



(RESEARCH ARTICLE)



Lifestyle practices among hypertensive patients attending the Family Medicine Clinic in a tertiary hospital in Nigeria

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Abstract

Introduction: Hypertension is a major modifiable cause of cardiovascular disease affecting more than one billion people globally. Lifestyle modifications form the corner stone for the mitigation of identified risk factors and the prevention and control of hypertension. Some of these factors include cessation of cigarette smoking, weight reduction, increase in physical activity, moderation of dietary sodium and alcohol intake and following the DASH eating plan. They may also facilitate drug step-down and drug withdrawal in highly motivated individuals. The objective of this study was to determine the extent to which diagnosed hypertensive patients modify their lifestyle.

Methods: This was a cross-sectional study among 230 patients with essential hypertension in the Family Medicine clinic in a tertiary hospital using a structured pretested questionnaire.

Results: Most of the participants (149; 64.8%) were educated on lifestyle practices by health workers. Abstaining from tobacco products (230; 100%) and drinking alcohol (230; 100%) were the most used lifestyle practices. Dietary fruit consumption (93; 40.4%) and engagement in physical activity for thirty minutes per day (35; 15.2%) were the least used lifestyle practices.

Conclusion: Health workers were the main source of education of the participants on lifestyle modification. Use of alcohol and consumption of tobacco products were not practiced by all the study participants. Dietary fruit consumption and engagement in physical activity were not popular lifestyle practices. It is recommended that primary care clinicians inquire about unhealthy lifestyles during clinical consultations as well as motivate hypertensive patients to adopt and adhere to appropriate lifestyle modifications.

Keywords: Lifestyle modification; Practices; Hypertension; Nigeria

1. Introduction

Hypertension is a significant modifiable cause of cardiovascular disease affecting an estimated 26% of the world's population (972 million people). [1] The complications of this disease include coronary heart disease, heart failure, stroke, myocardial infarction, chronic kidney disease (CKD), cognitive impairment and death. [2] Most of these complications occur among pre-hypertension stage (120-139 mmHg systolic blood pressure; 80-89 mmHg diastolic blood pressure) and hypertension stage- 1 (140-159 mmHg systolic; 90-99 mmHg diastolic). [3] Although it has become a major threat to health in many countries including Nigeria, effective consideration and investment response by many stakeholders are directed at the communicable and infectious diseases such as HIV/AIDS, malaria and now covid-19.

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The guideline in the control of blood pressure among hypertensive patients is now based on medication adherence and lifestyle modifications.[3] Lifestyle modification refers to the changes in the choices of an individual's behavioral pattern and practices with respect to daily activities.[4] These lifestyle modifications include termination of cigarette smoking, weight reduction, increased physical exercise, control of dietary sodium and alcohol intake and adopting the Dietary Approach to Stop Hypertension (DASH) eating plan. [5] They form the basis for the prevention and control of hypertension, hypercholesterolemia and diabetes mellitus [6] and ease medication step-down or withdrawal in very motivated patients. [7] Lifestyle modifications even when inadequate in themselves to reduce blood pressure, lessen the number and doses of antihypertensive medications needed for good control and minimize treatment cost. [3] Its use has therefore been suggested for the initial management of stage 1 hypertension (SBP = 140-159 mmHg, DBP = 90-99 mmHg). [8]

Regardless of the aforementioned benefits of lifestyle modification in blood pressure control, little is known about it among hypertensive patients at the primary care level in Nigeria. These patients may be eager to embrace modalities of therapy with minimal side effects. They may be willing to take more responsibility for their health and institute the necessary changes, but merely require approval and direction from their doctor, who may on the other hand not know what they are doing. This study will determine the level of utilization of lifestyle modifications among adult hypertensive patients in a primary care clinic in Nigeria. Hence, it will also spur physicians to educate their patients on what constitutes unhealthy lifestyles and its unfavorable effects.

