

Physical Activity Training and Middle-Aged Females' Quality of Life

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Abstract

Background: Despite the great benefits of physical activity, immobility is still a major health problem among females. Regular physical activity is associated with higher levels of health status and better quality of life.

Objectives: The current study aimed to evaluate the effects of physical activity training on middle-aged females' quality of life.

Methods: This randomized controlled field trial was conducted on 88 middle-aged females who referred to Nehbandan district healthcare center, Nehbandan, Iran. The females were randomly and evenly allocated into a control and an experimental group. Then, an eight-session physical activity training program was implemented for the females in the experimental group. Study data were collected both before and one month after the intervention on a self-report basis and by the short-form 36-item quality of life questionnaire (SF-36) and two seven-choice questions to assess the length of physical activity in the past two weeks. Finally, the data were transferred to the SPSS ver. 16 and analyzed through running the Kolmogorov-Smirnov, the paired- and the independent-samples T, the Mann-Whitney U, the Wilcoxon, and the Chi-square tests. The level of significance was 0.05.

Results: Before the intervention, the means of quality of life in the experimental and the control groups were 67.77 ± 17.39 and 67.57 ± 14.18 which increased respectively to 81.66 ± 11.88 and 69.00 ± 14.81 after the intervention. The difference between the groups regarding the pretest values of quality of life was not statistically significant ($P = 0.72$); while after the intervention, this difference was statistically significant ($P = 0.001$). On the other hand, the pretest mean values of physical activity duration in the groups were 45.00 ± 30.53 and 43.24 ± 42.31 which increased respectively to 158.45 ± 53.35 and 58.75 ± 55.39 minutes after the intervention. Again, intergroup difference regarding the pretest values of physical activity duration was insignificant ($P = 0.82$); while after the intervention, this difference was statistically significant ($P = 0.001$).

Conclusions: Active engagement in physical activities has positive effects on middle-aged females' quality of life. Therefore, developing and implementing training intervention is recommended to improve middle-aged females' quality of life.

Keywords: Training, Quality of Life, Physical Activity, Middle-Aged Females, SF-36

1. Background

Middle-aged adults have a pivotal role in maintaining and promoting family health and thus, their disability or death can affect all aspects of family health. Middle-aged females usually manage the health of their family members from infants to elder adults. However, they often pay little attention to their own health and allocate the lowest amount of time to it (1).

Compared with males, middle-aged females experience more age-related health changes. During middle adulthood, they usually face physical and mood changes such as facial wrinkles, physical weakness, immobility, weight gain, negative mood, etc. Therefore, paying attention to their lifestyle and quality of life (QOL) can help improve their own, their families' and community health (2).

QOL attracted considerable attention during the recent decades. Evaluating and publishing annual QOL indicators and ranking the countries based on them denote the growing importance of QOL. QOL is a multidimen-

sional concept which includes dimensions such as physical health, mental health, financial status, personal beliefs and interaction with environment (3). The physical dimension of QOL represents people's perceptions of their ability to do daily life activities, while its mental dimension deals with their perceptions of the meaning and the purpose in life and includes conditions such as depression, fear, happiness and peace. On the other hand, the social dimension of QOL relates to interactions with family members and environment. One of the most effective strategies to improve adults' QOL and life satisfaction is physical activity (4).

Different studies are conducted to evaluate the effects of educational interventions on QOL (5-7). However, most of these studies were conducted on people other than middle-aged adults or without paying special attention to physical activity. For instance, Haghghatian found that females who lived in Isfahan, Iran, had a moderate level of QOL, while their scores of the social functioning and the vitality dimensions of QOL were much less than other di-

mensions (8). Dunning et al. also performed a gender analysis of QOL and found that being middle-aged was an important predictor of females' QOL (9).

Physical fitness and body composition are the key elements in successful adaptation to environment; therefore, poor physical fitness and body composition can negatively affect psychological health and well-being. Therefore, high levels of physical health, well-being and fitness can reflect high levels of general health and QOL (3).

One of the most important indicators of health and well-being is the amount of daily physical activity. A sedentary lifestyle is associated with a greater risk to develop many chronic conditions. Currently, there are two million deaths each year in the world due to a sedentary lifestyle. It is estimated that 60% of the world population do not perform the minimum amount of the recommended level of moderate-intensity physical activity.

