	Minimum score	Maximum score	Mean of total score	Standard deviation
Medication adherence	9	9	26	12.4	2.99
Diet	4	4	16	5.3	1.43
Appointment keeping	2	2	8	2.9	1.12
Total score	15	15	50	20.6	5.54

ASSOCIATION BETWEEN LEVEL OF COMPLIANCE TO ANTIHYPERTENSIVE THERAPY AND MEDICAL HISTORY AND KNOWLEDGE OF HYPERTENSION

The study revealed that knowledge of hypertension had a significant impact on level of compliance (the lesser the knowledge of hypertension, the lesser the compliance and vice versa) (Table 7).

Table 7: Association between level of compliance to antihypertensive therapy and medical history and knowledge of hypertension

Variables	Means ± Standard deviation	Test statistic (ANOVA)	P value
Duration of morbidity (years)			
<1	23.85 ± 4.78	1.752	0.156
>1 to 5	22.58 ± 3.74		
>5 to 10	22.51 ± 3.69		
>10	23.25 ± 3.69		
Co-morbidities			
No	22.87 ± 3.88	0.042	0.838
Yes	22.95 ± 3.90		
Knowledge of Hypertension			
Poor	30.40 ± 5.15	25.795	<0.001*
Fair	23.67 ± 4.25		
Good	22.38 ± 3.35		

*Strong evidence of difference between categories.

ASSOCIATION BETWEEN MEDICATION ADHERENCE DOMAIN OF THE HILL-BONE COMPLIANCE TO BLOOD PRESSURE THERAPY SCALE AND DIFFERENT MEDICATIONS TAKEN BY RESPONDENTS

The study revealed that, for compliance, patients taking Valsartan were the least compliant with their medications (Table 8).

Table 8: Association between medication adherence domain of the Hill-Bone Compliance to High Blood Pressure Therapy Scale and different medications taken by respondents

	Means ± Standard deviation	Test statistic (ANOVA)	P value
Lisinopril			
Yes	12.50 ± 3.12	0.704	0.402
No	12.22 ± 2.82		
Valsartan			
Yes	12.27 ± 2.94	6.587	0.011*
No	13.69 ± 3.39		
Bisoprolol			
Yes	12.41 ± 3.13	0.743	0.477
No	12.33 ± 2.59		
Clopidogrel			
Yes	12.29 ± 3.00	1.527	0.217
No	12.77 ± 2.99		
Atorvastatin			
Yes	12.39 ± 2.99	0.070	0.792
No	12.60 ± 3.25		
Others/I don't know			
Yes	11.93 ± 2.56	0.984	0.275
No	12.50 ± 3.09		

*Reasonable evidence of difference between categories.

REPORTED BARRIERS TO ADHERENCE TO ANTIHYPERTENSIVE THERAPY

Majority of the patients reported that the cost of their medications was a significant barrier to adherence (61.9%) (Table 9).

Table 9: Reported barriers to adherence to antihypertensive therapy

	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)	Median (Interquartile range)
I am unable to do exercise	34 (9.7)	62 (17.8)	19 (5.4)	175 (50.1)	59 (16.9)	4.0 (2.0 – 4.0)
I like fast and fried food	3 (3 (0.9)	54 (15.5)	44 (12.6)	153 (43.8)	95 (27.2)	4.0 (3.0 – 5.0)
I like salty foods (I cannot keep myself away from salty foods)	1 (0.3)	34 (9.7)	18 (5.2)	158 (45.3)	138 (39.5)	4.0 (4.0 – 5.0)
In general, I do not like medication	16 (4.6)	92 (26.4)	55 (15.8)	128 (36.7)	58 (16.6)	4.0 (2.0 – 4.0)
My medication is too expensive	62 (17.8)	154 (44.1)	28 (8.0)	79 (22.6)	25 (7.2)	2.0 (2.0 – 4.0)
I have to take too many medications every day	31 (8.9)	114 (32.7)	18 (5.2)	136 (39.0)	50 (14.3)	4.0 (2.0 – 4.0)
My medication is not available	10 (2.9)	42 (12.0)	13 (3.7)	192 (55.0)	92 (26.4)	4.0 (4.0 – 5.0)

