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Factor analysis of knowledge, attitude and practice of life style modification measures among hypertensive patients in North – Western Nigeria

Saidu Hadiza, Ahmad Maifada Yakasai, Jamila Ado Yau, Fatima Idris Adamu, Muhammad Sani Mijinyawa[4]

1 *Department of Medicine, Bayero University / Murtala Muhammad Specialist Hospital, Kano, Nigeria*

2 *Public Health and Diagnostic institute, College of Medical Sciences, North- West University, Kano*

3 *Department of Medicine, Bayero University / Aminu Kano Teaching Hospital, Kano, Nigeria*

Abstract

Background: Hypertension is the most common of the risk factors for cardiovascular and renal disease affecting approximately 1 billion people worldwide, with more than 25% prevalence in Nigeria. Adherence to medications and life style changes are important to achieve desired therapeutic goal. This study was designed to evaluate the perception, knowledge and practices of life style modification measures among North – western Nigerian hypertensive patients. **Methods:** This was a cross–sectional study conducted at the Hypertensive clinic of Murtala Muhammad Specialist Hospital, Kano, North – Western Nigeria.Structuredpre-tested interviewer administered questionnaire was used for data collection.Questions werecategorized to elicit participants' demographic characteristics, knowledge, perception and practice of various lifestyle-modification measures. Chi square tests were performed.Reliability and validity of the dimensional structure of the questionnaire were assessed in factor analysis with principal component extraction using varimax rotation. **Results:** A total of 104 participants were recruited; 51 (49%) males and 53 (51%) females. Mean age was 56±11.7 years, with a range of 24 to 90 years. Mean systolic and diastolic BP were 151±25.7mmHg and 90±14.3mmHg respectively. Up to 92% were aware that regular exercise is part of lifestyle modification while 81% are aware about salt restriction. Only 9% and 13% of the participants are aware of the roles of unsaturated oil and reduction in diary food intake in the control of BP. Overall, 33(31.7%) of the patients had good knowledge, 40(38.5%) average knowledge and 31 (30%) poor knowledge. Despite the positive attitude towards lifestyle measures, only 59(56.7%) had good adherence. Questions in the knowledge domain had the best reliability index (alpha Cronbach 0.79) compared to attitude and practice domains. **Conclusion:** The level of knowledge and practice of lifestyle modification in blood pressure control among the studied population is low. Concerted strategies are required to increase the awareness, knowledge and practice of the lifestyle-modification measures in this part of the world.

Keywords: Blood pressure, Hypertension, Nigerian Hypertensive patients.

INTRODUCTION

Hypertension is a major health problem throughout the world with high morbidity and mortality rate. Globally the disease affects over one billion people, seven million of them die each year as a consequence of severe complications and lack of adequate control [1] Prevention is possible, although rarely achieved, and treatment can lead to a reduced incidence of complications, including stroke, coronary heart disease, heart failure, and kidney disease.[2] The global prevalence of hypertension has been increasing.[2]By 2030, 23 million cardiovascular deaths are projected, with 85% occurring in low- and middle-income countries.[3]Hypertension ranks first among the non-communicable diseases in Nigeria with high prevalence in reported series.[4,5,6] A recent community based study of rural and semi urban population in Enugu, Nigeria put the prevalence of hypertension in Nigeria at 32.8%.[7] This is similar to the result of a non-communicable disease survey in Abia state which obtained a prevalence of 31.8%.[8]

Despite all that is known about its adverse health consequences, high blood pressure (BP) is still poorly controlled in Nigeria.[9,10]The Eight Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-8), WHO – ISH and the Nigerian Hypertension Society (NHS) guideline for the management of hypertension recommends lifestyle modification for all patients with hypertension or pre- hypertension[11,12] These modifications, previously referred to as non-pharmacologic therapy, serve as adjunctive therapy for hypertension and include weight reduction, increased physical activity, moderation of dietary sodium and alcohol intake and following the Dietary Approach to Stop Hypertension (DASH) eating plan. A reduction in systolic blood pressure of 5mm Hg has