Physical activity is defined as any kind of body movements which happens due to muscular contraction or relaxation and necessitates energy consumption. The minimum amount of physical activity to maintain and promote adults' health is 30 minutes per day of moderate-intensity activity for five days a week (10). The results of a study conducted in the United States revealed that the amount of physical activity among females was less than that of males; therefore, immobility rate among females and males were 35.4% and 40.9%, respectively (11, 12). Enjebab et al. also found that the mean of females' physical activity was 1.7% which reflects a very low amount of physical activity (13). One of the most important strategies to promote middle-aged females' physical activity and QOL is educational interventions.

Given the importance of physical activity to health and QOL, increased rate of immobility in middle adulthood and improved life expectancy in Iran, special attention is needed to support middle-aged females' physical, psychological and social health.

2. Objectives

The current study aimed to evaluate the effects of physical activity training on middle-aged females' QOL.

3. Methods

This randomized controlled field trial was conducted on 88 middle-aged (30 - 55 year-old) females who referred to Nehbandan district healthcare center, Nehbandan, Iran. Sample size was calculated based on the findings reported by Solhi et al., a power of 90%, a confidence level of 95%, and a potential attrition rate of 7%. Accordingly, the sample size

calculation formula to compare the means of two populations revealed that 60 females were needed for each study group (14).

The inclusion criteria were to have the basic literacy skills and not to experience menopause, joint disorders, diabetes mellitus, hypertension, mental disorders or any disability which prevented regular participation in training sessions. Primarily, authors referred to the medical records units of the study setting and retrieved the records of middle-aged females. Then, the females were called and invited to the study. Subsequently, 120 middle-aged females were selected conveniently and allocated to the experimental and control groups.

Data collection tools included the short-form 36-item quality of life questionnaire (SF-36), two seven-choice questions to assess the amount of physical activity in the past two weeks, and a demographic questionnaire. These questionnaires were completed by the participants twice, i.e., before and after the study intervention. The SF-36 includes 36 items in the eight domains of general health, physical functioning, physical role limitation, emotional role limitation, mental health, bodily pain, social functioning and vitality. The purpose of this questionnaire is to assess both physical and mental aspects of health. This questionnaire can be applied to people of different age groups and other characteristics. Each SF-36 item is scored on a 0 - 100 scale. Besides, the total SF-36 score also ranges from 0 to 100 which respectively reflect the lowest and the highest levels of QOL.

The Persian version of the SF-36 is reported to have acceptable validity and reliability ($r = 0.7 - 0.9$) (15). In a study on the relationship of family communication patterns and students' QOL, Rahimi et al. assessed the reliability of the SF-36 through examining the correlation of the score of each item with the total score of the corresponding domain and reported that all correlations were statistically significant. They also reported that the Cronbach's alpha values of the SF-36 domains were as follows: general health: 0.70; physical functioning: 0.60; physical role limitation: 0.67; emotional role limitation: 0.65; mental health: 0.77; bodily pain: 0.70; social functioning: 0.65 and vitality: 0.77. These values confirmed the acceptable reliability of the questionnaire (16). Authors also evaluated the reliability of the SF-36 through calculating Cronbach's alpha. Accordingly, 30 middle-aged females who participated in the current study were asked to complete the questionnaire. The total Cronbach's alpha of the questionnaire was 0.91 while the alpha values of its domains were as follows: general health: 0.91; physical functioning: 0.95; physical role limitation: 0.89; emotional role limitation: 0.85; mental health: 0.90; bodily pain: 0.89; social functioning: 0.85 and vitality: 0.93.

Females' weekly physical activity was assessed by asking two seven-item questions. Ahmadi et al. reported that the correlation coefficient of these two questions were 0.84, confirming their reliability (17). These two questions measured the amount of daily time allocated to perform physical activity and the number of days in the past week allocated to perform physical activity. Therefore, the total amount of weekly physical activity was calculated in minutes through multiplying the number of days in which physical activity is done by the amount of time allocated to perform physical activity in each day.

