JOURNAL OF BEHAVIORAL HEALTH, 2018
VOL 7, NO. 1, PAGE 20–28
10.5455/jbh.20171013045005

eJManager

ORIGINAL RESEARCH

Open Access

Women with chronic conditions: Influence of selected psychosocial factors on exercise and physical activity level

Omoyemi O. Ogwumike,[1,2] Sola D. Olashore,[1,3] Ade F. Adeniyi[1,2]

[1]Department of Physiotherapy, College of Medicine, University of Ibadan, Ibadan, Nigeria

[2]Department of Physiotherapy, University College Hospital, Ibadan, Nigeria

[3]Department of Physiotherapy, State Hospital, Ijebu Ode, Nigeria

ABSTRACT

Background: Women in the menopausal transition experience body changes directly related to hormonal variation. Decrease in estrogen level may start a rapid decline in muscular strength, bone mineral density, aerobic fitness, and increased body weight. All these in turn are associated with development of chronic conditions such as hypertension, heart disease, diabetes, and others. Psychosocial factors have been documented as being capable of influencing physical activity (PA) in chronic conditions.

Objective: Influence of psychosocial factors such as self-efficacy, family support, and perceived barriers to exercise and PA level of menopausal women with chronic conditions were investigated in this study.

Methods: A cross-sectional survey in which women with hypertension, diabetes, and osteoarthritis were recruited from secondary and tertiary health centers in Ibadan and Ijebu-Ode in Oyo and Ogun States of Nigeria, respectively, after obtaining their informed consents. PA was assessed with the International Physical Activity Questionnaire, while Exercise Self-efficacy Scale and family version of the social support questionnaire as well as barrier scale of the Exercise Benefit and Barrier Scale were used to assess psychosocial variables and perceived barriers to exercise, respectively. Data were analyzed using Chi-square and logistic regression analysis at $P = 0.05$.

Results: Three hundred and five women, predominantly postmenopausal 249 (83.8%) participated in the study and hypertension 117 (38.4%) was the most prevalent chronic condition. Majority 212 (69.5%) reported low PA level with 138 (45.2%) reporting high barriers to exercise. Significant direct association between PA level and exercise self-efficacy ($P < 0.05$) was reported while a significantly negative association was reported between PA level and perceived barriers ($p < 0.05$). No significant association was observed between PA and family support.

Conclusion: Self-efficacy and perceived barriers to exercise significantly influenced PA level and exercise of menopausal women in this study, while family support played no prominent role. Important consideration should be given to these factors during exercise prescription to menopausal women.

ARTICLE HISTORY

Received May 05, 2017
Accepted September 05, 2017
Published November 17, 2017

KEYWORDS

Menopausal women; diabetes; osteoarthritis; self-efficacy; family support; Perceived barriers

Introduction

Menopausal women are in a stage of transition consequent to hormonal changes and chronological aging. The permanent cessation of menstruation at menopause results from the loss of ovarian function and therefore represents the end of a woman's reproductive life [1]. Decrease in the estrogen level of menopausal and post-menopausal women may start a rapid decline in aerobic fitness, muscular strength, bone mineral density, and increased weight, all of which increase the risk for many chronic diseases such as coronary heart disease,

Contact Paul D. Loprinzi ✉ pdloprin@olemiss.edu Department of Health, Exercise Science and Recreation Management, The University of Mississippi, 229 Turner Center, Oxford, MS 38677, USA.

type 2 diabetes, hypertension, stroke, osteoarthritis, and osteoporosis-especially among sedentary women [2,3].

