

ORIGINAL ARTICLE**Patient Education and Medication Adherence among Hypertensives in a Tertiary Hospital, South Western Nigeria**Ayodapo AO^{1*}, Elegbede OT², Omosanya OE², Monsudi KF³**OPEN ACCESS**

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ABSTRACT

BACKGROUND: Hypertension is a global health issue among the adult population with high morbidity and mortality rates. Poor adherence to medication is associated with bad outcome of the disease and wastage of health resources. Therefore, this study aims to determine the role of patient education in medication adherence among hypertensives attending tertiary hospitals in Ekiti State, South Western, Nigeria.

METHODS: This is a descriptive cross-sectional study involving 420 participants attending Family Medicine Department Clinic of Federal Medical Centre (FMC), Ido-Ekiti. Relevant data were collected using semi-structured questionnaire.

RESULTS: The mean age of respondents was 60.97 ± 11.28 years, and a slight female preponderance (male: female = 1:1.7 over male). Three hundred and forty nine (83.1%) were married, 273(65.0%) were from a monogamous family and 375(89.2%) had family sizes of more than 4. Ninety four (22.4%) had good knowledge about hypertension, and 257(61.2%) were adherent to their medication. Increased medication adherence proportion was observed as knowledge about hypertension improves. The odds of adherence to treatment among subjects with good knowledge is 2 times (OR = 2.320, 95%CI = 1.164, 4.626) higher than among subjects with poor knowledge.

CONCLUSION: The proportion of respondents with good knowledge about hypertension is low. However, the adherence among them to medication is higher and statistically significant. Patient education about the disease and its treatment by primary care physicians can help to improve adherence to medication.

KEYWORDS: Patient education, hypertension, adherence, medication, tertiary hospital

INTRODUCTION

Hypertension is one of the most prevalent chronic diseases. Hypertension is an overwhelming global challenge which ranks third as a cause of permanent life disability, and its complications could alter the life of the affected individual for the rest of his/her life (1,2). Even though the burden of hypertension is currently centered in economically developed countries, it was projected that developing countries would feel a greater impact due to their larger population

proportion (2). Indeed, studies estimated that up to three-quarters of the world's hypertensive population will be in economically developing countries by the year 2025 (2). Nigeria, like most other developing countries, is undergoing epidemiological transition and faces the double burden of communicable and non-communicable diseases (3,4). Of the latter, hypertension is one of the most important treatable causes of morbidity and mortality (3). This means that developing countries will be under two heavy burdens of communicable diseases and non-communicable diseases especially hypertension (4). This will eventually have a negative impact on the already over-stretched and inadequate health facilities in low-resources countries like Nigeria. Whereas communicable diseases exert a heavy toll on younger Africans, hypertension takes its toll on adult and middle-aged African populations on whom the young depends for survival (4). It has been well documented that uncontrolled blood pressure increases the risk of ischemic heart disease 3- to 4-fold (5,6) and the overall cardiovascular risk by 2- to 3-fold (1). The prevalence of hypertension in Nigeria, which was 15.3% (urban) and 10.6% (rural) in the general population (7) was later estimated in the hospital setting to be 15-20% (4).

A lot of factors have been attributed to poor adherence depending on the region and the demographic characteristic of the study. These factors include poor knowledge of disease and ignorance of the need for long-term treatment, high cost of medications, adverse drug reactions, religious practices and cultural beliefs, lack of access to medical care and facilities and use of complimentary medications and practices (8). Especially, common are poor knowledge, understanding and perception of hypertension or when a complex antihypertensive drug regimen is prescribed (9). The reported high incidence of complications even among those on treatment is attributable to poor adherence (9).

Most literatures focused on factors affecting adherence to antihypertensive therapy but not much has been published on the importance of information, education and counselling of patient by the attending physician on adherence to antihypertensive medication. However, few

studies have suggested patient education as a useful tool to be taken seriously in managing people with hypertension (8,10,11). This study therefore set out to address this knowledge gap by determining the relationship between patient education and adherence to medication among hypertensive accessing care in a tertiary hospital in Ekiti State, South Western Nigeria.

