

Impact of Health Education on Hypertension Knowledge, Motivation and Preventive Practices towards Hypertension Control among Pre-Hypertensive Traders in Lagos State, Nigeria

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ABSTRACT: *Undiagnosed cases of hypertension remain prevalent in developing countries. Insufficient and lack of knowledge of hypertension and its risk factors limit its proper management and healthy self-care practices. Therefore, this study assessed effect of health-education intervention on hypertension related knowledge, motivation and preventive practices among traders in Lagos State. Quasi-experimental design was employed with seventy participants forming experimental and control group each in major markets of Alimosho and Ajeromi-Ifelodun local government areas of Lagos State, Nigeria. Multistage sampling technique was used. Interviewer administered questionnaire was developed. Weight (kg) and height (m) were measured by bathroom weighing scale and sphygmomanometer respectively. Participants' body mass index (kg/m²) was calculated. Data were collected at baseline, immediate post intervention and sixth week of follow-up; analyzed by SPSS version 21.0 with level of significance placed at $p < 0.05$. Frequency, percentage, means and standard deviation were used to describe findings while independent t-test was used for inferential statistics. Treatment effect were judged on t-distribution and Cohen's d effect size. Participants' mean age in experimental and control groups was 44.91 ± 8.82 years and 44.37 ± 8.80 years respectively. More than a quarter (40.0%) in experimental group and 34.3% in control group had tertiary education. Overweight is 22.9% and 20.0%, while obesity is 41.4% and 57.1% in experimental and control groups respectively. Knowledge, motivation and preventive practices*

significantly increased after intervention among experimental group more than control group ($p < 0.05$). Information-Motivation Behavioral (IMB) model promotes hypertension knowledge, motivation and preventive practices.

KEYWORDS: health education, knowledge, motivation, pre-hypertension, preventive practices, traders

INTRODUCTION

Hypertension is a major contributor to cardiovascular diseases such as stroke, coronary artery disease, heart failure, atrial fibrillation, peripheral arterial disease, vision loss, chronic kidney disease and dementia among others (Lackland & Weber 2015; Lau, et al 2017). It is currently affecting over one billion people worldwide with nearly 26% of adult population being affected (Eze et al., 2020; WHO 2019). United Nations Sustainable Development Goal and political declaration on reducing mortality related to non-communicable diseases by one-third by 2030 and promotion of enabling, safe, and healthy working environments for workers seem unattainable in Africa because most workers are employed in informal sector and lack adequate access to structured occupational health programs and services (Ahaneku, 2011).

Factors identified to be associated with prevalence of hypertension among adults include gender, family history of cardiovascular diseases, lifestyle factors such as unhealthy food intake, physical inactivity, tobacco and alcohol use, abnormal serum lipids and lipoproteins, obesity, stress and insufficient sleep (Koti & Roetzheim 2015; Thawornchaisit et al., 2013). Hypertension is responsible for high economic and health costs due to expensive treatments over long periods and hospitalizations due to its complications (Ekwunife et al., 2010, Banik, 2009).

One in four market traders are undiagnosed of hypertension and asymptomatic. Majority of them are not aware of their condition until clinical manifestation of its complications (Eze et al., 2020; Vincent-Onabajo, et al, 2017; Mills et al., 2016). Most traders live sedentary lifestyle and eat foods rich in high salt and fat at work. They are unlikely to benefit from pre-employment and periodic medical screening programs provided to those in structured official sector (Dzhambov & Dimitrova, 2018; Oladoyinbo, et al, 2015; Ibrahim, 2012). Knowledge or awareness of hypertension is a strong predictor of prevention, treatment, self-care practices and medication adherence among hypertensive patients (Chotisiri et al., 2016; Barr et al., 2014; Cohn et al., 2012). Evidences have shown that health education strategies enhance cardiac awareness, adherence to lifestyle changes and medication adherence, as well as drop in prevalence of hypertension (Lu et al., 2015; Awosan, et al., 2013).

