MEDICATION ADHERENCE AND BLOOD PRESSURE CONTROL AMONG HYPERTENSIVE PATIENTS IN A NIGERIAN TERTIARY HOSPITAL: A CROSS-SECTIONAL STUDY

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Abstract

Background: Despite the availability of potent antihypertensive medications blood pressure control remains low worldwide. Poor blood pressure control is known to contribute significantly to the morbidity and mortality among hypertensive patients with developing countries disproportionately affected. There are limited studies locally on relationship between medication adherence and blood pressure control.
Aim: To investigate the relationship between medication adherence and blood pressure control among hypertensive patients attending Family Medicine clinic of UNIOSUN Teaching Hospital, Osogbo, Osun State, Nigeria.
Methods: A cross-sectional hospital-based study was conducted. Systematic sampling method was used to recruit 300 known adult hypertensive patients from August to November, 2021. Data was collected using a pre-tested interviewer-administered questionnaire and medication adherence was measured using Morisky 8-Item Medication Adherence Questionnaire. Data was analyzed using descriptive and inferential statistics with p-value < 0.05 taken to be statistically significant.
Results: This study recorded poor medication adherence among the study participants with 51.3% and 48.7% medium and low medication adherence respectively. Blood pressure control rate (46.7%) was also low. There is a directly proportional relationship between medication adherence and blood pressure control among the participants which was statistically (p= 0.001).
Conclusions: Hypertensive patients adhered poorly to antihypertensive medication and the blood pressure control among them was poor.

Keywords: Medication adherence, blood pressure control, hypertensive patients

Introduction

Hypertension is the most common preventable cause of cardiovascular disease worldwide.[1]

Prevalence of hypertension varies across regions and low-income and middle-income countries are disproportionately affected.[2] The WHO Africa region has the highest burden of hypertension with a prevalence of 27%, while the WHO region of the Americas has the lowest burden with a prevalence of 18%.[2] Hypertension is also the most frequently reported diagnosis in otherwise healthy individuals on routine visits to health care facilities since it is usually not accompanied by any symptoms.[3]

Medication adherence is "the extent to which the medication-taking behavior of a patient corresponds with agreed recommendations /prescriptions" including time, dosing and interval of medication intake.[4] The role of medication adherence in maintaining blood pressure control cannot be overemphasized and according to former US Surgeon General C. Everett Coop "Drugs don't work in patients who don't take them."[5] Having to take many drugs daily is a complex issue in patients with chronic diseases and particularly in hypertensive patients since patient may not manifest any symptoms. Nonadherence to medication, is a growing global concern militating against blood pressure control in the management of hypertension and, is associated with adverse outcome.[6] Many studies have suggested that a high level of adherence to antihypertensive drug treatment is related to better blood pressure control and a reduced risk of cardiovascular disease.[7,8] Nonadherence was responsible for nearly three-quarters of the hypertensive patients that fail to achieve optimal blood pressure control.[8] Therefore adherence to antihypertensive medications can be regarded as the cornerstone for achieving hypertension control.

Studies conducted in different countries all over the world reported adherence rates ranging from 15 to 88%.[9] A cross-sectional study carried out in Saudi Arabia using Morisky medication adherence scale documented a low medication adherence as only 42.2% of the participants were adherent to antihypertensive medications.[10] Blood pressure control was also found to be worse in those with poor medication adherence.[11] Another study carried out in Central Ethiopia revealed that, 32.3% of the participants demonstrated low adherence, while 31.7% demonstrated medium adherence, and 36.0% demonstrated high adherence.[12]

A Nigerian study conducted among hypertensive patients attending outpatient clinic in Lagos University Teaching Hospital, Nigeria, discovered that majority (89.2%) of the respondents in the study had 'moderate' adherence to antihypertensive medication while only 1.0% of the respondents had 'high' adherence and the rest (9.8%) had low adherence to hypertensive medication.[13] In another Nigerian study using the 8-item Morisky medication adherence scale, high adherence was found in 4.1% of the participants while 68.9% and 27% had moderate and low adherence, respectively.[14] The discrepancy observed in adherence rate is potentially due to the differences in population characteristics, medication adherence assessment tools employed, and healthcare systems.