To implement the training intervention, initially, the participants' educational needs were identified based on the pretest scores of the SF-36. The contents of the training program included: the importance of females' role in families, the importance of daily physical activity, the positive effects of simple physical activities (such as walking) on health and strategies to strengthen social relationships. Theoretical training was provided to the participants in the experimental group in five one-hour sessions by using teaching methods such as group discussion, lecture and video and PowerPoint presentations. The sessions were held by the first author. Besides, a written training package was also provided to the participants. After the theoretical training sessions, three 1.5-hour recreational practical training sessions were also held, which included one group walking session and two sessions on performing aerobic activities. The number of participants in each training session was 15. The study intervention lasted one month. The posttest was performed one month after the study intervention.

Participants who were reluctant to remain in the study, had two or more absentees from the training sessions, or filled out their questionnaires incompletely were excluded ($n = 32$). Consequently, the data retrieved from 88 females (44 in each group) were included in final data analysis. The data were analyzed by the SPSS ver. 16.0 at a significance level of less than 0.05. Primarily, the normality of the data was assessed through running the Kolmogorov-Smirnov test. Intragroup and intergroup comparisons of QOL and physical activity were performed by doing the paired- and the independent-samples T tests, respectively. The data with non-normal distribution were analyzed by the Mann-Whitney U and the Wilcoxon tests. Moreover, the study groups were compared with each other regarding variables such as marital, educational, and employment status by conducting the Chi-square test.

An ethical approval was obtained from the ethics committee of Birjand University of Medical Sciences, Birjand, Iran. The approval code was IR.BUMS.1394.100. Participation in the study was voluntary. The participants were ensured about keeping their data confidential. At the end

of the study, the written training package was also provided to the females in the control group and a two-hour training session was held for them. The present article was extracted from a Master's thesis in health education and promotion approved by Birjand University of Medical Sciences, Birjand, Iran, under the approval code B9303.

4. Results

The means of participants' age and body mass index (BMI) in the experimental and the control groups were 40.07 ± 7.82 and 40.91 ± 7.04 years and 24.09 ± 3.71 and 25.23 ± 4.11 kg/m², respectively. Most of the females in both groups were married and housewives. In addition, most of the females in the control group (52.3%) held primary education degree while most of the females in the experimental group (50%) held high school diploma or higher. There were no significant differences between the groups regarding the participants' age, BMI, and marital, educational, and employment status ($P > 0.05$) (Table 1).

Before the study, the mean of physical activity time in the experimental group (45.00 ± 30.53 minutes) was not significantly different from that of the control group (43.24 ± 42.31). However, after the study, the mean of physical activity time significantly increased in both groups. The amount of this increase in the experimental group was much more than that of the control group ($P = 0.001$ vs. 0.04). Moreover, intergroup difference regarding the posttest value of physical activity time was statistically significant ($P = 0.001$) (Table 2).

On the other hand, there were no significant differences between the groups regarding the pretest scores of QOL and its domains ($P > 0.05$). However, one month after the study intervention, the differences between the groups concerning the scores of QOL and its domains were statistically significant ($P < 0.05$). The only exception was related to the score of the physical role limitation domain ($P = 0.17$). Intragroup comparisons also revealed that in the experimental group, the mean scores of QOL and all its domains significantly increased after the intervention ($P < 0.05$) while in the control group, only the score of the bodily pain domain of QOL increased significantly ($P = 0.04$). Finally, except for the bodily pain and the physical role limitation domains, the differences between the groups regarding the pretest-posttest mean difference of QOL and its other domains were statistically significant (Table 3) ($P < 0.05$).

5. Discussion

The current study aimed to evaluate the effects of physical activity training on middle-aged females' QOL. Study

Table 1. Intergroup Comparison Regarding the Participants' Demographic Characteristics

Variable	Group		P-value (Chi-square Test)
	Experimental, No. (%)	Control, No. (%)	
Marital status			0.051
Single	12 (27.3)	4 (9.1)	
Married	32 (72.7)	40 (90.9)	
Employment status			0.12
Housewife	35 (79.5)	41 (93.2)	
Employed	9 (20.5)	3 (6.8)	
Educational status			0.1
Primary school	14 (31.8)	23 (52.3)	
Secondary school	8 (18.2)	8 (18.2)	
High school diploma and higher	22 (50)	13 (29.5)	

Table 2. Intergroup Comparison Regarding Pretest and Posttest Physical Activity Time

Group	Before, Mean \pm SD	After, Mean \pm SD	P Value ^a
Experimental	45 \pm 30.53	158.45 \pm 53.35	< 0.001 ^b
Control	43.24 \pm 42.31	58.75 \pm 55.39	0.04
P-value^c	0.82	< 0.001 ^d	

^aThe paired-samples T-test.

