LIFESTYLE AND ADHERENCE TO ANTIHYPERTENSIVE THERAPY IN SOUTHERN SENATORIAL DISTRICT OF CROSS RIVER STATE, NIGERIA

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ABSTRACT

Understanding patient's adherence to their antihypertensive therapy and the factors associated with it is critical to controlling hypertension and its' negative effects on patients. Studies have shown that there is a relationship between certain lifestyle of patients and adherence to antihypertensive therapy. The goal of this study was to determine the relationship between patients' lifestyle and adherence to antihypertensive therapy in the Southern Senatorial District of Cross River State. Specifically, the study sought to establish the relationship between smoking, alcohol taking and adherence to antihypertensive therapy. A descriptive cross-sectional survey design was adopted for the study. Structured questionnaire was administered to five hundred (500) patients. Four hundred and twenty-one (421) questionnaires were properly filled and returned. Data obtained from the study was analyzed using SPSS version 21. Results show the proportion of the patients that had moderate to an optimal level of adherence were higher 148 (38.5per cent) among the non-smokers compared to 6 (16.2 percent) among the smokers. There was a significant association between smoking and adherence to antihypertensive medication ($P < 0.05$). Also, higher proportions of those who do not take alcohol 121 (49.2 percent) had moderate to optimum level of adherence compared to the proportion 33 (18.9 percent) who had moderate to optimum adherence among those who take alcohol. The differences in levels of adherence to antihypertensive medication between those that take alcohol and those that do not take were statistically significant ($P < 0.05$). It was recommended that healthcare providers should be trained to understand and appreciate the influence of the lifestyle variables like smoking and alcohol taking on patients' adherence to their antihypertensive medications. Also, both government and healthcare providers should double their efforts in educating the populace on the negative impact of lifestyle like smoking and alcohol taking in hypertension control.

Keywords: lifestyle, adherence, antihypertensive therapy, smoking, alcohol-taking

INTRODUCTION

Although hypertension constitutes a major risk factor for cardiovascular morbidity and mortality, research on adherence to antihypertensive treatment has shown that at least 75 per cent of patients do not adhere to their drug prescription because of a combination of demographic, organizational, psychological, and disease- and medication-related factors. Low adherence to antihypertensive medication remains a public health challenge. Understanding barriers to, and determinants of adherence to antihypertensive medication may help identify interventions to increase adherence and improve outcomes. Evaluating patient adherence to antihypertensive medications in outpatient settings is an important first step for clinicians in understanding the effectiveness of the treatment administered.

According to the guidelines of the American Heart Association/American Stroke Association (AHA/ASA), the first step in managing hypertension is lifestyle modification. Some studies have found that lifestyle habits such as smoking and regular alcohol intake can influence patient's adherence to antihypertensive medication. It has been found that smoking status is a factor in antihypertensive medication adherence. A study carried out in France to evaluate predictive factors on antihypertensive medication adherence showed that smoking is a significant factor for low antihypertensive medication adherence (Vaur, et al., 1999). According to this study, young hypertensive smokers living in large urban areas showed poor adherence to antihypertensive medication. In another study on hypertensive patients attending the primary health care clinics in Almadina city, Saudi Arabia, patients' adherence to the medication plan was examined from their attendance at the clinic, periodic medical check-ups and blood pressure measurements. The result was statistically significant in the association of smoking status between the non-smokers, active smokers and passive smokers (Mahmoud, 2012). However, a related study in United Kingdom reported that smoking status was not a significant predictor of antihypertensive medication adherence in the study population (Zeller, Schroeder, & Peters, 2007).

The common assumption is that alcohol consumption tends to reduce patient willingness to follow medication regimens. In many cases, alcohol drinkers show a reduced tendency to take their medications on days when they use alcohol; and in other cases, this tendency is demonstrated on the days that follow active alcohol use. Generally speaking, it has been shown that heavier amounts of alcohol consumption are associated with a greater chance of missing single or multiple medication doses (Cook, et al., 2001; Grodensky, Golin, Ochtera, and Turner, 2012).

Studies that focus on the factors that influence the behaviour of hypertensive patients as regards to their use of antihypertensive medication in Nigeria are scanty. Therefore, this study aims to contribute to the hypertension research field by highlighting the lifestyle factors that affect antihypertensive medication adherence for hypertensive patients in Southern senatorial district of Cross State, Nigeria. Specifically, it studied the relationship between smoking and alcohol taking and adherence to antihypertensive therapy.