Information-motivation-behavioral (IMB) skills identify three fundamental contributing factors to initiation and maintenance of healthy behaviors. These are; accurate information that can be easily translated into health behavior performance; personal and social motivation to act on such information; and activity skills to successfully carry out the health behavior (Fisher &

Fisher, 2000). However, there is paucity of studies on health education based on IMB theory being used as intervention to address prevention of hypertension among traders in Lagos State, Nigeria. The available information is on retirees (Ozomena et al, 2019; Gu et al., 2010). Hence, this study evaluates effect of health education intervention on hypertension related knowledge, motivation, preventive behavior of market traders in Alimosho Local Government Area of Lagos State based on Information Motivation and Behavioral Skill model.

MATERIALS AND METHODS

This research adopted quasi-experimental design which comprised of one experimental and one control group. Study participants were traders in selected markets of Alimosho and Ajeromi-Ifelodun local government areas of Lagos State, Nigeria. The city extends to west mainland of lagoon, Ikeja, the capital of Lagos and Agege. More than 25 miles northwest of Lagos Island. According to Nigerian National Population Commission, Lagos is the largest city in Africa with an estimated population of 21 million inhabitants in 2016. Lagos was originally inhabited by Awori group of Yoruba people. Today, it has a very diverse population due to heavy migration from other parts of Nigeria and surrounding countries. There are more than 250 ethnic groups in Lagos and they include; Yoruba, Hausa, Igbo, and Fulani. However, Yoruba is dominant group. Few minorities of American, British, East Indian, Chinese, white Zimbabwean, Greek, Syrian, Lebanese and Japanese also reside in the city. Lagos State has 20 Local government areas and 39 Local Council Development Areas. Alimosho local government is the largest LGA. Its biggest market is Ile-Epo market which is known for perishable, processed and or unprocessed food items. Alayabiagba market in Ajeromi- Ifelodun LGA is also widely known and patronized in Lagos State. These markets open on week days and weekends as well as public holidays. Market traders who were adults within age of 30-60 years, who traded in shops, belonged to traders' association, those who gave informed consent to participate in study and those who had not been diagnosed of hypertension before. Sample size was calculated based on comparison of two independent means (Snedecor and Cochran, 1989) formulae with a standardized effect size of 0.50 and a standard deviation of 5%. The level of significance was set at $p < 0.05$ and a study power of 80% was assumed.

$$n = \frac{2(Z_{\alpha/2} + Z_{1-\beta})^2}{\left(\frac{\mu_1 + \mu_2}{\sigma}\right)^2} = \frac{2(1.96 + 0.84)^2}{(0.5)^2} = \frac{16}{0.25} = 64$$

Estimated sample size for each group was 64

Total number of participants for the experimental and control group $2n = 64 \times 2 = 128$

10% attrition = 12.8

$12.8 + 128 = 140.8$

Based on this calculation, a total number of 140.8 participants (70.4 X 2) which represents 70 people per group were enrolled for the study. A three-stage sampling procedure was performed to select study participants. First stage involved random selection of two local government areas (Alimosho and Ajeromi-Ifelodun) in Lagos State, Nigeria. This was followed by purposive selection of largest markets in each selected LGAs. Ile-epo Oke Odo market in Alimosho LGA (which had 1954 shops) and Alayabiagba market in Ajeromi- Ifelodun LGA (which comprised of 801 shops) were selected because they are biggest, well patronized by remarkable ethnic groups and have large representation of merchants more than other markets in their respective LGA.

Alayabiagba market was used as control group while Ile-epo Oke odo market was selected for experimental group. Last stage involved systematic selection of eligible study participants by listing of number of the shops for sampling frame to calculate sampling interval as total number of shops (1954 and 801 for experimental group and control group respectively) divided by calculated sample size of (140). This gave sampling interval of 14 for experimental group and 6 for control group.

