ORIGINAL ARTICLE

SOCIODEMOGRAPHIC AND CLINICAL CORRELATES OF UNCONTROLLED HYPERTENSION IN PATIENTS ON TREATMENT FOR HYPERTENSION IN A FAMILY PRACTICE IN SOUTHWEST NIGERIA

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ABSTRACT

Context: Hypertension causes cardiovascular morbidities globally, particularly in Africa. Hypertension is a disease that is difficult to manage and there are reports of sub-optimal control in hypertensive patients despite clinic attendance. This study sought to characterize the profile of outpatients with uncontrolled hypertension while on treatment.

Materials and Methods: There was a purposive consecutive sampling of 78 registered hypertensive patients diagnosed at least six months before recruitment and having clinic blood pressures at ≥140/90mmHg in at least two previous consecutive clinic visits in an out-patient clinic. Their sociodemographic and clinical variables were collected using a semi-structured questionnaire which incorporated the Hillbone Compliance to High Blood Pressure Scale.

Results: There were 52 (66.7%) females and 26 (33.3%) males. The mean age was 54.3years ± 11.48. The mean blood Pressure (B.P) at initial contact was 143.92 / 89mmHg. About 40.3% of Participants were obese. Most 71.4% of the patients were adherent to prescribed medications. There were no significant socio-

demographic factors associated with uncontrolled hypertension after multiple linear regression analysis. There was a significant positive linear correlation between poorer medication adherence and higher Diastolic blood pressure r=2.57, p = 0.024

Key words: Hypertension, Sociodemographic, NCDs, Uncontrolled Hypertension, family practice

Conclusion: Physicians ought to recognize the pattern of uncontrolled blood pressure in patients despite treatment and institute an appropriate intervention.

INTRODUCTION

Hypertension remains the leading non-communicable disease cause of morbidity and mortality in Nigeria as in many other sub-Saharan African countries.[1] Several studies have shown that blood pressure control to optimal levels remains a problem.[2],[3][4] The major challenge facing clinicians is achieving adequate control of the hypertension in other to prevent its burdensome complications. However, as with most chronic diseases, the cooperation of the patient is without doubt of utmost importance. Several studies have shown that when patient adherence to self-care is low, blood pressure remains uncontrolled.[3] Some studies have also shown that patients with good adherence to medications and lifestyle advice may also experience uncontrolled hypertension; suggesting that control of blood pressure may involve other factors or that patients under-report their non-adherent practices.[5][6]

Chai et al. found that people who were females, older and with a lower level of education had better adherence to Blood Pressure Management (BPM).[5] A study by Hyman et al. conducted in the USA has shown uncontrolled hypertension to be common in the elderly while access to physicians and access to healthcare were

not predictors of uncontrolled hypertension.[7] They suggested that understanding patients and systems is important to achieving optimal blood pressure levels in hypertensive patients.[7] Another study by Elperin et al. found that patients with no conjugal partners and those taking more pills showed a greater association with uncontrolled hypertension.[8] Sarfo et al. in Ghana found poor adherence to medications, challenges of access to medications, longer duration of hypertension, taking more pills and being treated at a tertiary centre to be associated with uncontrolled hypertension.[9]

In Rwanda, Sibomana et al found physician factors such as lack of adherence to hypertension treatment guidelines, as a barrier to blood pressure control in a cohort of patients who were mostly adherent to medications using the Morisky Medication Adherence Scale- MMAS.[6] Components of self-care for patients with hypertension such as low salt intake, exercise, taking medications, maintaining an optimum weight and regular clinic attendance although important to good outcomes, are often a challenge for most patients.[10] Research continues to show their benefits but this has not yet been translated to effective action by patients in Nigeria. In Uganda, Sibomana et. al found a self-reported adherence score with the Morisky medication adherence scale to be as high as 77% but recorded only 29% of the participants had controlled hypertension, and uncontrolled hypertension in the study was attributed to physician factors.[6] The findings from the studies above suggest individual and regional differences in the factors affecting control of blood pressure hence the relevance of this study in a Western-Nigeria group of patients.

