

ORIGINAL ARTICLE

Medicine Science 2018;7(3):587-93

The effect of physical activity level at postpartum period on quality of life and depression level

Esra Karatas Okyay, Tuba Ucar

Inonu University, Faculty of Health Sciences, Department of Midwifery, Malatya, Turkey

Received 05 February 2018; Accepted 15 March 2018

Available online 02.07.2018 with doi: 10.5455/medscience.2018.07.8822

Copyright © 2018 by authors and Medicine Science Publishing Inc.

Abstract

The study was conducted to determine the effect of physical activity level on quality of life and depression level during postpartum period. The cross-sectional data used in this study was collected in seven different Family Health Centers in Malatya between April-October 2017. The sample of the study consisted of 347 women with a postpartum period of six weeks to six months registered to these Family Health Centers. Personal Information Form, the International Physical Activity Questionnaire-Short Form (IPAQ), the SF-36 Quality of Life Assessment Scale and the Edinburgh Postpartum Depression Scale (EPDS) were used to collect data. In the analysis of the data, descriptive statistics (number, percentage, mean, standard deviation) as well as chi-square test, one-way variance analysis and Pearson correlation analysis were used. The mean IPAQ score of women was 1960.6 ± 1456.7 MET-min/week, while 18.4% had low levels of physical activity, 59.7% moderate, and 21.9% had high levels of physical activity. Based on physical activity levels, significant differences were found between physical role, general health, social functioning, mental role and mental health point averages among SF-36 subscales ($p < 0.05$). There was also significant difference between EPDS point averages based on physical activity levels ($p < 0.05$). Physical activity in postpartum period was found to have a positive effect on the quality of life and postpartum depression.

Keywords: Midwifery, postpartum depression, postpartum period, physical activity, quality of life

Introduction

The postpartum period is a period of 6 weeks in which all system organs including the reproductive organs, starting with the birth of the fetus and placenta, return to their pre-pregnancy status [1]. Regular physical activity during this period affects the emotional state positively, while cardiorespiratory helps to improve well-being, to lose weight, to reduce depression and anxiety [2].

In its physical activity guidelines, World Health Organization (WHO) recommends at least 150 minutes of moderate severity, 75 minutes of high severity, or equivalent combination of moderate and severe physical activity per week for adults in the 18-64 age range [3]. Nevertheless, there is a decline in physical activity due to physiological changes during postpartum period and child care responsibilities [4]. A reduction in the level of physical activity poses a risk for chronic health problems that adversely affect women's quality of life. At the same time, postpartum contributes to the faster progression of psychological problems [5].

Psychological problems that begin with maternal blues in the postpartum period go as far as postpartum depression (PPD) and psychosis [6]. PPD is a disease that can be seen during the first

twelve months after birth, in which women experience feelings of hopelessness, loneliness, anxiety, and sadness [7]. Regular physical activity has an important role in the recovery of this condition. Studies have shown that physical activity can reduce the symptoms of depression. A natural antidepressant such as exercise also promotes brain cell development, increases the level of serotonin in the brain, and can help women get rid of the postpartum mild depression [8].

Regular physical exercise can also make significant differences not only in the recovery of psychological problems but also in the removal of unwanted habits, socialization, improvement of physiological-metabolic parameters, reduction of many chronic diseases and premature mortality risk, in other words, increasing quality of life [9]. Quality of life is a dynamic, wide-scoped and multidimensional concept that affects an individual's performance in the physical, psychological, social and spiritual aspects of life [10]. An active lifestyle is associated with better health-related quality of life. In addition, the decrease in activities decreases the quality of life by affecting the individual's work, family and social life negatively by causing physical and mental energy loss [11].

Regular physical activity is a practice that affects both physical and psychological health of women, which has positive effects on all aspects of life, including the postpartum period [12]. It is therefore necessary to examine the effect of physical activity level on quality of life and depression level in postpartum period. In this

*Corresponding Author: Esra Karatas Okyay, Inonu University, Faculty of Health Sciences, Department of Midwifery, Malatya, Turkey
E-mail: esra.okyay@inonu.edu.tr

study, it was aimed to determine the effect of physical activity level on quality of life and depression level in the postpartum period.