Obesity and physical inactivity are both independent risk factors for type 2 diabetes. Those at highest risk for non-insulin-dependent diabetes mellitus include the overweight or obese and particularly, those over 40 years of age [4]. The excessive free fatty acid released by adipose tissue leads to a decrease in insulin sensitivity of muscle, fat, and liver, which is followed by raised glucose levels, insulin resistance and type 2 diabetes [5]. Physical inactivity accelerates the pathogenesis of type 2 diabetes and subsequently leads to excess morbidity and mortality [6]. Physical activity (PA) behavior has been explained using the social cognitive theory (SCT) which highlights how people acquire and maintain certain behavioral patterns, while also providing the basis for intervention strategies [7]. Central to SCT and critical for the ability of individuals to engage in a sort of self-regulation is the concept of self-efficacy [8]. Self-efficacy is the idea that people decide how to behave based more on their belief in their own capabilities or accomplishment rather than in their knowledge or skills [9]. Exercise self-efficacy or one's belief in successfully performing exercise is a strong predictor of exercise behavior [10] and studies have shown that women with greater exercise self-efficacy have more significant higher PA levels [11,12]. Previous studies have established the influence of self-efficacy and perceived barriers on PA level and exercise behavior of individuals in different populations [12–15]. However, few studies [16,17] have investigated PA level of menopausal women in Nigeria and none particularly on the psychosocial factors that influence PA level of menopausal women with chronic conditions. The influence of self-efficacy, perceived barriers and family support on the PA level of menopausal women with chronic conditions in the Nigerian population was investigated in this study.

Participants and Methods

Participants for this study were menopausal women being managed for the chronic conditions: osteoarthritis, hypertension, and type 2 diabetes in a tertiary and two secondary health care facilities in Oyo and Ogun states, Nigeria. They were purposively selected after the rationale for the study was explained to them and they gave their informed consent. Ethical approval was obtained from the Hospital Research ethics committee of the different hospitals from where the participants were recruited. Study design was cross-sectional and it took place from April 2013 to January, 2014. The following instruments were used for assessments:

Bio-data form: A self-developed, 10-item instrument that was used to retrieve participant's socio-demographic information including age, marital status, level of education—comprising primary, secondary, postsecondary, diploma, or university education referred to as tertiary educational level. Included were also occupation and clinical information such as last menstruation, menstrual cycle status, menopausal symptoms, and health status.

Exercise Self Efficacy Scale: A 10-item self-administered questionnaire developed by Kroll et al. [18] was used to assess participants' exercise self-efficacy. A 4-point Likert scale was used to rate each item (1 = not at all true to 4 = always true). The minimum score is 10 and the maximum score is 40. A high score indicate a high level of self-efficacy and vice-versa. Scores were transformed into percentages and 25th, 50th, and 75th percentiles were used to label transformed scores into low, medium, and high levels of self-efficacy. This scale has been shown to have adequate internal consistency, test re-test reliability and concurrent validity indexes, Cronbach's α was 0.93 for the Exercise Self Efficacy Scale [18].

Exercise Benefits and Barrier Scale: A 24-item self-administered scale developed in [19 and 20] was used to assess perceived barriers to exercise and PA among participants. The instrument has two components—the barrier and benefit scales. In this study, the barrier component of 14-items was used separately. This has a minimum score of 14-indicating less perceived barriers to exercise and PA while a maximum score of 56 indicates high perceived barriers. The instrument has a four-response, forced-choice Likert format from 4 (strongly agree) to 1 (strongly disagree). The Barriers scale has a standardized Cronbach α of 0.866 while the test–retest reliability was found to be 0.89 on the total instrument. Obtained scores were transformed to percentages and the 25th, 50th, and 75th percentiles were used to classify scores into low, medium, and high levels of perceived barriers.

International Physical Activity Questionnaire (IPAQ-long form): A 27-item self-administered recall questionnaire was used to assess PA of the participants.

It assessed walking, moderate intensity, and vigorous intensity activities in each of the four domains: leisure-time PA, domestic and gardening activities, work-related PA, and transport-related PA. It also includes questions on sitting activities such as reading, television viewing, and sitting at a desk, although this is not included as part of the summary score of PA [21]. The validity and reliability of this questionnaire has been tested in over 12 countries, the overall International Physical Activity Questionnaires (IPAQs) produced repeatable data of Spearman's rho clustered around 0.8. The overall total PA of participants was determined as: total PA implies metabolic equivalent [MET) minutes/week = sum of Total (Walking + Moderate + Vigorous) MET minutes/week scores].