METHODS

This was a descriptive cross-sectional study conducted over a four month period in the Department of Family Medicine, Federal Medical Centre, Ido-Ekiti, Ekiti State, South Western Nigeria. The hospital runs a postgraduate training in the Department of Family Medicine. As part of the training, recruited doctors do receive training on how to briefly educate patients about their illnesses especially chronic illnesses like hypertension during consultation hour, with a view to enhancing patient knowledge and subsequently medication adherence. The participants were hypertensive patients aged 18 years and above, and have been on treatment for at least 6 months, excluding those with complications of hypertension, pregnant women and critically ill patients.

A minimum sample size was statistically determined for the study using a medication adherence prevalence rate of 45.8% as reported by Kabir et al (3), the confidence interval of 95% and standard error of 5%, as 381. This was increased to 420 given an attrition value of 10%. Systematic random sampling technique was used to recruit participants among the hypertensive patients attending the clinic.

Pre-tested semi-structured questionnaire drafted in English language and translated in Yoruba (local language) and back-translated into English was used to obtain relevant information on characteristics of respondents and their knowledge about hypertension. Knowledge was assessed using Hypertension Fact Questionnaire (HFQ), a 15-item questions with a high reliability (Cronbach α = 0.70) and validity (12). The questions assess the knowledge of patients about hypertension, its causes, treatment and management. Each response was scored as 'yes',

'no' or 'do not know'. Knowledge was assessed by giving 1 to correct answer and 0 to the wrong answer. The "don't know" response was also taken as 0. The scoring range of HFQ was 15 (maximum) to 0 (minimum). A cut off level of < 8 was considered as poor, 8-12 average, and 13-15 as adequate/good knowledge about hypertension. Knowledge scores for individuals were calculated and summed up to give the total knowledge score.

Adherence was determined using Morisky Medication Adherence Scale (MMAS-4), a 4-item self-report scale developed by Morisky et al with a high reliability and validity (Cronbach α = 0.61) (13), which has been particularly useful in chronic conditions such as hypertension (1). It measures both intentional and unintentional adherence based on forgetfulness, carelessness, stopping medication when feeling better and stopping medication when feeling worse. The advantages of this over other methods of measurement include its simplicity, speed, cheap and validity of use. The total score was 100%. A cut off level of $\geq 80\%$ was considered good adherent while respondents having <80% score was poor adherent.

Five research assistants who are a resident doctor, a nurse and three information officers were used.

Blood pressure was measured using an appropriate cuff-sized Accosson® mercury sphygmomanometer and stethoscope. Data were entered into and analysed with SPSS 20 software. Frequency tables and diagrams in the form of charts were generated for relevant variables. Means, standard deviations, proportions and percentages were determined as appropriate. The means and standard deviation (SD) were calculated for continuous variables while categorical variables were summarized using proportions. Test of significance was done using Pearson's Chi-Square and Student's t-test as

appropriate. P-value of equal or less than 0.05 was taken to be statistically significant.

Ethical approval was obtained from the institution Ethical Review and Research Committee. Informed verbal and written consent was obtained from the participants before the administration of questionnaires.

RESULTS

Four hundred and twenty, patients participated in the study. The mean age of respondents was 60.97 ± 11.28 years. The majority were females (63.1%), married (83.1%) and above 45 years of age (82.1%). Most of the subjects (65.0%) were from a monogamous family but still enjoyed the tremendous support of extended family system as all respondents had a number of external dependants. Lower social class (class IV and V) constitute 43.3% while 38.5% had tertiary/postgraduate education. Table 1 shows the socio-demographic characteristics of respondents.

Ninety four (22.4%) of the respondents had good knowledge of hypertension, while 224(53.3%) and 102(24.3%) had average and poor knowledge respectively (Figure 1). The majority, 257(61.2%), had good adherence. Out of the 94 respondents with good knowledge, 67(71.3%) had good adherence while 27(28.7%) had poor adherence. Out of the 224 respondents with average knowledge, 134(59.8%) had good adherence while 90(40.2%) had poor adherence. Out of the 104 respondents with poor knowledge, 56(54.9%) had good adherence while 46(45.1%) had poor adherence (Figure 2). There is a significant association between mean arterial blood pressure and medication adherence ($P=0.000$) as in shown in Table 2. Social class, marital status, and level of knowledge about hypertension were found to be significantly associated with medication adherence (p-value 0.017, 0.017, and 0.048 respectively) as shown in Table 2.