Material and Methods

This study was designed as a cross-sectional study and conducted in seven different Family Health Centers in Malatya Province located in eastern Turkey between April and October 2017. The universe of the study consisted of 1293 women in postpartum period between six weeks and six months registered to these Family Health Centers. When power analysis was performed, the sample size was calculated as 347 women with 5% bi-directional significance level, in a 97% confidence interval, with an 80% power. Women who applied to the specified Family Health Centers for any reason and who met the inclusion criteria were included in the study by randomized sampling. The data were collected by the researcher in about 15-20 minutes by face-to-face interview (Figure 1).

Inclusion criteria

- Those who had no trouble communicating
- Those with no health problems in mother and baby during the postpartum period (such as cardiovascular diseases, musculoskeletal problems, diabetes in the mother; and prematurity, congenital anomalies, stillbirth).

Exclusion criteria

- Those who were previously diagnosed with depression and using a psychiatric drug.

Data collection tools

Data were collected using the Personal Information Form, the International Physical Activity Questionnaire-Short Form, the SF-36 Quality of Life Assessment Scale and the Edinburgh Postpartum Depression Scale.

Personal Information Form

In the form prepared by the researcher, there are 16 questions which include the descriptive characteristics of the women (age, education level, family type, working status, parity, last delivery method, height, weight etc.).

International Physical Activity Questionnaire: International Physical Activity Questionnaire (IPAQ) was developed to determine the levels of physical activity among individuals aged 15-65, and its validity and reliability study in Turkey was conducted by Öztürk [13]. With the survey, duration (min) of severe physical activity (playing football, fast cycling, weight lifting, aerobics, etc.), duration (min) of moderate physical activity (carrying light loads, folk dancing, dancing, table tennis, etc.), and walking and average daily sitting times (min) are questioned. To calculate the total score of the form the activity durations (minutes) and the frequencies (days) are summed. The MET-minute score is calculated as the result of the summation. The ratio of energy consumption from active to energy consumption at rest is called MET [9,14].

- Walking MET-min/week = 3.3 X walking minutes X number of walking days
- Moderate MET-min/week = 4.0 X moderate activity minutes X number of days with moderate severity activities

- Severe MET-min/week = 8.0 X severe activity minutes X number of days with severe activities

Total MET-min/week = (walking + moderate + severe) MET-min/week

Classification is made for three activity levels according to the score obtained from the summation above:

- Low level = <600 MET-min/week,
- Moderate level = 600 – 3000 MET-min/week,
- High level = >3000 MET-min/week [15].

SF-36 Quality of Life Assessment Scale: The validity and reliability study of the scale was conducted in Turkey in 1992 by Koçyiğit et al. In the Turkish validity and reliability study, the Cronbach's alpha values of the subscales ranged from 0.73-0.76 [16]. In this study, the Cronbach's alpha values of the subscales were between 0.64-0.84.

SF-36 is made up of 36 items providing measurement of eight dimensions. These are; physical function, social function, role limitations due to physical problems, role limitations due to emotional problems, mental health, energy/vitality, general perception of pain and health [16]. No total score calculation is performed on the scale. The subscales are scored between 0-100 points. Zero indicates "poor health", 100 indicates "good health" [16,17].

Edinburgh Postpartum Depression Scale: Edinburgh Postpartum Depression Scale (EPDS) was developed in 1987 by Cox et al. In our country, the validity and reliability study were conducted by Engindeniz et al. and the Cronbach's alpha coefficient was found to be 0.79 [18]. In postpartum cases, EPDS had a sensitivity of 86% and a specificity of 76%. The scale consists of 10 items. It contains questions about emotional state during the last seven days. The calculation of total score is done by scoring every item between 0-3. The lowest total score that can be obtained is 0, and the highest is 30. Individuals who score 12 or more are considered to be at risk for depression [18,19]. In this study, Cronbach's alpha value of the scale was found to be 0.73.

