

Original Article

Effect of Nursing Intervention on Knowledge and Practice of Salt and Diet Modification among Hypertensive Patients in a General Hospital South-West Nigeria

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Abstract

Background: Hypertension is the most common non-communicable disease and the leading cause of cardiovascular disease in the world. Current management of hypertension stressed the importance of salt and diet modifications. Unfortunately, many hypertensive patients do not have proper knowledge of this, which results to inadequate practice. Therefore, there is need to develop strategies that will help to improve knowledge and practice of salt and diet modifications among hypertensive.

Objective: To determine the effect of nursing intervention on knowledge and practice of salt and diet modifications among hypertensive patients.

Materials and Methods: A quasi experimental design was conducted using purposive sampling to select the sample size of 38 participants. A researcher-developed questionnaire derived from the literature review and Hypertension Self-Care Activity Level Effects (H-SCALE) adapted from Warren-Find low and Seymour (2011) was used to measure knowledge and practice of salt and diet modification among the participants. Data gathered from participants were expressed using tables and percentages while research questions were answered with descriptive statistics of mean and standard deviation through statistical package for the social science software version 21.

Results: the study revealed that higher percentage of the participants (81.6%) had poor of knowledge of salt and diet modification pre-intervention, also 92.1% of the participants reported poor practice before intervention. Intervention was given to the participants and results showed a positive change in knowledge and practice of salt and diet practice post-intervention.

Conclusion: regular training should be given to hypertensive patients by nurses to improve their knowledge and practice of salt and diet modification for effective blood pressure control.

Keywords: Hypertension, Knowledge, Practice, Salt and Diet modification, Nigeria

Introduction

The burden of hypertension and other non-communicable diseases is rapidly increasing and this poses a serious threat to the economic development of many nations. Hypertension is a global public health challenge due to its high

prevalence and the associated risk of stroke and cardiovascular diseases in adults.

Globally, hypertension is implicated to be responsible for 7.1 million deaths and about 12.8% of the total annual deaths (World Health Organization (WHO), 2018). Africa, among

other WHO regions was rated highest with increased prevalence of high blood pressure, estimated at 46% from age 25 years and above in which Nigeria contributes significantly to this increase (Okwuonu, Emmanuel, & Ojimadu 2014; Ekwunife, Udeogaranya, & Nwatu, 2018; WHO, 2018). This is so in spite of the availability to safe and potent drugs for hypertension and existence of clear treatment guidelines, hypertension is still grossly not controlled in a large proportion of patients worldwide.

Current national recommendations for the prevention and treatment of high blood pressure emphasized non-pharmacological therapy, also termed "lifestyle modification" which includes salt and diet modification. However, there is a dearth of information on the knowledge and practice of salt and diet modification among hypertensive patients attending Nigeria's health institutions (Abubakar et. al, 2017). Hence, poor knowledge of salt and diet modifications, and inability to practice these were one of the identified patient-related barriers to hypertension control (Tesema et.al, 2016). This gap may also be attributed to the type of information or training programmes given to patients on salt and diet modification.

Therefore, this study might help to improve the knowledge of hypertensive patients on salt and diet modification which in turn may affect its practice thus reducing the death burden, complications and economic cost of poorly controlled hypertension among patients and in the society.

Objective

The aim of the study was to determine the effect of nursing intervention on knowledge and practice of lifestyle modification among hypertensive patients. The following research questions were expected to be answered:

1. What is the pre-intervention knowledge and practice of salt and diet modification among hypertensive patients?
2. What is the post-intervention knowledge and practice of salt and diet modification among hypertensive patients?

Methods

It is a quasi-experimental study, which adopted one pre-test-post-test design, conducted between February and September 2019, at a secondary

health facility (General Hospital), South-west, Nigeria. The study was carried out among hypertensive patients attending medical out-patients department (MOPD) in the general hospital. The hospital was purposively selected being the only secondary health facility located in one of the densely populated communities in a major commercial city of South-west, Nigeria.

Sample size and sampling procedure: Sample size was calculated using Taro Yamane method of sample size determination, $n = \text{calculated sample size}$, Population size (N) = 42 based on daily clinic attendance of hypertensive patients, and margin of error = 0.05 with a confidence level of 95% given a sample size of 38 participants. Inclusion criteria were male and female patients who were ≥ 18 years of age, diagnosed to be hypertensive and attending medical out-patients department (MOPD), available and willing to participate in the study, who could communicate either in English or Pidgin English. Exclusion criteria were other patients at MOPD who were not diagnosed to be hypertensive, or with any co-morbidity that could interfere with participation in the training, and have attended previous educational programme on salt and diet modification. Participants were selected based on the inclusion criteria using purposive sampling.