It is often the case that human behaviour responds to cultural and social influences, which may be the reason for the variety of

unexpected and expected sociodemographic and clinical factors associated with Blood Pressure Management BPM in the studies above. Hence, our study was based on the premise that patients with difficult-to-control blood pressures may share certain characteristics. Therefore we explored certain factors known to be common to uncontrolled hypertension patients, in a group of patients recruited for an interventional (Blood Pressure Management) BPM study in a tertiary hospital in Western Nigeria. Our study sought to understand the current situation of patients with uncontrolled hypertension in terms of sociodemographic and clinical characteristics to offer relevant interventions for attaining blood pressure control.

Objectives:

1. To identify the sociodemographic & Clinical characteristics of the group of patients with uncontrolled hypertension

2. To determine the adherence pattern of the group using the Hillbone compliance to high blood pressure scale

3. To explore the factors associated with having more severe hypertension at recruitment.

MATERIALS AND METHODS

Study Site: This study was conducted in the General outpatient clinic of a University teaching hospital in South-West Nigeria between February 14, 2022, and May 31, 2023.

Definition of Variables:

Blood Pressure: the force with which the heart pumps blood through the body as measured by a sphygmomanometer.

Severity of Blood pressure: the measured elevation in blood pressure as it increases beyond 140mmHg for systolic blood pressure and 90mmHg for diastolic blood pressure. Higher values were taken as

worse blood pressure control or more severe hypertension.

Hypertension (HTN/htn): Blood pressure greater than or equal to 140mmHg Systolic Blood Pressure and or greater than or equal to 90mmHg diastolic blood pressure.

Adherence: measured by the Hill Bone Compliance to High Blood Therapy Scale (HCHBTS). Higher values denote worsening adherence.

Co-morbidities: Chronic conditions and diseases apart from Hypertension affecting the participant as documented in his health records

Body Mass Index: The proportion of weight to height per square meter used as an index to determine the presence of normal weight, overweight or obesity.

Study Design and Procedures: This part of the study was a pre-intervention survey (ie, a cross-sectional study). Using a semi-structured questionnaire we interviewed 78 adults, 30 years and above whose health records showed uncontrolled hypertension determined as Systolic BP ≥140mmhg and /or Diastolic BP ≥ 90mmHg in their last two clinic visits despite being on antihypertensive treatment. The participants were sampled consecutively using a purposive Sampling method, by a review of health records and they were approached for consent when they fulfilled the inclusion criteria. Patients with evidence of acute end-organ dysfunction, congestive cardiac failure, chronic kidney disease and cognitive impairment were excluded.

The Interviewer-administered questionnaire had sections on sociodemographic characteristics, average monthly income, sources of income, and sources of healthcare financing as well as, information on family history of hypertension or sudden death, report of family support, duration of hypertension

diagnosis and its treatment, use of alcohol, tobacco, presence of co-morbidities, insomnia and snoring. Insomnia and snoring were determined by asking participants if they had any of the conditions with a 'Yes' or 'No' option for response. The questionnaire also contained the Hill-bone Compliance to High Blood Therapy Scale (HCHBTS) which measured adherence in the domains of salt intake, appointment keeping and medication use. It uses a self-rated Likert scale of 1 to 4 with 1 meaning not at all and 4- all the time. The scale has a Cronbach Alpha of 0.74 to 0.84.[11] Lower scores denote good adherence and higher scores denote poorer adherence. A cut-off score of ≥ 22 was used to identify non-adherent respondents.

Blood pressure was measured for each participant using a standardized digital Sphygmomanometer Omron-3® with the patient in a sitting position which had been maintained for at least 5 minutes. Two readings were obtained from the left upper arm with an appropriate cuff size unless the left arm was unavailable due to contracture or immobilization, in which case the right upper arm was employed. The average of the two values was used for subsequent analysis. The pulse rates were recorded from the digital reading of the sphygmomanometer and also palpated. Weight was measured in light clothing using a hospital Scale Seca® model while the height was determined using an attached standiometer.

