https://dx.doi.org/10.4314/dujopas.v10i4a.12
ISSN (Print): 2476-8316
ISSN (Online): 2635-3490
Dutse Journal of Pure and Applied Sciences (DUJOPAS), *Vol. 10 No. 4a December 2024*

Knowledge, Attitude and Adherence to Exercise Among Adults with Hypertension in North-Western Nigeria: A Cross-Sectional Study

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Abstract

Research evidence has shown the effectiveness of exercise in blood pressure control. However, little is known about factors limiting exercise engagement in adults with hypertension. The purpose of this study is to assess knowledge, attitude and adherence to exercise for blood pressure control among adults with hypertension. An online cross-sectional survey study was conducted; a total of 150 adults with hypertension whose ages were 18 and older satisfied the inclusion criteria and participated in the study. A modified structured questionnaire which sought information on socio-demographics, knowledge, attitude and adherence to exercise was used to obtain data from the respondents using a convenient sampling technique. Data was analyzed using descriptive and inferential statistics of frequency and percentage at a 0.05 level of significance. The majority 90, (60.0%) of the respondents demonstrated poor exercise compliance, of which, 101(67.3%) had poor knowledge of exercise for hypertension control while 39, (26.0%) had a positive attitude towards exercise. There was a significant association between knowledge of exercise and level of education ($\chi 2=28.337$; $p=0.001$), attitude ($\chi 2=38.297$; $p=0.001$) and adherence to exercise ($\chi 2=12.757$; $p=0.001$) respectively. There was a significant relationship between knowledge and socio-economic status of the respondents ($\chi 2=19.192$; $p=0.001$), and between knowledge and attitude among the respondents ($\chi 2=25.634$; $p=0.001$). The study showed that compliance to exercise for blood pressure control is low among adults with hypertension in North-western Nigeria, which was significantly influenced by poor

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knowledge of and negative attitude towards exercise. Public health enlightenment campaigns and patient education should form part of the hypertension management protocol.

Keywords: Adherence, Attitude, Exercise, Hypertension, Knowledge.

INTRODUCTION

Hypertension is one of the most common non-communicable diseases in the world, affecting most of the adult population and remains the major risk factor for stroke, coronary artery diseases and chronic kidney disease. It is a global public health concern that is related to urbanization and socioeconomic changes favoring a sedentary lifestyle (Forouzanfar et al., 2017; Modesti et al., 2013).

Hypertension is ranked among the leading risk factors for morbidity and mortality with, an estimated 9.4 million deaths in 2010 across the world. In Nigeria, over 4.3 million individuals above the age of 15 years were classified as hypertensive using 160/90 mmHg cut-off point, with almost 51.5% across urban and rural population (Akinlua et al., 2015). Fortunately, treatment of hypertension can prevent progression or development of comorbidities (Carey et al., 2022; Taler, 2018)

A Sedentary lifestyle, including lack of exercise, is important modifiable risk factors in the development of hypertension. In addition to standard anti-hypertensive therapy, the benefits of exercise on hypertension and cardiovascular disease have been well demonstrated in the literature (Carey et al., 2022; Ibekwe, 2015). Accordingly, exercise and other lifestyle modifications are an important component of American, European, and World Health Organization guidelines for antihypertensive therapy (Pescatello et al., 2004a, 2015). It described the effects of exercise on hypertension, on the heart, and the associate blood vessels that enhance blood circulation.

Prevention and control of high blood pressure has become an important health concern with substantial evidence suggesting that pharmacological therapy is effective in the control and prevention of target organ damage in hypertensive patients (Chow et al., 2013). However, the success rate is still below the optimal level. Factors such as the cost of medication, multiple antihypertensive medications, socioeconomic differences and drug adverse effects (Chow et al., 2013; Karunarathna et al., 2024; Pescatello et al., 2015), have been implicated in poor treatment success rate, thus, non-pharmacological therapies for blood pressure control had been long advocated by many health care professionals and authorities (Chow et al., 2013)

The non-pharmacological approaches for blood pressure control include dietary modification, weight reduction and exercise program (Verma et al., 2021). These approaches are known to have no adverse effects and are less expensive than pharmacological therapy (Júnior et al., 2020; Karunarathna et al., 2024; Nascimento et al., 2017; Pescatello et al., 2004a). Studies have shown the effects of exercise in reducing a systolic blood pressure up to 12mmHg, and 5 mmHg of diastolic blood pressure, and clinical offers relevance in the management of hypertension (Verma et al., 2021).