^bThe Wilcoxon test.

^cThe independent-samples T-test.

^dThe Mann-Whitney U test.

findings indicated that the training intervention was effective in improving the females' QOL and promoting their engagement in physical activity.

Before the study, the participants' QOL in the domains of general health, mental health, social functioning, bodily pain, vitality and physical role limitation was at moderate level (the scores ranged from 50 to 70) while their QOL in the domains of physical functioning and emotional role limitation was superior (greater than 70). After the study intervention, the participants' QOL in all domains, except for the vitality domain, improved to superior levels of QOL (i.e., greater than 80). Moreover, the differences between the groups regarding the posttest score of QOL and its physical functioning, emotional role limitation, bodily pain and vitality were statistically significant ($P < 0.05$). However, the intergroup difference in terms of the physical role limitation was not statistically significant ($P > 0.05$). Tavafian et al. also found that except for the bodily pain and the physical role limitation domains, their educational intervention was effective in improving other domains of QOL among females with chronic back pain

(18). In addition, Ghahremani and Mosavi implemented an eight-week educational intervention (including physical activity training three times a week, three individual counseling sessions and two group discussions) and found that it significantly improved all domains of QOL among elderly people (19).

The study findings also showed that the training intervention based on group discussions and group walking significantly improved middle-aged females' QOL in the mental health domain. Group discussions and brain storming might improve the females' mental health through facilitating their self-expression. In agreement with the current study findings, Karimi et al. also found feelings of happiness due to establishing positive relationships with others as a determining factor behind healthy people's vitality, mental persistence and QOL (20).

No significant difference was found between the study groups regarding physical activity time in the pretest. However, after the study, physical activity time significantly increased from 45 minutes to 2.5 hours per week while in the control group, it did not change significantly. This finding denoted the effectiveness of the study intervention to promote the middle-aged females' engagement in physical activity. Amini et al. also reported the same finding (21). Creating a supportive environment and encouraging the participants to engage in inexpensive physical activities such as walking can be considered as the reasons for their increased engagement in physical activity as well as their improved QOL after the study intervention. Habibi et al. also found a significant correlation between QOL and daily physical activity. In other words, they found that elderly people with more independent physical activity had better QOL (22).