Sample Size Estimation:

The sample size was estimated for a before and after study (based on T-test) due to the intention to implement an intervention after the survey. The minimum sample size was calculated at a 5% threshold probability for rejecting the null hypothesis if it were true and 20% probability of failing to reject the null hypothesis if it were false, an effect size of 0.5, with a standard deviation of

change in the outcome of 1.38 based on a study by Woodham et. al. to check the effect of a multidisciplinary approach to control B.P[12] using the formula ;

$n= (Z_\alpha + Z_\beta)^2 / (E/S)^2$: $n= (0.05+0.2)/ (0.5/1.38)^2$: n= 60

Where : n= Sample size

Z_α = Z statistics for type 1 error set at 0.05

Z_β = Z statistics for type 2 error set at 20%

E= Effect size set at 0.5

S= Z Standard deviation based on the study above at 1.38

Attrition for non-completion of study set at 20%

The final n was calculated as 60 + (0.2 x 60) = 72

A minimum sample size of 60 was calculated with 20% added for attrition for non-completion of the study to reach a minimum sample size of 72 respondents. Finally, 78 persons were recruited into the study in its initial phase.

Ethical approval

Ethical approval for the study was obtained from the institutional ethics committee Approval numbers: UI/EC/21/0366 dated 15/12/2021 and UI/EC/0448 dated 20/12/2022.

Permission was obtained from the head of the family medicine department. The research followed the Helsinki Declaration on research in human subjects. Written consents were obtained from all participants before the interview.

Data analysis:

The data was analysed using SPSS version 23. Categorical data were captured using proportions and percentages. Continuous variables were captured as means and standard deviations. The normalcy of data distribution was checked using means, medians, Kurtosis and skewness to ascertain the normal distribution of the main dependent variables- Blood pressure values were normally distributed. The adherence scores were determined to be

skewed. A Pearson linear correlation analysis was done between continuous variables with a normal distribution like blood pressure and various sociodemographic variables. Spearman's correlation was done for variables which were skewed such as HCHBTS adherence Score. The differences in mean values of continuous variables were evaluated using the student T-test and Analysis of Variance. A multiple linear regression analysis was done with blood pressure as the dependent variable. The level of statistical significance of the various analyses was set a P-value of less than or equal to 0.05.

RESULTS

There were 78 persons interviewed. The mean age was 54.2 ± 11.46 with a range from 33years to 80 years. Most 52 (66.7%) of the respondents were female, Christian and educated Yorubas. Over 70% of them were earning above the minimum wage in the country at the time of the study. Table 1. summarizes the sociodemographic characteristics. About 50% of the respondents were on Health Insurance via the National Health Insurance Agency NHIA.

Table 1. Sociodemographic Characteristics of the Participants

Characteristics	Frequency	Percentage %
Sex		
Male	26	33.3
Female	52	66.7
Employment:		

Unemployed / retired	11	14.0.
Agric/sales, Services	35	45.0
Professional/ clerical	32	41.0
Education		
None	6	7.7
Primary	10	12.8
Secondary	14	18.0
Tertiary	48	61.5
Ethnicity		
Yoruba	63	80.8
Others	15	19.2
Marital Status		
Married	63	80.8
Unmarried*	15	19.2
Religion		
Christianity	61	78.2
Islam	17	21.8
Income		
<30,000	22	28.6
30,000 -59,999	12	15.6
60,000 - <119,999	16	20.8
>120,000	27	35.0
Family history of hypertension		
Yes	39	50.6
No	35	49.4
Family support for HTN		
Yes	42	53.8
No	36	46.2
Alcohol Use		
Yes	10	12.8
No	68	87.2
Cigarette		
Yes (Current Use)	2	2.6
No	76	97.4
Sources of Income		
Salary	30	38.5
Business	32	41.0
Family	12	15.4
Pension	4.0	5.1

Table 2. shows some clinical characteristics of the study participants. Sleep difficulties were reported by just about a quarter of the participants. Snoring was more common affecting 42.3% of them. Diabetes mellitus was the most common diagnostic co-morbidity with hypertension in the participants followed by lumbar spondylosis, eye disorders and mental disorders. The Average duration of

hypertension was 11 years while the average pill burden was 3pills/day. Almost three-quarters of them were aware of possible complications of untreated hypertension. Most of them 56 (71.4%) were adherent to recommended life style and medications.