To achieve effective control and management of hypertension, clinicians might be required to educate patients at the point of care and to promote its advocacy and awareness campaign. Adequate knowledge of a disease has been reported to have an influence on the patient care, and improving knowledge is known to improve adherence (compliance) with

treatment in conditions such as hypertension (Verma et al., 2021). In spite of emerging empirical evidence of the efficacy of exercise in blood pressure control, little is known about factors limiting exercise engagement in patients with hypertension in North-west Nigeria. Thus, the purpose of this study is to assess the level of knowledge/ awareness, attitude and adherence (compliance) to exercise among hypertensive patients in North-west Nigeria.

MATERIALS AND METHODS

Study Participants

The study was a descriptive cross-sectional survey, respondents for this study were adults with hypertension attending the medical outpatient department of General Amadi Rimi Specialist Hospital North-west Nigeria, recruited using a convenient sampling technique. Eligibilities for inclusion in the study were adults diagnosed with hypertension by a physician at least 3 months prior to the commencement of this study, the patient must be 18 years and older. Respondents were excluded if they presented or reported any comorbidity such as cancer, chronic obstetric pulmonary disease, dementia and neurological conditions. The Sample size was determined using standardized formula at 95% confidence interval (Adedoyin et al, 2005). Hence, a minimum sample size of 142 was obtained, and 150 respondents were recruited for the study to take care of possible attrition in the study.

Instruments for Data Collection

The instrument (Knowledge, Attitude and Adherence to Exercise Questionnaire KAAEQ) used in this study was a modified and validated questionnaire from the previous study of Adedoyin (2005). the validity and test-retest reliability of the questionnaire was determined in a pilot study of 10 respondents who were not part of the main study, the KAAEQ was found to be valid and reliable Questionnaire with internal consistency of 0.89 on Cronbach's alpha. The questionnaire was originally developed by a panel of experts on exercise prescription and cardiopulmonary rehabilitation comprising of three physical therapists and exercise physiologists respectively. The questionnaire sought information on knowledge, attitude and practice of exercise in knee osteoarthritis patients. Consequently, items on the questionnaire that were ambiguous or extraneous were modified. The questionnaire consists of two sections: section A seeks information on the socio-demographics such as age, marital status, sex, education, occupation and income while B seeks information on knowledge, awareness and adherence to exercise for blood pressure control. The results from this section were scored on 3 points scale; Yes, No or I don't know. A correct response was assigned a score of 2, an incorrect response was given a score of 0, and I do not know was given a score of 1. Responses to the questions were summed up and the maximum obtainable score for knowledge was 38 points, attitude was 14 points and adherence was 26 points. A below-average knowledge score (i.e. < 19 points) was graded as poor, average while scores >19 points were graded as good. A below-average attitude score (i.e. < 7 points) was graded as negative while >7 was graded as positive. Similarly, a below-average adherence score (i.e. <13 points) was graded poorly while > 13 was graded good compliance.

Procedure for Data Collection

An ethical clearance for the study was obtained from the ethical and research committee of Katsina State Ministry of Health with a protocol number MOH/ADM/SUB/1152/1/646. The purpose of the study was fully explained to the respondents and consented participants were asked to sign a written informed consent, copies of the questionnaires were distributed to the respondents, completed questionnaires were retrieved back for sorting, data entry, cleaning and analysis, and the questionnaire used in the study was a self-administered.

Statistical Analysis

The collected data was summarized using descriptive statistics of mean, standard deviation, frequency and percentage. Inferential statistics of the Chi Square test were used to determine associations among the level of education, occupation, socioeconomic status, knowledge, attitude and adherence for blood pressure control. SPSS version 20 was used at a 0.05 level of significance.