Data analysis

Evaluation of the data was done in SPSS 16.0 package program (Statistical Package for the Social Sciences; SPSS, Chicago, IL, USA). Descriptive statistics (number, percentage, mean, standard deviation) as well as chi-square test, one-way analysis of variance and Pearson correlation analysis were used. Tukey test was used to determine the difference between the groups. The results were evaluated in a confidence interval of 95% and a significance level of $p < 0.05$.

Ethics of the research

To carry out the research, ethical approval was obtained from İnönü University Health Sciences Scientific Research and Publication Ethics Committee (No: 2017/4-5) and research permission was obtained from Turkish Public Health Institution. Before starting the study, the purpose of the study was explained to women. In addition, verbal and written consent was obtained from all women before the research was carried out.

Results

The study included 347 women who were in the postpartum period. The descriptive characteristics of the women are presented in Table 1. The average age of the women was 28.93 ± 5.24 , 46.2% of them were primary school graduates and 85% of them were not working. It was found that 61.1% of the women had expenses equal to their income, 77.2% had a nuclear family, 86.7% did not smoke and all participants did not use alcohol. The average body mass index (BMI) (kg/m²) of women was 25.37 ± 4.21 and 44.1% had normal weight (BMI = 18.5-24.9) (Table 1).

Table 1. Distribution of descriptive characteristics of women (n=347)

Variables	n	%
Age (years) (mean±SD)	28.93±5.24	
Level of education		
Not literate	5	1.4
Literate	5	1.4
Primary school	160	46.2
High school	95	27.4
University	82	23.6
Working status		
Working	52	15.0
Not working	295	85.0
Occupation (n=52)		
Officer	34	65.4
Worker	10	19.2
Self-employment	8	15.4
Social security		
Yes	302	87.0
No	45	13.0
Income status		
Less than income	122	35.2
Equivalent to income	212	61.1
More than income	13	3.7
Family type		
Nuclear family	268	77.2
Extended family	76	21.9
Shattered family	3	0.9
Body Mass Index (BMI) (kg/m²) (mean±SD)	25.37±4.21	
Underweight (BMI<18.5)	16	4.6
Normal (BMI=18.5-24.9)	153	44.1
Overweight (BMI=25-29.9)	134	38.6
Obese (BMI≥30)	44	12.7
Smoking		
Yes	46	13.3
No	301	86.7
Superior		
Yes	-	-
No	347	100

It was found that the average duration from the most recent childbirth was 17.41 ± 5.31 weeks. It was determined that 71.2% of the women were multiparous, 53.9% of them had cesarean section as last delivery method, and 38% of them had two living children. It was determined that 90.2% of the women breastfed their babies, 62% had no postpartum support, and 44.7% of those with postpartum support had mother/mother-in-law support (Table 2).

Table 2. Distribution of obstetric characteristics of women (n=347)

Variables	n	%
Time since last birth (week) (mean±SD)	17.41±5.31	
Parity		
Primiparous	100	28.8
Multiparous	247	71.2
Last type of delivery		
Vaginal	160	46.1
Cesarean section	187	53.9
Number of living children		
1	121	34.9
2	132	38.0
≥ 3	94	27.1
Number of abortion		
No	278	80.1
1	48	13.8
≥ 2	21	6.1
Breastfeeding status		
Breast feeding	313	90.2
Not breastfeed	34	9.8
Presence of postpartum support		
Yes	132	38.0
No	215	62.0
Postpartum support (n=132)		
Spouse	38	28.9
Mother / mother-in-law	59	44.7
Other (sister-in-law, sister, child)	35	26.4

Table 3 shows the distribution of the mean IPAQ, SF-36 subscales and EPDS scores. According to IPAQ, the average weekly total physical activity score of women was 1960.6 ± 1456.7 MET-min/week. Among the SF-36 subscales, mean score of physical functioning was 86.26 ± 12.00 , physical role mean score was 63.54 ± 37.05 , pain score average was 57.60 ± 19.40 , general health score average was 65.47 ± 18.40 , vitality score average was 46.88 ± 11.93 , social function score average was 77.01 ± 22.09 , mental role score average was 47.16 ± 43.38 , and mental health score average was 54.99 ± 17.68 . The mean score obtained from EPDS was 10.34 ± 4.64 (Table 3).

