Medication Adherence and Its Correlates in Hypertensive Patients

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ABSTRACT

Hypertension is the foremost risk factor responsible for cardiovascular morbidity and mortality. Adherence is critical to the success of hypertension therapy, however, a lack of adequate knowledge of the disease and its complications may constitute barrier to adherence behaviour.

We undertook this study to determine the extent of adherence with medications by respondents and to ascertain the reasons for non-adherence.

A prospective study of 450 hypertensive patients on medication who reported at the outpatient department of Central Hospital Sapele was carried out. A structured pretested questionnaire consisting of 36-items and comprising of sociodermographic characteristics, knowledge of hypertension and its management, level of adherence was administered to the patients and reasons for non-adherence sought.

The study revealed that the level of adherence to antihypertensive medication was 66.2 % and non-adherence rate was 32.7 %. Respondents that had highest level of adherence were those between the ages of 45-54years (27.7 %), while those with highest level of non-adherence were between the ages of 55-64years (29.3 %). The major reasons for non-adherence were forgetfulness by the respondents to take medications (56.4 %) and affordability of prescribed medication.

The prevalence of adherence among hypertensive patients in this study was relatively high; however, activities to sustain better level of adherence should be encouraged.

Key Words: Hypertension, adherence, medication, patient.

INTRODUCTION

Hypertension is the foremost risk factor responsible for cardiovascular morbidity and mortality [1]. The World Health Organization has estimated that about 62 % of cardiovascular and 49 % of ischaemic heart disease burden worldwide are attributable to poorly controlled hypertension [2]. High blood pressure is estimated to cause 7.1 million deaths annually accounting for 13 % of all deaths globally [2]. It is reported that hypertension is well controlled in less than 20 % of hypertensive patients in many countries [3]. Despite the use of current antihypertensive drugs in the management of hypertension, the burden of hypertension is still enormous in Africa [4]. World professional bodies on hypertension regularly review drug management pattern as new drug molecules and the need for adjuvant drug therapy are discovered in research. The need for the skillful and prudent administration of these drugs cannot be overemphasized, as this

will help to reduce the burden of the disease, and also offer the advantage of controlling related disorders.

Adherence is critical to the success of hypertension therapy, however, a lack of knowledge about the complications of the disease and the importance of adhering to the prescribed treatment, as well as a lack of motivation to make some lifestyle changes in terms of diet and physical exercise may constitute barriers to adherence behavior.

Non-adherence to prescribed medications and failure to adopt healthy lifestyle is associated with uncontrolled hypertension and the risk of developing complications [5].

As a result of this long term non-adherence to therapy, both the incidence and complications of the disease are simultaneously increased, thus the need to urgently orchestrate increased population sensitization to prescribed medication and lifestyle

modification regimens consistent with lowering blood pressure.

Medication adherence is a multidimensional phenomenon involving various personal and social factors which are not clearly understood [6]. It is therefore important that health care professionals understand what factors affect adherence in their own context in order to manage the disease effectively.

While studies [1] have been conducted universally on the subject, specific studies to evaluate factors associated with medication and lifestyle compliance behavior in Sapele are lacking. To the researcher's knowledge, no such study has been undertaken in Sapele.

The objectives of this study, therefore, were to determine the level of adherence with antihypertensive medications and ascertain the reasons for non-adherence amongst respondents.

METHODS
Setting
This study was undertaken at the outpatient department of Central Hospital Sapele, Nigeria. The hospital is a secondary health facility which offers comprehensive health care services to the people of Sapele and environs. Ethical/administrative approval was obtained from the management of the hospital and informed consent from the patients.

Sample
The sample comprised hypertensive patients visiting the outpatient department of the hospital at the time the study was undertaken. Patients that met the inclusion criteria were consecutively recruited until a purposive sample size was obtained. The inclusion criteria were patients 18years and above, with stage 1 hypertension (140-158/90-99mmHg) and stage 2 hypertension (greater than 160/100mmHg {7], currently or had previously been treated with at least one antihypertensive drugs. Those patients who were too ill to participate, patients with pre-hypertension who do not require therapy and patients who refuse to participate in the study.

Data Collection
A quantitative prospective survey of adult patients attending the medical outpatients department of Central Hospital Sapele over a period of four months was conducted. The required information was elicited using a pretested questionnaire. Patients' adherence with medication was measured using a validated 6-item instrument.

The questionnaire used for data collection was carefully developed and pretested by the researchers. It consisted of two sections (A and B). Section A comprising of 30-items and B comprising of 6-items.

Section A comprised patients' demographic data including age, gender, marital status, level of education. Section B comprised questions on patient's level of adherence with medication.

