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Research Article

Treatment Satisfaction and Medication Adherence Among Hypertensive Patients Seeking Care in Selected Hospitals in Ibadan, Nigeria

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Abstract

Poor adherence to hypertension treatment is a major health-related problem, and a significant risk factor for complications, disability and hypertension associated mortality. There is a paucity of evidence on the impact of treatment satisfaction on medication adherence among hypertensive patients in Nigeria. This study aimed to determine the association between treatment satisfaction and medication adherence among hypertensive patients in Ibadan, Nigeria. A descriptive cross-sectional study was conducted, wherein hypertensive patients were consecutively recruited from 5 hospitals in Ibadan, Nigeria. A pre-tested, interviewer-administered questionnaire was used to collect data. Medication adherence was assessed using the 8-item Morisky Medication Adherence Scale (MMAS-8), and treatment satisfaction using the 9-item Treatment Satisfaction Questionnaire for Medication (TSQM). Descriptive statistics were computed for all variables. Bivariate analysis was carried out using chi-square test, and multivariate analysis using binary logistic regression. Sensitivity analysis was conducted to adjust for unmeasured binary confounders. Statistical significance was set at $p < 0.05$ for a 2-tailed. A total of 342 respondents with the mean age of 59.6 ± 12.6 years participated in the study. The overall prevalence of medication adherence was 35.1% (MMAS-8 scores = 8). Treatment satisfaction (AOR=2.03, 95% CI: 1.21-3.43) was independently associated with medication adherence. Sensitivity analysis revealed that the observed association between treatment satisfaction and medication adherence was unlikely to be due to unmeasured confounding variables. Medication adherence was low, and treatment satisfaction independently increases medication adherence. Treatment satisfaction strategies should be part of any treatment intervention packages in this population.

Key Words: *Hypertension, Medication adherence, Hypertension care, Treatment satisfaction*

INTRODUCTION

Worldwide, cardiovascular disease accounts for about 17 million deaths every year, representing nearly one third of the total deaths (WHO, 2017). Of these, complications of hypertension account for 9.4 million deaths every annually (WHO, 2017), making hypertension a major global public health problem. The worldwide prevalence of hypertension in adults aged 25 and above was about 40% in 2008 (WHO, 2017). Globally, the number of hypertensive individuals rose from 600 million in 1980 to 1 billion in 2008 while the number of adults with hypertension has been projected to increase by 60% in 2025 (Kearney *et al*., 2005).

In Nigeria, with a prevalence rate of 22.7% (Adediran *et al*., 2013), hypertension remains the commonest non-communicable disease and cause of sudden natural death (Amakiri *et al*., 1997). As a result of poor socio-economic background among hypertensive patients, poor adherence to hypertension treatment is very prevalent. Generally, sticking to the treatment instructions for a long-term illness poses a great challenge to the patients. Meanwhile, medication adherence is a cost saving measure since it decreases the incidence of complications and the need for additional medications (WHO, 2003).

Although lifestyle modifications (e.g. weight reduction, diet restriction, physical activity, smoking cessation) are a potent approach in controlling hypertension, drug therapy is the mainstay of hypertension control (WHO, 2003). The efficacy of antihypertensive drugs is compromised if they are not appropriately taken or if patients' behavior in taking medication does not corresponds with agreed recommendations from a health care provider (WHO, 2003). Patients' assessment of medication's effectiveness, convenience, side effects, and overall satisfaction has been reported to impact on medication adherence in multiple therapeutic areas (Albrecht and Hoogstraten, 1998; Atkinson *et al*., 2004; Barbosa *et al*., 2012; Delestras *et al*., 2013). However, evidence on the impact of treatment satisfaction on medication adherence among hypertensive patients in Nigeria is limited. Therefore, this study was aimed to investigate the association between patient satisfaction and medication adherence among hypertensive patients in Ibadan, Nigeria. Such information could inform policy and engender intervention.