Table 1: Socio-demographic characteristics of respondents (N=420)

Variables		Frequency (n)	Percentage (%)
Gender	Male	155	36.9
	Female	265	63.1
Age group (years)	36-45	43	10.2
	46-55	106	25.2
	56-65	123	29.3
	66-75	116	27.6
	76+	32	7.6
Ethnicity	Yoruba	413	98.3
	Ibo	7	1.7
Domicile	Urban Ekiti	174	41.4
	Rural Ekiti	230	54.8
	Outside Ekiti	16	3.8
Marital Status	Single	2	0.5
	Married	349	83.1
	Separated	3	0.7
	Widowed	66	15.7
Religion	Christianity	379	90.2
	Islam	38	9.0
	Traditional	3	0.7
Educational level	None	109	26.0
	Primary	90	21.4
	Secondary	59	14.0
	Tertiary	135	32.1
	Postgraduate	27	6.4
Social class ^a	Class I	23	5.5
	Class II	133	31.7
	Class III	82	19.5
	Class IV	177	42.1
	Class V	5	1.2
Family size	Less than 5	45	10.7
	5-9	295	70.2
	≥10	80	19.0
Number of dependant	Less than 5	320	76.2
	≥5	100	23.8
Type of Family	Monogamy	273	65.0
	Polygamy	143	35.0

N=Study population

^a=social class, as classified by Oyedeji

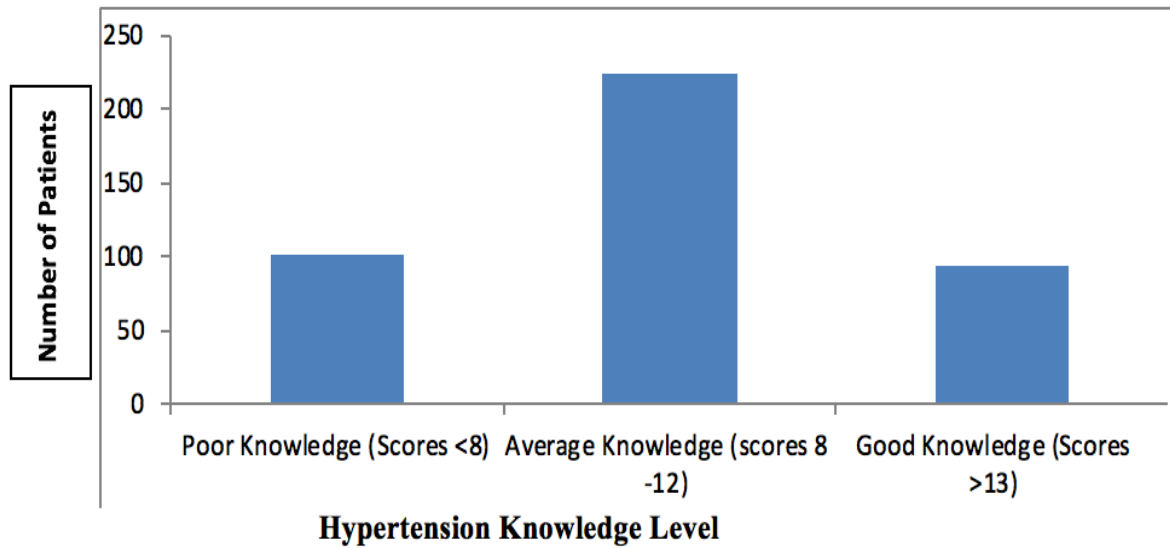


Figure 1. Bar Chart showing frequency distribution of respondents' hypertension knowledge level