Table 2: Clinical Characteristics of Study Participants

Clinical Characteristics	**n**	**Percentage %**
Sleep Difficulties		
Yes	22	28.2
No	56	71.8
Snoring		
Yes	33	42.3
No	45	57.7
Awareness of possible htn* complications		
Yes	52	79.5
No	16	20.5
Adherence via HCHBPTS		
Yes	56	71.4
No	22	28.6
Comorbidities		
Diabetes mellitus Yes	12	15.1
No	67	84.6
Osteoarthritis Yes	01	1.3
No	77	84.7
Lumbar Spondylosis Yes	4	5.1
No	74	94.9
Eye Disorders Yes	4	5.1
No	74	94.9
Mental Health Condition Yes	4	5.1
No	74	94.9
Other Medical Conditions Yes	11	14.1
No	67	85.9
*htn- hypertension		

Table 3 shows the mean and standard deviation of quantitative variables in the study. Most of the participants were middle-aged. The mean Systolic Blood Pressure (SBP) was 144.48(median-145, skewness-0.128, kurtosis- -0.274). The mean diastolic blood pressure was 88.57 (median-88.8, skewness- 0.406, kurtosis-0.184). The average adherence score

showed that most were adherent and used about 3 pills a day.

Table 3: Mean & Standard Deviations of Quantitative Clinical Variables

Characteristics	N	Mean ± S.D
Age	78	54.2 ± 11.475
Duration of Hypertension	78	11.05 ± 9.06
Mean duration of HTN treatment	78	10.41 ± 9.10
Average No. pills/day	78	3.21± 2.40
BMI	73	29.35 ± 6.10
Adherence Score HCHBTS	77	19.52 ± 3.71
Average SBP at recruitment	78	144.48 ± 15.5
Average DBP at recruitment	78	88.57 ± 10.74

Table 4 shows the pattern of responses to the HCHBTS, a reflection of self-reported adherence to self-care behaviours for hypertension. Most respondents were adherent scoring below an aggregate score of 22. This variable was skewed (mean=19.52, median=19.0, Kolmogov-smimov 0.04, Shaspiro Wilk= 0.00) However, about a quarter reported non-adherence shown in deciding not to take pills 27.3%. Other non-adherent behaviours were skipping pills before seeing the doctor 41%, eating salty food 41.6% and eating fast foods 57.1%. On the other hand, no one reported taking someone else's pills. Some reasons given for non-adherence include fear of harm

from prolonged use of medication, intolerable side effects, financial constraints, thinking that a drug holiday is not harmful and rarely forgetfulness.

Table 4a. Pattern of Adherence to Lifestyle and Medication factors based on the Hill Bone Compliance to High Blood Pressure Scale (HCHBTS)

Variable	F	%
a. Frequency of Forgetting to take BP pills-		
None of the time	54	70.1
Some of the time	22	28.6
Most of the time	1	1.3
All of the time	0	0.0
b.Frequency of Deciding not to take BP pills		
None of the time	52	67.5
Some of the time	21	27.3
Most of the time	3	3.9
All of the time	1	1.3
c.Frequency of Eating Salty Food		
None of the time	44	57.1
Some of the time	32	41.6
Most of the time	1	1.3
All of the time	0	0
d.Frequency of adding salt to food before eating		
None of the time	71	92.2
Some of the time	6	7.80
Most of the time	0	0
All of the time	0	0
e. Frequency of eating fast food		
None of the time	28	36.4
Some of the time	46	59.7
Most of the time	3	3.90
All of the time	0	0.00
f. Frequency of getting next appointment before leaving doctor's office		
None of the time	27	35.1
Some of the time	13	16.9
Most of the time	0.0	0.0
All of the time	37	48.1
g. Frequency of missing appointments		
None of the time	46	59.7
Some of the time	18	23.4
Most of the time	9	11.7
All of the time	0	5.2
h. Frequency of forgetting to refill Prescription		
None of the time	67	87
Some of the time	10	13
Most of the time	0	0
All of the time	0	0
i.Frequency of running out of BP pills		
None of the time	55	71.4
Some of the time	21	27.3

