

THE EFFECTIVENESS OF SELECTED AEROBIC TRAINING ON THE MENTAL HEALTH IN NON-ATHLETE POSTMENOPAUSAL WOMEN

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Abstract

Goals: Various problems occurs with the onset of menopause in women. The purpose of this study was to examine the effectiveness of selected aerobic training on the mental health in non-athlete postmenopausal women. **Method:** 40 postmenopausal women were selected by the convenience and purposive sampling. The instrument of this study was the General Health Questionnaire (GHQ-28). The collected data were analyzed by dependent and independent T-test, Wilcoxon test, chi-Square, and two-way ANOVA. Subjects' training program was included 8 weeks running (3 sessions per week) in a 50-minute scheduling. **Results:** the mean score of intervention group was respectively 25.7 ± 6.9 and 20.1 ± 5.9 in the post-test and pre-test and it was respectively 24.5 ± 6.9 and 25 ± 7.8 in the control group. There was a significant effect in depression, social dysfunction, anxiety, and physical symptoms subscales in the experimental group ($P < 0.05$). It was no significant in none of the subscales in the control ($P > 0.05$).

Conclusion: the results of this study showed that selected aerobic training led to improve and promote mental health in non-athlete postmenopausal women.

Key words: Selected aerobic training, mental health, postmenopausal women, non-athlete

INTRODUCTION

The menopause is one of the factors that can has a negative effect on women's performance (1). The average age of onset of menopause is 48 to 55 years. Today, woman spends almost a third of her life in menopause due to the increasing of life expectancy (2). The loss of follicle function and reduction of estrogen levels is physiologically associated with many symptoms that main consequences of menopause are mainly associated with estrogen deficiency (3, 4, 5). Principal health concerns of menopausal women include vasomotor symptoms, urogenital atrophy, osteoporosis, cardiovascular disease, cancer, psychiatric symptoms, cognitive decline, and sexual problems (3, 4, 5). Menopause are divided into the following steps: 1) early menopausal transition: the menstrual cycle is long in this phase; 2) late menopausal transition: with 2 or more than 2 missed menstrual cycle and at least 60 days or more amenorrhea will be determined; 3) after an early menopause: it is defined as five years after the last menstrual period; and 4) it ends after a late menopause with the woman's death (6). Many women experience physical, hormonal and psychological changes during this period and it forms a complex stage of women's life (7). Also, the risk of psychological changes is increasing during this period (8). Women spend almost a third of their life in postmenopausal (9). It can disrupt a woman's sense of well-being due to the above-mentioned problems and it can affect women's work, social activities, leisure time, mood, concentration,

communication with others, sexual activity, enjoyment of life, and quality of life (9). Studies about quality of life and general health in postmenopausal women in Iran shows that most problems were feelings of nervousness and anxiety (63%), muscle and joint pain and fatigue (56%), depression (54%), and feeling a little patience and impatience with others (48%) (10, 11). Research evidence shows that there is a direct relationship between physical activity and bone density and the part of reduction of the bone density in the elderly may be due to lower levels of physical activity during this period and the start of sports trainings can increase bone density in individuals (12). On the other hand, researches results about the effect of physical activity on menopausal symptoms in women are contradictory so that some studies suggests the reduction (13), no change (14), and increasing (15, 16). Moilanen, et al., (2016) examined the effect of aerobic training on menopausal symptoms (17). They concluded that aerobic training for 50 minutes (four times weekly for 24 weeks) led to a significant reduction in depressive mood, headache, mood swings, and irritability in experimental group (17). Salesi and Joukar (2011) studies the effect of physical activity on postmenopausal women's happiness using Goldberg's General Health Questionnaire. Subjects participated in aerobic trainings for 8 weeks in this study (18). They concluded that sports activities had a significant effect on postmenopausal women's happiness (18). Arabameri, et al., (2010) surveyed the relationship between general health, depression

and body mass index in female and male athlete and non-athlete students in University of Tehran. The results of this study showed that there is no significant difference between athlete and non-athlete students. Athlete students had better indexes than non-athlete students (19). Luoto, et al., (2012) examined the effect of aerobic training on hot flushes and quality of life in sedentary women (n = 176), 43-63 years, (20). The intervention was unsupervised aerobic training for 50 minutes four times per week during 6 months. The results showed that aerobic training decreased significantly the frequency of hot flushes and improve quality of life, but there was no significant change in women's health subscale (20). Sattar, et al., (2012) concluded that the aquatic-resistance training was effective on quality of life in postmenopausal women (21). Imayama, et al., (2011) examined the effect of dietary weight loss and moderate-to-vigorous aerobic exercise for 225 minutes per week on quality of life in overweight/obese postmenopausal women (N=118). They concluded that physical activity program can improve the quality of life and physical function in overweight/obese postmenopausal women (22). Elavsky and McAuley (2007) expressed that walking had more effect on the improvement of mental health in postmenopausal women than yoga (23). Menopause is associated with several early and late complications that leads to reduce women's efficiency. Therefore, the prevention of menopausal symptoms is important with regard to the increasing of awareness and technological advances in order to increase the efficiency of aging. The purpose of this study was to examine the effectiveness of selected aerobic training on the mental health in non-athlete postmenopausal women due to the significant relationship between exercise and women's menopause and help planning and the use of appropriate interventions to promote mental and physical health in postmenopausal women.