***Corresponding author:**
Dr. Hadiza Saidu
Department of Medicine, Bayero University / Murtala Muhammad Specialist Hospital, Kano, Nigeria
Tel: +2348033238333
Email:
hsaidu2006[at]yahoo.com

been associated in observational studies with reductions of 14 % in mortality caused by stroke, 9 % in mortality caused by heart disease, and 7 % in all-cause mortality.[13] Also, a weight loss of 4.5 kg, a realistic goal for most individuals who are overweight, can reduce or prevent hypertension.[14] In addition, even when not adequate in themselves to control hypertension, they may reduce the number and doses of antihypertensive medications needed to achieve good control.[15]Patient's knowledge and awareness of blood pressure play important roles in the ability to successfully control hypertension.[16,17]

Several studies were conducted around the world to assess the level of perception, practice and adherence to lifestyle changes among hypertensive patients. Iloh et al and Uzun et al,identified very low adherence rate especially to physical activity measure.[18,19] In addition to the low adherence rate, in Nigeria both hospital and especially community based studieshas shown a poor level awareness, knowledge and practice of the lifestyle-modification measures, but a high level of willingness to adopt the lifestyle measures.[20,21,22]

There is paucity of studies on knowledge and practice of lifestyle modification measures among hypertensive patients in the North Western region of Nigeria despite the advantages earlier mentioned. Therefore, our aim is to assess the level of perception, practice and adherence to lifestyle measures among hypertensive adults in the region. We also assessed the reliability and validity of the questions commonly used to assess knowledge, attitude and practice of lifestyle measures among hypertensives.

METHODOLOGY

The study was cross sectional carried out in Murtala Muhammad Specialist Hospital, Kano a tertiary healthcare institution in Kano State, the North-Western region of Nigeria.

The study protocol was approved by the research and ethics committee of the hospital, before the commencement of the study. The study population comprised of hypertensive patients at least 18years of age, attending the Hypertensive Clinic of the Hospital. One hundred and four patients were selected consecutively, from the male and female hypertensive clinics.

Structured pre-tested interviewer administered questionnaire containing 47 items was the tool for data collection.It was composed of 4 parts. The first part was designed to collect data on the participants' demographic characteristics, the second part on knowledge about life style measures, the third part on the attitude towards the lifestyle measures and the fourth part on the level of adherence to the life style measures. There were 9 questionson knowledge with a total score of 9. Thus, 0 – 3 =poor knowledge, 4 – 6 = Average knowledge and 7 – 9= Good knowledge.

Attitude was measured with both positive and negative statements using Likert scale. Total maximum score was 44. Scores between 0 – 22 were considered as having negative attitude and those scored between 23 – 44 were termed as having positive attitude. The adherence section had a total score of 42. Scores of between 0 – 21 were considered as having bad adherence and those scored between22 – 42 were considered as having good adherence.

Blood pressure was measured using mercury sphygmomanometer according to the recommendations of American Society of Hypertension.[23] The blood pressure was categorized according to JNC-8.[1]

Statistical analysis

Data was analyzed using Statistical Package for Social Science (SPSS version 21.0). Continuous variables were presented as means ± standard deviation. Qualitative variables were expressed as proportions and percentages. A P value of <0.05 was considered statistically significant. Alpha Cronbach coefficients were utilized to examine the reliability of the test instrument and > 0.50 was considered as satisfactory whereas values > 0.90 may indicate redundancy.[24]Factor analysis and principal component extraction using varimax rotation was employed to determine the validity of the structure of the questionnaire. Components with Eigen value > 1 were extracted.

RESULTS

Complete data were available for 104 subjects. The socio-demographic characteristics of the respondents are shown in table 1 and figure 1.There were 51 (49%) males and 53 (51%) females. Mean age was 56±11.7 years with a range of 24 to 90 years. Mean systolic and diastolic BP were 151±25.7 mmHg and 90± 14.3mmHg respectively. 71 participants (68.3%) had no formal education, 11 (10.6%) primary, 10 (9.6%) secondary and 12 (11.5%) tertiary education. The socio - demographic characteristics of the study population are as shown in Table 1.

Eighty – seven (87%) were aware of lifestyle as a measure to control hypertension. All the participants aware had received a health talk on lifestyle measures from either a health personnel (doctors (52%), nurses (20%), dietician (15%) and other sources (42%). See figure 1.

