



Association of Socio Demographic Factors and Blood Pressure Control in Patients attending a Tertiary Health Facility in North Eastern Nigeria

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Abstract

Hypertension is an overwhelming global challenge, it is high in Nigeria and there is generally low level of awareness. The mainstay of management is pharmacotherapy, interventions such as lifestyle and diet are often overlooked. Poor knowledge, attitude and practices of lifestyle and dietary modifications are major challenges to managing hypertension. This study was conducted to assess patient's knowledge, attitude and practices of Lifestyle and diet. A multiphasic interventional study was adopted, which is a questionnaire based study with sections on knowledge, attitude and practices of lifestyle and diet. The pretested interviewer's questionnaire was administered before and after the intervention. The intervention however included counselling on the benefits of lifestyle and dietary modification on clinic days and through reminder phone calls. 286 patients with hypertension were interviewed using the questionnaire. Out of the 286 participants, majority (51.7%) were females and the larger age group are 40-49. Knowledge, attitude and practices of lifestyle and diet improved after intervention. Scores of knowledge attitude and practice were compared on the basis of Wilcoxon signed rank test before and after the intervention. The results of this study indicates that patients need more advice and counselling on lifestyle and dietary modifications. Therefore, clinicians and health educators should give adequate and relevant information on the value of lifestyle and dietary modifications in the control of blood pressure.

Keywords: Hypertension, Blood pressure, Knowledge, Practices.

Introduction

Hypertension contributes to approximately 17 million deaths worldwide every year despite the fact that it is one of the major, modifiable risk factors of cardiovascular diseases (Yacheta et al., 2004). The prevalence of hypertension in Nepal increased from 26.4 percent in 2000 to 40 percent in 2008, and this figure is projected to reach 60 percent by 2025 (Dhital et al., 2013). The prevalence of hypertension is higher in low- and middle-income countries (Ibrahim et al., 2012) where health resources are scarce and stretched by a high burden of infectious diseases such as HIV, malaria and tuberculosis. (Ibrahim et al., 2012). Currently the world wide burden of hypertension is greatest in low and middle income countries (LMIC's) where it affects about 1 out of 5 adults which is projected to increase and the mortality rates of cardiovascular diseases are also higher in these countries, these

accounts for major economic burdens (Seedat, 2000). According to the World Health Organization (WHO), worldwide raised blood pressure is estimated to cause 7.5 million deaths which is about 12% of the total of all deaths. Globally, the overall prevalence of raised blood pressure in adults aged 25 and above was around 40% in 2008, however because of the growing population, the number of people with uncontrolled hypertension rose from 600 million in 1980 to nearly 1 billion in 2008. The increase in physical activity and reduced salt intake were associated with successful blood pressure control while increased BMI was negatively associated with adequate blood pressure control (Myung et al, 2017)

Prevalence of hypertension is high and ranks first among the non-communicable diseases in the country (Akinkugbe, 1997). The prevalence of hypertension is high among the Nigerian

population, appropriate interventions need to be developed and implemented to reduce the preventable burden of hypertension especially at primary health care center's which is the first point of call for over 50% of the Nigerian population (Akinluaetal.,2015). A community based study of rural and semi urban population in Enugu, Nigeria put the prevalence of hypertension in Nigeria at 32.8% (Ulasi, *etal.*, 2010) and increasing (8-46%), (Ogahet *al.*, 2012). A similar figure (31.8%) was reported for Abia(Ogahet *al.*, 2013).

In Nigeria, Hypertension is basically managed with pharmacotherapy, interventions such as lifestyle and dietary modifications often not emphasized. Lifestyle and dietary modification programs in developing countries are often affected by low literacy levels and income(Okwuonu*etal.*,2014).The 8th Joint National Committee on Prevention, Detection, Evaluation and Treatment of high blood pressure and the Nigerian Hypertension Society (NHS) guideline for the management of hypertension recommends lifestyle modification for all patients with hypertension. 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 using the Dietary Approach to Stop Hypertension (DASH) eating plan (Okwuonu*etal.*,2014).