MATERIAL AND METHODS

The method of research was semi empirical and design of it included pre-test and post-test with control group.

Participants

The statistical population of this study was all non-athlete postmenopausal women. 40 postmenopausal women were selected by the convenience and purposive sampling. Subjects were randomly divided into control and experimental groups.

Instruments and Tasks

The instrument of this study was the General Health Questionnaire (GHQ-28). Both groups

completed this questionnaire in the pre-test and post-test.

Procedure

Married postmenopausal women aged 50 to 60 years old, lack of physical activity in the past year, lack of kidney, thyroid, cardiovascular, diabetes, and psychological disease, lack of estrogen during the last three months, lack of special diet, and severe stressors such as first degree relatives' death during the last three months were the study criteria. The experimental and control groups were selected to survey the effect of created intervention. The experimental group did the selected aerobic training program under the supervision of a trained and experienced coach. Subjects' training program was included 8 weeks running (3 sessions per week) in a 50-minute scheduling. The training method included a 10 minute warm-up and three periods of 6 minutes of moderate-intensity running with 60 to 65 percent of maximum heart rate. There was a running 3 minutes of rest between each period of running. One minute was added to the running time as overload each week. The time of activity lasted 40 minutes in the first session and 60 minutes in the last session. The researcher controlled exercise intensity through subjects' heart rate at each stage of the exercise. Researcher offered feedback to subjects when it was necessary to increase or decrease the intensity training.

Data Analysis

The collected data were classified by descriptive statistical methods and were analyzed by dependent and independent t-test, Wilcoxon test, chi-Square, and two-way ANOVA. The SPSS software (version 21) was used for data analysis ($\alpha \leq 0.05$).

RESULTS

Subjects' age mean and standard deviation was 53.5 ± 3.31 in the experimental group and was 53.7 ± 3.11 in the control group. More subjects were married in this study so that %93 of them were married in the experimental group and %94.2 of them were married in the control group. %89.2 of subjects were housewife in the experimental group and %88.3 of them were housewife in the control group. All subjects were homogenization by researchers in terms of demographic criteria such as age, education, economic status, marital status, lack of exercise, and the onset of menopause in both groups. The results of table (1) showed that there was no significant difference between experimental and control groups in the total score of health and its subscale in the pre-test ($P > 0.05$). The results of table (2-5) showed that there was a significant difference in mental health and its subscales in

the post-test in postmenopausal women ($P < 0.05$). There was a significant difference between pre-test and post-test in the total score of mental health and depression, social dysfunction, anxiety, and physical symptoms subscales in the experimental group ($P < 0.05$). There was no significant difference between

health variable and depression, social dysfunction, anxiety, and physical symptoms subscales in the control group ($P > 0.05$). The results of two-way ANOVA showed that there was no significant difference between pre-test and post-test in the total score of mental health in postmenopausal women ($P > 0.05$).

Table 1. The mean and standard deviation of the total score of mental health in the pre-test and post-test of the experimental and control groups

Variable		Groups	Experimental Group	Control Group	
Total score of mental health	Pre-test		M±SD 25.7±6.9	M±SD 24.5±6.9	Independent T-test T=0.2 P=0.802
	Post-test		20.1±5.9	25.1±7.8	
Dependent T-test			T=8.9 P<0.0001	T=1.1 P<0.0001	

Table 2. The mean and standard deviation of depression subscale in the pre-test and post-test of the experimental and control groups

Variable		Groups	Experimental Group	Control Group	
Depression	Pre-test		M±SD 4.2±2.4	M±SD 4.1±2.3	Independent T-test T=0.5 P=0.611
	Post-test		3.1±2.1	4.3±2.2	
Dependent T-test			T=1.5 P<0.0001	T=1.5 P=0.211	

Table 3. The mean and standard deviation of social dysfunction subscale in the pre-test and post-test of the experimental and control groups

Variable		Groups	Experimental Group	Control Group	
Social dysfunction	Pre-test		M±SD 8.3±3.4	M±SD 9.1±3.2	Independent T-test T=2.7 P=0.717
	Post-test		6.1±2.2	9.3±2.0	
Dependent T-test			T=4.6 P<0.0001	T=0.6 P=0.419	