MATERIALS AND METHODS

Study design, setting and population: The study was a descriptive cross-sectional study and was carried out among

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hypertensive out-patients of University College Hospital, Ring Road State Hospital, University of Ibadan Health Centre (Jaja Clinic), Elyon Specialist Clinic and Maternity and, Toun Memorial Specialist Hospital, Ibadan, Nigeria. University College Hospital is a tertiary hospital and a major referral hospital in Southwestern Nigeria. Ring Road State Hospital is the largest government-owned secondary hospital in Oyo State, Nigeria. Elyon Specialist Clinic and Maternity and Toun Memorial Specialist Hospital are private secondary health facilities in Ibadan.

Sampling technique, sample size determination and inclusion criteria: The study employed a consecutive sampling technique. The sample size was calculated using the prevalence of medication adherence (p = 30.3%) reported by Boima *et al*. (2015). For 0.05 probability of type I error and a precision rate of 5%, the minimum sample size computed for the present study was 342 patients, after adjusting for a 5% nonresponse rate.
Participants were adult (≥18 years) patients diagnosed with hypertension at least 3 months before recruitment into the study and undergoing treatment for hypertension with at least one antihypertensive medications.

Data collection: Data were collected using a pre-tested, interviewer-administered, structured questionnaire. The questionnaire contained items on respondents' socio-demographic characteristics, life style characteristics, clinical characteristics, treatment satisfaction, and medication adherence.

Assessment of treatment satisfaction: The Treatment Satisfaction Questionnaire for Medication (TSQM-9) (Atkinson *et al*., 2004; Atkinson *et al*., 2005; Bharmal *et al*., 2009) was adapted. The TSQM has four domains: effectiveness, side effects, convenience of use, and global satisfaction. Based on results of the pre-test, the 14-item scale was reduced to a 9-item scale. However, the multidimensional properties (4 domains) of the scale were retained: effectiveness, side effects, convenience, and global satisfaction. The adapted TSQM contained a negatively worded item (item 4) and its score was reversed. All item scores were summed (total composite score) and 75th percentile of the total composite score was used as the cut off value. Respondents were classified into high treatment satisfaction (≥ 75th percentile) and low treatment satisfaction groups (< 75th percentile).

Assessment of medication adherence: The Morisky Medication Adherence Scale (MMAS) (Morisky *et al*., 1986) is the most commonly used self-reported measure of medication adherence. The eight-item MMAS (MMAS-8) was used to assess medication adherence. The first seven items of the MMAS-8 have dichotomous response (Yes or No), and the last item is a 5-point Likert response. Individual item scores were summed and respondents with a score of 0 were classified as high adherence to medication, else poor adherence to medication.

Data management and statistical analysis: Data obtained were coded and entered in Statistical Package for Social Sciences (SPSS), version 17.0 (IBM, Chicago, USA) and analyzed in R, version 3.2.5 (R Core Team, Vienna, Austria).

The internal consistency reliability estimates of MMAS-8 and TSQM were assessed using the Cronbach's alpha and McDonald's omega total respectively. McDonald's omega is a more accurate measure of internal consistency reliability for multidimensional scales than Cronbach's alpha (Revelle *et al*., 2009). Descriptive statistics were computed for all variables. Bivariate analysis (chi-square test) was used to assess association of each of the independent variables with medication adherence. Multivariate adjustment was performed using multivariate binary logistic regression to control for measured confounders. The multivariate model included variables with $p < 0.2$ upon bivariate analysis (Hosmer *et al*., 2013). The goodness of fit of the multivariate model was assessed using Hosmer-Lemeshow test.