Control of blood pressure is still poor in our setting according to a Nigerian study carried out in Dutse.[15] The study found out that less than a third (27.6%) of the study participants had their blood pressure controlled at <140/90mmHg.[15] A similar result was reported in another study carried out in Cameroon, which also revealed a low blood pressure control as only 36.8% of patients had their mean blood pressure controlled.[16] Despite the increase in awareness of hypertension in Nigeria, its prevalence has substantially increased over the last two decades however control rates remain low.[17] On the other hand, developed countries have shown improved control of hypertension and has led to a considerable reduction in overall morbidity and mortality associated with uncontrolled hypertension over the last five decades.[18]

Adherence to antihypertensive medications has been recognized as a key factor in successful management of hypertension as well as adoption of healthy lifestyle.[19] Also majority of diagnosed hypertensive patients do not have their blood pressure under control despite availability of potent antihypertensive medications.[20] Factors identified to be responsible for poor blood pressure control in hypertension are heterogeneous and include poor adherence to antihypertensive medications and lifestyle changes, poor compliance with scheduled follow-up visits and suboptimal pharmacotherapy.[21] Adisa et al in a cross-sectional study reported that reasons for non-adherence to prescribed medications were forgetfulness, dose omission, side effects, non-affordability of medication costs, dislike for medication, intentional decision to take medicine when desired, preference of herbal medicine to conventional drugs and too many drugs to take.[22] Another study carried out at Federal Medical centre, Umuahia recorded a low medication adherence rate (42.9%) to antihypertensive medication as well as low blood pressure control rate (35.0%) among the study participants.[23] This study found a significant relationship between medication adherence and blood pressure control.[23]

Methods

Study design and setting

A hospital-based cross-sectional study was conducted from August to November, 2021. The study was carried out at the Family Medicine Clinic of UNIOSUN Teaching Hospital, Osogbo, Osun, State. The hospital is located in the southwest geopolitical zone of Nigeria and provides care for people of all age groups Osogbo, surrounding towns and villages of Osun state, Ekiti, Oyo, Kwara, Ogun and Ondo states. The Family Medicine clinic renders out-patient medical services irrespective of their sex and disease entities. The clinic is managed under the supervision of Family Physicians.

Inclusion criteria

All hypertensive patients aged 18 years and above who have been diagnosed with hypertension and were on antihypertensive treatment for at least 6 months before the study period and were on follow-up from August to November, 2021 were included in the study.

Exclusion criteria

Non-consenting patients with hypertension and those unable to communicate due to mental or physical illness were excluded.

Sample size and sampling technique

Single population proportion formula was used to calculate the minimum sample size for the study at 95% confidence interval and the desirable% margin of error was set at 5% while 75.1 % medication adherence rate among hypertensive patients attending the Debre Tabor General Hospital, northwest Ethiopia was utilized.[24] The calculated sample size was rounded up to 300.

Systematic sampling technique was used to recruit subjects for this study within a period of three months. Sampling interval of 3 was arrived at by dividing the sapling frame (900) by the calculated sample size (300). Thus every third patient was recruited into the study after taking informed consent. Each study participant was interviewed with semi-structured questionnaire until the total calculated sample size of 300 was obtained.

Data collection tool

A pre-tested interviewer-administered semi-structured questionnaire was used to collect data from the respondents on socio-demographic data. Mercury sphygmomanometers (An Accosson brand), and Littmann stethoscopes were used to measure the blood pressure of respondents. Morisky 8-Item Medication Adherence Questionnaire was used to assess for adherence to antihypertensive medication. Each question on the Scale has a yes or no response. Each item was scored 1 for correct response (yes) and 0 for incorrect response (no). The total score on the Scale was 8 while, the lowest score was 0. Scores greater than 2 was regarded as low adherence, scores of 1 or 2 was regarded as medium adherence while score of 0 was regarded high adherence.

Operational definition

A controlled office blood pressure was regarded as an average clinic blood pressure of less than 140/90mmHg.[25]

Data analysis

All data was checked, cleaned and fed into a personal computer and analyzed using the Statistical Package for Social Sciences (SPSS 25.0) for windows software version. Descriptive and inferential analysis were done with results presented using frequency tables and Charts with Chi-square used to evaluate strength of association for bivariate analysis with p value of < 0.05 taken as statistically significant.

Results

A total of 300 known hypertensives completed the study and were included in analysis.

Table 1 shows the Socio-demographic characteristics of respondents. Respondents aged less than 40 years constitutes 6% of the respondents while the rest of the respondents were aged 40 years and above, 62.7% were females, 85.3% were Yoruba, 64.3% had tertiary education, 81.3% were married with 79.3% in monogamous relationships, 52.7% were civil servants, 68.3% were Christians, while 91.7% earned more than 30,000 Naira/month.