Table 3. The distribution of IPAQ, SF-36 subscales and EPDS mean scores (n=347)

Scales	Min-Max	Mean±SD
IPAQ Total Physical Activity (MET-min/week)	66-8946	1960.6±1456.7
Severe physical activity (met-min/week)	0-2880	29.3±222.2
Moderate physical activity (met-min/week)	0-7560	1465.9 ±1365.6
Walking physical activity (met- min/week)	0-3465	465.2±573.8
Sitting time (min/day)	180-600	385.4±102.8
SF-36 subscales		
Physical Function	35-100	86.26±12.00
Physical Role	0-100	63.54±37.05
Pain	0-90	57.60±19.40
General Health	5-95	65.47±18.40
Vitality	0-75	46.88±11.93
Social Function	12.50-100	77.01±22.09
Mental role	0-100	47.16±43.38
Mental health	8-92	54.99±17.68
EPDS Total	0-27	10.34±4.64

IPAQ: International Physical Activity Questionnaire, SF-36: SF-36 Quality of Life Assessment Scale, EPDS: Edinburgh Postpartum Depression Scale

According to IPAQ, 18.4% of the women had a low level of activity, 59.7% had a moderate level and 21.9% had a high level of physical activity (Figure 2).

Table 4 compares the mean scores of the SF-36 subscales and EPDS according to the level of physical activity. The mean scores of physical role, general health, social function and mental health of the women with moderate and high physical activity were found to

be higher than those with low physical activity, and the difference between the groups was statistically significant ($p<0.05$). It was found that the mean score of mental role was higher in women with high physical activity than those with low and moderate physical activity, and the difference between the groups was statistically significant ($p<0.05$). When EPDS scores were compared according to physical activity levels, a statistically significant difference was found between the three groups ($p<0.05$, Table 4).

Table 4. Comparison of SF-36 subscales and EPDS average scores according to physical activity level of women (n=347)

Scales	Physical Activity Level			Test and p-value	Significance
	Low physical activity level (<600 MET min/week)	Moderate physical activity level (600-3000 MET min/week)	High physical activity level (>3000 MET min/week)		
SF-36 subscales	(n=64)	(n=207)	(n=76)		
Physical Function	84.37±14.94	86.20 ±11.32	88.02 ±10.92	F=1.618 p=0.200	
Physical Role	50.78±39.83 ^a	64.73±36.78 ^b	71.05±32.92 ^c	F=5.609 p=0.004	b,c>a
Pain	54.68±22.32	57.58±18.72	60.13±18.51	F=1.370 p=0.255	
General Health	57.57±22.85 ^a	67.65±16.42 ^b	66.18±17.75 ^c	F=7.692 p=0.001	b,c>a
Vitality	43.90±10.67	47.22±12.04	48.48±12.35	F=2.789 p=0.063	
Social Function	68.75±25.68 ^a	78.20±21.39 ^b	80.75±19.08 ^c	F=6.036 p=0.003	b,c>a
Mental role	36.45±41.87 ^a	46.85±43.56 ^b	57.01±42.44 ^c	F=3.980 p=0.020	c>a,b
Mental health	48.06±19.09 ^a	56.07±17.47 ^b	57.89±15.66 ^c	F=6.525 p=0.002	
EPDS Total	12.71±4.55 ^a	10.21±4.65 ^b	8.69±3.86 ^c	F=14.25 p=0.000	a>b>c

SF-36: SF-36 Quality of Life Assessment Scale, EPDS: Edinburgh Postpartum Depression Scale