The goal of hypertension management is to prevent short and long term complications by achieving and maintaining the blood pressure lower than 140/90mm Hg (Lambert*etal.*, 2006). Patients need to be aware of various modifiable risk factors associated with hypertension which can improve their blood pressure (Akter*etal.*, 2014). The Dietary Approach to Stop Hypertension (DASH) eating plan which effectively lowers blood pressure should be encouraged in these patients (Okwuonu*etal.*, 2014).The DASH plan emphasizes fruits, vegetables and low fat dairy products, protein and reduction in fat and cholesterol etc. (Okwuonu*etal.*, 2014).

Materials and methods

Study site

The study was conducted at the University of Maiduguri Teaching Hospital (UMTH), Maiduguri. Borno State, which lies on the geographical coordinates of 11° 50' 42" N, 13° 9' 35" E.UMTH is an ultra -modern hospital owned by the Federal Government of Nigeria. It is one of the tertiary health institutions in the North-East of the country and was designated as a center of excellence in medical and surgical conditions. University of Maiduguri Teaching Hospital has 23 wards and several units with a bed capacity of 650. UMTH is saddled with the responsibilities of training,

teaching and research and serves as a referral center for the six North-Eastern States of Nigeria and the neighboring countries of Chad, Cameroon and Niger Republics.

Research design

The study was a multi-phase Interventional study consisting of three phases where Phase 1 was the pre intervention phase, Phase 2 the intervention phase and Phase 3 was the post intervention phase.

Data Instrument

A pretested interviewer administered questionnaire was used in the study (Appendix III).The Questionnaire was adapted from a study conducted by Shibiruet *al.*, 2016. The first part of the questionnaire gathered data relating to the demographics of the patient, their age, sex, marital status, educational level and employment status. The second part of the questionnaire include questions related to knowledge and attitude of lifestyle and diet modifications, questions such as Do you believe exercise can lower your blood pressure and what are the benefits of exercise? The last part of the questionnaire included questions relating to the practices of lifestyle and diet these include do you engage in healthy diet?

The Questionnaire was scored using the Likert scale, each correct answer was scored as 1 and an incorrect answer scored as 0, a total of 15 points is an acceptable summary score. The questionnaire was compiled in English and then translated to the respondents in either Hausa, Shuwa or Kanuri by the interviewer. The baseline characteristics of the patients were obtained from the patient's hospital folder, blood pressure readings recorded in the hospital folder were noted. The questionnaire was tested on 10% of the sample size prior to the study in a similar population and questions were modified after the pilot test, to suit the study. Questions such as 'Do you take alcohol' was deleted from the questionnaire, this is because of the cultural inclinations related to alcohol and that during the pilot study patients find the question offensive. The data from the pilot test were not used in the final study. A call chart was used to register each and every call made to a participant and a diary to note clinic appointment days of the participants

Pre intervention phase

During this phase selected subjects were interviewed. Data collection included baseline demographics, subjects' knowledge, attitude and practices of lifestyle and diet modifications.

Intervention Phase

A prospective intervention (counselling and education) on lifestyle and dietary modifications. A structured advice and counselling (Appendix V)

based on the JNC VII recommendations on lifestyle and diet was delivered on the clinic days and biweekly via phone calls. These included smoking cessation, reduction in salt, total and saturated fats, red meat, sugar, sugary drinks, refined carbohydrate and alcohol-except modest amounts of red wine and increase in fruits, vegetables, whole grains, fish, poultry, low fat dairy product, olives and olive oil etc.

Post Intervention Phase

Post-intervention assessment of knowledge and practices of lifestyle and dietary modifications was carried out using the same questionnaire administered during pre intervention.

Study Population

The population for the study included consenting hypertensive patients registered with and attending General outPatient Department (GOPD) and Cardiology Clinic of University of Maiduguri Teaching Hospital. Patients that fit into the inclusion criteria and who consent to take part were recruited into the study.

Inclusion criteria

These include outpatient hypertensive patients, old and new cases of hypertension, adults regardless of sex and patients with active mobile phones

Exclusion criteria

These include patients with mental illness leading to confusion e.g. delirium, dementia, psychosis, schizophrenia etc., In-patients, patients with renal failure, cardiac failure, pregnancy-induced hypertensive patients and non-consenting patients

Sample Size

From the study population attending GOPD/Cardiology Clinic of University of Maiduguri Teaching Hospital, the sample size was determined which was estimated to be less than 10,000 according to the records of the Health Management Information System (HMIS) of the hospital.

