Stage of physical activity change and correlates among hypertensive out patients at a tertiary hospital In Jos, Nigeria

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Abstract

Objective: Trans-theoretical model stage-specific exercise prescription is vital to achieving sustained physical activity and reducing morbidity and mortality in hypertensives. This study aimed to determine the stage of change of physical activity of hypertensives, in order to improve the practice of prescribing exercise.

Methods: A cross sectional study of 414 consenting, adult hypertensives was carried out. Sociodemographic, behavioral and clinical parameters of the participants were obtained, and their stage of change was determined using the Physician based Assessment and Counselling for Exercise tool (PACE). Correlations between the stage of change category and sociodemographic/clinical parameters were also determined.

Results: The participants were mostly female (52.9%), married (84.5%), with tertiary education (52.9%), urban dwellers (86%) with a mean age of 51±8 years. Most (75.1%) were overweight/obese with a mean BMI of 28.2±5.0 Kg/m^2, were non –smokers (98.3%) and non-diabetics (92.3%). The median PACE score was 4.0 (1.0-8.0) and most were Contemplators (79.5%) followed by Actives (16.4%) and Pre-contemplators (4.1%). Multivariate analysis revealed that unemployed and retired hypertensives were twice more likely to be in active stage (AOR 2.2, 95% CI 1.04-4.56). Educational level, marital status, age, sex, place of dwelling, smoking status, BMI category, family history of diabetes, arthritis and heart disease, were not significant predictors of stage of change.

Conclusion: Most hypertensives in the outpatient setting are in inactive stages of change (83.6%), but the unemployed are more likely to be in active stage. Physicians managing hypertensives should offer more cognitive-based change counselling, and exercise prescriptions that consider employment status.

Key words: Stage of change; hypertensives; motivation; behavior change; physical activity, PACE

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Introduction

Chronic diseases are major contributors to mortality worldwide with cardiovascular disease accounting for 30% of these deaths especially among sedentary people.[1] By 2030, non-communicable disease will account for more global deaths in low and middle income countries than HIV/AIDS, Malaria, Maternal, Nutritional, Perinatal diseases and Tuberculosis combined.[2]

An estimated 50% of adults globally have hypertension with increasing prevalence among those above 60 years.[3,4] The prevalence of hypertension in sub-Saharan Africa is pooled at 30% with a range of 15-70%.[5] This is a threat to public health in sub-Saharan Africa.[6,9] Overall age standardized prevalence of hypertension in Nigeria is 19.3%.[7] About 3% of Nigerians with hypertension die yearly.[7] The prevalence in Jos, North Central Nigeria is 17.5%.[8]

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The generally low physical activity in many countires puts them at risk of cardiovascular diseases and its complications.[10] Prevalence of physical inactivity in Nigeria is put at 41% with a reported range of 25- 57%.[10] Exercise is a subset of physical activity that is planned, purposeful, repetitive and structured with the aim improvement and maintenance of physical fitness and health benefits is the objective.[11] Exercising at required level reduces mortality from all causes by 20-30%.[12]

The trans-theoretical model of behavior change stage is central to behavioral motivation.[13] It integrates the stages and processes of behavior change and has four main constructs; stage of change, process of change, decisional balance, and self-efficacy. The utilization of the stage of change model to prescribe exercise has been found to be useful in improvement and maintenance of physical activity.[14] Individuals in precontemplator/ contemplator stages respond more to cognitive based change processes advice whereas those in active stages and above do better with behavioral based change processes.[14,15] Most hypertensives are physically inactive, with active hypertensives reported to be 16.4% .[16]

This study aimed at determining the stage of change of hypertensives attending General out-patient department (GOPD) of a tertiary hospital using PACE score, to improve tailored exercise prescription practice.

Material and Methods

Participants

The study area was the general out-patient department of an urban tertiary hospital in Jos, Plateau State Nigeria. Informed consent was obtained from participants who were previously diagnosed hypertensives, between 25 and 74 years of age, on anti-hypertensives for less than four weeks. Patients on beta blockers, those diagnosed with coronary artery disease, heart failure, incapacitating musculoskeletal diseases, pulmonary disease, Type 1 Diabetes Mellitus, patients unable to read, and those with hearing or visual loss were excluded.

Sample Size

The estimated sample size for the study was based on the formula;[17]

$N=Z^2pq/d^2$

N= Sample size

P=prevalence of 50% was assumed for active hypertensives in the study area

q= 1-p

d= permissible error of 5% (0.05) or degree of accuracy.