RESULTS

Table 1 describes the socio-demographic information of the respondents and their graded scores for knowledge, attitudes and adherence. One hundred and fifty adults with hypertension (150) who were aged 18 to 65 years completed the questionnaire. The mean age of the respondents in this study was 57.7±12.6 years. The study recruited a higher proportion of males constituting 56.0%. The majority 106(70.7%) of the respondents were married while less than half, 64(42.7%) had tertiary education. More than half, 94(62.7%) of the respondents were in the middle socio-economic status. 67.3% had poor knowledge of exercise for blood pressure control and 26.0% had a good attitude towards exercise while 40.0% demonstrated good compliance for exercise (Table 1).

Table 1: Socio-demographic characteristics socioeconomic status, graded scores for knowledge, attitude and adherence of respondents (N=150)

Variable	n (%)
Age Group	
20 -30	6 (4.0)
31- 40	7 (4.7)
41- 50	28 (18.7)
51 – 60	109 (72.6)
Sex	
Male	66 (44.0)
Female	84 (56.0)
Occupation	
Business	57 (38.0)
Civil servant	46 (30.6)
Artisans	24 (16.0)
Retirees	23 (15.3)
Marital status	
Single	5 (3.3)
Married	106 (70.6)
Divorced	1 (0.6)
Widowed	38 (25.3)
Level of education	
Primary	20 (13.3)
Secondary	32 (21.3)
Tertiary	64 (42.6)
No formal education	34 (22.6)
Socioeconomic status	
Low	33 (22.0)
Middle	94 (62.6)
High	23 (15.3)
Knowledge score	
Poor	101 (67.3)
Good	49 (32.6)
Attitude score	
Negative	111 (74.0)
Positive	39 (26.0)
Adherence score	
Poor	90 (60.0)
Good	60 (40.0)

Table 2 explains the knowledge, attitude and adherence to exercise; respondents who had received advice from health-care providers on the benefits of exercise for blood pressure control were less than half, 72(48.0%). The majority of the exercise is conducted indoors 107 (71.3), a quarter, 39(26.0%) reported moderate confidence in exercise engagement for blood pressure control while 15(10.0%) believed that exercise may interfere with their personal responsibilities. Similarly, 90(60.0%) of the respondents admitted that they were not engaged in any form of exercise. Also, 17(11.3%) of the respondents were found to engage in exercise three times a week, and 8.0% of the study participants exercised for 30 minutes respectively. The study also showed that 149(99.3%) considered brisk walking while 21(14.0%) opined strength training as a form of exercise for blood pressure control, the majority 137 (91.3) of the participants found it difficult to comply with the exercise.

Table 2: Respondents' knowledge, attitude and adherence of exercise for blood pressure control (N=150)

Variable	Yes n (%)	No n (%)	Do not know n (%)
Knowledge			
Exercise advice by healthcare provider			
	72 (48.0)	78 (52.0)	0.00
Aerobic	63 (42.0)	0.00	0.00
Anaerobic	1 (0.7)	0.00	0.00
Others	86 (57.3)	0.00	0.00
Combination of exercise and medication			
	50 (33.3)	1 (0.7)	99 (66.0)
Exercise is important in controlling high BP			
	49 (32.7)	3 (2.0)	98 (65.3)
Important	29 (19.4)	0.00	0.00
Very important	20 (13.3)	0.00	0.00
Not sure	101 (67.3)	0.00	0.00
Exercise has adverse effects on patients with high BP	18 (12.0)	9 (6.0)	123 (82.0)
Place of exercise			
Indoors		107 (71.3)	0.00
Outdoors		43 (28.3)	0.00
Forms of exercise			
Brisk walking	149 (99.3)	1 (0.7)	0.00
Running	24 (16.0)	126 (84.0)	0.00
Cycling	24 (16.0)	126 (84.0)	0.00
Strength training	21 (21.0)	129 (86.0)	0.00
Swimming	3 (2.0)	147 (98.0)	0.00
Stretching	60 (40.0)	90 (60.0)	0.00
Jogging	25 (16.7)	25 (83.3)	0.00
Attitude			
• Confidence about exercise			
Try hard enough to always overcome the barriers with regard to exercise	22 (14.7)	0.00	0.00
Always find a way to exercise and be physically active	39 (26.0)	0.00	0.00
Easy for me to accomplish my activity and exercise goals	56 (37.3)	0.00	0.00
When confronted with the barrier to exercise I could find several solutions to overcome this barrier	17 (11.3)	0.00	0.00
I could exercise even when am tired	16 (10.7)	0.00	0.00