For population < 10,000

$$nf = n/1 + (n)/(N) \text{ (Araoye, 2004)}$$

nf= desired sample size, when study population < 10,000

n=desired sample size, when study population > 10,000

N= estimate of the population size

$$nf = 400/1 + 400/1000$$

$$nf = 400/1.4$$

$$nf = 286$$

286+10% of sample size (29) in the case of attrition= 315 patients

Ethical Clearance

Prior formal permission was obtained from the Research and Ethics Committee of the UMTH and a consent form was administered to volunteer patients after informing and educating them on the study protocol.

Data Collection

Data was collected from each subject using the designed questionnaire with sections on socio demographic data, degree of knowledge/attitude towards lifestyle or dietary modification and frequency of practice of lifestyle and dietary modification

Data Analysis

The questionnaires were coded and analyzed using statistical package for social sciences version 16. Descriptive statistics was used to summarize socio demographic parameters. To compare the knowledge, attitude and practices scores before and after intervention a Mann whitney test was carried out. For the knowledge, attitude and practices questions a correct or positive answer was scored as 1 whereas an incorrect or negative answer was scored as 0. For the establishment of association between the demographic data and time of intervention and to measure the blood pressure control, a nonlinear regression analysis was carried out. Findings were presented using relevant frequency tables. Statistical calculation was done at 5% significance level.

Results

This study was conducted at university of Maiduguri teaching hospital to evaluate the effect of lifestyle and dietary modifications in hypertensive patients. The study showed hypertension was more common among females than males (Fig 1).

Blood pressure control was associated with socio demographics of the patients. there was significant blood pressure control in the educated compared to the uneducated this trend may be related to the fact that literacy level is associated with perception, beliefs and understanding (Fig 2).

Table 1. Distribution of Socio-demographic Characteristics of the Hypertensive Patients attending UMTH (N=286)

S/no	Participants Characteristics	Frequency (%)
1.	Sex	
	Male	138 (48.3)
	Female	148 (51.7)
2.	Age (yrs.)	
	< 30	18 (6.3)
	30-39	35 (12.2)
	40-49	86 (30.1)
	50-59	85 (29.7)
	60-69	43 (15)
	70-79	13 (4.5)
	>79	6 (2.1)
3.	Ethnic Group	
	Kanuri	102 (35.7)
	Shuwa	43 (15.0)
	Hausa	42 (14.7)
	Babur	19 (6.6)
	Others	80 (28.0)
4.	Marital Status	
	Married	214 (74.8)
	Widowed	49 (17.1)
	Single	20 (7.0)
	Divorced	3 (1.0)
5.	Educational level	
	Primary	35 (12.2)
	Secondary	24 (8.4)
	Tertiary	46 (16.1)
	University	72 (25.5)
	No formal education	109 (38.1)
6.	Occupation	
	Civil servants	74 (25.9)
	Self employed	81 (28.3)
	Unemployed	114 (39.9)
	Student/Volunteer	3 (1.0)
	Retiree	14 (4.9)

Table2. Associations between Socio-demographic Characteristics and Blood Pressure Control

Factors	Time	F	% with controlled BP	p value	OR	95% CI
Gender						
Male	Pre	138	34.8	Ref		
	post	138	43.5	0.139	1.442	0.887 – 2.344
Female	Pre	148	39.9	Ref		
	post	148	48.1	0.002	2.092	1.316 – 3.226
Age						
< 50	Pre	139	43.2	Ref		
	post	139	54.0	0.072	1.543	0.961 – 2.477
≥50	Pre	147	32.0	Ref		
	post	147	48.3	0.005	1.988	1.237 – 3.193
Educational level						
No formal	Pre	109	42.2	Ref		
	post	109	50.5	0.001	2.012	1.312-3.086
Formal	Pre	177	34.5	Ref		
	post	177	51.4	0.222	1.395	0.818-2.380
Marital status						
Not married	Pre	72	36.1	Ref		
	post	72	48.6	0.004	1.770	1.204-2.600
Married	Pre	214	37.9	Ref		
	post	214	51.9	0.130	1.674	0.059-3.261
Occupation						
Employed	Pre	169	39.1	Ref		
	post	169	53.3	0.009	1.778	1.154-2.739
Unemployed	Pre	117	35.0	Ref		
	post	117	47.9	0.047	1.702	1.006-2.877
Total						
	Pre	286	37.4	Ref		
	post	286	51.0	0.001	1.745	1.250-2.435