Knowledge was good in 33 (31.7%), average in 40 (38.3%) and poor in 31 (30%). Ninety – two percent (92%) of the participants were aware that regular exercise is part of lifestyle modification while 81% are aware about salt restriction. Awareness about adequate intake of vegetables, fruits, cessation of smoking, moderation of alcohol intake were 66%, 59%, 51% and 44% respectively. However,more than 80% of the participants are unaware of the roles of unsaturated fat and reduction in dairy food intake in the control of BP. See figure 2.

There was a positive attitude towards non- pharmacological therapy. Ninety – nine (99%) of the participants had positive attitude towards life style modification measures. With regards to the practice patterns, 59 (56.7%) of the participants had good adherence while 45 (43.3%) had bad adherence.

Table 2 showed the results of factor analysis on the aspects of knowledge, attitude and practice of lifestyle modification measures. For the knowledge aspect, three components were extracted based on Eigen values >1, whereas for attitude and practice, two components were extracted. Factor loadings on to extracted components are indicated in table 2. Items enquiring about knowledge had good factor loading on to components I and II except for the use of dairy products and unsaturated fat that loaded separately on to component III. Question on attitude loaded well on to component I and II except for the questions on "life style measures improves blood pressure" and "salt reduction improves blood pressure", that failed to load on any component. Similarly, questions on the practice loaded on to I and II, except on exercise, alcohol intake, smoking cessation and visits to dietician that failed to load on any component.

DISCUSSION

This study assessed the level of knowledge and practice patterns of lifestyle modification among individuals with a previous diagnosis of hypertension. Among the participants, 87% had received a health talk on lifestyle modification in blood pressurecontrol from different sources.31.7%had good knowledge, 38.3 % average knowledge and 30% poor knowledge.Our finding is similar but lower than what wasreported in Enugu, south western Nigeria, where 51.4 % of the participants received health talk, with 33% having good knowledge.[20] In a community based study in Abia, Nigeria, none of the participants received a health talk on lifestyle modification with a resultant poor

Table 1: Socio - demographic characteristics of the participants

Characteristics		Frequency	Percentage
Sex	Male	5149	
Female		5351	
Age (years)		<20	00
20 - 39		1211.5	
40 – 59		47	47.2
60 – 79		39	37.5
>80			65.8
Mean Age± SD (years) =		56 ± 11.7	
Tribe	Hausa	103	99
Others		1	1
Marital status	Married	83	80
Single		43	
Others (widowed, Divorced etc)		18	17
Educational Level	None		7168.3
Primary		11	10.6
Secondary		10	9.6
Tertiary			1211.5
Duration of Hypertension	1 – 5		5351
(years)	6 –10		2827
>10			2322
Mean SBP±SD(mmHg)		151 ± 25.7	
Mean DBP±SD(mmHg)		90 ± 14.3	

Key: SD: Standard deviation; SBP :Systolic blood pressure; DBP: Diastolic blood pressure.

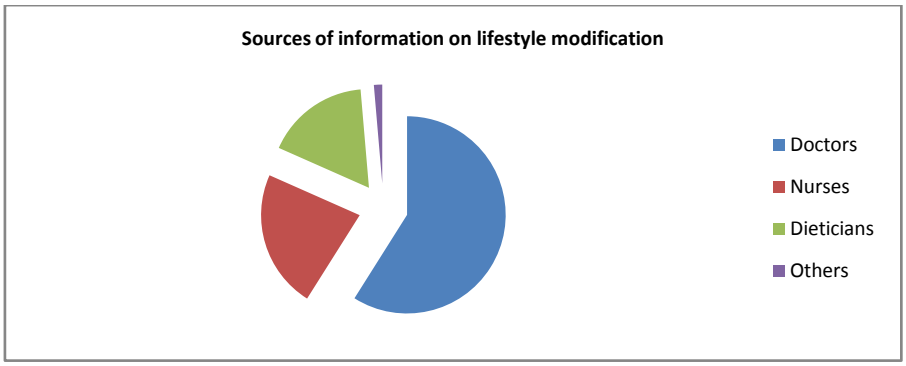

Figure 1: Sources of information on lifestyle modification among the participants