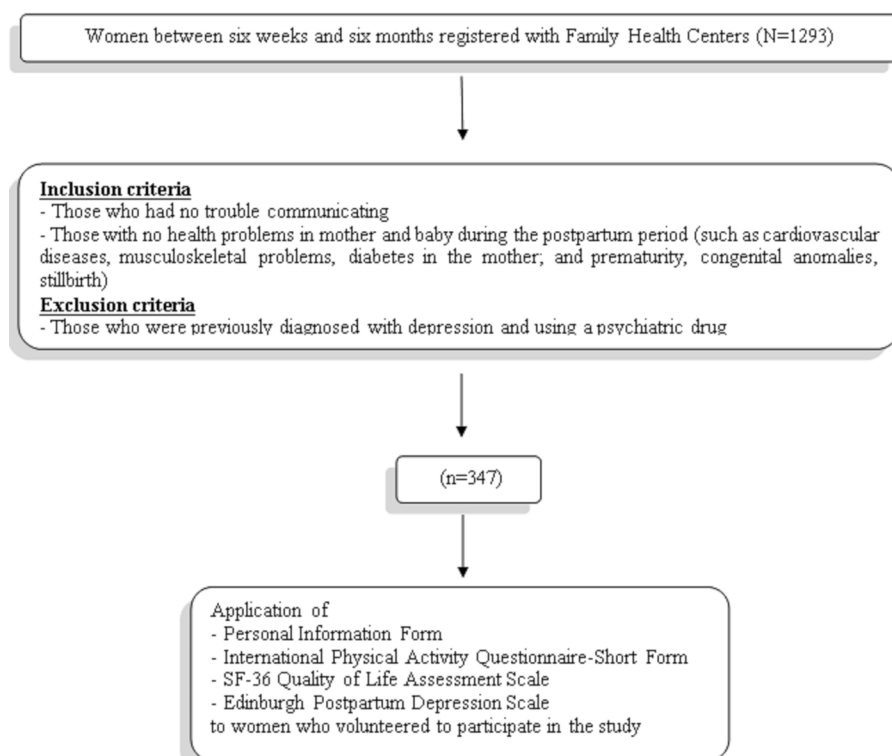


Figure 1. Flow Chart of Participants

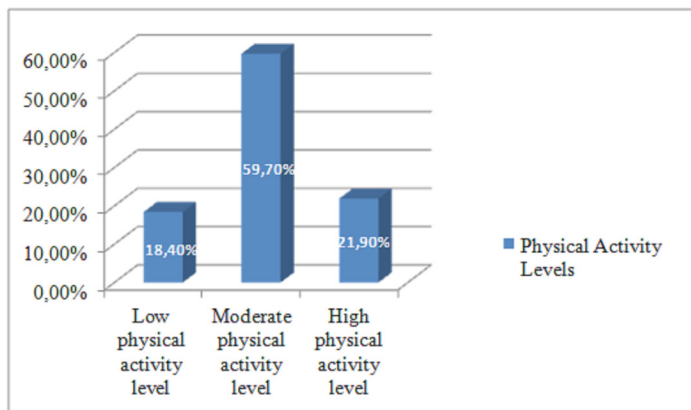


Figure 2. Physical Activity Levels of Women According to IPAQ

IPAQ: International Physical Activity Questionnaire

Table 5 shows the correlation coefficients between the average IPAQ total and the average scores SF-36 subscales and EPDS total score average. A significant positive correlation was found between IPAQ and SF-36 subscales physical role ($r=0.161$), social function ($r=0.170$), mental role ($r=0.131$) and mental health ($r=0.158$) ($p<0.05$). It was found that the relationship between IPAQ and physical function, pain, general health and vitality was not statistically significant ($p>0.05$). A significant negative correlation was found between the average total scores obtained from IPAQ and EPDS ($r=-0.266$; $p<0.05$).

Table 3. The distribution of IPAQ, SF-36 subscales and EPDS mean scores ($n=347$)

	IPAQ	
	r	p
SF-36 subscales		
Physical Function	0.101	0.060
Physical Role	0.161	0.003
Pain	0.103	0.056
General Health	0.067	0.215
Vitality	0.102	0.058
Social Function	0.170	0.001
Mental role	0.131	0.014
Mental health	0.158	0.003
EPDS Total	-0.266	0.000

IPAQ: International Physical Activity Questionnaire, SF-36: SF-36 Quality of Life Assessment Scale, EPDS: Edinburgh Postpartum Depression Scale, r: Pearson correlation coefficient

Of the women who had EPDS scores lower than 12 (low risk), it was found that 11.4% had low, 61.6% had moderate, and 27% had high level of physical activity. Of the women who had EPDS scores of 12 and above, it was found that 29.4% had low, 56.6% had moderate, and 14% had high level of physical activity ($p<0.05$, Figure 3).