MATERIALS AND METHODS

Study design and setting:
The study adopted a cross sectional descriptive survey to determine the lifestyle variables that influence patients' adherence to antihypertensive therapy in Southern Senatorial District of Cross River State. The Southern Senatorial District is one of the three districts in Cross River state and has a land area of 10,468.81 square kilometres. While the estimated population of Cross River State as at 2016 is about 3,866,300, the estimated population of the Southern Senatorial District as at the same period is 1,590,200 (National Population Commission of Nigeria, 2016). The people of the area are predominantly Christians. However; other religious groups such as Muslims, traditionalists and free thinkers co-exist in the district. The major occupations of the people of Southern Senatorial District are subsistent farming, fishing, and different forms of craftsmanship. However, a good number of the educated ones from this area are in the public services.

Sample size and sampling procedure

A total of 500 respondents were targeted for the study. The sample size was determined using Blunan's (2004) and Edet's (2004) formula.

$$n = \frac{z^2pq}{d^2}$$

Using the above formula, setting the confidence level at 95% with a precision of 5%, we obtained a sample size of 384, which was adjusted to 400. An addition of 25% to account for non-response brought the final sample size to 500.

The multi-stage sampling technique was used for the selection of the sample used for the study. This helped the researcher to draw a representative sample from the different subunits involved. Stage one involved the selection of local government areas from the senatorial district. Four Local Government Areas (LGAs) were selected out of the seven LGAs. Purposive sampling technique was used to select the two LGAs of Calabar Metropolis (Calabar Municipality and Calabar South LGAs) because they host the referral centres (University of Calabar Teaching Hospital and the General Hospital Calabar respectively), both of which have the heaviest patient load in the study area. To avoid bias, the other two LGAs (Akamkpa LGA and Akpabuyo LGA) were selected from the remaining five LGAs by balloting. Stage two involved the selection of health facilities. Given that the public health facilities are of three strata – the tertiary, the secondary and the primary, all of which are in the study area, the stratified sampling technique was employed in the selection of health facilities. However, only the tertiary and the secondary healthcare facilities were used which formed the strata, because they are the referral centres that run clinics for hypertensive patients. As such, the University of Calabar Teaching Hospital and the three General hospitals in the selected LGAs were selected purposively. The third stage involved the selection of respondents at the health facilities. Proportionate sampling technique was used to select respondents from the tertiary and secondary healthcare facilities in the proportion of 2:1. As such, 200 respondents were selected from the tertiary healthcare facility and 100 each from the three secondary healthcare facilities thereby making a total of 500 respondents who were selected using the out-patients register and were administered the questionnaire.

Survey instrument

The survey instrument includes Morisky Medication Adherence Scale (MMAs) and structured questionnaire with open and close ended questions. The MMAs is an eight-item instrument. This adherence measure was designed to facilitate the identification of barriers to and behaviours associated with adequate adherence to chronic medications (Morisky, Ang, Krourel-Wood & Ward, 2008). A previous study shows that MMAs has a reliability of 2=0.83, MMAs scores range from zero to eight with low adherence defined as MMAs scores of < 2; moderate adherence as MMAs scores of 1-2 and optimal adherence as MMAs scores of 0 (Morisky et al., 2008). A structured questionnaire was used to capture the socio-demographic characteristics and lifestyle of respondents.

Data collection procedures

Five field assistants were trained to assist in data collections. The questionnaire was administered to each respondent at the clinics after obtaining his/her oral consent. After detailed explanations, the respondents were allowed to fill in the questionnaire. Where the respondent cannot write, the locally recruited trained field assistants helped to fill in the respondents' answers after duly explaining the questions and the response options where necessary.

Method of data analysis

Data was analysed using the Statistical Package for Social Sciences (SPSS) version 21, and was presented mainly in frequencies, percentages, in tabular and graphical descriptive statistics. The association between

variables and the hypotheses were tested using chi-square.

Ethical consideration

Ethical clearance was obtained from the clinical governance unit of University of Calabar Teaching Hospital (UCTH), Calabar and Cross River State Ministry of Health to allow access to health facilities. Informed consent was obtained from the voluntary participants. The participants were assured of the confidentiality of the information elicited, and no names were recorded on the questionnaire.