Most of the time	1	1.30
All of the time	0	0.00
j. Frequency of Skipping pills before going to the doctor None of the time	41	53.2
Some of the time	26	33.8
Most of the time	5	6.5
All of the time	5	6.5
k. Frequency of missing BP pills because of feeling better		
None of the time	56	72.7
Some of the time	14	18.2
Most of the time	6	7.8
All of the time	1	1.3
l. Frequency of missing BP pills when sick		
None of the time	70	90.9
Some of the time	2	2.6
Most of the time	2	2.6
All of the time	3	3.9

F-frequency

Table 5. Shows the results of tests for association between some socio-demographic variables and the mean of blood pressure. The Blood Pressure data was normally distributed with congruity between mean and median values for SBP and DBP, The Kolmogorov- Smimov test was not significant. Using the t-test for bivariate analysis revealed that there were no significant relationships between the dichotomous sociodemographic variables tested and severity (mean elevation) of blood pressure elevation except for marital status where married participants appeared to have a higher mean diastolic hypertension at recruitment than unmarried persons. The latter part of the table shows the relationship between some multichotomous sociodemographic variables and mean blood pressures using Analysis of Variance ANOVA with post hoc analysis. There was no association found between income category and occupation with mean Systolic and Diastolic blood pressures. There was a difference in mean diastolic BP between Unemployed/ Retired persons compared with those in Agriculture, sales and Services with the former group having lower mean blood pressure than the latter. There was a difference in mean diastolic blood pressure between persons with no

formal education and those with Secondary Education which was not statistically significant.

Table 5. Association between Sociodemographic and clinical variables with Severity of blood pressure Elevation

Variable	Mean ± Standard Deviation	T-statistics	P-value
SBP Sex- Males	147.38 ± 14.66	0.569	0.57
Females	145.12 ± 17.35		
DBP Sex – Male	90.19 ± 10.15	0.942	0.35
Female	87.75 ± 11.03		
SBP vs Marital Status			
Married	144.34 ± 15.34		
Unmarried/ widowed	145.07 ± 16.75	-0.162	0.87
DBP vs Marital Status			
Married	90.73±10.23	3.97	0.00*
Unmarried	79.50±7.73		
SBP vs Religion			
Christianity	145.18 ± 16.36	0.75	0.45
Islam	141.97 ± 12.09		
DBP vs Religion			
Christianity	89.41 ± 10.90	1.33	0.19
Islam	85.53 ± 9.90		
		Anova f	p-value

*p< 0.05 is statistically significant

Table 6 shows the relationship between some clinical variables and level of blood pressure using ANOVA. There was an association between having co-mordities and higher Systolic Blood Pressures but not diastolic blood pressures while there was no association between the weight measured as Body-Mass Index and level of blood pressure elevation as shown in the table.

Table 6. Association of Clinical Characteristics with mean blood pressures

Variable	Mean	F test statistic	p-value
SBP vs Normal weight			
Normal Weight	147.17 ± 14.61	0.63	0.54
Overweight	145.67± 12.57		
Obese	142.26 ± 18.17		
DBP vs Weight			
Normal weight	90.14± 8.65	0.41	0.67
Overweight	87.19 ±10.09		
Obese	89.14 ± 13.00		
Comorbidity Vs SBP			
Yes	150.44± 14.66	7.6	0.015*
No	141.50 ± 15.19		
Comorbidity Vs DBP			
Yes	87.11± 11.12	0.30	0.401
No	89.3 ± 10.59		

*$p \leq 0.5$ is statistically significant

Table 7 shows Simple Linear correlation analysis of continuous clinical variables with blood Pressure and adherence. There is a statistically significant relationship between duration of Hypertension treatment and diastolic blood pressure level but not with systolic blood pressure at baseline ($p<0.01$). The age of the participant correlated significantly with severity of diastolic blood pressure elevation at recruitment as well as adherence score using the Hillbone compliance to high blood pressure scale. Older participants were more adherent and had lower diastolic blood pressure measurements at baseline. Those who took fewer pills had better adherence scores than those who took more pills. There was no significant correlation between Age, Adherence and diastolic blood pressure.