Ethical consideration: This study was approved by the Oyo State Ethical Review Committee. The respondents were fully informed about the research and their written consent to participate in the study was obtained. Participants were free to withdraw from the study at any point without any consequence
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Table 1

Medication adherence within Participants' Demographic Characteristics

Characteristic	Participants (%)	% Adhering to medication
Age (mean ± SD) - 59.6 ± 12.6 years		
≤ 49	80 (23.4)	30.0
50-69	176 (51.5)	36.9
≥ 70	86 (25.1)	36.0
Gender		
Male	140 (40.9)	35.0
Female	202 (59.1)	35.1
Marital status		
Never married	16 (4.7)	31.2
Married	272 (79.5)	38.2
Divorced	19 (5.6)	10.5
Widowed	35 (10.2)	25.7
Education		
No education	29 (8.5)	31.0
Primary	77 (22.5)	45.5
Higher	236 (69.0)	32.2
Religion		
Christianity	217 (63.5)	27.6
Islam	125 (36.6)	38.9
Monthly income (Naira)		
< 10,000	76 (23.1)	34.2
10,000-50,000	174 (50.9)	39.7
> 50,000	89 (26.0)	27.0

RESULTS

Respondents' characteristics and reliability of the instruments: A total of 342 respondents with the mean age of 59.6±12.6 years, and had had hypertension for 6.5±7.0 years. One-third (33.0%) of the respondents had at least one chronic disease besides hypertension (comorbidity). Most (60.2%) respondents were on 3 or more antihypertensive drugs (Table 1). The Cronbach's α of the MMAS-8 was 0.68, indicating moderate internal consistency reliability while the McDonald's omega total for the TSQM showed good reliability (0.82).

Prevalence of medication adherence: The overall prevalence of medication adherence among the respondents was 35.1% (Table 1). Table 1 further shows the prevalence of medication adherence by socio-demographic characteristics; compared to other age groups, prevalence of medication adherence was lowest (30.0%) among respondents aged 49 or less. Respondents who were employed had higher prevalence of medication adherence (38.9%) than those who were not employed (27.6%). Also, prevalence of medication adherence was higher among respondents without comorbidity (42.4%) than those with comorbidity (20.4%) (Table 2).

Table 2
Medication adherence within Participants' life styles and clinical characteristics

Characteristic	Participants (%)	% Adhering to medication
Smoking		
Yes	6 (1.7)	33.3
No	336 (98.3)	35.1
Alcohol use		
Yes	312 (91.2)	20.0
No	30 (8.8)	36.5
Social support		
Yes	170 (49.7)	30.0
No	172 (50.3)	40.1
Duration of hypertension	**6.5 ± 7.0**	
≤ 1	65 (19.0)	46.2
2-5	144 (42.1)	31.9
> 5	133 (38.9)	33.1
Comorbidities		
Yes	113 (33.0)	20.4
No	229 (67.0)	42.4
Hospital type		
Public	273 (79.8)	36.3
Private	69 (20.2)	30.4
Health insurance		
Yes	90 (26.3)	36.7
No	252 (73.7)	34.5
Antihypertensive therapy		
Monotherapy	37 (10.8)	32.4
Bitherapy	99 (29.0)	44.4
Multitherapy	206 (60.2)	31.1
No. of different medications	**3.4 ± 1.5**	
≤ 4	282 (82.5)	38.7
≥ 5	60 (17.5)	18.3
Treatment satisfaction score,	**35.1 ± 4.3**	
Low satisfaction	209 (61.1)	30.0
High satisfaction	133 (38.9)	48.4
Medication adherence	**6.2 ± 1.8**	
Yes	120 (35.1)	
No	222 (64.9)	

Association between treatment satisfaction and medication adherence: Proportion adhering to medication was significantly higher among patients with treatment satisfaction (61.7%) compared with those with no satisfaction (P=0.001). Employment (p = 0.037) and comorbidity (p < 0.001) were significantly associated with medication adherence. Marital status, employment, income, duration of hypertension, antihypertensive therapy, total number of antihypertensive medications, social support, and alcohol use were not associated with medication adherence (Table 3).

The adjusted multivariate logistic regression shows that respondents with high treatment satisfaction were about two times more likely than those with low satisfaction to adhere to medication (AOR=2.03, 95%CI:1.21-3.43). Also, respondents with comorbidity diseases were less likely than those without comorbidity to adhere to medication (AOR = 0.43, 95% CI = 0.23 – 0.80) (Table 4)

DISCUSSION

In the present study, we investigated association between patient satisfaction and medication adherence in hypertension. We found a low rate of medication adherence among hypertensive patients studied. Treatment satisfaction was positively associated with medication adherence among hypertensive patients undergoing treatment. Presence of at least an additional chronic illness was also independently associated with medication adherence in this study.