Social Support and Exercise Survey (Family version): This is a two part, 23-item questionnaire developed by Sallis et al. [22] to assess social support (family and friends) that individuals get when trying to improve their exercise and diet. The part concerning social support and exercise survey consisting of 13-items was used to collect data on family support in this study. The family version (sub-scale) of this questionnaire was used separately and scored separately to indicate the extent of family support participants got from their family members (those living in the same house) when trying to exercise regularly and change their exercise behavior. Cronbach's α coefficients for the family support was 0.89. An 8-point Likert scale (1 = none to 8 = does not apply) was used to rate each item. According to the developers, in scoring either the scales "8" was recoded to "1" and family participation is the sum of items 11–16 and 20–23 and family rewards and punishment (an optional scale): sum items 17–19 [22]. Obtained scores were transformed into a percentage score. The 25th, 50th, and 75th percentiles were used to label transformed scores into low, medium, and high levels of family support.

Data were summarized using descriptives. Bivariate analysis was done to determine level of associations between PA and participant psychosocial variables. Logistic regression model was also used to determine psychosocial predictors of PA in participants.

Results

Characteristics of participants

Participants in this study were 305 women with either one of osteoarthritis, hypertension, and diabetes, age range (40–83) years, modal age (50–59) years and they were predominantly postmenopausal 249 (71.9%). Most were married 191 (63.2%), of tertiary educational level 192 (49.8%) and employed 203 (63.6%). Hypertension was the most common health condition reported by 117 (38.4%) of the participants while sleeplessness 164 (53.8%) was the most common menopausal symptom. All these are as shown in Table 1. A bi-variate analysis of characteristics of participants in association with PA level is as shown in Table 2 in which age, occupation, educational status, and health problems were significantly associated with PA level.

Table 1. Characteristics of participants in the study (*N* = 305).

Variable	*n*	%
Age (years)		
40–49	35	11.5
50–59	98	32.1
60–69	97	31.8
70–83	75	24.6
Occupation		
Employed	203	66.6
Unemployed	75	24.6
Retired	27	8.9
Marital status		
Married	191	63.2
Not married/widowed	114	37.4
Educational status		
None	36	11.8
Primary/secondary	117	38.4
Tertiary	152	49.8
Level of income		
Low	234	76.7
Middle	62	20.3
High	9	3
Menstrual cycle status		
Premenopause	31	10.2
Perimenopause	25	8.2
Postmenopause	249	82
Health problems		
Diabetes	94	30.8
Hypertension	117	38.4
Osteoarthritis	51	16.7
Co-morbidities	43	14.1
Menopausal symptoms		
Sleeplessness	164	53.8
Hot flushes	42	13.8
Back pain	78	25.6
Night sweats	12	3.9
Depressive symptoms	46	15.1

n = frequency of occurrence of variable, % = percentage occurrence, Co-morbidities = diagnosis of a combination of any of the three chronic illness.

Physical activity levels of the women in chronic condition groups

Majority of the participants 212 (69.5%) reported low PA while only 94 (30.8%) reported moderate to

Table 2. Bivariate analysis of participants characteristics and physical activity level.

Variable	Physical activity level		c^2	*P*
	Low	Moderate-high		
Age group (years)				
40–49	17	18	26.3	0.000*
50–59	60	38		
60–69	67	30		
70–83	68	7		
Occupation				
Employed	127	76		
Unemployed/retired	85	17	18.6	0.000*
Marital status				
Married	128	63		
Not married/widowed	81	33	1.17	0.28
Educational status				
None	30	6		
Primary/secondary	99	18	18.2	0.000*
Tertiary	93	59		
Health problem				
Osteoarthritis	46	5		
Hypertension	82	35		
Diabetes	55	39	15.8	0.001*
Co-morbidities	29	14		
Menstrual cycle status				
Premenopause	17	14		
Perimenopause	15	10	2.86	0.24
Postmenopause	179	70		

n = frequency of occurrence of variable, % = percentage occurrence, Co-morbidities = diagnosis of a combination of any of the three chronic illness.

high PA. Participants with osteoarthritis were most unlikely to exhibit moderate to high PA level compared to those with hypertension and diabetes. This is because out of the 51 (100%) of the participants who reported having osteoarthritis 46 (90.2%) reported low PA. This can be observed in Table 3.