Table 4. The mean and standard deviation of physical symptoms subscale in the pre-test and post-test of the experimental and control groups

Variable		Groups	Experimental Group	Control Group	
Physical symptoms	Pre-test		M±SD 6.3±2.1	M±SD 6.1±2.6	Independent T-test T=0.1 P=0.881
	Post-test		5.2±2.2	6.2±2.8	
Dependent T-test			T=6.1 P<0.0001	T=0.2 P=0.801	

Table 5. The mean and standard deviation of anxiety subscale in the pre-test and post-test of the experimental and control groups

Variable		Groups	Experimental Group	Control Group	
Anxiety	Pre-test		M±SD 6.9±3.4	M±SD 5.2±3.2	Independent T-test T=0.3 P=0.686
	Post-test		5.7±3.1	5.3±2.8	
Dependent T-test			T=7.6 P<0.0001	T=1.3 P=0.159	

Discussion and Conclusion

The purpose of this study was to examine the effectiveness of selected aerobic training on the

mental health in non-athlete postmenopausal women. Research evidence show that sports activities can have non-athlete individuals' long-term effects on well-being, vitality, efficiency, self-esteem, and confidence in addition to their short-term effects on many factors in postmenopausal women (24). Physical activity affect the secretion of neurotransmitters that play an important role in menopause symptoms. On the other hand, it was shown that sports such as therapeutic hormone can be effective in the reduction of vasomotor symptoms and it is a proper mechanism for vasomotor symptoms (25). Vasomotor symptoms is dependent on the level of Beta-endorphin of hypothalamus. Postmenopausal women have low levels of beta-endorphins and the reduction of opioid activity in the brain. Beta endorphin produces with the increasing of physical activity that this can be one reason for the effects of exercise on the improvement of vasomotor symptoms As a result it will lead to the improvement of psychiatric symptoms in postmenopausal women that it will lead to the improvement of psychological symptoms in postmenopausal women (26). The results of this study showed that the creation of an appropriate intervention can be effective to promote mental health in post-menopausal women. These results is consistent with the results of Duff's (2008) study that he examined the effect of physical activity on psychological symptoms of menopause. He concluded that regular physical activity improves psychological symptoms of menopause (27). The increasing of endorphins levels can be the reason of the effects of physical and sports activity on the improvement of psychological symptoms of menopause (27). This is despite the fact that Endorphins also have a large impact on the human condition (27). Gutierrez and Luque expressed that showed that regular physical activity during menopause is an important and effective mechanism to prevent and reduce the symptoms of depression that this result is consistence with the results of this study (28). Elavsky and McAuley (2007) examined the effect of 4-weeks of walking (three sessions per week, each session included 1 hour with 50% of maximal oxygen consumption in the first session and with 50% of maximal oxygen consumption in the last session) and yoga in 164 non-active women (23). The results of this study showed that walking and yoga led to positive effects on menopausal symptoms, mental health, mood and physical fitness that this result is consistent with the results of this study. The results of this study

is consistent with the results of Roghani, et al.,'s (2013) study. They examined the effect of 6-weeks of training and their study showed that submaximal training led to improve postmenopausal women's physical symptoms (29). this fact that estrogen levels increases in the body after exercise and endorphin increases in the central and nervous system and its periphery with the higher concentration of estrogen and the increasing of the intense trainings so that beta endorphin levels is low in postmenopausal women than younger women (30). We can say that Physical exercise affects directly mood through releasing of endorphins and the reduction of cortisol (stress hormone) (31). Therefore, it is clear that physical exercise can increase endorphins and serotonin in body and keep them for a long time in the body and leads to improve mental health in postmenopausal women (31). The results of this study is consistence with the result of Karacan's (2010) study (32). Karacan (2010) concluded that 24-weeks of aerobic training for 55 minutes (three sessions per week) had a positive effect on physical and mental performance in postmenopausal women (32). The results of this study is consistence with the result of Shekarvey, et al.,'s (2009) study (33). Shekarvey, et al.,'s (2009) examined the relationship between physical activity and quality of life in middle-aged women (33). The results of this study showed that regular physical activity with walking improved women's quality of life. They offered the design and implement programs to encourage women to do regular and purposive walking (33). Therefore, physical activities may reduce destructive effects of menopause in women and increase self-confidence in postmenopausal women and improve their mental health. The results of this study showed that a significant percentage of postmenopausal women have mental health problems are in menopause. The need of psychological care with an appropriate and effective intervention is clear in menopause. Therefore, selected aerobic trainings are suggested to improve non-athlete postmenopausal women's mental health due to the significant relationship between all subscales of mental health and selected trainings.

Conflict of interest

The authors declare no conflict of interest.

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