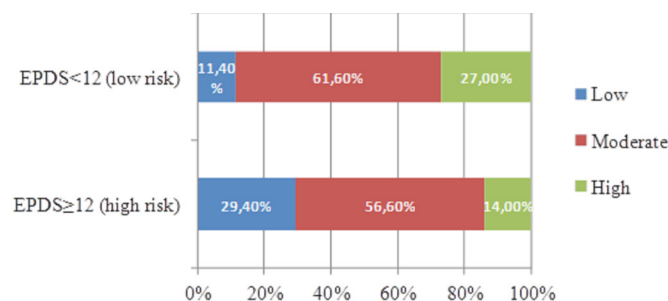


Figure 3. Distribution of physical activity levels of women according to EPDS score averages ($n=347$)

Discussion

Postpartum physical activity is a practice that affects the physiological and psychological health of women. In this study conducted to determine the effect of physical activity on the quality of life and depression level of postpartum women, it was found that the average IPAQ score of women was 1960.6 ± 1456.7 (Table 3) and most women (59.7%) had moderate physical activity (Figure 2). Similarly, in a study conducted by Adeniyi in Nigeria to determine the level of exercise in the postpartum period, 49.6% of the women were found to have moderate physical activity [20]. In our country, no study has been conducted so far on the physical activity levels of postpartum women. In studies conducted on different groups, Genç et al. found that 61.6% of women had moderate physical activity [9]. In studies conducted by Vatansever and friends with middle-aged men and women, 47.7% of women found moderate physical activity (14). These results are similar to our research findings.

Although many studies have been conducted in recent years on the relationship between physical activity and quality of life, there has been no study that focuses on the effect of this relationship on women in the postpartum period. In our study, women with moderate and high physical activity levels had a higher quality of life in terms of physical role, social function, general health and mental health subscales of SF-36 compared to women with low physical activity levels. Those with high physical activity levels had higher quality of life in terms of mental role compared to those who had low and moderate physical activity levels ($p<0.05$; Table 4). In addition, it was found that the average IPAQ scores and average SF-36 subscale scores of physical role, mental role, social function and mental health of women increased as physical activity level increased ($p<0.05$, Table 5). In parallel with our findings, Claesson et al. compared women who were obese and physically active during the pregnancy-postpartum period with women who were also obese and physically inactive during the same period. At the end of the study, they stated that physical activity during pregnancy positively affected SF-36 subscales of social function and mental role [21]. In the study conducted by Campolong et al. to investigate the relationship of quality of life and depression with exercise during pregnancy and postpartum period, it was shown that quality of life was positively affected in most areas when women with inadequate exercise during pregnancy and postpartum period were compared to those who exercised adequately [22]. In a study conducted on different groups, Lara et al. also examined the quality of life in pregnant women after a physical activity program. At the end of physical activity program, SF-36 subscales of general health, mental role and mental health were positively affected. They also noted that the applied physical activity program provided benefits related to the perception of health-related quality of life [23]. Physical activity affects positively the quality of life of all groups as well as positively affects the quality of life. In a study investigating the relationship between physical activity and quality of life in middle-aged women by Vatansever et al., it was found that as the physical activity scores of women increased, quality of life also increased in terms of social function and physical role [14].

There are also studies with results contradictory to the findings obtained in our study. In the study of Vallim et al. investigating the

effect of physical activity on quality of life in pregnant women, there was no significant relationship between physical activity and quality of life [24]. Similarly, Nascimento et al. found no significant relationship between physical activity and quality of life in another study on pregnant women [25]. We believe that individual, cultural, environmental factors and the effect of women making physical activity a part of their everyday life may have an effect on these results.