Psychosocial factors and physical activity level of participants

Participants with chronic conditions generally exhibited low PA level as shown in Table 3. In the bi-variate analysis of association between psychosocial factors and PA level of participants in all the conditions as presented in Table 4, exercise self-efficacy was significantly positively associated while perceived barriers to exercise were significantly negatively associated (P = 0.000 and 0.002, respectively) with PA levels of the women. Family support was, however, not significantly associated. Table 5 is also a bivariate analysis using Chi-square analysis of association between psychosocial factors and PA level of participants (with specific conditions). Here, it was observed that for women with osteoarthritis, significant positive association existed between only family support and PA level (p = 0.050); for those with hypertension, exercise self-efficacy is the variable significantly positively associated with PA level (p = 0.035) and for those with type 2 diabetes, exercise self-efficacy was significantly positively associated with PA (p = 0.022) while perceived barriers to exercise were significantly negatively associated with PA (p = 0.036). However, participants with co-morbidities exhibited significant association of all psychosocial variables with PA level with exercise self-efficacy and family support being significantly positively associated, while perceived barriers were significantly negatively associated.

Table 4. Bivariate analysis of psychosocial variables of menopausal women (all conditions) in the study and physical activity level.

Psychosocial variable	Physical activity level		c^2	*P*
	Low (*n*)	Moderate-high (*n*)		
Self-efficacy levels				
Low	79	18		
Moderate	93	39	16.78	0.000*
High	40	36		
Total	212	93		
Perceived barriers				
Low	69	54		
Moderate-high	143	39	12.14	0.002*
Total	212	93		
Family support levels				
Low	110	41		
Moderate	53	22	2.92	0.23
High	49	30		
Total	212	93		

n = frequency of occurrence of variable.

Table 3. Physical activity level of menopausal women in different chronic condition group.

Chronic condition group	Physical activity level		
	Low (%)	Moderate-high (%)	Total (%)
Osteoarthritis only	46 (90.2)	5 (9.8)	51 (100)
Hypertension only	82 (70.1)	35 (29.9)	117 (100)
Diabetes only	55 (58.5)	39 (41.5)	94 (100)
Co-morbidities	29 (67.4)	34 (32.6)	43 (100)

% = Percentage, Co-morbidities = participants with more than one chronic condition.

Table 5. Bivariate analysis (c^2) of psychosocial variables of menopausal women in the study (condition specific) with physical activity levels.

Psychosocial variable	Chronic conditions of menopausal women			
	Osteoarthritis	Hypertension	Type II diabetes	Co-morbidities
	P	P	P	P
Exercise self-efficacy	0.120	0.035*	0.022*	0.021*
Perceived barrier to exercise	0.496	0.299	0.036*	0.003*
Family support for exercise	0.050*	0.35	0.469	0.015*

P = probability values.

Table 6. Logistic regression analysis for predictors of moderate-high physical activity level among menopausal women with chronic conditions.

Psychosocial variable	Chronic conditions of menopausal women				
	All respondents	Osteoarthritis	Hypertension	Type II diabetes	Co-morbidities
	OR (95% CI) *P*-value	OR (95% CI) *P*-value	OR (95% CI) *P*-value	OR (95% CI) *P*-value	OR (95% CI) *P*-value
Exercise self efficacy					
Low	1	1	1	1	1
Moderate	1.8 (0.9–3.5) 0.059	—	2.7 (1.0–7.4) 0.050	0.4 (0.1–1.3) 0.136	7.4(1.3–44.2) 0.027
High	3.8 (2.0–7.8) 0.000	—	4.9 (1.8–13.4) 0.000	1.6 (0.5–4.9) 0.387	10.5 (1.5–76.1) 0.019
Perceived barriers					
Low	1	1	1	1	
Moderate	0.4 (0.2–0.7) 0.001	0.2 (0.02–2.9) 0.264	0.6 (0.2–1.4) 0.25	0.3 (0.1–1.0) 0.054	0.4 (0.1–2.1) 0.286
High	0.5 (0.3–0.9) 0.030	0.7 (0.8–5.5) 0.707	0.5 (0.2–1.4) 0.26	0.6 (0.7–4.5) 0.322	—
Family support					
Low	1	1	1	1	1
Moderate	1.1 (0.6–2.1) 0.731	6.15 (0.6–61.4) 0.12	1.9 (0.7–5.3) 0.202	0.7 (0.3–1.9) 0.500	1.7 (0.3–8.3) 0.513
High	1.6 (0.9–2.9) 0.093	—	0.9 (0.3–2.3) 0.768	1.4 (0.5–3.8) 0.494	12.8 (1.8–88.4) 0.010