A structured and interviewer administered questionnaire was developed based on literature review. It was used to obtain information on participants' demographic characteristics, hypertension knowledge, motivation, and prevention practices. Blood pressure levels were classified as; normal (SBP < 120 mmHg and DBP < 80 mmHg); Prehypertension (SBP 120–139 mmHg and/ or DBP 80–89 mmHg); hypertension (SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg). Weight (kg) and height (m) were measured by using bathroom weighing scale and sphygmomanometer respectively. Participants' body mass index (kg/m²) was calculated. With a response format of “yes” or “no”, hypertension knowledge was measured through 21-item questions; motivation on 40-item questions; behavioral skill on 15-item questions and preventive practices on 24-item questions. The questions involved meaning of hypertension; risk factors of hypertension, its signs and symptoms, BP measurement and interpretation, complications, management and control. Each correct response was allotted 1 mark while incorrect answer had 0 allotted. Knowledge index which ranges from higher score indicates greater hypertension knowledge.

Additionally, behavioural skills towards hypertension prevention was assessed using 5-question item. Response was on likert scale and options provided include; confident (3 points), fairly confident (2 points), barely confident (1 point) and not at all (0 point). Prevention of hypertension contained 8-item questions which focused on four domains such as routine blood pressure check, regular physical activity, abstinence or reduction in use of substance and healthy diet.

Ten research assistants were recruited and trained for this study. Data were collected three (3) times for baseline, immediate post-intervention and impact evaluation at different intervals. Intervention was conducted for six weeks and it involved health education on hypertension, cause, risk factors, life style modifiers, complications and preventive measures given to experimental group. Immediate post intervention data were collected on last day of the training.

The aim was to assess changes in hypertension knowledge, motivation, behavioral skill and prevention practices.

At 6th week follow-up, a third data collection was performed to measure impact of intervention particularly with respect to outcomes on increase in knowledge, motivation, behavioral skill, prevention of hypertension. At baseline, experimental group and control group had 70 participants each. However, one participant from experimental group pulled out due to undisclosed ailment. This led to having 98.6% response rate at post intervention and follow-up periods.

Pilot study was conducted to pretest research instruments among 20 traders (with similar socio-demographic characteristics with the study participants) in Ipodo market, Ikeja of Lagos State. Reliability test was performed by Statistical Package for Service Solution (SPSS) version 22 and overall α -cronbach score of 0.80 was obtained. Knowledge has 0.77. Motivation scored 0.79. Behavioral skill has 0.89 and prevention practices scored 0.75.

Data obtained were screened to ascertain completeness of the data. Thereafter, analysis of data was performed by SPSS with level of significance placed at $p < 0.05$. Descriptive (means, standard deviation, standard error) and inferential (t-test) statistics were carried out. Mean for scores of variables were compared between the two groups using independent t-test. Treatment effect were judged on t-distribution with degree of freedom to incorporate variation between the two experimental groups and with Cohen's *d* effect size.

RESULTS

Basic biodemographic characteristics of Participants

Participants' mean age in experimental and control groups was 44.91 ± 8.82 years and 44.37 ± 8.80 years respectively. More than a quarter (40.0%) in experimental group and 34.3% in control group had tertiary education. More than half in experimental (58.6%) and control groups (54.3%; 57.1%) were married and Christians respectively. Participants' body mass index showed that 22.9% and 20.0% were overweight while 41.4% and 57.1% were obese in experimental and control groups respectively (Table 1).

Table 1: Basic Characteristics of Participants

Variables	Experimental group (n= 70)		Control (n=70)		χ^2	P
	F	%	F	%		
Age						
30-40	26	37.1	27	38.6	0.35	0.84
41-51	25	35.7	27	38.6		
52-62	19	27.1	16	22.9		
Mean±SD	44.91±8.82		44.37±8.80			
Gender						
Female	30	42.9	33	47.1	0.26	0.73
Male	40	57.1	37	52.9		
Formal Education						
None	18	25.7	19	27.1	0.52	0.91
Primary	11	15.7	12	17.1		
Secondary	13	18.6	15	21.4		
Tertiary	28	40.0	25	34.3		
Marital Status						
Married	41	58.6	38	54.3	1.48	0.69
Single	13	18.6	10	14.3		
Widowed	9	12.9	13	18.6		
Divorced	7	10.0	9	12.9		
Religion						
Christian	41	58.6	40	57.1	0.42	0.81
Islam	27	38.6	29	41.4		
Others	2	2.9	1	1.4		
Body Mass Index						
Under weight	1	1.4	2	2.9	5.30	0.38
Normal	24	34.4	14	20.0		
Overweight	16	22.9	14	20.0		
Obesity class 1	15	21.4	18	25.7		
Obesity class11	8	11.4	14	20.0		
Extreme obesity	6	8.6	8	11.4		