There was a significant negative correlation between the IPAQ and EPDS total score averages of the women who were included in the study (Table 5), and it was found that as the physical activity levels of women increased, the symptoms of postpartum depression decreased ($p < 0.05$; Table 4). Similarly, in a meta-analysis study conducted by Leon et al., the effect of exercise on postpartum depression was examined and it was found that physical activity in the postpartum period reduced the symptoms of postpartum depression [26]. In their study, Currie and Develin reported that even low-intensity aerobic activities such as walking with a baby cart lead to a significant reduction in symptoms of postpartum depression [27]. Walking alone, as you can see from this study, can significantly reduce the level of depression and affect the body in a positive direction. In a randomized and controlled study, McCurdy et al. examined the effect of physical activity on symptoms of mild-moderate postpartum depression and found that physical activity reduced the symptoms of mild-moderate depression [28]. In a study conducted by Craike et al. on mothers with a baby of 3-19 months, a significant negative correlation was found between physical activity and depression [29]. Other studies have shown that people who become physically active or remain so are less likely to develop clinical depression [8,30]. These results are similar to the findings of our study.

Limitations

This study has some limitations. One limitation is that the results cannot be generalized to the women across the country since the study was conducted only with the women in one city. Second, data collection has been performed by self-report using questionnaires from women that have resulted in underreporting of the conditions. Future research by using alternative methods such as interviews might obtain a more detailed.

Conclusion and Recommendations

Our findings showed that the average physical activity score of women was 1960.6 ± 1456.7 MET-min/week and the majority of women (59.7%) had moderate physical activity levels. In postpartum period, physical activity was found to have a positive effect on some areas of quality of life (physical role, general health, social function, mental role, mental health), and postpartum depression in women. We found that women with moderate and high levels of physical activity in our study had higher quality of life than SF-36 subscales in terms of physical role, general health, social functioning, and mental health. Those with high level of physical activity had a higher quality of life than those with low to moderate physical activity.

Based on these results;

- Encouraging women who do not have any problems in the postpartum period to participate in physical activities,
- Since postpartum physical activity affects women's perceptions

of quality of life and depression levels, informing women in this regard,

- Planning training programs for increasing physical activity in women,
- Providing the health personnel who will take part in these trainings with adequate information about the subject,
- And planning future studies to be prospective and repeating this study on larger samples is recommended.

Competing interests

The authors declare that they have no competing interest

Financial Disclosure

The financial support for this study was provided by the investigators themselves.

References

1. Gölbaşı Z, Eğri G. Doğum sonu dönemde annenin bakımına yönelik yapılan geleneksel uygulamalar. Cumhuriyet Tıp Dergisi. 2010;32:276-82.
2. Evenson KR, Mottola MF, Owe KM, et al. Summary of international guidelines for physical activity following pregnancy. Obstet Gynecol Surv. 2014;69:407-14.
3. World Health Organization. Global recommendations on physical activity for health. http://www.who.int/dietphysicalactivity/factsheet_recommendations/en/ access date 06.07.2017
4. Blum JW, Beaudoin CM, Caton-Lemos L. Physical activity patterns and maternal well-being in postpartum women. Matern Child Health J. 2004;8:163-9.
5. Albright CL, Steffen AD, Wilkens LR, et al. Effectiveness of a 12-month randomized clinical trial to increase physical activity in multiethnic postpartum women: Results from hawaii's nā mikimiki project. Prev Med. 2014;69:214-23.
6. Gülseren L. Doğum sonrası depresyon: Bir gözden geçirme. Türk Psikiyatri Dergisi. 1999;10:58-67.
7. Kara B, Çakmaklı P, Nacak E, et al. Doğum sonrası depresyon. Sted. 2001;10:333-4.
8. Heh SS, Huang LH, Ho SM, et al. Effectiveness of an exercise support program in reducing the severity of postnatal depression in Taiwanese women. Birth. 2008;35:60-5.
9. Genç A, Şener Ü, Karabacak H, et al. Kadın ve erkek genç erişkinler arasında fiziksel aktivite ve yaşam kalitesi farklılıklarının araştırılması. Kocatepe Tıp Dergisi. 2011;12:145-50.
10. Rezaei N, Azadi A, Zargousi R, et al. Maternal health-related quality of life and its predicting factors in the postpartum period in Iran. Scientifica (Cairo). 2016;2016:8542147.
11. Tendais I, Figueiredo B, Mota J, et al. Physical activity, health-related quality of life and depression during pregnancy. Cad Saude Publica. 2011;27:219-28.
12. Durukan E, İlhan MN, Bumin MA, Aycan S. 2 hafta-18 aylık bebeği olan annelerde postpartum depresyon sıklığı ve yaşam kalitesi. Balkan Med J. 2011;28:385-93.
13. Öztürk M. Üniversitede eğitim-öğretim gören öğrencilerde uluslararası fiziksel aktivite anketinin geçerliliği ve güvenilirliği ve fiziksel aktivite düzeylerinin belirlenmesi. Yüksek Lisans Tezi, Hacettepe Üniversitesi, Ankara, 2005.
14. Vatansever Ş, Ölçücü B, Özcan G, et al. Orta yaşlılarda fiziksel aktivite düzeyi ve yaşam kalitesi ilişkisi. Uluslararası Eğitim Bilimleri Dergisi. 2015;2:63-73.