In order to investigate the psychosocial variables most predictive of moderate to high PA in women with chronic conditions, a multivariable logistic regression analysis was carried out. This is presented in Table 6. Results here showed that: considering all participants in the study, those with moderate and high efficacy for exercise were almost twice and four times more likely to have moderate to high PA level [odds ratio (OR) = 1.8, 95% confidence interval (CI) 0.9–3.5; *P* = 0.059; OR = 3.8, 95% CI: 2.0–7.8; *P* = 0.000], respectively, compared to those with low self-efficacy for exercise. Those with moderate and high perceived barriers for exercise were less likely to engage in moderate to high PA (OR = 0.4, 95% CI: 0.2–0.7; *P* = 0.001; OR = 0.5, 95% CI: 0.3–0.9; *P* = 0.030), respectively, compared with those with low perceived barriers to exercise. Concerning family support, participants with moderate and high levels of family support were more likely to engage in moderate to high PA levels (OR = 1.1, 95% CI: 0.6–2.1; *P* = 0.731; OR = 1.6, 95% CI: 0.9–2.9; *P* = 0.093) compared to those with low level of family support. Among the women with osteoarthritis, those with moderate and high levels of perceived barriers to exercise (OR = 0.2, 95% CI: 0.02–2.9; *P* = 0.264) and (OR = 0.7, 95% CI: 0.8–5.5; *P* = 0.707), respectively, were less likely to engage in moderate to high PA than those with low level of perceived barriers. For those with hypertension, those with moderate level of exercise self-efficacy were 2.7 times more likely to be moderate to highly physically active than those with low exercise self-efficacy (OR = 2.7, 95% CI: 1.0–7.4; *p* = 0.05), those that reported high level of exercise self-efficacy were almost five times more likely to be active (OR = 4.9, 95% CI: 1.8–13.4; *p* = 0.000). For women with type 2 diabetes, those with high perceived exercise barriers were less likely to be more moderate to highly physically active (OR = 0.6, 95% CI: 0.7–4.5; *P* = 0.322) than those with low perceived barrier. Also those with high level of family support were more likely to be more moderate to highly physically active (OR = 1.4 95% CI: 0.5–3.8; *p* = 0.494) than those with low level of support.

Discussion

Socio-demographic characteristics of participants

Most participants in this study were post-menopausal women. This may be understandable

because chronic illnesses such as hypertension, diabetes, and osteoarthritis are more prevalent among older adults [23] and hypertension was the most prevalent chronic condition reported by the participants. Indeed it has been observed that hypertension is very common in most African populations [24,25] probably because most African women lead a relatively stressful lifestyle in which they usually have to combine economic pursuits with the responsibility of taking care of their homes and children [20,26]. The second most common chronic condition of the participants was diabetes; this is not an unusual observation because World Health Organization [27] described diabetes as a major public health problem. Majority of the women in this study were of low income and the menopausal symptoms mostly reported were sleeplessness and back pain.

In this study, from age-group 50–59 years, number of participants who reported low PA were almost double compared to those who reported moderate to high PA. Educational status was significantly associated with PA level such that participants with tertiary education tended to be more active than those with primary or secondary education. This may be due to the fact that higher educated women were well informed of the negative health consequences of unhealthy lifestyle behavior and particularly benefits of improved PA. This observation correlates with the findings of previous studies [13,18,28,29].

Physical activity level of women with chronic diseases

Majority of the participants in this study reported low levels of PA. Previous studies have shown that women's rate of participating in PA is commonly low and they tend to be less physically active than men [30–32]. In addition, most midlife and older adults lead sedentary lifestyles. As women reach midlife, the incidence of chronic diseases increase significantly and symptoms of various chronic conditions such as fatigue, weakness, and sleep disorders may make it more challenging to engage in health promoting behavior—PA and exercise [15]. In this study, women that presented with diabetes were more likely to be physically active than those with hypertension and osteoarthritis, women with osteoarthritis were the least likely to be physically active and this could be due to the fact that osteoarthritis is a debilitating condition that leads to pain, mobility impairment, and reduced physical functioning.