Data collection tools and procedures: Data were gathered using researcher-developed questionnaire derived from the literature review with the opinions of experts in the field to assess participants' knowledge of salt and diet practice and modified Hypertension Self-Care Activity Level Effects (H-SCALE) developed by Warren-Findlow and Seymour (2011) to assess practice of salt and diet modification among the participants. The questionnaire consists of three parts. The first part includes the demographic characteristics of the participants with eight (8) items; the second part assessed the participants' knowledge of salt and diet modification. The knowledge of salt and diet modification questions includes twelve (12) items with maximum and minimum scores of 12 and 0 respectively. Participants' knowledge scores of 9-12 points indicate high knowledge, 6-8 points indicate moderate knowledge and scores < 6 points indicate poor knowledge. The third part assessed the practice of salt and diet modification among the participants with seven items which were used to assess practices related to eating a healthy diet, avoiding salt while cooking and

eating, and avoiding foods high in salt content. Responses were coded ranged from never (1) to always (3). Responses were summed up creating a range of scores from three (3) to twenty one (21). Scores of eleven (11) and above indicates that participants followed the low-salt diet and was considered as having good low salt diet practice while score <11 indicate poor salt diet practice. The psychometric properties of the instrument was checked by experts in the field using face and content validity criteria, the reliability of the instrument was determined using split-half method and the Cronbach's alpha reliability coefficient on knowledge of salt and diet modification was 0.78, while salt and diet practice was 0.72 which showed high reliability of the instrument. The method of data collection involved three phases:

Phase 1: this involved meeting with the consultant and nurses in charge of MOPD of the General Hospital to explain the purpose of the study and its benefits, and to seek their co-operation for the success of the study. This took place during the first week of the study. In the second week of the study, the researcher with two research assistants visited the MOPD to listen to health talk given to the patients by the nurses and other health personnel, gaps were identified which was used to modify the training modules. The participants were met to discuss the purpose, course and potential benefits of the study. Interested participants were enrolled for the study after obtaining their consent. Further selection of the participants continued in the third and fourth week. A pre-test instrument (questionnaire) was given to the selected participants to complete during the selection. No external interference was allowed during data collection, researcher and research assistants stayed with the participants throughout the period of completing the questionnaire after which they were thoroughly checked for completeness before retrieval from the participants. The results from this phase were also used to modify the training module for better intervention. Reminder for the training programme was given through phone calls, text messages and visits on the clinic- days prior to the training.

Phase 2: A developed intervention package was implemented based on feedback obtained from

pre-intervention knowledge and practice score with learning modules which was used for the educational training of hypertensive patients on salt and diet modification. The intervention package had two modules of learning which was delivered for two hours weekly for two weeks. Different instructional methods were utilized to deliver the programme including lectures, group discussion, questions and answers, chats/pictures and educational hand out. Follow-up through phone calls and text messages was done every week after intervention to ensure adequate practice before the post-intervention test.

Phase 3: A post-test was given one month post-intervention with the same instruments used during the pre-test. Data collected were coded and processed using statistical package for social science (SPSS), version 21. Frequency table was constructed and data were expressed on it. The research questions were answered using descriptive statistics of mean and standard deviation.

Ethical Consideration: The ethics committee of the researcher's institution approved the study with approval reference BUHREC102/19 dated 27th February, 2019 and written permission of the State Health Service Commission was also obtained to conduct the study. Participants were informed about the purpose of the study and their consents both verbal and written were taken before the study commences. Participation was voluntary and participants have the right to withdraw at any stage of the study.

Results

The socio-demographic data reveals that greater number of the participants was females (68.4%) possibly, because females tend to pay more attention to their health and engaged more in physical and emotion stress than their male counterparts. Majority, (44.7%) participants were between the ages of 46 to 60 years, also many of the participants (28.9%) have primary education and 42.1% were self-employed. This could also be related to the fact that the study was carried out in one of the largest commercial city in South-west Nigeria and research facility was located in one of the densely populated communities in the state which often require constant subsidized health care services (Table 2)