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency (N)	Percentage (%)
Age Group		
< 40 years	18	6.0
40-50 years	105	35.0
> 50 and older	177	59.0
Gender		
Male	112	37.3
Female	188	62.7
Tribe		
Yoruba	256	85.3
Others	44	14.7
Educational		
Status	107	35.7
Secondary and	193	64.3
less		
Tertiary		
Marital Status		
Single	26	8.7
Married	244	81.3
Divorced	6	2.0
Separate	5	1.7
Widowed	19	6.3
Marriage		
pattern	238	79.3
Monogamous	62	20.7
Polygamous		
Occupation		
Civil servant	158	52.7
Artisan	17	5.7
Trader	76	25.3
Unemployed	49	16.3
Religion		
Christian	205	68.3
Islam	93	31.0
Traditional	2	0.7
Income		
≤30,000	25	8.3
>30,000	275	91.7

Figure 1 illustrates medication adherence among the study respondents. The figure shows that just above half (51.3%) of the study respondents had medium adherence to medication while just below half (48.7%) of the study respondents had low medication adherence.

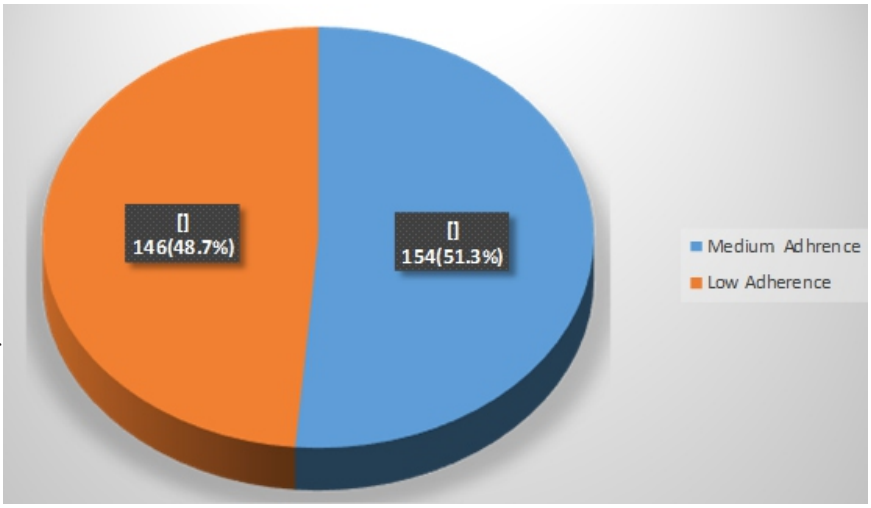

Figure 1: Pie chart showing medication adherence among the study respondents, N=300

Figure 2 illustrates blood pressure control among respondents. The figure shows that just less than half (46.7%) of the respondents had their blood pressure controlled while the blood pressure of just above half (53.3%) of the respondents was not controlled.

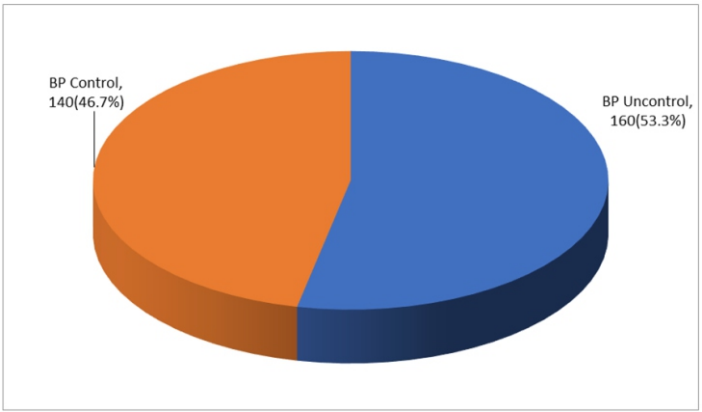

Figure 2: Pie chart showing blood pressure control among the study respondents, N=300

Table 2 illustrates the association between medication adherence aAnd blood pressure control. It reveals that there is a statistically significant relationship between medication adherence and blood pressure control with a p-value of 0.001.

Table 2: Association between medication adherence and blood pressure control

Variable	BP controlled		Total(%)	X^2 value	p-value
	Control	Not control			
Adherence					
Medium	91(59.1)	63(40.9)	154(100)	19.626	0.001*
Low	49(33.6)	97(66.4)	146(100)		

*p =statistically significant at <0.05

Table 3 illustrate Logistic regression of blood pressure control on socio-demographic characteristics. It shows that respondents that are in polygamous type of marriage are about three times less likely to have controlled blood pressure compared to those in monogamous family type.