2. Methodology

This is a cross-sectional study conducted on adult patients with essential hypertension between April and November 2015 in the Family Medicine clinic of a tertiary hospital in Nigeria.

The patients included in the study were those with essential hypertension aged 18 years and above who consented to the study, hypertensive patients on treatment in the clinic for not less than 6 months, patients on lifestyle modification interventions for elevated blood pressure (140/90 mm Hg) and those who had attended the clinic not less than three times.

Critically ill patients and hypertensive patients with co-morbidities such as diabetes mellitus, renal disease, myocardial infarction and stroke were excluded from the study.

The sample size was estimated with the formula: $n = z^2 pq / d^2$ used to estimate minimum sample size for descriptive studies. [9] Considering 16.4% prevalence of patients who practiced lifestyle modifications [10] and 95% confidence interval and 5% margin of error, a sample size of 210 was calculated. This was however increased to 230 to allow for 10% non-response.

The study commenced with the use of a mercury sphygmomanometer to measure blood pressure using the palpation and auscultation method in the right arm supported at heart level, with the patient seated with feet on the floor. Appropriately sized cuff for the upper-arm circumference was used. The cuff was placed such that the middle was on the patient's upper arm at the level of the right atrium (the midpoint of the sternum), and not over clothes. Systolic blood pressure (SBP) was recorded as the first arterial blood flow sounds and Diastolic blood pressure (DBP) at the point before the disappearance of the arterial blood flow sounds. To reduce within-patient variability, blood pressure was measured after 5 minutes of rest and readings taken 2 minutes apart, and the average of the readings taken for analysis. [11] Hypertension was diagnosed if blood pressure was equal to/ greater than 140/90 mmHg.

The study tools consisted of a specially designed three-part questionnaire; the first part consisting of the socio-demographic characteristics of the participants such as age, sex, monthly income, marital status and level of education. Other parts of the questionnaire were designed based on information on lifestyle modifications gathered from informal conversations with patients attending the clinic, review of pertinent literature [12] and a previous study. [13] Hence, the second part sought information regarding sources of education on lifestyle practices and the third was on alcohol and tobacco use, practice of low salt diet, dietary vegetable and fruit consumption and physical activity for a minimum of thirty minutes per day. A five points Likert scale was used in scoring the practice of each lifestyle item as described by Iloh et al [12] as follows: All times=5 points, most times=4 points, sometimes=3 points, rarely=2 points and none=1 point. Those assessed to have good lifestyle practices were scored "Yes" and on the contrary "No".

The concept of the study was briefly explained to the participants and effort was made to encourage sincere response in order to reduce the tendency for information bias.

The questionnaire was designed in English language which is understood by most patients in the study area and pre-tested on 5% of the sample size among patients in a nearby hospital of similar status to eliminate ambiguities prior to actual data collection.

The data retrieved from the questionnaire was entered into a personal computer, crossed-checked by the researchers to ascertain their completeness and analyzed using the statistical package for social science [SPSS], version 15 statistical software (www.spss.com). Frequency tables were constructed to organize the raw data; rates were expressed as percentages and chi square was used to examine the differences between discrete variables. Statistical significance was set at 95% confidence level or at p-value < 0.05. An informed written consent was obtained from each member of the study population before recruitment into the study. Ethical approval was obtained from the state ethical and research committee.

3. Results

A total of 230 hypertensive patients consisting of males (161; 70%) and females (69; 30%) were studied over a period of four months. The age range was 35- 84 years, with a mean age of 55.6 ±10.3 years. Participants with primary education constituted the highest number (69; 30.1%). The low income bracket of N5, 000-30,000 had the greatest number of subjects (101; 44.1%) and was predominated by males (77; 47.6%). Most of the participants (55; 67.4%) were married (Table 1).