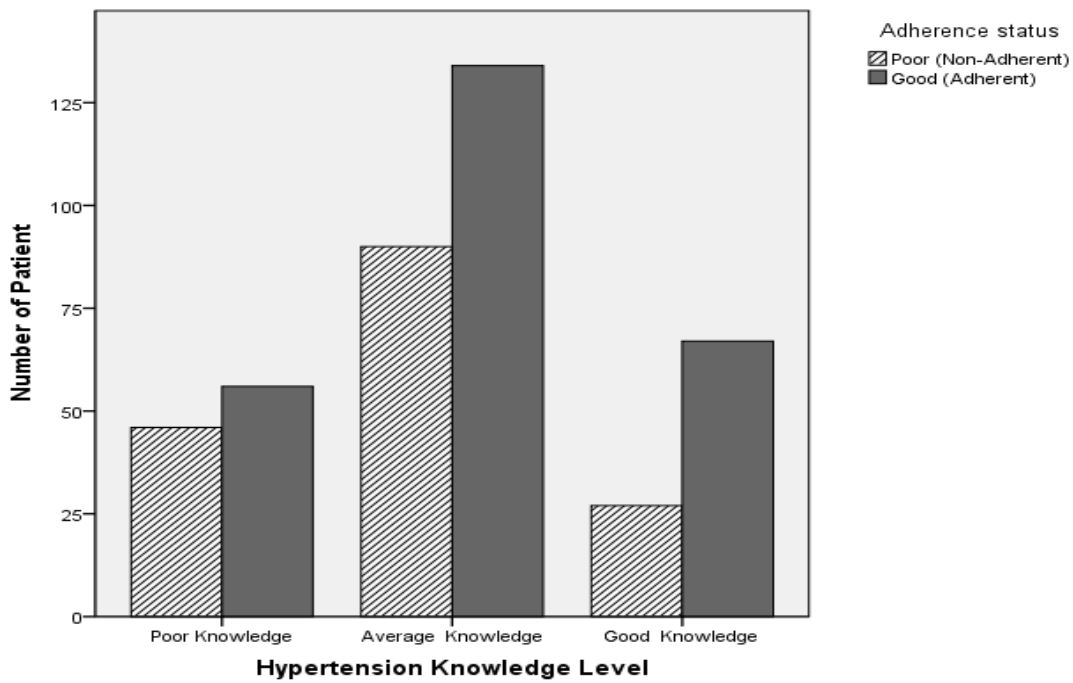


Figure 2. Comparison of respondents' knowledge level with medication adherence

Table 2: Relationship between socio-demographic characteristics and medication adherence

Variables		Adherence Status		X ²	P-Value
		Good Adherent (%)	Poor Adherent (%)		
Gender	Male	85(54.8)	70(45.2)	3.760	0.052
	Female	172(64.9)	93(35.1)		
Age group (years)	36 – 45	29(67.4)	14(32.6)	9.324	0.053
	46 – 55	63(59.4)	43(40.6)		
	56 – 65	80(65.0)	43(35.0)		
	66 – 75	73(62.9)	43(37.1)		
	76+	12(37.5)	20(62.5)		
Social Class	Class I	13(56.5)	10 (43.5)	11.987	0.017*
	Class II	80(60.2)	53(39.8)		
	Class III	61(74.4)	21(25.6)		
	Class IV	98(55.4)	79(44.6)		
	Class V	5(100.0)	0 (0.0)		
Educational level	None	65(59.6)	44(40.4)	6.957	0.138
	Primary	47(52.2)	43(47.8)		
	Secondary	43(72.9)	16(27.1)		
	Tertiary	86(63.7)	49(36.3)		
	Postgraduate	16(59.3)	11(40.7)		
Ethnicity	Yoruba	254(61.5)	159(38.5)	0.375	0.540*
	Ibo	3(42.9)	4(57.1)		
Religion	Christianity	233(61.5)	146(38.5)	4.805	0.090*
	Islam	24(63.2)	14(36.8)		
	Traditional	0(0.0)	3(100.0)		
Domicile	Urban Ekiti	104(59.8)	70(40.2)	4.867	0.088*
	Rural Ekiti	139(60.4)	91(39.6)		
	Outside Ekiti	14(87.5)	2(12.5)		
Marital Status	Single	2(100.0)	0(0.0)	10.216	0.017*
	Married	207(59.3)	142(40.7)		
	Separated	0(0.0)	3(100.0)		
	Widowed	48(72.7)	18(27.3)		
Number of external Dependants	<5	191(59.7)	129(40.3)	1.026	0.311
	≥5	66(66.0)	34(34.0)		
Hypertension knowledge	Poor	56(54.9)	46(45.1)	5.902	0.048
	Average	134(59.8)	90(40.2)		
	Good	67(71.3)	27(28.7)		