I experience side effects from medication	8 (2.3)	71 (20.3)	18 (5.2)	135 (38.7)	115 (33.0)	4.0 (3.0 – 5.0)
I have no time for regular exercise in my life	23 (6.6)	44 (12.6)	21 (6.0)	206 (59.0)	54 (15.5)	4.0 (3.0 – 4.0)
Lack of motivation as there is no cure	17 (4.9)	34 (9.7)	37 (10.6)	184 (52.7)	77 (22.1)	4.0 (3.0 – 4.0)
I am not interested in doing exercise	22 (6.3)	28 (8.0)	18 (5.2)	205 (58.7)	76 (21.8)	4.0 (4.0 - 4.0)
I find it difficult to follow my treatment regime	1 (0.3)	23 (6.6)	13 (3.7)	159 (45.6)	153 (43.8)	4.0 (4.0 – 5.0)
I forget to take my medication	3 (0.9)	88 (25.2)	20 (5.7)	99 (28.4)	139 (39.8)	4.0 (2.0 – 5.0)
I do not want to take my medication	5 (1.4)	41 (11.7)	22 (6.3)	168 (48.1)	113 (32.4)	4.0 (4.0 - 5.0)
I am not able to go to the clinic to get my medication	0 (0)	18 (5.2)	11 (3.2)	191 (54.7)	129 (37.0)	4.0 (4.0 – 5.0)
I am not interested in stopping smoking	3 (0.9)	3 (0.9)	12 (3.4)	75 (21.5)	256 (73.4)	5.0 (4.0 – 5.0)
I would like to stop smoking, but find it difficult	3 (0.9)	2 (0.6)	12 (3.4)	83 (23.8)	249 (71.3)	5.0 (4.0 – 5.0)

DISCUSSION

This study was conducted to determine patients' knowledge of hypertension and its management, level of compliance and barriers to the use of antihypertensive medications. The findings from this study provide valuable insights into patient behaviors, their understanding of hypertension, and the barriers they may face in managing their condition effectively. The results from different domains- Knowledge, medication adherence, lifestyle practices, and barriers-highlight critical areas for intervention and improvement in hypertension management.

Our findings revealed that age, gender, marital status, educational background, and place of residence significantly impact patients' knowledge of hypertension. Specifically, patients aged 41-60 years demonstrated the most knowledge, while older patients (over 60 years) exhibited poorer knowledge. This could reflect the cumulative effects of health education over time, with younger individuals possibly being more exposed to modern health campaigns or more proactive in seeking health information. Females were shown to have a higher level of knowledge than males, which may be due to greater health-seeking behaviors in women or higher levels of healthcare engagement. Married individuals were generally more knowledgeable than widowed patients, likely due to the social support and shared health information in family units, while widowed patients had the least knowledge, possibly due to limited access to health-related conversations or resources. Educational status was another key factor, with patients who had tertiary education demonstrating the best knowledge of hypertension. Additionally, patients residing in urban areas had better knowledge compared to those in rural areas, which could be attributed to easier access to healthcare facilities and health information in urban settings. This is similar to a study done in Asia, which revealed that older patients, male sex, lower educational status, and unemployed had poor knowledge of hypertension and its management (17).

The study elucidated the relationship between the knowledge of hypertension and treatment compliance in the management of hypertension. The study shows that the more knowledgeable patients are about hypertension, the higher their compliance with prescribed treatments, including medication adherence, dietary recommendations, and appointment keeping. This finding aligns with a study done by Beata et al that suggests that patients' knowledge of hypertension is a significant independent determinant of good

adherence (18). Our findings showed 73.9% of patients had good knowledge, 23.2% of patients had fair knowledge, and 2.9% of patients had poor knowledge. The proportion of people with good knowledge about hypertension in our study was higher than that of a study done in Cameroon which showed only 14% with adequate knowledge. The proportion of patients with poor knowledge in our study was lower as compared to the Cameroonian study, which showed 32.6% with poor knowledge (19). Studies have shown that knowledge about hypertension varies across different populations. A study by Ghembaza et al. found that many hypertensive patients had limited knowledge about the causes and consequences of high blood pressure. While some were aware of the risks associated with hypertension, many did not fully comprehend its chronic nature or the need for long-term medication use (8). This knowledge gap can lead to misconceptions, such as the belief that hypertension can be cured or that medication is unnecessary once symptoms are controlled. Another study by Magadza et al found that increased patient education on hypertension led to improved adherence rates. They emphasized that when patients understood the significance of controlling blood pressure and the potential risks of non-adherence, they were more likely to comply with prescribed treatment (9). Another study by Ozoemana et al.(2019) observed that when patients received regular health education on the importance of adhering to antihypertensive medications, their compliance significantly improved (10).