• Exercise interference with personal responsibilities	15 (10.0)	115 (76.7)	20 (13.3)
• Exercise during the workday	115 (76.7)	35 (33.3)	0.00
Practice			
• Engage in an exercise presently	60 (40.0)	90 (60.0)	0.00
• Participation in exercise			
Once a week	13 (8.7)	0.00	0.00
Twice a week	13 (8.7)	0.00	0.00
Thrice a week	17 (11.3)	0.00	0.00
Forth a week	17 (11.3)	0.00	0.00
No exercise	90 (60.0)	0.00	0.00
• Duration of exercise			
0 min	90 (60.0)	0.00	0.00
10 min	15 (10.0)	0.00	0.00
20 min	24 (16.0)	0.00	0.00
30 min	12 (8.0)	0.00	0.00
1 hour	9 (6.0)	0.00	0.00
• Difficulty in participating in an exercise	11 (7.3)	139 (927)	0.00
• Being on exercise before and unable to stick with it due to health problems	13 (8.7)	137 (91.3)	0.00

Table 3 showed a significant association between knowledge of exercise for blood pressure control and each of attitude ($\chi2$ = 23.823; p=0.002) and adherence ($\chi2$=12.757; p=0.001). There was a significant association between knowledge of exercise for blood pressure control and socio-demographics such as level of education ($\chi2$= 28.337; p=0.001) and SES ($\chi2$=19.192; p=0.001). Table 4 showed a significant inverse association between attitude towards exercise and age ($\chi2$=25.615; p=0.001); level of education ($\chi2$ =38.297; p=0.001) and socioeconomic status ($\chi2$=25.634; p=0.001) respectively. Table 5 showed a significant inverse association was also found between the level of education ($\chi2$=14.861; p=0.002) and adherence to exercise for blood pressure control.

Table 3: Association between respondents' knowledge, demographic characteristics, attitude and adherence to exercise for blood pressure control

		Knowledge of Exercise		
Variables	**Yes n (%)**	**No n (%)**	X^2 - Value	**p- value**
Age group (years)				
20-30	3 (50.0)	3 (50.0)		
31-40	3 (42.9)	4 (57.1)		
41-50	12 (42.9)	16 (57.1)	3.357	0.340
>51	31 (28.4)	78 (71.6)		
Level of education				
Primary	8 (15.0)	12 (85.0)		
Secondary	9 (28.1)	23 (71.9)	28.337	0.001*
Tertiary	35 (54.7)	29 (45.3)		
No formal education	2 (5.9)	32 (94.1)		
Socio-economic status				
Low	2 (6.1)	31 (93.9)		
Middle	33 (35.1)	61 (64.9)	19.192	0.001*
High	14 (60.9)	9 (39.1)		
Attitude				
Slightly confident	1 (4.5)	21(95.5)		
Moderately confident	13 (30.8)	26(69.2)		
Very confident	14 (42.9)	32(57.1)	23.823	0.002*
Extremely confident	10 (58.8)	15(41.2)		
Not at all confident	1 (6.3)	17(93.7)		
Adherence				
Yes	25(58.3)	35(41.7)		
No	14(15.6)	76(84.4)	12.757	0.001*

Key: Test statistics-Chi square, α level=0.05, p value=0.000, *significance

Table 4: Association between attitude toward exercise as blood pressure control and each of respondent's age group, level of education and socioeconomic status.