*Fishers exact test

DISCUSSION

The mean age of the hypertensive patients in this study was 60.97 ±11.28 years. The mean age in this study ranked higher than the mean age reported in the studies on compliance by Kabir *et al.* (3) and Akpa *et al.* (14) carried out among hypertensive patients attending medical outpatient clinic in Kano and Port Harcourt respectively. Kano and Port Harcourt are industrialised cities in Nigeria which may have effect on life expectancy due to

pollution, stress and over crowding found in such places. In contrast to this is the non-industrialised and township environment of Ido-Ekiti with only one tertiary health institution and two banks. Nevertheless, the mean age of the hypertensive patients in Nigeria was lower when compared with that of 70 years' reported in the studies done in Europe (15). This may be explained by the stressful lifestyle the Nigerians are exposed to early in life compared to their European counterpart. In this

study, 64.5%(271) of the subjects were over the age of 55years. This is consistent with the fact that the prevalence of hypertension increases with age in most populations, and the prevalence is highest in individuals over the age of fifty (3,16,17).

This study shows that most respondents had average and good knowledge about hypertension. Two hundred and fifty seven (61.2%) of the subjects were found to have good adherence to their medication. This is similar to that reported by Akpa *et al.* (14) in Port Harcourt, Nigeria and in Ethiopia (18) where 60.0% and 64.6% good adherence of respondents was found respectively. However the result in this study is higher than that found by Kabir *et al.*(3) in Kano, Northern Nigeria who reported 54.2%. The probable reasons for the difference are the low literacy level in the Northern part of Nigeria (19) and poor access and care to patients. Good adherence found in this study is also higher than what has been reported in Malaysia (44.2%), Gambia (27%) and (57%) Pakistan (18, 20), but lower than the studies reported in Egypt (74.1%), Tayside (85%), another part of Pakistan (77%) and (91%) Scotland (1, 21).

The social class as classified by Oyedeji (22) was found to significantly affect medication adherence as found in another study (3). Poorer adherence found among the upper social class may be connected to busy schedule/activities, enhancing missing pills despite their economic status. Level of education was found not to significantly affect medication adherence. This may be because patients were educated irrespective of their educational level about hypertension and its treatment by the attending primary care Physician in the study centre. This underscores the role of a primary care physician as physician skillful in communication-a communicator and an educator.

There is an increase in adherence as knowledge about hypertension increases. A number of studies (12,18) support such association in which a positive relationship was found between knowledge and adherence. A similar study from Pakistan and Gaza demonstrated that patients who were aware of their diseases and treatments had better adherence compared to those who did not (18,23). Right knowledge about hypertension and its treatment creates a clear understanding and

avoids confusion about the treatment and disease condition. Patients with better awareness were more likely to adhere to their treatment. The odds of adherence to treatment among knowledgeable subjects in this study was 2 times (OR=2.320, 95%CI=1.164, 4.626) higher than the odds of adherence among subjects who were not knowledgeable.

Ultimately, blood pressure control was associated with adherence behaviour, as shown in this study. Those that are adherent had a significantly lower blood pressure. This was also reported by Casson *et al.* (24),Morris *et al.* (25)and DiMatteo *et al.* (26).

In conclusion, this study shows that patient education as revealed by patient depth of knowledge about hypertension enhances medication adherence among the hypertensives. Hence, patient education, which is an overlooked aspect of disease management, is underscored. Further study using experimental design will ascertain the effect patient education can have play in medication adherence.

This study is not without limitation. The cross sectional approach and short-term or one-time assessments of patient education is a limitation of this study. Self-reporting used as the only method of measuring adherence has the disadvantage of recall bias and eliciting only socially acceptable response and hence may overestimate the level of adherence.

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