There was no significant association between menopausal status and PA level of participants and this is consistent with the findings of Im et al. [15], Ogwumike et al. [16], and Guimarães and Bapista [33]. Majority of the participants spent more time in domestic and yard activities than other forms of activities, women generally are involved in more of household duties and responsibilities.

Reported levels of self–efficacy, family support, and perceived barriers to exercise in women with chronic conditions

Majority of participants in this study reported moderate levels of exercise self-efficacy, low family support, and high perceived barriers to exercise. Quite alarming is the low level of family support for exercise that was reported by most of the participants with osteoarthritis, diabetes, and hypertension. This may be as a result of the gradual breakdown of strong family ties that was characteristic of the Nigerian family due to modernization. In fact, it may also be possible that as many families in the Nigerian population are preoccupied with the stress of making ends meet due to poor economic conditions, little or no importance is attached to leisure activities and exercise. Family members may therefore not consider it as important to encourage family members with chronic diseases to be active. In addition, majority of the participants in this study were post-menopausal women with grown-ups who probably no longer lived with them in the same household, many were also widowed, and hence may have received little or no family support and encouragement to remain active. Noteworthy is the fact that majority of the participants in this study found it strange that family members should encourage them to be active, they assume that the encouragement they receive from their healthcare provider was enough to keep them active. The observation in this study is similar to the findings of other studies that reported that social (family and friends) support in patients with chronic illness is low [34]. Majority of the respondents in each of the selected chronic condition groups reported high levels of perceived barriers to PA. Of significance is the fact that majority reported fatigue and tiredness as most important barriers to PA on physical exertion subscale. This may not be surprising because symptoms of most chronic disorders are fatigue, weakness, and sleep disorder.

Association between physical activity and psychosocial factors in women with chronic conditions

Self-efficacy

Results of this study revealed a significant positive association between self-efficacy and PA level in women with chronic conditions. Participants with higher exercise self-efficacy were likely to be more active than those with low self-efficacy. This may be because individuals with higher self-efficacy tend to have confidence in adopting and maintaining a health seeking behavior such as exercise [7] compared to those with low self-efficacy. This is consistent with the findings of several studies that revealed that women with high self-efficacy have significantly higher PA level [11,12,15].

Noteworthy is the fact that women with hypertension in this study had moderate to high levels of self-efficacy and they were about three and five times, respectively, likely to be more active than those with low self-efficacy. Thus the most important predictor of high PA level among participants with hypertension in this study was self-efficacy. This is consistent with findings of other studies [35,36].

Among post-menopausal women with chronic conditions, the most significant predictor of high PA level was high self-efficacy and this is consistent with the findings of Barnett and Spinks [12]. This may possibly be due to the fact that post-menopausal women with chronic conditions are older women that may have little confidence in their ability to be physically active due to fear of falls, sustaining injuries and pain and fatigue associated with chronic conditions. These could present as barriers to their being active, therefore only those with high exercise self-efficacy would likely remain active during this phase of life.

Perceived barriers

A significantly negative association was observed between PA level and perceived barriers to PA among participants in this study. Women with fewer perceived barriers to exercise were more likely to be physically active than those with high perceived barriers. This is consistent with the findings of Komar-Samardzija et al. [11].

This study also revealed that the level of perceived barriers was a significant predictor of PA level of women with hypertension and diabetes and this is in line with the findings of Komar-Samardzija et al. [11] and Adeniyi et al. [13]. Among women with osteoarthritis, those with moderate and high perceived barriers for exercise were less likely to engage in moderate to high PA compared with those with low perceived barriers, this may probably be due to the debilitating effect of the condition.

Family support

In this study, no significant association was observed between family support and PA level of women with hypertension, diabetes, and those with co-morbidities. The reason for this finding may be because most of the women involved in this study were post-menopausal women, many were widowed, and with grown-ups that were probably no longer living at home. Most would probably not have relied on family connections or support to remain active. In addition, as individuals with diabetes and hypertension do not present with obvious physical disabilities, family members may not perceive the need to encourage them to be physically active. This finding is in contrast to that of several other studies conducted among women with chronic conditions [11,37].