Table 1 Socio-demographic characteristics of the study population

Socio-demographic Characteristics	Male n=161 (%)	Female n=69(%)	Total n=230 (%)
Age(Years)			
35-44	27 (16.9)	12 (17.4)	39(17.1)
45-54	51 (31.8)	10 (14.5)	61 (26.5)
55-64	53 (32.8)	32 (46.4)	85 (37.0)
65-74	29 (17.9)	11 (15.9)	40(17.3)
75-84	1 (0.7)	4 (5.8)	5(2.1)
Educational Status			
Primary	48 (29.7)	21 (31.0)	69 (30.1)
Secondary	33 (20.6)	11 (15.9)	44 (19.2)
Tertiary	30 (18.6)	34 (49.2)	64 (27.7)
Vocational	4 (2.7)	0 (0.0)	4 (1.9)
No Formal Education	46 (28.4)	3 (4.0)	49 (21.1)
Monthly income(in Naira)			
<5000	31 (19.3)	10 (15.1)	41 (18.0)
5000-30000	77 (47.6)	24 (35.7)	101 (44.1)
30000-100000	35 (22.0)	30 (42.9)	65 (28.2)
>100000	10 (6.4)	4 (4.8)	14 (5.9)
Variable	8 (4.7)	1 (1.6)	9 (3.8)
Marital Status			
Married	112 (69.6)	43 (62.3)	55 (67.4)
Unmarried	49(30.4)	26(37.7)	75(32.6)

Most of the participants (149; 64.8%) were educated on lifestyle practices by the doctors followed by those educated by the nurses (48; 20.9%) and radio (42; 18.3%). (Table 2). Distribution of the patients based on their practice of lifestyle modification showed two hundred and thirty (100%) of the participants were neither using tobacco products nor drinking alcohol. Dietary fruit consumption (93; 40.4%) and engagement in physical activity for thirty minutes per day (35; 15.2%) were the least used lifestyle practices (Table 3).

Table 2 Sources of education on lifestyle practices *

Variables	Frequency	Percentage
Doctors	149	64.8
Nurses	48	20.9
Radio	42	18.3
Television	35	15.2
Pamphlets/ Posters	14	6.1
Internet	12	5.2
Magazines/Newspaper	12	5.2
Books	5	2.2

*Multiple Responses

Table 3 Distribution of the hypertensive patients based on their practice of lifestyle modifications*

Variables	Yes (%)
Non-alcohol consumption	230(100.0)
Non-tobacco consumption	230(100.0)
Practice of low salt diet	122(81.3)
Dietary vegetable consumption	102(44.3)
Dietary fruit consumption	93(40.4)
Practice physical activity for thirty minutes per day	35(15.2)

*Multiple Responses

Although a high proportion of the study population (150; 65.2%) utilize increased physical activity as a form of lifestyle modification, the association between the utilization and the socio-demographic characteristics was not statistically significant ($p>0.05$) (table 4).

Table 4 Association between demographic factors and practice of increased physical activity among the participants

Socio-demographic Characteristics	Increased physical activity		P-value	χ^2
	Yes(%) n=150(65.2)	No(%) n=80(34.8)		
Age in years				
35-44	27(18)	12(15)	0.46	3.69
45-54	39(26)	22(27.5)		
55-64	51(34)	34(42.5)		
65-74	31(20.7)	9(11.25)		
75-84	2(1.3)	3(3.75)		

Gender				
Male	105(70.7)	56(70.0)	0.95	0.004
Female	44(29.3)	24(30.1)		
Monthly income (in Naira)				
<5000	22(14.7)	20(25.0)	0.49	3.45
5000-30000	71(47.3)	30(37.5)		
30000-100000	41(27.3)	23(28.8)		
>100000	9(6.0)	4(5.0)		
Unknown	7(4.7)	2(2.5)		
Educational status				
Primary	47(31.3)	23(28.8)	0.10	7.74
Secondary	29(19.3)	15(18.8)		
Tertiary	47(31.3)	16(20.0)		
Vocational	4(2.7)	0(0.0)		
No Formal Education	23(15.3)	25(31.3)		
Marital Status				
Married	91(67.2)	53(66.3)	0.40	0.70
Unmarried	59(32.8)	27(33.7)		