Duration of HTN diagnosis and duration of hypertension treatment had a weak significant correlation with Diastolic but not Systolic blood pressure. Longer duration of diagnosis suggested higher DBPs. There was no significant correlation

between number of pills taken and systolic

or diastolic blood pressure.

Table 7: Linear Correlations Between Socio-demographic & Clinical Variables and Severity of Hypertension

Variable	Pearson correlation	p-value
Age	0.53	0.645
Systolic BP		
Age		
Diastolic BP	-0.386	< 0.01*
Age	-0.442	<0.01 *
Adherence		
	Sperman's correlation	
Systolic BP	0.075	0.515
Adherence		
Diastolic BP	0.308	0.007*
Adherence		
Total Number of Pills Adherence	-0.332	0.003*
Duration of HTN diagnosis	-0.055	0.636
Adherence Score		
Duration of HTN treatment SBP	`0.081	0.49
Duration of HTN treatment`	0.277	0.014*
DBP		

*Statistically significant

Table 8 shows the results of multiple linear Regression Analysis between systolic blood pressure and variables that appeared significant or relevant on bivariate analysis. No significant relationships were found between Age, gender, religion, education, alcohol use and taking low calorie diets on stepwise forward and backward regression with SBP as the dependent variable.

Table 8. Multiple linear Regression of relevant variables with Systolic Blood Pressure

Model 1	B	test statistic	P-value	
Constant	173.90	8.90	.000	
Sex	-7.29	-1.74	0.09	
Education	-4.81	-1.83	0.071	
Religion	-7.33	-1.57	0.12	
Use of alcohol	8.05	1.36	0.18	
Low calorie /fat	-4.65	-1.21	0.23	
Age	-0.28	-0.95	0.35	

Table 9 shows the results of multiple linear regression analysis with significant and relevant variables using diastolic blood pressure as dependent variable. The significant relationship of age with DBP persisted in the model despite analysis with various sociodemographic and clinical data: with every unit increase in age, DBP reduced by 0.59 points. All other variables lost their significance in the model which used stepwise multiple linear regression.

Table 9. Multiple Linear Regression of Relevant variables against Diastolic Blood Pressure levels

Variables	B	T	p-value
Age	-0.590	-3.96	<0.01*
Sex	-4.722	1.55	0.13
Employment	0.329	0.23	0.82
Marital Status	-2.970	-0.85	0.40
Education	-3.81	-1.29	0.23
Income category	-1.76	-1.44	0.16

Family History of HTN	-2.20	-1.44	0,16
Family support	0.56	0.02	0.88
Presence of complication	-2.89	-0.10	0.40
Difficulties with sleep	-1.68	-0.619	0.54
Use of alcohol	5.74	1.53	0.13
Use of cigarette	-6.704	-0.88	0.38
Regular Exercise	2.98	1.17	0.25
Low salt	3.82	1.14	0.26
Adherence score	-0.13	-0.36	0.72

B=β, T-Test statistic

DISCUSSION

This study sought to identify sociodemographic and clinical characteristics of a cohort of patients with uncontrolled hypertension, to determine their adherence pattern to some lifestyle strategies for hypertension management and their adherence to prescribed medications and finally to explore factors that may be associated with having a higher blood pressure at the time of recruitment.

This Study found that patients with uncontrolled hypertension cut across various age groups from 30 years to 80 years. Older persons were not available for recruitment because a good number of elderly patients attend the hospital's geriatric center.