Participants' level of hypertension Knowledge, Motivation, Behavioral skills and Preventive Practices at Baseline

Baseline information of participants are presented on table 2. There were more participants in control group with high hypertension knowledge (65.7%), motivation (34.3%) and preventive practices (67.1%) towards hypertension control than in experimental group. While, participants with high behavioral skills (81.4%) were more among experimental group than control group. However, there was no significant difference in mean scores of these variables between experimental and control groups ($p > 0.05$).

Table 2: Participants' Hypertension Knowledge, Motivation, Behavioral skills and Preventive Practices at Baseline

Variable	Category	Experimental group		Control group		t-test	P
		F	%	F	%		
Knowledge	Low	6	8.6	3	4.3	0.02	0.98
	Moderate	26	37.1	21	30.0		
	High	38	54.3	46	65.7		
Mean ± SD		15.37 ± 5.20		15.33 ± 3.93			
Motivation	Low	55	78.6	46	65.7	-1.74	0.08
	High	15	21.4	24	34.3		
Mean ± SD		16.06±7.60		17.99±5.50			
Behavioral skills	Low	13	18.6	16	22.9	0.51	0.61
	High	57	81.4	54	77.1		
Mean ± SD		10.57±3.74		10.26±3.25			
Preventive practices	Low	41	58.6	23	32.9	-1.87	0.06
	High	29	41.4	47	67.1		
Mean±SD		12.14±5.60		13.82±5.07			

Participants' level of hypertension Knowledge, Motivation, Behavioral skills and Preventive Practices at Immediate Post Intervention

Table 3 presents participants' level of hypertension knowledge, motivation, behavioral skills and preventive practices at immediate post intervention. There were more participants in experimental group with high hypertension knowledge (98.6%), motivation (57.1%), behavioral skills (97.1%) and preventive practices (71.4%) towards hypertension control than in control group. There was significant difference in mean scores of these variables between experimental and control groups ($p < 0.05$).

Table 3: Participants' Hypertension Knowledge, Motivation, Behavioral skills and Preventive Practices at Immediate Post Intervention

Variable	Category	Experimental group		Control group		t-test	P
		F	%	F	%		
Knowledge	Low	-	-	3	4.3	6.60	<0.01
	Moderate	-	-	21	30.0		
	High	69	98.6	46	65.7		
Mean±SD		18.64±1.68		15.30±3.85			
Motivation	Low	29	41.4	47	67.1	6.27	<0.01
	High	40	57.1	23	32.9		
Mean±SD		27.49±11.52		17.91±5.49			
Behavioral skills	Low	1	1.4	16	22.9	4.66	<0.01
	High	68	97.1	54	77.1		

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Mean±SD		12.38±2.09		10.20±3.27			
Preventive practices	Low	19	27.1	23	32.9	2.91	<0.01
	High	50	71.4	47	67.1		
Mean±SD		16.28±5.16		13.80±5.08			

Impacts Evaluation of Participants' level of hypertension Knowledge, Motivation, Behavioral skills and Preventive Practices

Table 4 presents findings on impacts evaluation of participants' level of hypertension knowledge, motivation, behavioral skills and preventive practices between baseline and post intervention stages. There was significant increase in participants' level of knowledge from 15.37±5.20 to 18.64±1.68 after health education with effect size of -0.85 at p<0.01.

Likewise, participants' motivation (16.06±7.60 to 30.09±9.85), behavioral skills (10.57±3.74 to 12.86±1.84) and preventive practices (12.14±5.60 to 19.83±4.15) also significantly increased with effect sizes of -1.61, -0.78 and -1.57 at p<0.01 respectively.