Z= 1.96 (95% confidence interval)

$N = (1.96)^2 \times 0.5 \times (1-0.5)/ (0.05)^2$

$= 3.8416 \times 0.5 \times 0.5/ 0.0025$

= 385 + 29 (7.5% non-response rate) = 414

Ethical Considerations

Ethical clearance for the study was obtained from the Health Research Ethics Committee of the hospital. Written informed consent was obtained from each participant.

Measurements

Relevant behavioral and clinical history was obtained from the participants, and the Physician-based Assessment and Counselling for Exercise (PACE) questionnaire was also administered to each participant. PACE was developed by the Centers for Disease Control and Prevention (CDC), and was designed to aid counselling protocols matched to patient's level of activity/ readiness to change.[19] It is a tool used in clinical settings for physical activity evaluation and intervention.[20] The PACE questionnaire has a good construct validity based on its test-retest reliability (0.8).[21,22] The PACE scoring was originally done on an 8-item questionnaire which was modified to 11-item questionnaire. In this scoring system, a PACE score of 1 corresponds to pre-contemplator stage, 2-5 is contemplator stage and 6-11 is active stage.[23-25]

The height and weight were taken to the nearest 0.05metres and 0.5kg respectively. The researcher used a standard stand metre for the height and a Camry 0-120 KG scale (Model BR 9707; Zhongs China) for the weight. The measurements were done according to World Health Organisation guidelines for standard physical measurements.[18]

Statistical Analysis

Data was analyzed using SPSS version 21 (IBM, Chicago, Illinois, U.S.A). Normally distributed variables such as age, weight, Systolic Blood Pressure, Body Mass Index were expressed as means ± standard deviation. The Chi-squared and Fisher exact tests were used to determine significant association between categorical variables, and student t-test was used to compare group means. Multiple logistic regression was used to assess relationship between sociodemographic, behavioral and clinical variables with stage of change. Variables with probability levels of =0.10 were included in the model, and a p-value of <0.05 was taken as statistically significant.

Results

Sociodemographic distribution of study participants

The mean age of the participants was 51**±8** and age group 50-59 years had the most participants (42%). They were mostly female (52.9%), married (84.5%), had tertiary education (52.9%) and were urban dwellers (86%). Almost half (49.5%) were civil servants. Other details are in Table 1.

Behavoral/clinical parameters of study participants

A small proportion of the participants had family history of type 2 diabetes (7.7%), arthritis (4.1%) and heart disease (8.2%). Most (70.7%) were overweight or obese and only 1.7% had previously smoked cigarettes. The mean systolic blood pressure (SBP) was 129.22±16.07 mmHg. Other details are in Table 1.

Stage of change distribution of study participants

The mean PACE score of the participants was 3.9±1.5, median score was 4.0 (range 1.0-8.0) and majority (79.5%) were contemplators. Other details are in Table 1.

Multivariate analysis

Multivariate analysis revealed that employed hypertensives were twice more likely to be in active stage (AOR 2.2, 95% CI 1.04-4.56). Educational level, marital status, age, sex, place of dwelling, smoking status, BMI category, family history of diabetes, arthritis and heart disease, were not significant predictors of stage of change (Table 2).

Table 1: Distribution of clinical characteristics of hypertensives seen at Bingham University Teaching Hospital

Variable	Frequency	Percentage
Age (years)		
30 - 39	23	5.6
40 - 49	143	34.5
50- 59	174	42.0
60- 69	70	16.9
70 - 79	4	1.0
Female sex	219	52.9
Marital status		
Single	36	8.7
Married	350	84.5
Divorced	3	0.7
Widowed	25	6.0
Level of education		
Primary	9	2.2
Secondary	186	44.9
Tertiary	219	52.9
Urban Residence	356	86.0
Occupation		
Civil servant	205	49.5
Retired	16	3.9
Self-employed	106	25.6
Unemployed	87	21.0
Non-smoking	407	98.3
Non-diabetic	382	92.3
No family history of arthritis	397	95.9
No family history of heart disease	380	91.8
BMI category		
Normal	118	28.5
Underweight	3	0.7
Overweight	144	34.8
Obese Class 1	109	26.3
Obese class 2	34	8.2
Obese class 3	6	1.4
Stage of change category		
Active	68	16.4
Contemplator	329	79.5