Participants with moderate to high family support were more likely to engage in moderate to high PA compared to those with low family support. Those with osteoarthritis presented with pain and physical disability thus making being physically active difficult. They may therefore have needed stronger family support for exercise. In some cases, they may even have needed family members to accompany them while they exercise. This is consistent with the findings of Rosemann et al. [38] who reported that social support was one of the predictors of PA among patients with osteoarthritis.

Limitations to the Study

In this study, use of the seven-day recall instrument—IPAQ is an obvious limitation. Participants were, however, encouraged to be as exact as possible. It was also possible that participants could have responded to some questions in the questionnaires with some element of bias thus providing some socially desirable responses. As the researcher does not have any control over this, the generalizability of the result in this study may thus be limited.

Conclusion

The three psychosocial variables investigated in this study are to be given considerable attention when prescribing exercise programs for women

with chronic conditions. This is because of their modifiable effect on the attitude of these women toward PA and exercise. Future studies may probably examine influence of patient education on exercise self-efficacy.

Funding

This work was entirely funded by the researchers.

References

[1] Jane FM, Davis SR. A practitioner's toolkit for managing the menopause. Climacteric 2014; 17:1–16.
[2] Sowers MR, La Pietra M. Menopause: its epidemiology and potential association with chronic disease. Epidemiol Rev 1995; 17:287–302.
[3] Wilson MM. Menopause. Clin Geriatr Med 2003; 19:483–506.
[4] American Diabetes Association: Clinical Practice Recommendations 2002. Expert committee on the diagnosis and classification of diabetes mellitus. Diabetes Care 2002; 25(Suppl 1):S1–147.
[5] Lewis GF, Carpentier A, Adeli K. Disordered fat storage and mobilization in the pathogenesis of insulin resistance and type 2 diabetes. Endocr Rev 2002; 23(2):201–29.
[6] La Monte MJ, Blair SN, Church TS. Physical activity and diabetes prevention. J Appl Physiol 2005; 99(3):1205–13.
[7] Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev 1997; 84(2):191–215.
[8] Bandura A. Self-efficacy. In: Ramachaudran VS (ed.). Encyclopedia of human Behavior. Academic Press, New York, NY Vol. 4, pp 71–81, 1994.
[9] Pajares. Overview of social cognitive theory and of self-efficacy [Internet]. 2002. Available via http://www.emory.edu/EDUCATION/mfp/eff.html (Accessed 19 May 2012).
[10] Sherwood NE, Jeffery RW. The behavioral determinants of exercise: implications for physical activity interventions. Annu Rev Nutr 2000; 20:21–44.
[11] Komar-Samardzija M, Braun LT, Kelthley JK, Quinn LT. Factors associated with physical activity levels in African-American women with type 2 diabetes. J Am Acad Nurse Pract 2012; 24(4):209–17.
[12] Barnett F, Spinks W. Exercise self-efficacy and perceived barriers of postmenopausal women in North Queensland. Proceedings of 2007 Australian Conference of Science and Medicine in Sport (10), From: 2007 Australian Conference of Science and Medicine in Sport, Adelaide, Australia, 13–16 October 2007.
[13] Adeniyi AF, Idowu OA, Ogwumike OO, Adeniyi CY. Comparative influence of self-efficacy, social support and perceived barriers on low physical activity development in patients with type 2 diabetes, hypertension or stroke. Ethiop J Health Sci 2012; 22(2):113–9.
[14] Anderson RL, Anderson DJ, Hurst CP. Modeling factors that influence exercise and dietary change among midlife Australian women: results from the Healthy Aging of Women Study. Maturitas 2010; 67(2):151–8.
[15] Im EO, Lee B, Hwang H, Yoo KH, Chee W, Stuifbergen A, et al. "A waste of time": Hispanic women's attitudes toward physical activity. Women Health 2010; 50(6):563–79.
[16] Ogwumike OO, Sanya AO, Arowojolu AO. Endurance exercise effect on quality of life and menopausal symptoms in Nigerian women. Afr J Med Med Sci 2011; 40:187–95.
[17] Ogwumike OO, Kaka B, Adegbemigun O, Abiona T. Health related and socio-demographic correlates of physical activity level of urban menopausal women in Nigeria. Maturitas 2012; 73:349–53.
[18] Kroll K, Kehn M, Ho P-S, Groah S. The exercise self-efficacy scale: development and psychometric properties. Int J Behav Nutr Phys Act 2001; 34:1479–85.
[19] Sechrist KR, Walker SN, Pender NJ. Development and psychometric evaluation of the exercise benefits/barriers scale. Res Nurs Health 1987; 10:357–65.
[20] Schulz A, Israel B, Williams D, Parker E, Becker A, James S. Social inequalities, stressors and self-reported health status among African American and white women in the Detroit metropolitan area. Soc Sci Med 2000; 51(11):1639–53.
[21] Hillsdon M. Tools to measure physical activity in local weight management [Internet]. 2009. Available via http://www.ipaq.ki.se (Accessed 15 July 2012).
[22] Sallis JF, Grossman RM, Pinski RB, Patterson TL, Nader PR. The development of scales to measure social support for diet and exercise behaviors. Prev Med 1987; 16:825–36.
[23] Marengoni A, Winblad B, Karp A, Fratiglioni L. Prevalence of chronic diseases and multi-morbidity among the elderly population in Sweden. Am J Public Health 2008; 98:1198–200.
[24] Opie LH, Seedat YK. Hypertension in sub-Saharan African populations. J Hum Hypertens 2005; 20:59–65.
[25] Kengne AP, Dzudie A, Sobngwi E. Heart failure in sub-Saharan Africa: a literature review with emphasis on individuals with diabetes. Vasc Health Risk Manag 2008; 4(1):123–30.
[26] Gravlee CC, Dressler WW, Bernard HR. Skin color, social classification, and blood pressure in Southeastern Puerto Rico. Am J Public Health 2005; 95:2191–7.
[27] The World Health Report. Life in the 21st century: a vision for all. Geneva, Switzerland, World Health Organization, 1998.