This finding on the prevalence rate of medication adherence is consistent with the range of medication adherence prevalence reported by previous authors in Nigeria and other countries in the Sub-Saharan Africa. Boima *et al*. (2015) reported an adherence prevalence of 33.3% among hypertensive patients in Ghana and Nigeria. Akintunde and Akintunde (2015) reported a prevalence of 36.8% among hypertensive patients in Nigeria. However, it is lower than the prevalence (50.7%) reported by Osamor and Owumi (2011) in Nigeria, and the prevalence (45.8%) reported by Lulebo *et al*. (2015) in Demographic Republic of Congo, and the prevalence (59.6%) reported by El Zubier (2000) in Eastern Sudan. This variation may be due to differences in study groups, methods of assessment of adherence, and drug regimens and complexities.

Treatment satisfaction emerged as an independent predictor of medication adherence. This is explainable as satisfaction is critical to adoption and adherence to therapy. Previous studies in Nigeria and other parts of the world have reported similar findings. For instance, Iloh and Amadi (2017) identified treatment satisfaction as a predictor of medication adherence among hypertensive patients in Nigeria. Also, Sa'ed *et al*. (2013) and Saarti *et al*. (2016) found a positive association between treatment satisfaction and medication adherence in studies among hypertensive patients from Palestine and Lebanon, respectively.

Comorbidity was negatively associated with medication adherence. Ambaw *et al*. (2012) reported a similar finding from Ethiopia. Comorbidity increases the number of prescribed medications, and this may increase the complexity of drug regimens. The WHO (2003) stated that socio-economic (age, gender, education, employment), lifestyle or behavioral (smoking, alcohol use) variables are associated with medication adherence. Of these variables, only employment was associated with medication adherence upon bivariate analysis in this study.

Table 3:
Bivariate analysis of factors associated with medication adherence

Characteristic		Medication Adherence		χ^2	P-value
		No, *n (%)*	Yes, *n (%)*		
Age group (years)	≤ 49	56 (70.0)	24 (30.0)		
	50-69	111 (63.1)	65 (36.9)	1.21	0.547
	≥ 70	55 (64.0)	31 (36.0)		
Gender	Male	91 (65.0)	49 (35.0)	< 0.01	0.977
	Female	131 (64.9)	71 (35.1)		
Marital status	Never married	11 (68.8)	5 (31.2)		
	Married	168 (61.8)	104 (38.2)	7.67	0.053
	Divorced	17 (89.5)	2 (10.5)		
	Widowed	26 (74.3)	9 (25.7)		
Education	No education	20 (69.0)	9 (31.0)	4.70	0.095
	Primary	42 (54.5)	35 (45.5)		
	Higher	160 (67.8)	76 (32.2)		
Employment	Unemployed	84 (72.4)	32 (27.6)	4.34	0.037
	Employed	138 (61.1)	88 (38.9)		
Monthly income (Naira)	< 10,000	52 (65.8)	27 (34.2)	4.20	0.122
	10,000-50,000	105 (60.3)	69 (39.7)		
	> 50,000	65 (73.0)	24 (27.0)		
Smoking	Yes	4 (66.7)	2 (33.3)	0.008	1.00*
	No	218 (64.9)	118 (35.1)		
Alcohol use	Yes	24 (80.0)	6 (20.0)	3.29	0.070
	No	198 (63.5)	114 (36.5)		
Duration of hypertension (years)	≤ 1	35 (53.8)	30 (46.2)	4.35	0.113
	2-5	98 (68.1)	46 (31.9)		
	> 5	89 (66.9)	44 (33.1)		
Comorbidity	Yes	90 (79.6)	23 (20.4)	16.09	< 0.001
	No	132 (57.6)	97 (42.4)		
Social support	Yes	119 (70.0)	51 (30.0)	3.84	0.050
	No	103 (59.9)	69 (40.1)		
Health facility	Public	174 (63.7)	99 (36.3)	0.82	0.365
	Private	48 (69.6)	21 (30.4)		
Health insurance	Yes	57 (63.3)	33 (36.7)	0.13	0.715
	No	165 (65.5)	87 (34.5)		
Antihypertensive therapy	Monotherapy	25 (67.6)	12 (32.4)	5.38	0.068
	Bitherapy	55 (55.6)	44 (44.4)		
	Multitherapy	142 (68.9)	64 (31.1)		
Total number of medications	≤ 4	173 (70.0)	109 (38.7)	8.97	0.003
	≥ 5	49 (81.7)	11 (18.3)		
Treatment satisfaction	Yes	49(22.1)	46(61.7)	10.27	0.001
	No	173(77.9)	74(38.3)		