Low salt intake was used by 211(91.7%) of the participants. Statistically significant association was found between educational status and low salt intake (p=0.02) (table 5). Only 47(20.4%) of the participants take fruits regularly. Educational and marital status were the only socio- demographic characteristics significantly associated fruit intake (p<0.05) (table 6)

Table 5 Association between demographic factors and practice of low salt diet among the participants

Socio-demographic Characteristics	Practice of low salt diet		P-value	χ²
	Yes n=211(91.7%)	No n=19(8.3%)		
Age in years				
35-44	38(18.0)	1(5.3)	0.34	4.50
45-54	57(27.0)	4(21.1)		
55-64	79(37.4)	11(57.9)		
65-74	33(15.6)	7(36.8)		
75-84	4(1.9)	1(5.3)		
Gender				
Male	149(70.6)	13(68.4)	0.94	0.004
Female	62(29.4)	6(31.6)		
Monthly income(in Naira)				
<5000	39(18.5)	2(10.5)	0.50	3.36
5000-30000	91(43.1)	11(57.9)		

30000-100000	62(29.4)	2(10.5)		
>100000	12(5.7)	2(10.5)		
Unknown	7(3.3)	2(10.5)		
Educational status				
Primary	68(32.2)	1(5.3)	0.02	11.49
Secondary	41(19.4)	3(15.8)		
Tertiary	59(28.0)	5(26.3)		
Vocational	4(1.9)	0(0.0)		
No Formal Education	39(18.5)	10(52.6)		
Marital Status				
Married	97(64.7)	47(58.8)	0.38	0.78
Unmarried	53(35.3)	33(41.2)		

Table 6 Association between demographic factors and practice of fruit consumption among the participants

Socio-demographic Characteristics	Practice of fruit consumption		P-value	χ^2
	Yes(%) n=47(20.4)	No(%) N - 183(79.6)		
Age				
35-44	7(14.9)	32(17.5)	0.82	1.26
45-54	13(27.7)	48(26.2)		
55-64	16(34.0)	69(37.7)		
65-74	11(23.4)	29(15.8)		
75-84	0(0.0)	5(2.7)		
Gender				
Male	33(70.2)	128(69.9)	0.89	0.02
Female	14(29.8)	55(30.1)		
Monthly income(in Naira)				
<5000	9(19.1)	24(13.1)	0.40	4.08
5000-30000	20(42.6)	97(53.0)		
30000-100000	14(29.8)	31(16.9)		
>100000	3(6.4)	14(7.7)		
Unknown	2(4.3)	16(8.7)		
Educational status				
Primary	15(31.9)	22(12.0)	0.007	13.96
Secondary	9(19.1)	31(16.9)		
Tertiary	13(27.7)	49(26.8)		
Vocational	1(2.1)	0(0.0)		
No Formal Education	9(19.1)	80(43.7)		

Marital Status				
Married	13(27.7)	141(77.0)	<0.0001	39.03
Unmarried	34(72.3)	42(23.0)		

The number of participants who were taking vegetables was low(93;40.4%). Statistically significant association was found between vegetable consumption and monthly income ($p=0.005$), educational status ($p=<0.001$) and marital status ($p=<0.001$) (table 7).

Table 7 Association between demographic factors and practice of vegetable consumption among the participants

Socio-demographic Characteristics	Practice of vegetable consumption		P-value	χ^2
	Yes(%) n =93(40.4)	No (%) n =137(59.96)		
Age in years				
35-44	17(18.3)	22(16.1)	0.97	0.54
45-54	25(26.9)	36(26.3)		
55-64	35(37.6)	50(36.5)		
65-74	14(15.1)	26(19.0)		
75-84	2(2.2)	3(2.2)		
Gender				
Male	65(69.9)	93(67.9)	0.86	0.032
Female	28(30.1)	44(32.1)		
Monthly income(in Naira)				
<5000	17(18.3)	16(11.7)	0.005	14.64
5000-30000	40(43.0)	77(56.2)		
30000-100000	28(30.1)	17(12.4)		
>100000	5(5.4)	12(8.8)		
Unknown	3(3.2)	15(10.9)		
Educational status				
Primary	30(32.3)	7(5.1)	<0.001	37.56
Secondary	18(19.4)	22(16.1)		
Tertiary	26(28.0)	36(26.3)		
Vocational	2(2.2)	0(0.0)		
No Formal Education	17(18.3)	72(52.6)		
Marital Status				
Married	32(34.4)	102(74.5)	<0.001	17.31
Unmarried	61(65.6)	15(10.9)		