Variables	Odds-ratio	p-value	95% Confidence Interval	
			Lower	Upper
Age				
< 40 years	1			
40-50 years	0.736	0.589	0.242	2.239
> 50 years	1.340	0.319	0.754	2.380
Gender				
Male	1			
Female	1.573	0.134	0.869	2.846
Ethnicity				
Yoruba	1			
Hausa	1.133	0.852	0.307	4.181
Igbo	3.827	0.263	0.366	40.026
Others	1.842	0.479	0.340	9.983
Marital Status				
Single	1			
Married	0.564	0.449	0.129	2.477
Divorced	1.265	0.684	0.408	3.920
Separated	1.082	0.941	0.134	8.729
Widowed	0.260	0.248	0.026	2.562
Marriage Pattern				
Monogamous	1			
Polygamous	0.371	0.005*	0.185	0.741
Educational Level				
No formal education	1			
Primary	0.959	0.958	0.199	4.632
Secondary	0.580	0.475	0.131	2.581
Tertiary	0.288	0.104	0.064	1.291
Occupation				
Civil servant	1			
Trader	0.772	0.663	0.241	2.471
Unemployed	0.983	0.978	0.288	3.361
Artisan	0.667	0.535	0.185	2.397
Income				
< 30,000	1			
30,000- 50,000	1.214	0.789	0.293	5.024
> 50,000	0.963	0.969	0.257	3.656
None	0.730	0.813	0.251	2.633

* Statistically significant.

Discussion

This study documented low and medium adherence to antihypertensive medication among the study respondents. Just below half (48.7%) of the study respondents had low medication adherence to antihypertensive medications while just above half (51.3%) of the study respondents had medium medication adherence to antihypertensive medications. Globally, studies conducted in different countries reported medication adherence rates ranging from 15% to 88% to antihypertensive medications.[9] A similar poor medication adherence among hypertensive patients was reported in an analytical cross-sectional study by Akintunde and Akintunde in Nigeria.[26] Result from a similar hospital based cross-sectional study in Saudi Arabia also found that only 42% of the study participants were adherent to antihypertensive medications.[10] This is also similar to what was obtained in another similar study in Malaysia where low adherence to antihypertensive medication was observed in 46.6% of the study participants.[27] Another similar hospital based study conducted among 282 hypertensive patients on follow up at Jimma University Specialized Hospital, southwest Ethiopia, revealed that 61.8% of the study participants were adherent to antihypertensive medication while 38.3% were not adherent to antihypertensive medications.[28] The study has similarities with this study in some areas such as being a hospital-based study and was conducted in outpatient clinic of a tertiary health care service. The study was also a cross-sectional study and Morisky medication adherence scale-8 (MMAS-8) was also employed.[28] MMAS-8 score of less than 6 was considered as non-adherent and MMAS-8 score of ≥ 6 was declared as adherence.[28] The reclassification of Morisky medication adherence scale from low, medium and high adherence to adherent and non-adherent as shown above could have been responsible for the slight difference in medication adherence observed here.

This study revealed that just below half 140(46.7%) of the study respondents had blood pressure control defined as average office blood pressure of less than 140/90mmHg. A similar study carried out in Cameroon also reported a slightly lower blood pressure control rate of 36.8%.[10,16] A retrospective study carried out at University of Benin Teaching Hospital, Nigeria, revealed that less than half (40.92%) of the treated hypertensive patients attained blood pressure control of less than 140/90mmHg.[29]Another Nigerian study also reported a low blood pressure control rate of 27.6% among hypertensive patients which translates to less than a third of the studied hypertensive patients achieving blood pressure control.[15] This is however different from reports of better blood pressure control rates from developed world with overall better outcome in terms of morbidity and mortality.[18]

This study found a statistically significant association between medication adherence and blood pressure control with a p-value of 0.001. This finding is supported by a similar finding from a study in Makkah, Saudi Arabia.[30] Similarly, another cross-sectional study conducted at Kinshasa hospital also reported an association between non-adherence to antihypertensive medication and blood pressure control.[31]

Limitations: Drawing of inferences from this study as regards causal-effect relationship may not be realistic due to cross-sectional nature of the study and also it may not be a true representation of the general population of hypertensive patients since it is hospital-based study. Self-reporting instruments used to collect data in this study is capable of introducing response and recall biases.

Conclusion: This study suggests that medication adherence to antihypertensives among hypertensive patients is low and that medication adherence helps in blood pressure

control. Clinicians should monitor hypertensive patients for medication adherence and more research on how medication adherence can be improved in hypertensive patients is needed.

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