The study highlighted financial constraint as a major barrier to medication compliance. 61.9% of patients reported that their medications were too expensive. This highlights the financial burden of managing hypertension, particularly for individuals without adequate insurance coverage. When medications are costly, patients may skip doses, reduce the frequency of their intake, or stop treatment altogether. This is similar to a study done in Ekiti state, which highlighted that medication adherence was suboptimal and negatively associated with cost of drugs (14).

The study also revealed that dietary practices play a significant role in hypertension management. The data shows that a majority of respondents reported avoiding salty foods, fast food, and excessive salt in their meals, which aligns with the recommended lifestyle changes for managing hypertension. These practices demonstrate that many patients are committed to making dietary changes to improve their health. The fact that 57.9% of patients do not eat salty food and 86.5% do not consume extra salty foods suggests that there is a general awareness about the relationship between salt intake and hypertension. Excessive salt can elevate blood pressure, and the avoidance of salty foods is one of the most effective lifestyle changes for managing the condition(20).

Another noteworthy finding is the level of appointment adherence. While a significant proportion of respondents (82.8%) schedule their next appointment before leaving the clinic, 54.4% never miss scheduled appointments. This indicates that many patients are proactive in seeking follow-up care, but there is still a substantial proportion of patients who may struggle with keeping their medical appointments. This is in contrast to a study done in Pakistan which highlighted alarmingly low attendance at follow up visits among patients with hypertension (21).

The proportion of patients that stopped taking their antihypertensives when they felt better in the University of Uyo teaching hospital was 42.7%. This is higher than the proportion of patients who stopped taking their medications when they felt better, found in a study in Mumbai (22). The least drug compliance was amongst patients placed on Valsartan and the highest drug compliance was found in patients placed on Bisoprolol. This is contradictory to a study which showed the highest drug compliance with angiotensin receptor blockers (23). 61.89% of patients agreed that their

medications were too expensive and were a barrier to proper medication adherence. This was in contrast to a study in Lagos which revealed 23.8% of patients agreed to their medications been expensive, citing financial constraints as a reason for non-compliance (24).

LIMITATIONS

Due to the small sample size, findings from this study may not be generalizable or applicable to hypertensive patients across Nigeria.

CONCLUSION

The findings from this study revealed a good awareness and knowledge of hypertension and its management, which significantly impacted on their Level of compliance to antihypertensives. The findings showed that Female patients were more knowledgeable than males; educated patients more than the uneducated and patients residing in urban areas more than those in rural areas. Married patients showed more knowledge than single patients, indicating the relationship between a good support system and compliance to antihypertensive medications. Patients were more compliant on beta blockers than other classes of antihypertensives and more than half of patients admitted to high cost of drugs as a major barrier to drug adherence. Majority of the patients stopped the medications when they felt better. There is therefore a need to address knowledge deficits and financial constraints that could potentially affect compliance. It is of great need that Healthcare professionals pay more attention to patient counselling and lifestyle modification promotion during clinic sessions. More prevention awareness campaigns should be carried out in the rural areas to improve compliance. Patients should be made aware of the available health insurance policies and encouraged to subscribe to an insurance plan to reduce the need for out-of-pocket spending on medications. Physicians should stress the risks involved in stopping medications due to relief of symptoms and the fact that hypertension therapy is for life. There is a need to encourage good social support systems as the study showed an increase in knowledge amongst married people than singles or widowed. A better knowledge of hypertension also positively influenced compliance to medications.

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Nil

CONFLICTS OF INTEREST

There are no conflicts of interest to declare.

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