RESULTS

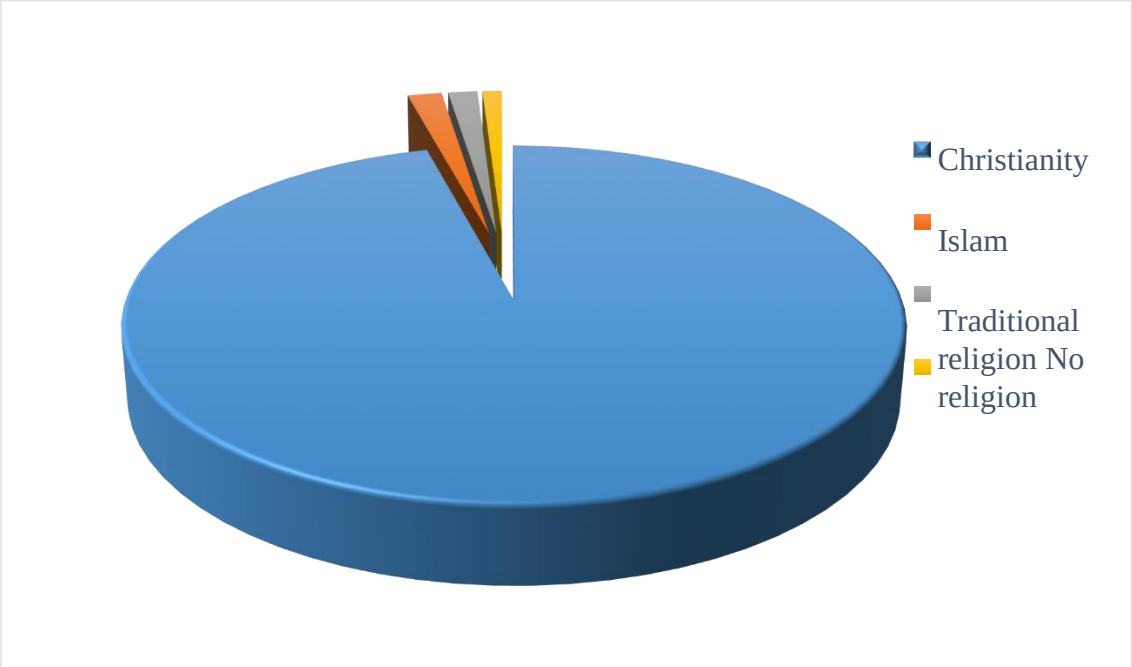
Table 1 shows that 16 subjects (3.8 per cent) were less than 30 years old, while majority 153 subjects (36.3 per cent) were 50 - 59 years old; 212 subjects (50.36 per cent) were female; majority of them (286 subjects or 67.93 per cent) were married; at least 9 subjects (2.1 per cent) had no formal education, while majority of the subjects (217 subjects or 51.5 per cent) had tertiary education and above; 156 subjects (37.05 per cent) were civil servant, 7 subjects (1.7 per cent) were uniformed officers; 152 subjects (36.1 per cent) earned ₦18,000 - ₦50,000, 13 subjects (3.1 per cent) earned ₦151,000 - ₦200,000; 264 subjects (62.71 per cent) dwellin the urban areas; and finally majority (404 subjects or 96.0 per cent) of the subjects were Christians as shown in Chart 1.

Table 1: Distribution of patients' socio-demographic characteristic

Variable		Frequency (N)	Per cent (%)
Age	< 30 years	16	3.8
	30 – 39 years	30	7.1
	40 – 49 years	91	21.6
	50 – 59 years	153	36.3
	60 – 69 years	91	21.62
	70 years and above	40	9.5
	Total	421	100.0
Sex	Male	209	49.64
	Female	212	50.36
	Total	421	100.0
Marital status	Single	45	10.69
	Married	286	67.93
	Divorced/separated	19	4.5
	Widow/widower	71	16.9
	Total	421	100.0
Level of Education	No formal education	9	2.1
	Primary	69	16.39
	Secondary	126	29.93
	Tertiary and above	217	51.5
	Total	421	100.0
Occupation	Unemployed	52	12.4
	Self employed	127	30.17
	Civil servant	156	37.05
	Uniform officers	7	1.7
	Corporate industry	14	3.3

	Retiree	65	15.4
	Total	421	100.0
Income	< #18K	62	14.7
	#18K- #50K	152	36.1
	#51K- #100K	120	28.50
	#101K- #150K	58	13.8
	#151K- #200K	16	3.8
	#200K	13	3.1
	Total	421	100.0
Place of Residence	Urban	264	62.71
	Rural	85	20.19
	Semi-urban	72	17.1
	Total	421	100.0

Source: Fieldwork, 2018



Source: Fieldwork, 2018

Chart 1: Pie chart showing distribution of patients according to their religion.