Prior to the interview, patients were assured of the confidentiality of the information provided and used strictly for the purpose of research. Therefore, the questionnaire was self-administered and for those who could not read, the questions were read to them by the interviewer.

DATA MANAGEMENT AND STATISTICAL ANALYSIS
The data collected was coded as per variables and entered in spss data sheet. Spss statistical software (spss for windows, version 16.0) was used to compute descriptive statistics.

Associations between socio-demographic variables and adherence were explored using the Chi-square test and the differences between obtained means were examined through the Analysis of Variance test. Logistic regression was used to explore the association between dependent variable (adherence and non-adherence) and various independent variables.

RESULTS
The socio-demographic characteristics of the respondents are shown in table 1. Of the 450 patients interviewed, 49.6 % were males while 53.1 % were females. More than half of the respondents surveyed were above 55years (50.2), the other respondents between eighteen and fifty four years. The majority of the respondents were married (55.6 %) and others were single at the time of this study.

The educational status of respondents used in this study is given in table 2. Less than half of the respondents had tertiary education as the highest level of education attained and only 7 % of the respondents had no educational qualification.

Majority of the respondents were self-employed (36.0 %), followed by government employees (33.8 %), unemployed (20.9 %) and 9.4 % were retired.

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Table 1: Socio-demographic characteristics of respondents

| Characteristics	Frequency	Percent
Age	22	4.9
18-24YRS		
25-34 YRS	42	9.3
35-44 YRS	40	8.9
45-54 YRS	120	26.7
55YRS & ABOVE	226	50.2
Sex		
MALE	211	46.9
FEMALE	239	53.1
Marital status		
SINGLE	200	44.5
MARRIED	250	55.6
Educational status	32	7.1
NONE		
PRIMARY	86	19.1
SECONDARY	149	33.1
TERTIARY	183	40.7
Occupation		
SELF-EMPLOYED	162	36.0
EMPLOYED	152	33.8
UNEMPLOYED	94	20.9
RETIRED	42	9.4
TOTAL	450	100.0
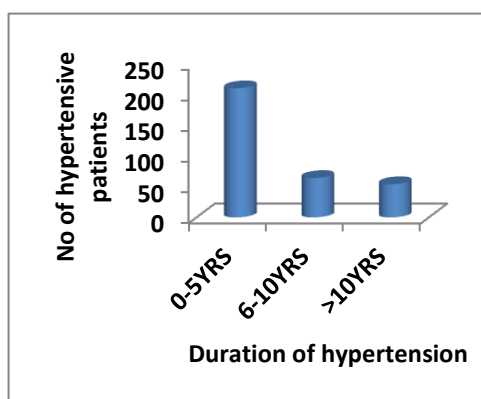
Fig 2: The duration of hypertension among the patients.

DURATION OF HYPERTENSION OF RESPONDENTS

Most of the respondents were diagnosed less than five years ago, while 14.2 % were diagnosed more than five years ago and the others more than ten years ago.

Table 2: Number of different kinds of medicine respondents were taking

NUMBER OF DRUGS	Frequency	Percent
ONE	92	20.4
TWO	128	28.4
THREE	110	24.4
FOUR	48	10.7
MORE THAN FOUR	52	11.6
DON'T KNOW	20	4.4
TOTAL	450	100.0

NUMBER OF MEDICINES WHICH THE RESPONDENTS WERE TAKING FOR HYPERTENSION

A good number of the respondents took two different kinds of medicines (28.4 %), followed by 24.4 % who took three kinds, (20.4 %) took one kind of medicine, (11.6 %) took more than four kinds of medicines, while (10.7) took four kinds of medicine. Interestingly, (4.4 %) did not know the number of drugs they were taking.

Table 3: Self reported level of adherence to medication

Level Of Adherence	Frequency	Percent
Non-Adherence	147	32.7
Adherence	298	66.2
No response	5	1.1
Total	450	100.0

LEVEL OF ADHERENCE

More than half of the respondents were adherent to their blood pressure medications (66.2 %), while (32.7 %) of the respondents were not adherent to their blood pressure medication. Interestingly, (1.1 %) did not respond.

REASONS FOR NON-ADHERENCE

Fig 2 shows that the major factor why respondents did not adhere to their medication is forgetfulness (56.4 %), while only a small percent of respondents miss their medication as a result of not understanding their medicine regimen (1.3 %).
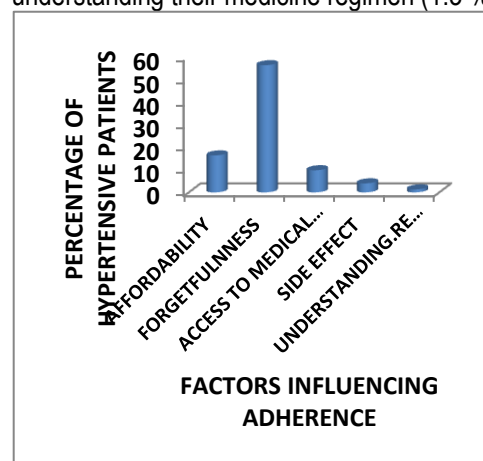

Fig 2: Percentage distribution of factors influencing adherence among the hypertensive patients.
NB: some respondents had more than one reason for not adhering to medicine regimen.