4. Discussion

The importance of lifestyle modification lies in its utilization as a primary intervention for newly diagnosed hypertensive patients. [6] It enhances medication efficacy and may also lessen the quantity of medications required to control blood pressure among those requiring antihypertensive medications, enhance fitness, health and productivity [14].

The finding that health workers; mainly doctors and nurses were the main educators on lifestyle modification practices to prevent hypertension corroborates previous studies in Ethiopia and Nigeria. [6,15] It also brings to the fore the importance of doctor-patient communication in efficient health care delivery.[16] Apart from the direct doctor-patient communication in the hospital, doctors and other healthcare providers use the radio as a medium in the propagation of information on prevention and treatment of diverse diseases including hypertension. The efficacy of the radio as a source of health promotion and disease prevention lies on the fact that there are many radio channels that are accessible in the rural areas where the bulk of the population reside. Its efficacy is also enhanced by the availability of reasonably priced mobile phones in Nigeria which can pick up radio frequencies hence minimizing reliance on other sources of information which might be expensive.

The high prevalence of lifestyle modification practices in this study mirrors the 92% reported in a hospital based study in Kano, Nigeria. [17] However, it is not consistent with findings of a similar study in a sub urban Nigerian community and Israel which reported inadequate lifestyle practices among hypertensive patients. [18, 19] This inconsistency may be due to differences in the study population and high patient load which may influence healthcare workers' attitude towards health promotion and education. The primary care strategies to manage blood pressure, minimize the risk of cardiovascular events and enhance the quality of life should consider not only blood pressure control with medications but also on the advantages of lifestyle practices.

The non- consumption of alcohol by the participants in this study is an outstanding finding when compared with reports in previous studies by Buda et al in Ethiopia and Durai et al. in India where 87.9% and 72% respectively were reported not using alcohol.[6,20] The nonutilization of alcohol could have emanated from the low socio-economic status of the people, the religious and cultural standards in the study area and the possible perception of the negative effect of alcohol on the efficacy of antihypertensive medications.

Abstinence from tobacco use was found in 100% of the participants in this study. Literature reveals a general trend in reduced use of tobacco worldwide as seen in the report of 98.2% in Ilorin, North Central Nigeria, [21] 97.7% in Ibadan, South West Nigeria,[22] 91.2% in Ethiopia[6] and 89% in India.[20] The low tobacco consumption in these studies could be related to the age of the study participants which is above the school age when tobacco consumption is learnt as a behaviour due to peer pressure and stress.[23] Several control strategies have been adapted to control tobacco and alcohol consumption in different parts of the world.[24] These include adverts in radio and television discouraging the use of tobacco products and also use of outdoor media, such as billboards, posters and other print media.[25]

Governments in different countries have also introduced policies for the control of alcohol and tobacco. These include adjusting upwards the minimum legal drinking age; introduction of random breath testing programs to discourage drink-driving, media campaigns, health warning labels on the danger of alcohol and tobacco use and increasing taxes on alcohol and tobacco products. These have significantly reduced alcohol and tobacco consumption. [24, 26] The high figure in this study could have also emanated from some cultural practices and religious reasons [21] which deter people from the use of tobacco. This avoidance of tobacco use constitutes an essential modifiable risk factor to circumvent unpleasant tobacco-related cardiovascular events such as myocardial infarction, stroke, congestive heart failure and peripheral arterial disease. [27]

Although the association between socio-demographic factors and practice of physical activities was not significant, a large percentage (65.2%) of the participants practiced physical activities for thirty minutes per day. This percentage is higher than 16.4% reported by Iloh et al in Nigeria, [10] 16.1% reported in Southern Ethiopia [6] and 54.6% reported in a similar study in the out- patient department in India. [20] This could be due to the presence of organized setups for regular exercises and intensive health education at the clinic by the health workers in the clinic where this study was conducted.