The Table 2 shows result on the lifestyle of the respondents. It revealed that only 37 subjects (8.8 per cent) smoke, and among the smokers, 28 subjects (75.7 per cent) smoke 1-2 sticks of cigarette per day; 175 subjects (41.6 per cent) drink alcohol, and among those who drink alcohol, 144 subjects (82.3 per cent) drink 1-2bottles of their alcoholic brand per day; all of the subjects (100 per cent) take fruits, and majority of them(263 subjects or 62.5 per cent) only take fruit occasionally; 241 subjects (57.2 per cent) take their last mealbetween 6 and 8 pm.

Table 2: Distribution of respondents according to lifestyle variables

Variable		Frequency	Percentage
Smoking	Yes	37	8.8
	No	384	91.2
	Total	421	100
Smoking frequency (number of sticks per day)	1 – 2	28	75.7
	3 – 4	3	8.1
	More than 4	6	16.2
	Total	37	100
Alcohol drinking	Yes	175	41.6
	No	246	58.4
	Total	421	100
Alcohol frequency (number of bottles per day)	1 – 2	144	82.3
	3 – 4	29	16.6
	More than 4	2	1.1
	Total	175	100
Fruits taking	Yes	421	100
per day)	Once	126	29.9
	Occasionally	263	62.5
	Total	421	100
Last meal time per day	Latest 6pm	52	12.4
	Between 6pm and 8pm	241	57.2
	Between 8pm and 10pm	110	26.1
	Later than 10pm	16	3.8
	Missing	2	0.5
	Total	421	100

The Table 3 shows the distribution of the patients' response to MMA questionnaire. For the question, "Do you sometimes forget to take your high blood pressure pills?", majority of them (223@53 per cent) answeredNo, for the question "Thinking over the past two weeks, were there any days when you did not take yourhigh blood pressure medication?", majority of them (231@54.9) answered No, for the question "Have youever cut back or stopped taking your medication without telling your doctor, because you felt worse when you took it?", 260 or 61.8 per cent of them answered No, for the question "When you travel or

leave home,do you sometimes forget to bring your high blood pressure medications?" 214 or 50.8 per cent) of them answered No, for the question "Did you take your high blood pressure medication yesterday?" majority ofthem (343 subjects or 81.5 per cent) answered Yes, for the questions "when you feel like your high bloodpressure is under control, do you sometime stop taking your medicine?" majority of them (254 subjects or 60.3 per cent) answered No, for the questions "Do you ever feel hassled sticking to your blood pressure treatment plan?" majority of them (273 subjects or 64.8 per cent) answered No.

Table 3: Distribution of patients' response to Morisky medication adherence

Response	Yes	No
	Frequency (percent)	Frequency (percent)
Do you sometimes forget to take your blood pressure pills?	223(53.0)	198(47.0)
People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were thereany days when you did not take your high blood pressure medicine?	231(54.9)	188(44.7)
Have you ever cut back or stopped taking your medication without telling your doctor, because you felt worse when you took it?	260(61.8)	156(37.1)
Do you sometimes forget to take your blood pressure pills?	223(53.0)	198(47.0)
People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your high blood pressure medicine?	231(54.9)	188(44.7)
Have you ever cut back or stopped takingyour medication without telling your doctor, because you felt worse when you took it?	260(61.8)	156(37.1)
When you travel or leave home, do you sometimes forget to bring along your high blood pressure medication?	214(50.8)	207(49.2)
Did you take your high blood pressure? medicine yesterday?	78(18.5)	343(81.5)

When you feel like your high blood pressure is under control, do you sometimes stop taking your medicine?	254(60.3)	167(39.7)
Taking medication every day is a real inconvenience for some people. Do you ever hassled about sticking to your blood pressure treatment plan?	273(64.8)	146(34.7)

Source: Fieldwork, 2018

The Table 4 shows the chi-square analysis of lifestyle (in terms of smoking and alcohol taking) and adherenceto antihypertensive therapy. On smoking and adherence to antihypertensive therapy, there were two categories namely; those who smoke cigarette and those who do not smoke cigarette. Among those who smoke a total of 37(8.8 per cent) were involved; 2(5.4 per cent) had optimum adherence, 4(10.8 per cent)had moderate adherence, and most 31(83.8 per cent) had poor adherence. Among those who do not smoke, 57(14.8 per cent) had optimum adherence, 91(23.7 per cent) had moderate adherence, and majority 236(61.5per cent) had poor adherence. The chi-square test showed that the variation in the level of adherence among the different categories was statistically significant (P-value < 0.05). On alcohol taking and adherence to antihypertensive therapy, also two categories were involved, namely, those who drink alcohol and those who do not drink alcohol. Among those who drink alcohol, a total of 175(41.6 per cent) were involved; 9(5.1 per cent) had optimum adherence, 24(13.7 per cent) had moderate adherence, most 142(81.1 per cent) had poor adherence. Majority of patients, 246(58.4 per cent) do not take alcohol. Among them, 50(20.3 per cent) had optimum adherence, 71(28.9 per cent) had moderate adherence, and 125(50.8 per cent) had poor adherence. The chi-square test showed that the variation in the level of adherence among the different categories was statistically significant (P-value < 0.05).