It is significant to observe that most of the participants had a post-secondary level of education, a feature which is in tandem with their awareness of the possible complications of hypertension and the relatively high level of adherence.[13] Uncontrolled hypertension despite the high level of adherence was found among our study participants and this is not uncommon as shown by other studies.[7],[6] These findings suggest the fact that uncontrolled hypertension is a complex issue resulting from multifactorial

problems such as lifestyle adherence, and salt intake, amongst other factors.[5]

A Study by Hyman et al, 2001 in the USA identified age above 65 years, being male, and making no visit to a physician in the last year as predictors of uncontrolled hypertension.[7] In that same study, access to health care and physician contact were not predictors of hypertension.[7] In contrast, patients in our study had access to physicians and no significant difference in blood pressure levels between the genders while being older was associated with lower diastolic blood pressure. This is probably due to the higher prevalence of Systolic hypertension in the elderly in general as also found in our study participants.[14] Younger persons may also have higher diastolic blood pressure as a result of their poorer adherence to medication and lifestyle recommendations.[13]

Alcohol and tobacco use were not common among our participants although alcohol use mostly referred to social intake of insignificant quantities. Hence, it is possible to infer that lifestyle modification relating to alcohol intake and smoking cessation had been adopted by most of our study participants. Just about half of the participants reported family support for their hypertension management, this was a little less than expected due to the often reported strong family ties in Nigeria.[15] However, it may also reflect the simplicity of the strategies involved in managing uncomplicated hypertension which usually can be done alone by the patients. On the other hand, lack of family support may hinder lifestyle changes related to meals which are often shared by family members.[15]

Diabetes mellitus also showed up as the commonest diagnostic comorbidity as in other studies in the study site,[16] although it had no significance in the severity of blood

pressure. Notably, self-reported snoring was present in up to 40% of the participants and snoring is usually associated with sleep apnoea which is, a known cause of resistant hypertension.[17],[18] It may be proposed that snoring as a factor affecting the attainment of good blood pressure levels in Nigerian patients be explored. Having any co-morbidity although initially associated with the level of blood pressure, lost its significance on regression analysis in our study, plausibly its significance is influenced by other factors.

Adherence in this study was quite high compared to what is often reported for hypertension in general.[2] This may be a reflection of the educational status of the respondents or perhaps better knowledge of the disease due to patient education efforts at the study site. Patient education efforts at the study site include health talks by the nursing staff and periodic health education by the attending physician. We found that factors such as older age and being retired or unemployed showed better adherence unlike in the study by Swiatonioska et al in which older age reduced adherence.[19] Most of the patients in our study denied forgetfulness, running out of pills, or not refilling prescriptions as a cause of non-adherence. Since as many as half of them were on health insurance, medication refills should be easier because of the reduced fee for service and highly subsidized medication fee on the insurance plan.

On the other hand, adding salt to already cooked food and skipping pills before going to see the doctor were relatively common among the participants as were eating salty foods and fast foods. Reduced dietary compliance may be related to having a common pot and a lack of control over meal preparation in the family setting.

Obtaining an appointment for the next visit was not common among the participants. This detail cannot be easily explained. It may be attributable to the requirement for monthly medication refills for health

insurance patients and the fluidity of the clinic protocol which does not require patients to obtain an appointment before seeing a doctor.

Only a few factors were found to be associated with the severity of the blood pressure elevation in our study population. Adherence to medication and dietary adjustments are already established factors which correlated inversely with diastolic blood pressure showing better DBP control with better adherence i.e lower adherence score. We also found better adherence among older individuals. Diabetes mellitus as the commonest comorbidity was not associated with a higher blood pressure than not having diabetes. Regression analysis however attenuated the relevance of most factors except age which showed a negative relationship with blood pressure levels with older patients having better diastolic blood pressure.

CONCLUSION:

This study suggests that uncontrolled hypertension could occur in a wide variety of patients including those who are younger. It is opined that physicians should pay more attention to younger patients to address adherence problems and improve blood pressure control. Physicians also need to be alert to the adequacy of BP control to reduce complications. It would seem that the journey to greater success in hypertension control requires the commitment of both patients and physicians to personalise and optimise treatment.

Limitations of the study:

The study was able to demonstrate the heterogeneity of uncontrolled hypertension at the study site as well as the need for vigilance in younger patients with hypertension to achieve better control. As a cross-sectional study, no true causal relationships can be established. A larger sample size would have given more power to the study but this could not be achieved

due to the social circumstances because the study was conducted at the later end of the Covid-19 Pandemic. It could also be argued that a control group might have given more credence to the study but this was not deemed necessary because it was a pre-.intervention survey of persons with uncontrolled hypertension.

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