[28] Wilbur J, Chandler PJ, Dancy B, Lee H. Correlates of physical activity in urban Midwestern African-American women. Am J Prev Med 2003; 25(3):45–52.
[29] Cleland V, Ball K, Hume C, Timperio A, King AC, Crawford D. Individual, social and environmental correlates of physical activity among women living in socioeconomically disadvantaged neighborhoods. Soc Sci Med 2010; 70:2011–8.
[30] Behavioral Risk Factor Surveillance System Prevalence Data. Texas-2003. Physical activity [Internet]. Avaialble via http://apps.nccd.cdc.gov/brfss/display.asp?cat (Accessed 14 May 2012).
[31] Berg JA, Cromwell SL, Arnett M. Physical activity: perspectives of Mexican American and Anglo American midlife women. Health Care Women Int 2002; 23(8):894–904.
[32] Hageman PA, Walker SN, Pullen CH. Tailored versus standard Internet-delivered interventions to promote physical activity in older women. J Geriatr Phys Ther 2005; 28(1):28–33.
[33] Guimarães ACA, Baptista F. Influence of habitual physical activity on the symptoms of climacterium/menopause and the quality of life of middle-aged women. Int J Womens Health 2011; 3:319–28.
[34] Gleeson-Kreig J. Social support and physical activity in type 2 diabetes: a social-ecologic approach. Diabetes Educ 2008; 34(6):1037–44.
[35] Lee TS, Laffrey SC. Predictors of physical activity in older adults with borderline hypertension. Nurs Res 2006; 55(2):110–20.
[36] Sol BG, van der Graaf Y, van Peterson R, Visseren FL. The effect of self-efficacy on cardiovascular lifestyle. Eur J Cardiovasc Nurs 2011; 10(3):180–6.
[37] Yuan S, Weng S, Chou M, Tang YJ, Lee SH, Chen DY, et al. How family support affects physical activity (PA) among middle-aged and elderly people before and after they suffer from chronic diseases. Arch Gerontol Geriatr 2011; 53(3):274–7.
[38] Rosemann T, Kwehlem T, Lanx G, Szecsenyi J. Factors associated with physical activity of patients with osteoarthritis of the lower limbs. J Eval Clin Pract 2008; 14:288–93.