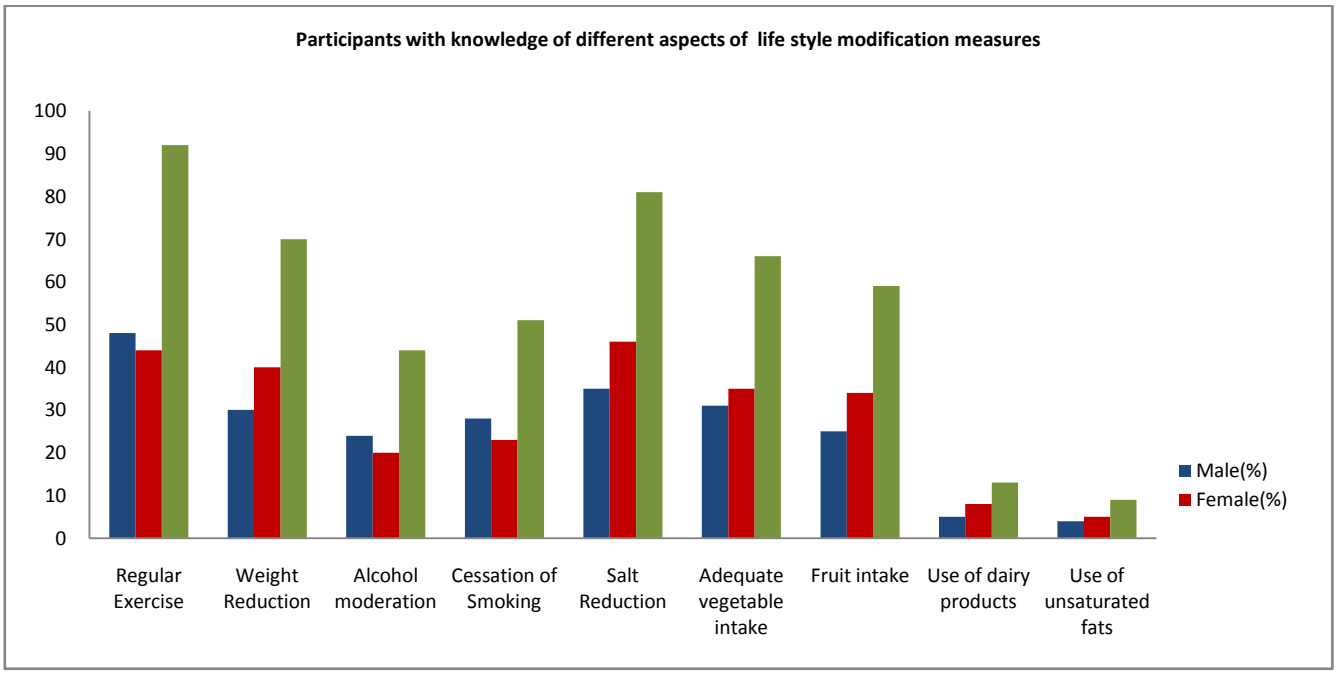

Figure 2: Participants with knowledge of lifestyle modification measures

Table 2: Factor analysis with principal component extraction using varimax rotation

KAP subunits and reliability/sample size adequacy indices	Question	Factor loadings on to extracted components with EV >1.						
		Knowledge*			Attitude†		Practice‡	
		I	II	III	I	II	I	II
Knowledge *Alpha Cronbach = 0.79* *KMO = 0.67* *BTO: Chi-squared = 365, p <0.001.*	Regular Exercise	0.66	-	-	-	-	-	-
	Weight reduction	0.66	0.31	-	-	-	-	-
	Alcohol moderation	-	0.90	-	-	-	-	-
	Cessation of Smoking	-	0.92	-	-	-	-	-
	Salt Reduction	0.63	-	-	-	-	-	-
	Adequate intake of vegetables	0.85	-	-	-	-	-	-
	Fruit intake	0.79	-	-	-	-	-	-
	Use of Dairy products	-	-	0.91	-	-	-	-
	Use of Unsaturated fat	-	-	0.90	-	-	-	-
Attitude *Alpha Cronbach = 0.42* *KMO = 0.71* *BTO: Chi-squared = 155, p <0.001.*	Blood pressure	-	-	-	-	-	-	-
	Salt reduction	-	-	-	-	-	-	-
	High Salt intake	-	-	-	-	0.56	-	-
	High intake of Vegetables/fruits	-	-	-	0.84	-	-	-
	Intake of Grains/legumes	-	-	-	0.82	-	-	-
	High Dairy food intake	-	-	-	-	0.70	-	-
Practice *Alpha Cronbach = 0.32* *KMO = 0.50* *BTO: Chi-squared = 10, p = 0.458.*	High intake of fried foods	-	-	-	-		0.72	-
	Exercise	-	-	-	-	-	0.83	-
	Smoking	-	-	-	-	-	0.33	0.66
	Exercise/BP	-	-	-	-	-	-	-
	Eating fruits/ vegetables	-	-	-	-	-	-	0.80
	Eating dairy produce	-	-	-	-	-	-	0.68
	Exercise frequency	-	-	-	-	-	0.82	-
	Exercise duration	-	-	-	-	-	0.78	-
	Alcohol intake	-	-	-	-	-	-	-
	Smoking	-	-	-	-	-	-	-
	Visit to dietician	-	-	-	-	-	-	-