Table 1: Intervention programme module about salt and diet modification

Goals	Learning content
<p>At the end of the module, the participants will:</p> <p>Have a background knowledge of hypertension</p> <p>Know and identify the risk factors of hypertension</p> <p>Understand the contribution of salt and diet modification to blood pressure control.</p> <p>Describe salt intake reduction and the recommended quantity of salt intake for blood pressure control.</p>	<p>Week One</p> <p>Background knowledge of hypertension</p> <p>Hypertension is the leading cause of heart and blood vessels diseases worldwide.</p> <p>About 7.1 million deaths worldwide (~12.8% of total deaths) are estimated to be caused to hypertension.</p> <p>Africa has the highest numbers of people with hypertension.</p> <p>In Nigeria, hypertension is graded as number one of all terrible diseases among the people.</p> <p>It affects both men and women, rich and poor people in rural and urban communities.</p> <p>Hypertension is also called high blood pressure. Blood pressure is the measurement of force against the walls of your arteries when your heart pumps blood through your body. It has two numbers; the top number is called systolic blood pressure while the bottom number is diastolic pressure.</p> <p>Your blood pressure is normal when these numbers are lower than 120/80mmHg most of the time. Whenever these numbers are 120/80mmHg or higher most of the time but below 140/90mmHg is called pre-hypertension. Any time the number is 140/90mmHg or higher most of the time is hypertension.</p> <p>The risk factors of hypertension</p> <p>These are situations that can make one to have hypertension.</p> <p>Those situations that you can control</p> <p>Unhealthy (bad) diet</p> <p>Too much of salt intake</p> <p>Overweight or obese</p> <p>Sedentary lifestyle (lack of physical activity)</p> <p>Tobacco usage</p> <p>Excessive alcohol usage</p> <p>Stress</p> <p>Lack of sleep</p> <p>Those situations that you can control</p> <p>Age</p> <p>Race</p> <p>Family History</p> <p>The contribution of salt and diet modification to blood pressure control.</p> <p>Salt restriction: when you take not more than 2.4 g of sodium per day it reduces your blood pressure by 2-8 mmHg.</p> <p>Adopt DASH eating plan: when you eat a diet rich in fruits, vegetables, and low fat dairy products with a reduced content of saturated (solid fats) and total fat it reduces your blood pressure by 8–14 mmHg.</p> <p>Salt intake reduction and recommended quantity of salt intake for blood pressure control.</p> <p>Ways to reduce your salt intake:</p> <p>Salt intake should be reduced to less than 2,400 milligrams (mg) a day (1</p>

	<p>teaspoon). Aim for less than 1,500 mg a day (not more than ½ teaspoon), if possible. Do not add extra salt at the table. Remove or reduce the amount of salt used in cooking and baking. Reducing salt to less than 2,400mg (1 teaspoon) can reduce your blood pressure to 2-8 mm Hg.</p>																
<p>At the end of the module, the participants will: Adopting Dietary Approaches to Stop Hypertension eating plan (DASH diet) that lowered blood pressure</p> <p>Components of Dash eating plan</p> <p>Examples of daily and weekly servings that meet DASH eating plan targets for a 2,000 to 2,100-calorie-a-day diet.</p> <p>Examples of food items that make up the DASH eating plan.</p>	<p>Week Two Adopting Dietary Approaches to Stop Hypertension eating plan (DASH diet) that lowered blood pressure Food is an essential measure in prevention and treatment of hypertension. DASH diet is a simple and complete eating plan that helps produce a heart-healthy eating style for life. It requires no special foods but provides daily and weekly nutritional goals. Studies have shown that the DASH diet can lower blood pressure within 2 weeks. Adopting DASH eating plan can produce blood pressure lowering effects of 8-14mmHg, comparable to drug monotherapy.</p> <p>Components of Dash eating plan The plan recommends eating vegetables, fruits, and whole grains fat-free or low-fat dairy products limiting foods that are high in saturated fat, Avoiding /limiting sugar-sweetened beverages and sweets</p> <p>Examples of daily and weekly servings that meet DASH eating plan targets for a 2,000 to 2,100-calorie-a-day diet</p> <table border="0"> <thead> <tr> <th>Food Group</th> <th>Daily Servings</th> </tr> </thead> <tbody> <tr> <td>Grains</td> <td>6–8</td> </tr> <tr> <td>Meats, poultry, and fish</td> <td>6 or less</td> </tr> <tr> <td>Vegetables</td> <td>4–5</td> </tr> <tr> <td>Fruit</td> <td>4–5</td> </tr> <tr> <td>Low-fat or fat-free dairy products</td> <td>2–3</td> </tr> <tr> <td>Fats and oils</td> <td>2–3</td> </tr> <tr> <td>Sodium (salt)</td> <td>2,300 mg*</td> </tr> </tbody> </table> <p>Weekly Servings Nuts, seeds, dry beans, and peas 4–5 Sweets 5 or less.</p> <p>Examples of food items that make up the DASH eating plan.</p> <ol style="list-style-type: none"> 1. Rich in potassium, calcium, magnesium (fruits and vegetables). Examples: Avocado, Bananas, Carrots, Beans, orange, Pears (fresh), Peanuts, Spinach, Tomatoes, Skimmed Milk, Pawpaw, Oysters, Soy milk, Tofu. 2. Low in saturated and trans- fat or low-fat dairy products : Examples: fish, yogurt, mayonnaise, unsalted nuts and seeds such as almonds, peanuts, walnuts, vegetable oils: canola, olive, peanut, sunflower, corn, soybean, cottonseed. 3. Good source of fibre and protein Examples: Whole grains, Whole wheat bread, Brown rice, oats, barley, wheat , White beans, kidney beans, northern beans. 4. Avoid food high in saturated diet 	Food Group	Daily Servings	Grains	6–8	Meats, poultry, and fish	6 or less	Vegetables	4–5	Fruit	4–5	Low-fat or fat-free dairy products	2–3	Fats and oils	2–3	Sodium (salt)	2,300 mg*
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	<p>Example:</p> <p>Meat: fatty/red meats, processed meats like hot dogs, organ meat</p> <p>Full-fat dairy products: whole milk, whole-milk products and 2% milk</p> <p>Tropical oils: coconut oil, palm oil or palm kernel oil.</p> <p>Fats: Margarines, cocoa butter, vegetables cooked in excessive amounts of sauce and butter, fried foods.</p> <p>Snacks and Sugar: chocolate, ice cream, cakes, candy (sweet), butter rolls, egg breads, and commercial doughnuts.</p>
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Table 2: Socio-demographic data of the participants n=38