Table 3. Intergroup Comparison Regarding the Scores of QOL and its Domains

QOL Score	Group	Before (Mean \pm SD)	After (Mean \pm SD)	P-value ^a	Mean Difference (Mean \pm SD)
General health	Experimental	55.45 \pm 17.97	70.11 \pm 15.1	< 0.001	14.66 \pm 15.3
	Control	55.11 \pm 17.03	57.39 \pm 16.01	0.24	2.27 \pm 12.64
	P value ^b	0.93	< 0.001		< 0.001 ^c
Mental health	Experimental	67.36 \pm 16.39	75.18 \pm 15.73	0.002	7.82 \pm 15.53
	Control	62 \pm 16.03	63 \pm 16.6	0.5	1 \pm 9.69
	P value ^b	0.12	0.001		0.02 ^c
Physical functioning	Experimental	77.05 \pm 25.37	87.73 \pm 15.31	< 0.001 ^d	10.68 \pm 19.75
	Control	76.14 \pm 20.37	74.66 \pm 20.84	0.6 ^d	-1.48 \pm 15.08
	P value ^b	0.85	0.001 ^c		0.007 ^c
Social functioning	Experimental	72.72 \pm 20.04	84.09 \pm 18.75	0.001 ^d	11.36 \pm 19.96
	Control	67.33 \pm 20.03	68.75 \pm 17.98	0.45 ^d	1.42 \pm 12.71
	P value ^b	0.21	< 0.001 ^c		0.014 ^c
Physical role limitation	Experimental	69.3 \pm 36.91	88.64 \pm 23.78	< 0.001 ^d	19.32 \pm 29.46
	Control	77.84 \pm 26.53	82.39 \pm 27.27	0.17 ^d	4.54 \pm 21.75
	P value ^b	0.46 ^c	0.17 ^c		0.008 ^c
Emotional role limitation	Experimental	73.48 \pm 37.75	96.45 \pm 17.1	< 0.001 ^d	21.97 \pm 38
	Control	70.45 \pm 36.1	80.30 \pm 31.6	0.051 ^d	9.85 \pm 31.81
	P value ^b	0.6 ^c	0.004 ^c		0.09 ^c
Bodily pain	Experimental	72.72 \pm 25.5	84.43 \pm 16.71	< 0.001 ^d	11.70 \pm 18.98
	Control	63.35 \pm 22.58	66.42 \pm 22.63	0.04 ^d	3.07 \pm 10.14
	P value ^b	0.07	< 0.001 ^c		0.054 ^c
Vitality	Experimental	62.61 \pm 18.69	72.5 \pm 19.45	0.006	9.89 \pm 22.63
	Control	60 \pm 13.93	59.43 \pm 14.91	0.76	-0.57 \pm 12.26
	P value ^b	0.46	0.001		< 0.001 ^c
Total QOL	Experimental	68.77 \pm 17.39	81.66 \pm 11.88	< 0.001 ^d	12.89 \pm 14.62
	Control	67.57 \pm 14.18	69 \pm 14.81	0.24	1.63 \pm 9.13
	P value ^b	0.72	0.001 ^c		< 0.001 ^c

Abbreviation: QOL, quality of life.

^aThe paired-samples T-test.^bThe independent-samples T-test.^cThe Mann-Whitney U test.^dThe Wilcoxon test.

The findings of the current study also indicated that the effects of physical activity training on the mental health and the social functioning domains of the middle-aged females' QOL were greater than those of the other domains. Aminshokravi et al. also found that walking (30 minutes daily for at least three days a week) had a significant correlation with the physical and the mental aspects of females' QOL. In line with the current study findings, they also found that walking was effective to improve the

score of females' mental health (23).

The current study also found that physical activity training had significant effects on the females' social functioning. The Australian national public health partnership's report in 2003 also presented that physical activity can positively affect collaboration, self-confidence, self-image, and social functioning among people of different age groups (24).

Morbidity and disability due to a sedentary lifestyle

can reduce humans' QOL. Because of their body composition and physiological characteristics, middle-aged females are at greater risk for adopting a sedentary lifestyle (3). Besides, in small cities (such as the city in which the current study was undertaken), females are at greater risk for developing psychological disorders due to specific sociocultural context and shortage of recreational and sports facilities. Consequently, developing and implementing educational and training interventions to socially and environmentally support females' engagement in physical activity can improve their QOL. Besides, future studies are recommended to identify barriers to females' engagement in physical activity and develop strategies to reduce the barriers.

One of the reasons for the effectiveness of the current study physical activity training program might be the fact that the intervention and the materials were developed based on the females' personal characteristics and educational needs. Moreover, theoretical training was provided through group discussions known to be effective in changing attitudes. This fact reflects that educational and training interventions can even affect enduring personality characteristics (25).

Among the study limitations was the fact that the study was done only on the middle-aged females who lived in urban areas. Studies showed that the QOL of females living in urban areas was better than that of the ones in rural areas. Consequently, the study findings may not be generalized to all females. Future studies are recommended to include females living both in rural and urban areas. The other study limitations were high attrition rate and data collection through the self-report method.

5.1. Conclusion

Study findings indicated that regular physical activity is among the factors for females' QOL. Simple physical activities such as walking or more intense indoor activities can improve individuals' perceptions of their own abilities, boost their morale and increase their vitality. Besides, enhancing females' awareness of the positive effects of physical activity during middle adulthood and changing their attitudes can result in behavior modifications. In addition, adequate recreational and sporting facilities should be provided for females to promote their engagement in physical activities.

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