BP – Blood pressure, BTO - Bartlett's Test of Sphericity, EV – Eigen value, KMO - Kaiser-Meyer-Olkin Measure.

*70% of total variance explained by three components.

†58% of total variance explained by two components.

‡60% of total variance explained by two components.

-denotes factor loadings <0.30 or not relevant.

knowledge level (57.4%) and practice of lifestyle measures.[21] However, in another community based study in Imo, Nigeria, up to 26.7% had good knowledge.[22]In Gavar region, Armenia, knowledge to lifestyle modification measures was also inadequatewith cumulative mean percent score of 50.2 ± 21.5SD.[23]

Majority of the participants (99%) had positive attitude towards lifestyle modification in the management of hypertension. This is consistent with findings from other hospital-based study in Enugu, Nigeria and Turkeywhere more than 50% of the participants adopted healthy lifestyle measures once they were aware of it.[20, 26]However, it is not consistent with finding of a similar study in sub – urban Nigerian community which revealed negative attitude and inadequate practice towards life style modification among hypertensives where up to 81.5% use much table salt, 21.3% eat vegetables regularly with only 9.3% engaging in exercise.[27] This may be due to differences in the study area, in which there is more enlightenment by health workers in hospital based studies.

Factor analyses in this study indicated satisfactory reliability of the knowledge questionnaire with questions loading on to three components that explained 70% of the variability. For the other parts of the questionnaire (attitude and practice), reliability was not satisfactory with specific questions loading on to two components each and total variance was explained in the range of 58 to 60%. However, the principal component extraction found several questions to have very good factor loading ranging from 0.63 to 0.92(knowledge), 0.56 to o.84 (attitude) and 0.66 to 0.83(practice). Given the relatively small sample size, findings need to be confirmed further studies with larger sample size and controlled confounders. Most of the subjects had received health talks from different sources of which the content and extent of coverage may vary.

The present study has a few limitations. Being a hospital based study, the findings may not be representative of the general population. Also, the alpha cronbach coefficient was not satisfactory across attitude and practice questions. This may be related to the small sample size and short nature of the questions.

CONCLUSION

This study revealed that there is a good level of awareness of lifestyle modification which is needed in the management of hypertension. However, the level of knowledge and practice is relatively low. Measures need to be taken to improve both knowledge and practice of this non-pharmacological aspect of patients care.

Correct measures need to be taken from the point of diagnosis of hypertension or pre-hypertension by the doctors or other members of the health care team. The importance of lifestyle modification in the management of hypertension should also be emphasized. Doctors should be more involved in this aspect of patient education despite heavy clinics. Positive effects of health education on BP control has been demonstrated when clinicians are sources of such health education.[28]The patients need to be given a clear understanding of every aspect oftheir care including the life style measures. The government and health policy makers need to assist through public enlightenment campaigns and sensitization programs down to the community level, where awareness and knowledge is poor. With good awareness level and adequate motivation hypertension and its complications in our environment could be controlled.

Further high powered studies are also needed to assess the reliability and validity of test instruments used to determine knowledge, attitude and practice of hypertension lifestyle measures in our environment.

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Authors' contributions

SH conceived the study, participated in the study design, data acquisition and drafted the manuscript. FIA and JAY participated in the conception of study, the study design and supervision of the manuscript writing. AMY participated in the study design, statistical analysis and supervision of the manuscript writing. MSM participated in the overall supervision from inception to manuscript writing.

Conflict of interest

The Authors declare that there are no conflicts of interest.

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