- P value was from exact test

Since this study was cross-sectional, the temporal sequence of the observed association could not be established. Analytic epidemiological studies (e.g. cohort design) would be more suitable in establishing the temporal sequence. Also, this study utilized a self-reported measure (MMAS-8) to assess medication adherence. As such, this might overestimate adherence because of recall and social desirability biases. An objective measure, such as biological assay, might have demonstrated a lower level of medication adherence. Furthermore, the measure of treatment satisfaction was also self-reported, and this might suffer from recall and social desirability biases. Notwithstanding, the use of validated tools to assess medication adherence and treatment satisfaction constitute a strength of the present study. Also, the present study is one of the few studies relating treatment adherence to satisfaction in Nigeria.

In conclusion, poor adherence to medication is a public health problem with huge consequences. This study showed a low prevalence of medication adherence among hypertensive patients in Nigeria, and a positive association between treatment satisfaction and medication adherence. Efforts should be made to optimize drug regimens factoring in patient convenience, medication side-effect profile, cost of therapy and clinical effectiveness.

Table 4:
Binary logistic regression analysis of factors associated with medication adherence

	Factors	UOR	95% CI	AOR	95% CI
Treatment satisfaction	Yes	1.48	0.94-2.33	2.03	1.21-3.43*
	No	-	-	-	-
Marital status	Married	1.36	0.48-4.42	1.55	0.46-5.68
	Divorced	0.26	0.03-1.43	0.25	0.03-1.55
	Widowed	0.76	0.21-2.95	1.38	0.32-6.16
	Never married	-	-	-	-
Education	Higher	1.06	0.47-2.54	0.95	0.36-2.64
	Primary	1.85	0.76-4.76	1.81	0.67-5.10
	No formal education	-	-	-	-
Employment	Employed	1.67	1.04-2.75*	1.47	0.86-2.55
	Unemployed	-	-	-	-
Monthly income (Naira)	10,000-50,000	1.27	0.73-2.22	1.68	0.86-3.55
	> 50,000	0.71	0.37-1.37	1.38	0.59-3.27
	< 10,000	-	-	-	-
Alcohol use	Yes	0.43	0.16-1.03	0.72	0.23-2.01
	No	-	-	-	-
Duration of hypertension (years)	> 5	0.58	0.31-1.06	0.61	0.31-1.21
	2-5	0.55	0.30-1.00	0.40	0.20-0.78*
	≤ 1	-	-	-	-
Comorbidity	Yes	0.35	0.20-0.58†	0.43	0.23-0.80*
	No	-	-	-	-
Antihypertensive therapy	Multitherapy	0.94	0.45-2.04	0.72	0.30-1.73
	Bitherapy	1.67	0.76-3.78	1.12	0.46-2.81
	Monotherapy	-	-	-	-
Total number of medications	≥ 5	0.36	0.17-0.69*	0.64	0.28-1.40
	≤ 4	-	-	-	-
Social support	Yes	0.64	0.41-1.00	0.72	0.23-2.01
	No	-	-	-	-

* $p < 0.05$ † $p < 0.001$

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