Regression analysis

Key: OR= Odd Ratio, F= Frequency, CI= Confidence Intervals

Discussion

Findings from table1 had been reported in a study carried out in Egypt by Abdelhay and El Mezayen in Egypt (2015). Anowie and Darkwa (2015) have similar findings. The same trend was seen in a study conducted in Nepal by Sharma *et al* (2014). From the findings of this study, it is evident that the largest age group fell within the age range of 40-59 (59.8 %) this was reported in a study conducted by Pushpamala (2015) in India which showed that majority (58 %) of the hypertensive patients belong to age group 45-55years. This was reported in a study conducted by Abdelhay and El mezayen 2015 which showed that the largest age group fell within 55-64 years. This is similar to a study conducted in Ibadan, Nigeria by Abdullahi and Amzat, (2011) which showed there is a relationship between level of education and knowledge of risk factors of hypertension. The same findings were reported in a study conducted by Li *et al.*, (2013) who mentioned that educational level has an impact in hypertension control and that 77.3% of the patients in the study were not educated and that

those who have no formal education have problem with acceptance. A similar trend was also observed in the employed in comparison with the unemployed class, this may be due to the fact that the employed earn salary/wages and therefore have choice to what they eat. The married classes also have a significant improvement in their blood pressure levels compared with the unmarried, this may be related to the fact that the married have a choice to what they eat and can regulate their salt intake *etc.* In general, the intervention significantly improved the blood pressure levels of patients, This is similar to the result of an interventional study conducted by Saranya *et al.*, (2016) which reported that knowledge, attitude and practice scores improved after intervention which is also in conformity with a study conducted by Mahajan *et al.*, (2012) in Mumbai, India. This reported that the poor knowledge attitude and practice decreased after the intervention and those practices of lifestyle modification improved after intervention. There is relationship between degree of subjects' knowledge about dietary modification and

hypertensive control, and the association between degree of subjects' knowledge about lifestyle modification and hypertensive control. This is important because patients would most likely adopt positive behavioral changes that would show clinically significant improvement in blood pressure control, coronary heart diseases risk factors and quality of life measures as reported by Toobert *et al.* (2003). Behavioural change, although difficult to obtain, is possible with regular support and counselling, therefore patient education is a key to behavioural change. The same study conducted by Toolbert *et al.* (2003) reported a smoking cessation rate of 36% in diabetes-hypertensive patients undergoing lifestyle modification educational programme compared with only 8% in the usual care group. It is critical that persons with high B.P are advised to stop smoking because B.P Levels in smokers are rarely recorded during or immediately after smoking. When acute rises in B.P occur, usual B.P levels of smokers tend to be systematically underestimated (Primatesta *et al.*, 2001)

Exercise is an aspect of lifestyle modification which should never be neglected. Exercise improves circulatory function, an important factor in hypertension management. It helps maintain normal body weight, aids in breathing, digestion and metabolism (Eric and Gourley, 1993). Exercise contributes positively to well-being physically and mentally. It also increases glucose utilization. Hypertensives should participate in some form of regular exercise as it will enhance stable blood glucose and blood pressure.

Overall, this study revealed an association between practice of lifestyle modification and blood pressure control. A comprehensive lifestyle programme has been reported by Toolbert *et al.* (2003) to improve blood pressure control, lower the risk of cardiovascular diseases which are potential complications of hypertension and improves quality of life outcomes. Research showed that intensive lifestyle changes may prevent and even reverse coronary heart disease (Ornish *et al.*, 1998), which occur 2.5 times more in hypertensives than in normotensives (Haffner *et al.*, 1998). The study also showed that there was an association between practice of dietary modification and blood pressure control. This agrees with Trichopoulou *et al.*, (2003) who found that adherence to dietary modification caused a 25% reduction in overall mortality due to poor blood pressure control. The results of this study supports dietary (low fat, low carbohydrate, moderately high protein) and lifestyle modification (exercise and maintenance of ideal body weight) in managing hypertension and patient education and counselling plays a key role. However, there were limitations to the study as follows; i- The research results are applicable to one health institution and may not be generalized to

other health facilities in Nigeria. ii- Decrease in blood pressure is not uniform to all patients. iii- The study was carried out in a year; this may not give the true picture of patient's lifestyle practices iv- The Study did not capture patient's medication and adherence.

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