Table 2 Multiple logistic regression of factors predicting active stage of change among hypertensives seen at Bingham University Teaching Hospital

Variables	Adjusted Odds ratio	(95%CI)	P Value
Occupation (unemployed/retired vs employed)	2.2	1.04-4.65	0.04
Education (primary/secondary vs others)	0.73	0.42-1.28	0.27
Marital status (married vs others)	0.81	0.39-1.66	0.56
BMI category (normal vs others)	1.20	0.66-2.20	0.55
Family history of heart disease (no vs yes)	0.51	0.20-1.33	0.17
Family history of arthritis (no vs yes)	1.46	0.30-7.04	0.64

BMI: Body mass index

Discussion

The participants in this study were slightly older than the subjects in a similar study in South eastern Nigeria which had mean age of 41.7±18.5.[26] Most of the participants were however women, in keeping with previous findings from a similar Nigerian study which reported 52.1% of their participants as women.[26] The unemployed proportion of our participants was also higher than previous Nigerian studies that reported 15% unemployed.[26] This might however be in keeping with the general trend towards increasing unemployment due to economic factors. Most were also urban dwellers, which was expected since our study site was urban. A similar community-based study had reported only 45% of its subjects as urban dwellers.[27]

Only a small proportion of the participants had family history of hypertension and type 2 diabetes mellitus. This is unusual in a cohort of hypertensives but may reflect a high rate of undiagnosed hypertension in their family members. Our study did not explore concordance linkages but this might be a significant avenue for exploration. An even smaller proportion reported that they had been previously diagnosed with co-morbidities like type 2 diabetes. It is known that exercise also benefits those with morbidities as shown by Duclos et al.[28]

The mean BMI of the study participants was in the overweight range and was comparable to the findings of Ezenyiwa et al.[29] The participants' mean systolic blood pressure was however lower than that reported by Ezeyinwa and colleagues who had a mean systolic blood pressure of 154.22±23.56 for men and 150.80±26.44 for women.[29] Our findings could be explained by the fact that our participants were relatively newly diagnosed hypertensives on medications for four weeks or less.

The study participants in this clinic based study were mainly sedentary. This was also reported by an Eastern Nigerian study which found that most of the participants of a community based study were physically inactive.[27] The findings of increased BMI coupled with very high rates of physical inactivity in this cohort of hypertensives was disturbing in view of the significant increase in cardiovascular risk it indicates.

Most participants were also in inactive stages of change. This is similar to an earlier study by van Sluijs et al who reported 60% in inactive stage.[30] Another American study by Sbrocco et al among African-American women however reported 31% as inactive.[31] Both studies had significantly higher proportion of actives compared to our study. This would imply that in addition to the fact that most hypertensives in our study were physically inactive, a very high proportion were also psychologically inactive. Our participants were mostly drawn from outpatient hypertensives who had recently been started on medications. This should be the cohort of

hypertensives more likely practicing non-pharmacological measures including exercise. It is therefore a cause of concern in view of the potentiation of the risk for cardiovascular events in such patients.

This study showed that unemployed or retired hypertensives were twice more likely to be in active stage of behavior change compared to the employed. A previous report from a Swedish population showed association between employment status and physical activity but with varying results.[20] A US study reported by van Domelen et al[32] also showed a significant relationship between employment status and physical activity. Grayson et al[33] in 1993 and 1996 reported better health and physical activity level of employed versus the unemployed. Similarly, Oyeyemi et al[29] in Maiduguri, North east Nigeria, reported that physical activity was positively associated with blue collar work but negatively associated with car ownership.

The fact that the unemployed and retired were more likely to be in active stages of change may be a pointer to fact that work places and work schedules generally do not support physical activity among employed adult Nigerian hypertensives. It may also be a pointer to the fact that busy people like the unemployed fail to realize that they are far from the exercise requirements that would improve their health and prevent cardiovascular events.

Conclusion

This study found that most hypertensives (83.6%) in the outpatient setting are in inactive stages of change, either pre-contemplation or contemplation. Unemployed or retired hypertensives were more likely to be in active stage of behavior change. This calls for physicians managing hypertensives in outpatient settings to institute measurement of stage of physical change as routine precursors to non-pharmacological management particularly exercise prescription. It also implies that more cognitive-based change counselling strategies should be employed in such settings, and that exercise prescriptions should consider employment status. Researchers should also explore workplace factors influencing physical activity in workers especially hypertensives.

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