		Knowledge of Exercise		
Variables	**Yes n (%)**	**No n (%)**	X^2 - Value	**P-value**
Age Group (years)				
20-30	0 (0.0)	6 (14.4)		
31-40	0 (00.0)	4(3.6)	25.615	0.001*
41-50	4 (10.3)	24(21.6)		
>50	35 (89.7)	74(66.7)		
Level of education				
Primary	4(10.3)	16(14.4)		
Secondary	6 (15.8)	25(22.5)	38.297	0.001*
Tertiary	9(23.7)	55(49.5)		
No formal education	19(50.0)	15(13.5)		
Socio-economic status				
Low	16(41.0)	17(15.3)		
Middle	18(46.1)	76(68.5)	25.634	0.001*
High	5(12.8)	18(16.2)		

P<0.05*

Table 5: Chi-Square Test of association between adherence to exercise for blood pressure control and each of respondent's age group, level of education and socioeconomic status

		Adherence to Exercise		
Variables	**Yes n (%)**	**No n (%)**	X^2 - Value	**P-value**
Age Group (Years)				
20-30	5(83.3)	1(16.7)		
31-40	5(71.4)	2(28.6)	8.390	0.390
41-50	11(39.3)	17(60.7)		
>50	39(35.8)	70(64.2)		
Level of education				
Primary	6(30.0)	14(70.0)		
Secondary	17(53.1)	15(46.9)		
Tertiary	32(50.0)	32(50.0)	14.861	0.002*
No formal education	5(14.7)	29(85.3)		
Socio-economic status				
Low	7(21.2)	26(78.8)		
Middle	(43.6)	53(56.4)	6.786	0.340
High	12(52.2)	11(47.8)		

P<0.05*

DISCUSSIONS

The main objective of this study is to assess the level of knowledge, attitude and adherence to exercise for blood pressure control among adults with hypertension in Northwest Nigeria. The finding of this study showed that there is a poor level of knowledge among adults with hypertension; this is in conformity with the result of previous studies that studies knowledge of pharmacological agents on hypertension among adults diagnosed

with hypertension (Karunarathna et al., 2024; Taler, 2018). This finding may be due to lack of knowledge of exercise by stake holders in the management of hypertension as complementary or start-up therapy in early mild hypertension other than medication. Evidence abounds in the literature that pharmacological therapy is the only widely known approach for blood pressure control in spite of emerging evidence on the efficacy of the non-pharmacological management (Karunarathna et al., 2024). Consequently, this finding may be a result of a lack of adequate public health education and awareness campaign on the causative and precautionary measures of hypertension, including the role of lifestyle modifications and the impact of other healthcare professionals in the cure and management of hypertension as an endemic.

Despite conclusive evidence of hypotensive efficacy and enormous benefits of exercise in the control and management of hypertension, knowledge of exercise for Blood Pressure control still remains low. Over-dependence on drugs seems to contribute to poor exercise application for blood pressure management. There is evidence that knowledge transferred from medical staff induces patients 'ability to comply with lifestyle modification (Bhatt et al., 2008; Nascimento et al., 2017). However, there is strong suspicion that advice such as regular exercise may not be adequate enough to influence patients in making informed decisions for their condition (Higgins et al., 2007). Higgins also submitted that low counseling rates and lack of expertise in exercise prescription among health care professionals could contribute to a low level of knowledge on exercise.

Furthermore, the lack of referral to exercise experts such as physical therapists in the cardiopulmonary rehabilitation constitutes a significant shortcoming. Hence, emphasis on teamwork in the management of hypertension may help increase the use of exercise for blood pressure control among adults with hypertension. Exercise culture is a health behavior which may be influenced by many psychosocial factors such as family support and confidence. Our study revealed that the attitude of adults towards exercise was negative. Similar to the finding of a previous study, that the attitude of adults with chronic disease towards exercise was negative (Chotisiri et al., 2016). Many individuals with hypertension are known to engage in sedentary behavior and consequent poor confidence in taking up specific tasks such as exercise behavior (Batool et al., 2023). The ability to take up specific task as self-efficacy has been described as a strong predictor of exercise behavior. This psychosocial construct is central to several theoretical models such as the Trans-theoretical Model, Social Cognitive Theory, Ecological models of health behavior and Health Belief Model and has been used to explain exercise behavior in many studies (Baştan and Dülek, 2023). Hence, exercise self-efficacy should be taken into consideration when goal-setting and reinforcement for exercise programs in achieving adequate blood pressure control.