Table 4: The association of life-style variables with level of adherence

Variable		Level of adherence N (per cent)				
		Optimal	Moderate	Poor	Total	p-value
Smoking	Yes	2(5.4)	4(10.8)	31(83.8)	37(8.8)	
	No	57(14.8)	91(23.7)	236(61.5)	384(91.2)	0.028
	Total	59(14.0)	95(22.6)	267(63.4)	421(100.0)	
Alcohol Taking	Yes	9(5.1)	24(13.7)	142(81.1)	175(41.6)	0.000
	No	50(20.3)	71(28.9)	125(50.8)	246(58.4)	
Total		59(14.0)	95(22.6)	267(63.4)	421(100.0)	

Source: Fieldwork, 2018

DISCUSSION

Two habits were considered related to the level of medication adherence among the hypertensive patients namely smoking and alcohol intake. Majority of the patients do not smoke (384 subjects or 91.2 per cent). Probable reason for the low proportion of smokers could be because once diagnosed with hypertension, patients are often counselled against smoking and other such habits that may worsen their health condition, additionally, part of the lifestyle modifications is cessation of smoking. Concerning the level of adherence to antihypertensive medications among smokers and non-smokers, it was found that the proportion of the patients that had moderate to optimal level of adherence were higher (148 subjects or 38.5per cent) among the non-smokers compared to the smokers (6 subjects or 16.2 per cent). There was a significant association between smoking and adherence to antihypertensive medication ($P < 0.05$). In a related study carried out in France to evaluate predictive factors on antihypertensive medication adherence by Vaur et al. (1999), it was found that smoking was a significant factor for low adherence to antihypertensive medication. However, in another related study conducted in Bristol by Zeller et al. (2007) it was found that there was no significant variation between the antihypertensive medication adherence in patients who had never smoked and current smokers. Hence they concluded that smoking status was not a significant prediction of antihypertensive medication adherence in their study population. They went on to assert the effects of smoking status on medication adherence differed depending on the study population. On alcohol taking, the study showed that only 175 subjects or 41.6 per cent consumed alcohol. Probable reason for this nature of distribution may be due to the routine advice against alcohol intake usually given to hypertensive patient. Concerning the levels of adherence between those that take and those that do not take alcohol, thestudy showed that, higher proportions of those who do not take alcohol (121 subjects or 49.2 per cent) had moderate to optimum level of adherence compared to the proportion 33 subjects (18.9 per cent) who had moderate to optimum adherence among those who take alcohol. The differences in levels of adherence to antihypertensive medication between those that take alcohol and those that do not take was statistically significant ($p<0.05$). This shows that there was significant association between alcohol taking and adherence to antihypertensive medication. Generally, studies have shown that alcohol consumption is associated with greater chances of missing single or multiple medication doses. It had been found that the chances of skipping medication are higher with alcohol drinkers. In a systematic review of sixty studies which addressed medication adherence for HIV, diabetes and hypertension by Grodensky, Golin, Ochtera, and Turner (2012), it was concluded that most studies reported negative effects of alcohol consumption on adherence. In another related study by Bryson et al. (2008), it was found that the proportions of patients treated for hypertension and hyperlipidemia that were non-adherent to their medications were higher among those that consumed alcohol. Probable reason for this may be because alcohol consumption is likely to reduce patients' willingness to follow medication regimen. Moreover, given that most hypertensive patients are advised against alcohol use, it follows that those patients who show less willingness to adhere to the instruction against alcohol drinking may invariably show less willingness to follow the doctor's advice on his/her drug regime.

CONCLUSION

This study established that lifestyle factors such as smoking and alcohol intake have significant association with adherence to antihypertensive therapy in the study area. It was recommended that healthcare providers should be trained to understand and appreciate the influence of smoking and alcohol intake on patients' adherence to their antihypertensive medications. Also, both government and healthcare providers should double their efforts in educating the population on the negative impact of smoking and alcohol intake in managing hypertensive patients.

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