Dietary fruit and vegetable consumption in this study did not feature prominently in the lifestyle modification practices. This is not commendable considering the beneficial effect of sufficient fruit and vegetable consumption on cardiovascular health due to their high content of water and fiber, and low fat content. Deficiency in dietary fruits and vegetables is associated with the risks of chronic non-communicable diseases such as diabetes, obesity, strokes and hypertension. [28, 29] The significant association of educational and marital status with the consumption of fruits could be related to the fact that higher educational status predisposes to good adherence to medications, knowledge of disease and self-care.[30] Being married could increase the probability of being adherent to medications and lifestyle measures through providing practical support (e.g., reminding patient to take medications) or by improving patients' self-concept.

The significant association of monthly income, educational status and marital status with consumption of vegetable agrees with a report regarding hypertension among Kenyan military personnel in which those of higher educational

level practiced healthier lifestyle behaviours compared with individuals with low educational attainment.[31] Educational attainment is associated with higher socioeconomic status with resultant better disease awareness and proper health seeking behaviours. [32, 33] Higher educational level may qualify an individual for good skilled jobs with higher income status with the attendant increased access to health-related activities.

The large percentage of the participants engaging with reduced salt intake is surprising considering the fact that daily salt intake exceeds the recommendations in most countries, the main contributors to salt intake being condiments including table salt, cereals and cereal products, meat and meat products and dairy products [34] which form a big chunk of the food among the study population. This finding could be attributed to the wide spread awareness of the role of dietary salt on blood pressure in Nigeria [35] and is in consonance with the reports that reduced salt consumption benefits hypertensive patients. [36] The significant association of level of education and reduced salt intake could be attributed to the fact that a high percentage of the study participants were educated and this is associated with good adherence to medications, knowledge of disease and self-care. [30]

4.1. Limitations and strength of the study

This study has some limitations. The cross-sectional nature of the study prevented the establishment of a sequential cause and effect relationship among the variables of interest and blood pressure control. The study is hospital based hence findings cannot be extrapolated to the general population. The self-reporting of the behavioral attributes such as physical activity, alcohol intake, smoking etc is fraught with is a tendency to over-report or under-report such attributes

The strengths of this study lie on the fact that firstly, the objectives that were set out to be investigated were achieved, secondly, probability sampling technique was used which reduced the likelihood of selection bias occurring in the study, thirdly, the instruments used in this study have standard properties to measure behavioral style and have been validated for use in local and international research and finally blood pressure and anthropometric measurement were carried out by one researcher using consistent/standardized protocols and the same type of instruments to avoid measurement bias

5. Conclusion

In light of the findings obtained in this study, it was concluded that health care providers were the main source of education of the participants on lifestyle modification. Use of alcohol and tobacco products was not found among the study participants. Dietary fruit consumption and engagement in physical activity were the least used lifestyle practices. Considering the importance of lifestyle modification in the management of hypertension, it is recommended that primary care clinicians inquire about unhealthy lifestyle practices during clinical consultations as well as motivate hypertensive patients to adopt and adhere to appropriate lifestyle modifications. The benefits of lifestyle modification should not be limited to the control of blood pressure and its complications but also other chronic cardio-metabolic disorders.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors disclose no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

Author contributions

DA conceptualized the research, collected the data and wrote the manuscript, DPO supervised the collection of data, conducted the statistical analysis and wrote the manuscript, NNO collected the data and read through the manuscript. US collected the data and read through the manuscript.

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