Based on the outcome of this study, it was found that, adults with hypertension have low-level adherence to exercise. This finding is consistent with findings of a previous study that adherence to exercise among adults with hypertension was below optimal level. Many factors may contribute to poor levels of exercise adherence among adults which are not limited to perceived benefit of exercise, level of education, access to recreational facilities and neighborhood environment (Martell, 2023). Amongst these, the educational level has been reported to play a significant role in influencing good compliance. This is in accordance with the study of Sana et al (2023) who opined that individuals with higher levels of education were more knowledgeable about the health benefits of exercise.

Consequent to the foregoing, our study revealed that socioeconomic status was significantly associated with knowledge, attitude and adherence to exercise. This is consistent with the result of a previous study that socioeconomic status is a salient factor in hypertension pathogenesis and management (Chotisiri et al., 2016; Sana et al., 2023). Socioeconomic status might be independently associated with hypertension care which could affect factors such as disease awareness and knowledge, and health promoting behaviors, access to health care, and family and social support systems.

Health education played an excellent role in educating adults about the benefit of exercise in blood pressure control. There is a need to improve social equality in terms of health services, social welfare and health education on various lifestyle modifications. In line with studies on knowledge, attitude and adherence (KAA), this present study has some limitations which bothered on non-availability of a standardized instrument for KAA of exercise for blood pressure control which has been employed previously or in other settings. However, the questionnaire used in this study was subjected to various psychometric processes. Furthermore, the sample size used in this study may limit its generalizability; however, the study employed a multi-venue approach to reduce sampling bias.

Epidemiological studies suggest that exercise is efficacious in blood pressure control. Exercise has multiple benefits for adults with hypertension thereby reducing the risk of cardiovascular events and mortality. Even though, majority of them receive exclusive antihypertensive drug regiments without complementary interventions such as exercise and dietary modifications. More so, some informed physician often advises adults with hypertension to engage in exercise programs. Furthermore, there seems to be an insufficient number of physical therapists who are skilled in exercise prescription and management of high-risk adults such as the hypertensives. In line with emerging evidence-based practice, it behooves physical therapists to have empirical data on the perception of adults with hypertension towards exercise for blood pressure control and also to understand the limiting and facilitators of exercise practice for blood pressure control. This present study provides insight into the exercise level of adherence of adults with hypertension and also evaluates the influence of knowledge and attitude towards exercise and exercise compliance. The outcome of this study may serve as leverage for future studies on the use of exercise in the prevention and management of hypertension.

The non-probability sampling technique and relatively small sample size used in the study may not be generalized to the entire hypertensive population in Nigeria; also this research was a hospital-based study, so these findings may not be applicable to the general population.

CONCLUSIONS

This study revealed that a significant percentage of adults with hypertension were not knowledgeable about the benefit of exercise as a non-pharmacological modality for blood pressure control. The level of adherence/compliance to exercise for blood pressure control was found to be poor among adults with hypertension in Katsina state North-western Nigeria, which was significantly influenced by poor knowledge about the benefit of exercise and negative attitude towards exercise.

The study has important policy implications; all stakeholders (Physicians and Physiotherapists) in the management of hypertension should put their hands together to encourage a multi-disciplinary approach to hypertension management. Education and

health enlightenment campaigns, and media campaigns about the benefit of exercise (individual and group) should be adopted with the help of experts in exercise prescription in order to reverse the menace of hypertension, knowledge-based education on exercise recommendation should be part of the routine counselling sessions in both physiotherapy and medical outpatient department. Family physicians should routinely educate adults with hypertension on the benefits of regular exercise and a proper referral system to physiotherapists should be emphasized.

Further research should be conducted on the effect of exercise on blood pressure control as a non-pharmacological management of hypertension to bridge the gap between the pharmacological and non-pharmacological management of hypertension. Studies on the combined effect of lifestyle modifications on blood pressure needed to be conducted in a bid to further breach the gap between pharmacological and non-pharmacological management of hypertension. The benefit of exercise prevention should be part of secondary and tertiary education curricula to provide knowledge for the prevention of exercise.

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