ASSOCIATION BETWEEN OCIODEMOGRAPHIC CHARACTERISTICS AND ADHERENCE TO TREATMENT.

Factors found to be significantly associated with adherence on CHI square test association were, gender (x^2=9.54, df=1, p<0.01), marital status (x^2=19787, df=4, p<0.01), educational qualification (x^2=12.696, df= 4, p<0.05) and occupation (x^2=25.873, df=3, p<0.01). Age was not significantly associated with adherence. Table 4 shows the result of the CHI square test of association.

Table 4: Adherence level for various variables in the study population

Variables		Level of Adherence				
		Non-Adherent n (%)	Adherent n (%)	x^2 Value	Df	P-Value
Age	18-24 Yrs	2 (1.4)	18 (6.2)			
	25-34 Yrs	18 (12.2)	24 (8.2)			
	35-44 Yrs	8 (5.4)	32 (11.0)			
	45-54 Yrs	40 (27.2)	78 (26.7)	11.357	6	P>0.05
	55-64 Yrs	43 (29.3)	68 (23.3)			
	65-74 Yrs	26 (17.7)	54 (18.5)			
	75 Yrs &	10 (6.8)	18 (6.2)			
	Total	147 (100.0)	292 (100.0)			
Gender	Male	84 (57.1)	124 (41.6)			
	Female	63 (42.9)	174 (58.4)	9.54	1	P<0.01
	Total	147 (100.0)	298 (100.0)			
Marital Status	Single	16(10.9)	42(14.1)			
	Married	71 (48.3)	176 (59.1)			
	Divorced	22 (15.0)	12 (4.0)	19.787	4	P<0.01
	Separated	10 (6.8)	12 (4.0)			
	Widowed	28 (19.0)	56 (18.8)			
	Total	147 (100.0)	298 (100.0)			
Educational qualification	None	12(8.4)	20(6.7)			
	Primary	26(18.2)	60(20.1)			
	Secondary	59(41.3)	78(26.2)	12.696	4	P<0.05
	Tertiary	44(30.8)	133(44.6)			
	Others	2(1.4)	7(2.3)			
	Total	143(100.0)	298(100.0)			
Occupation	Self-Employed	70 (53.4)	90 (30.2)			
	Employed	27 (20.6)	122 (40.9)	25.878	3	P<0.01
	Unemployed	24 (18.3)	70 (23.5)			
	Others e.g. retired	10 (7.6)	16 (5.4)			
	Total	131 (100.0)	298 (100.0)			

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When the factors were fitted into a logistic regression for multivariate analysis, access to medication was the only factor found to be independently associated with non-adherence after controlling for other factors (OR=0.279, 95CI=0.114-0.681).

Affordability, forgetfulness, side effects and understanding the medication regimen were not significantly associated with adherence to medication. This is given in table 6 below.

Table 6: Logistic regression of factors that influence medication adherence

Factors	Non Adherence		Odd Ratios	P-value	95 % C. I. (Lower-Upper)
	N	%			
Affordability	74	16.4	1.238	P>0.05	0.715-2.141
Forgetfulness	254	56.4	1.425	P>0.05	0.939-2.162
Access To Medication	44	9.8	0.279	P<0.01	0.114-0.681
Side Effect	18	4	1.836	P>0.05	0.674-4.998
Understanding Regimen	6	1.3	0.959	P>0.05	0.155-5.928

P>0.05- Not Significant
P<0.01- Highly Significant

DISCUSSION

In this study, more than half of the respondents were females. Although there have been male predominance in a few studies [8,9]. Female predominance is a common feature in hospital studies involving chronic disease conditions like hypertension [10,11].

Majority of the respondents were in the age range of 45years and above. This finding is coincident with the finding of Alebiosu in Nigeria, that increasing age is a risk factor for essential hypertension. It has also been reported that increase in blood pressure occurs progressively with increase in age and that about two third of the elderly can be defined as hypertensive [12].

A good number of the respondents were married. Marriage provides a positive social environment that promotes adherence as spouse can support by way of reminders. This is important since majority of the respondents attributed their non-adherence to medication regimen to forgetfulness.