Variable	Experimental (n=38)
Age (years)	Freq. (%)
18-30 years	2 (5.3)
31-45 years	3 (7.9)
46-60 years	17 (44.7)
>60 years	16 (42.1)
Total	38 (100.0)
Gender	
Male	12 (31.6)
Female	26 (68.4)
Total	38 (100.0)
Educational Level	
No formal education	11 (28.9)
Primary education	11 (28.9)
Secondary education	5 (13.2)
Tertiary education	11 (28.9)
Total	38 (100.0)
Occupation	
Employed	8 (21.1)
Retired	10 (26.3)
Self employed	16 (42.1)
House keeper	4 (10.5)
Total	38 (100.0)
Duration of Hypertension	
1-5 years	16 (42.1)
6-10 years	21 (55.3)
>10 years	1 (2.6)
Total	38 (100.0)

Table 3: Summary of responses on knowledge and practice of salt and diet modification pre-intervention

	Knowledge Level n=38			
	Poor knowledge (0-5 points)	Moderate knowledge (6-8 points)	Good knowledge (9-12 points)	Total
Pre-intervention	31 (81.6%)	7 (18.4%)	0 (0.00%)	38 (100%)
	Practice Level n=38			
	Poor practice (0-10 points)	Good practice (11-21 points)	Total	
Pre-intervention	35 (92.1)	3 (7.9)	38 (100%)	

Table 4: Comparing pre - and post-intervention knowledge and practice of salt and diet modification.

	Knowledge and Practice Level n=38			
Knowledge of salt and diet modification n=38	Poor knowledge (0-5 points)	Moderate knowledge (6-8 points)	Good knowledge (9-12 points)	Total
Pre-intervention	31 (81.6%)	7 (18.4%)	0 (0.00%)	38 (100%)
Post-intervention	1 (2.6%)	0 (0.0%)	37 (97.4%)	38 (100.0%)
Practice of Salt and Diet Modification	Poor practice (0-10 points)	Good practice (11-21 points)	Total	
Pre-intervention	35 (92.1)	3 (7.9)	38 (100%)	
Post-intervention	4 (10.5)	34 (89.5)	38 (100%)	

Table 3 summarily shows participants responses on knowledge and practice of salt and diet modification pre-intervention. 81.6% of the participants had poor knowledge of salt and diet modification, 18.4% had moderate knowledge level and none of the participants had high knowledge level (0.00%) of salt and diet modification. Participants also demonstrated poor practice of salt and diet modification as 92.1% of the participants reported poor practice, while only 7.9% of the participants reported good practice of salt and diet modification before intervention. However, Table 4 reveals a positive change in the participants' level of knowledge and practice of salt and diet modification after intervention. Only 2.6% of the participants demonstrated poor level of knowledge of salt and diet modification post intervention as against 81.6% before intervention. While 97.4% demonstrated high knowledge level post-

intervention training as opposed to none (0.00%) before intervention. When comparing pre and post intervention practice of salt and diet modification, the practice of diet and salt restriction was good (≥ 11) from 7.9% pre-intervention to 89.5% post intervention. While poor practice level (≤ 10) was reduced to 10.5% from 92.1% after intervention.