Table 4: Impacts Evaluation of Participants' Hypertension Knowledge, Motivation, Behavioral skills and Preventive Practices among Experimental Group

Variables	Baseline N=70 x̄(SD)	At 6 th week follow-up N=69 x̄(SD)	ME(CI)	p-value
Knowledge	15.37(5.20)	20.04(1.54)	-1.22 (-1.86 to -0.59)	<0.01
Motivation	16.06(7.60)	30.09(9.85)	-1.61 (-3.06 to 0.16)	<0.01
Behavioral skills	10.57(3.74)	12.86 (1.84)	-0.78 (-1.27 to -0.0)	<0.01
Preventive Practices	12.14 (5.60)	19.83 (4.15)	-1.57 (-2.38 to -0.76)	<0.01

DISCUSSION

In recent years, prevalence of hypertension is increasing in developing countries like Nigeria. This has been associated to untimely diagnosis, inadequate obesity management, high morbidity and death in adult population. This is evident with high prevalence of overweight and obesity among participants of this study.

Mean age of traders in this study is similar to that of Eze et al., (2020) on impact of health education intervention on knowledge and prevalence of hypertension among retirees in southeast Nigeria. But it is lower than what Ozoemena et al. (2019) reported in their experimental study in Nigeria. However, Ozoemena et al. (2019) affirmed to report of this study that there are high proportion of adults with tertiary education in Nigeria.

Furthermore, this study found low hypertension related knowledge at baseline in both intervention and control groups. Knowledge of specific domains of hypertension like risk factors, complications, and prevention was minimal. This finding agrees to studies of traders in Nigeria (Osuala et al., 2014; Iyalomhe et al., 2010) and Egypt (Al-wehedy et al., 2014) where

low level of knowledge was reported. Poor knowledge of hypertension can be linked to limited access to adequate health information by workers in most informal sectors where there is insufficient or lack of structured occupational health services (Banik, 2009).

Appropriate knowledge of hypertension and its prevention has been highlighted as a prerequisite for lifestyle changes, medication adherence, and efficient blood pressure management among hypertensive patients, including market traders (Cohn, et al., 2012; Chotisiri et al., 2016). When compared to control group, mean score of hypertension knowledge among intervention group in this study rose considerably at baseline and immediately after intervention. This is similar to a recent study, which found that post-intervention hypertension knowledge, attitude, and practices (KAP) scores were greater than baseline (Roopa et al., 2014). Ozoemena et al. (2019) also found that education about a healthy diet and medication adherence greatly increased knowledge of hypertension.

Low motivation towards hypertension prevention was observed among intervention group and control group at baseline in this study. However, a study conducted in a rural community in Indonesia revealed positive attitude among most hypertensive patients at baseline (Kurnia et al., 2022). This difference could be attributed to the fact that the research studied patients that are already diagnosed with hypertension and they could have been informed about their condition during their clinic visits. Attitude of people with hypertension affects their compliance and adherence to lifestyle modification needed for blood pressure control and better management of hypertension (Tarigan et al., 2018).

Health education helps in modifying people's attitudes toward following daily routines like regular physical exercise and taking their medications (Nuruddani, 2019). This was evident among traders who participated in this study. Preventative practices of experimental group rose significantly after following the intervention. This shows that a model-based educational intervention can influence adults' health habits and self-care practices as shown by studies conducted by Ozoemena et al. (2019) and Eze, et al. (2020) in Nigeria. However, findings of Babae et al. (2014) contradict this finding.

CONCLUSION

This study shows effectiveness of health education through Information-Motivation Behavioral (IMB) model on hypertension knowledge, motivation and preventive practices towards hypertension control among traders in Lagos State, Nigeria. This is evident with increase in knowledge of hypertension, motivation and preventive practices towards hypertension control among the intervention group.

Recommendations

Healthcare providers are encouraged to intensify efforts on health education during medical outreaches and screening. This will increase people care seeking habit, rate of early diagnosis of hypertension, compliance to healthy lifestyle modification and lower complications related to hypertension.

Conflict of Interest

Authors have no conflict of interest as regard this study.

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