It was also observed that majority of the respondents had formal education and were literate. A literate population is associated with better understanding of medication regimen and higher rates of adherence. This study population was mainly literate and capable of comprehending the significance of medication adherence. Hence, this may have contributed to the small number of respondents that were non-adherent due to lack of the understanding of medication regimen.

A good number of respondents in this study were self-employed. Enwere et al, similarly observed that majority of hypertensive population were self-employed. Self-employment is generally associated with a higher degree of stress than paid employment. As well as more psychological disturbance. In the etiology of hypertension, stress (physical, exertion, psychological disturbance and mental calculation)is a contributory factor to the development of hypertension{13].

It was observed that most of the respondents had hypertension less than 5years ago. This may be an indication that most hypertensive patients do not live long with their disease condition, probably due to the development of complications resulting from non-adherence to medication regimen. It is also probably due to the fact that hypertensive patients could have retired and have relocated or changed to another health facility or even trying alternative medicine.

Most of the respondents were taking two or more antihypertensive drugs, this probably contributed to the relatively high level of adherence in this study. Some studies have shown that increasing the number of medication for hypertensive patients increases the level of adherence [14]. This is inconsistent with the finding of Murray et al.

The level of adherence was relatively high. Most workers in Nigeria have reported a high level of adherence among hypertensive patients[15,16,17,18,19,20]. A study in United Kingdom by Ross et al also reported a high level of adherence.

Many factors affect non-adherence with medication regimen. These can be grouped into patients factors, disease factors, medication related factors and healthcare system re lated factors. In this study, the patient's factors were used to evaluate non-adherence. The major reason why the respondents did not adhere with their medication regimen is forgetfulness. Most of the respondents in the study are employed and are very busy, leading to forgetfulness. Since this is one of the major reasons for non-adherence in this study, patients should be encouraged to adopt systems and method for remembering to take their medicines. Pharmacists should endeavor at all times to write instructions on

medication use for patients. Written instructions are better than oral advice for reminding patients to take medications [21,6].

Another reason why respondents did not comply with their medication is affordability. A good number of the patients had problem of financing their refills and this contributed to their non-adherence. Doctors should consider the financial status of their patients in prescribing anti-hypertensive medicines to enable affordability e.g. generic prescribing should be encouraged. Prices of antihypertensive medicines should be subsidized by the Government. This is why the National Health Insurance Scheme (N.H.I.S.), recently introduced should be encouraged and supported by all in order to make access to health service and medicines affordable to the populace. Pharmacists in health institutions should ensure that wherever possible all medicines prescribed are within the recommended list for re-imbursement by the N.H.I.S. and patients must always be encouraged to register with the N.H.I.S.

Some respondents also attributed their not adhering to medication regimen to side effects of the medicines. There is therefore the need for pharmacists to counsel patients on common side effects that may be encountered, including how to avoid them and what to do when they occur. The counseling environment should be relaxed and none threatening so that patients would not be afraid to ask about potential side effects and what to do when they occur.

There was no significant association between age and level of adherence; this might be due to similarities in the numbers of people within the lower age bracket of below 20-44years and 65years and above suffering from hypertension when compared with the larger number of respondents within the age range of 45-64years and above. This is consistent with the finding reported in Sagamu[19].

Most of the female respondents were adherent to their medication and there was a significant association between gender and level of adherence. This may be due to the fact that females visit hospital more frequently and are exposed to counseling on various health issues including hypertension. Okeahialam in 2011 similarly observed the association between gender and level of adherence.

Majority of the respondents that were employed were adherent to their medication. There was a significant association between occupation and level of adherence, this might be due to monthly income associated with occupation.

There was a significant association between marital status and adherence. Marital status might influence patients' adherence with medication positively [22]. The help and support from a spouse could be the reason why married patients were more adherent with medication regimen than single patients.

On the basis of educational qualification, there was a significant association between the level of education and adherence. Other workers have reported mixed findings. Some researchers have reported that patients with lower level of education have better adherence [23,24], but not in line with the findings in Kano[25] and Nsukka[20] respectively. Uneducated patients or those with lower level of education might have more trust in physician's advice.

The prevalence of adherence among hypertensive patients in this study was relatively high; however, activities to sustain better level of adherence should be encouraged.

Forgetfulness and affordability of prescribed medication are important considerations that pharmacists must take into account when attempting to increase level adherence among hypertensive patients.

Pharmacists and pharmacy technicians should be adequately trained to offer proper counseling to hypertensive patients on their medications and disease conditions.

Healthcare professionals should assist hypertensive patients develop systems that will remind them to take their medications.

Local pharmaceutical companies should be assisted and encouraged to produce affordable, quality and effective antihypertensive medicines in Nigeria.

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