Discussion

The study revealed that the pre-intervention knowledge of participants about salt and diet modification was poor (81.6%). This finding corroborates the findings of a study done in India in 2011 and South Ethiopia (2017) that majority of the respondents have poor knowledge of salt and diet modification (Subramanian et. al 2011; Buda et.al, 2017). The finding is also in agreement with Okwuonu, Emmanuel, and Ojima (2014) that most hypertensive patients

are not fully aware of the impact of unsaturated oil, reduction in diary food, whole grains, consumption of fruits and vegetables in the control of blood pressure and salt reduction. The study also showed poor practice of salt and diet modification (92.1%) among the participants before intervention. This finding was a bit higher compare with a similar study done in China that about 70% of the participants had poor adherence to modification practices (Lu, et. al, 2017). This may be attributed to poor knowledge of salt and diet modification which in turn affects its practice among the participants. This agreed with Babu, (2015) who said that the desired changing level in patients' attitude toward knowledge and practice of salt and diet modification was not achieved due to insufficient information in relation to effect of salt and diet modification on blood pressure control given by the health care professionals. Hence, an intense effort should be made by health care givers for effective improvement.

According to the findings of the study, poor knowledge and practice of salt and diet modification as demonstrated by the participants may affect effective blood pressure control which may be attributed to poor health seeking behavior on the part of patients or inadequate information provided by the health personnel. This is particularly supported by a group of researchers who posited that targeted health education strategies are obviously necessary to enhance the knowledge level of hypertensive as this will help to prevent adverse effect of poor blood pressure control, and that health care givers are needed to provide appropriate cost-effective programmes on management of hypertension with a lot of reinforcement and motivation for effective practices (Gnanaselvam et. al, 2016). In addition, patients need to be taught the basic underlying principles behind every part of their care for them to be motivated and adopt any change of behavior. Therefore, patient education should be strengthened on the use of salt and different type of diets that are suitable for prevention and effective control of blood pressure (Okwuonu, Emmanuel, and Ojimadu, 2014); Tesema et.al, 2016).

The study findings revealed a notable improvement on knowledge and practice of salt and diet modification after the intervention training programme as shown by post-intervention test score. This shows that intervention programme was very effective as the

participants gained more insight salt and diet modification in relation to blood pressure control. This agreed with Babu (2015) that when a structured instructional module is used to divulge facts on salt and diet modification among hypertensive patients this will in turn affect their practice and thus lowered blood pressure.

The findings validate the report of a randomized controlled clinical trial which states that increase in knowledge about the role of lifestyle in the occurrence of high blood pressure would cause people to start modifying their lifestyles and enhance their preventive behaviours (Jafari et.al, 2016). This was proven with the result of a meta-analysis of 37 randomized controlled trials by Aburto et. al, (2013) who demonstrates the strong and consistent relationship that has been observed between dietary sodium and blood pressure that reduced sodium intake reduces blood pressure in both non-acutely ill adults and children. The largest controlled feeding study of potassium supplementation effects on blood pressure was conducted among Chinese adults by Gu et. al (2013) the study demonstrated a significant reduction in blood pressures that was reproducible after an average of 4.5 years. Even more encouraging are the results of magnesium supplements decreasing systolic and diastolic blood pressure 3 to 4 mmHg and 2 to 3 mmHg, respectively, with greater dose-dependent effects at supplementations >370 mg/day (Kupetsky-Rincon & Uitto, 2012). In subgroup analyses involving five trials conducted among hypertensive, fiber intake significantly reduced both systolic and diastolic blood pressure by 5.95 and 4.20 mmHg, respectively (Bazzano et.al, 2015). Buda et al. (2017) added that irrespective of other treatments options, if all hypertensive patients are given needed information and support required in controlling blood pressure it will assist in achieving and maintaining salt and diet practices. Hence, educational programs are essential in increasing knowledge, improving self-management, and controlling dietary habits that are detrimental to effective blood pressure control (Beigi et. al, 2014)

Conclusion and Recommendation: The study helped to validate that a nurse-led intervention programme has significant effect in improving knowledge and practice salt and diet modification among hypertensive patients. Therefore, it is recommended that nurses should ensure adequate provision of such programme in a continuous and intermittent way with accurate

information while providing care for these patients.

Limitation of the Study: There are other variables that are effective in control of blood pressure which were not included in the study such as measurement of patients' clinical parameters like cholesterol level and triglycerides due to financial constraints. Another important limitation was follow-up time, hence, future studies should be conducted given enough time for follow-up.

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