15. Bozkuş T, Türkmen M, Kul M, et al. Beden eğitimi ve spor yüksekokulu'nda öğrenim gören öğrencilerin fiziksel aktivite düzeyleri ile sağlıklı yaşam biçimi davranışlarının belirlenmesi ve ilişkilendirilmesi. *IntJSCS*. 2013;1:49-65.
16. Koçyiğit H, Aydemir Ö, Fişek G, et al. Form-36 (KF-36)'nın Türkçe versiyonunun güvenilirliği ve geçerliliği. *İlaç ve tedavi dergisi*. 1999;12:102-6.
17. Muşlu C, Baltacı D, Kutanis R, et al. Birinci basamak ve hastanede çalışan hemşirelerde anksiyete, depresyon ve hayat kalitesi. *Konuralp Tıp Dergisi*. 2012;4:17-23.
18. Engindeniz AN, Küey L, Kültür S. Edinburgh doğum sonrası depresyon ölçeği Türkçe formu geçerlilik ve güvenilirlik çalışması. *Bahar Sempozyumları 1 Kitabı, Psikiyatri Derneği Yayınları*, Ankara, 1996;51-2.
19. Bingöl TY, Tel H. Postpartum dönemdeki kadınlarda algılanan sosyal destek ve depresyon düzeyleri ile etkileyen faktörler. *Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi*. 2007;10:1-6.
20. Adeniyi AF, Ogwumike OO, Bamikefa TR. Postpartum exercise among nigerian women: issues relating to exercise performance and self-efficacy. *ISRN Obstet Gynecol*. 2013;1:1-7.
21. Claesson IM, Klein S, Sydsjö G, et al. Physical activity and psychological well-being in obese pregnant and postpartum women attending a weight-gain restriction programme. *Midwifery*. 2014;30:11-6.
22. Campolong K, Jenkins S, Clark MM, et al. The association of exercise during pregnancy with trimester-specific and postpartum quality of life and depressive symptoms in a cohort of healthy pregnant women. *Arch Womens Ment Health*. 2017;1-10.
23. Lara JMV, Díaz LR, Rodrigo JR, et al. Calidad de vida relacionada con la salud en una población de gestantes sanas tras un programa de actividad física en el medio acuático (pafmae). *Rev Esp Salud Publica*. 2017;191:e1-10.
24. Vallim AL, Osis MJ, Cecatti JG, et al. Water exercises and quality of life during pregnancy. *Reprod Health*. 2011;8:14.
25. Nascimento SL, Surita FG, Parpinelli M, et al. The effect of an antenatal physical exercise programme on maternal/perinatal outcomes and quality of life in overweight and obese pregnant women: A randomised clinical trial. *BJOG*. 2011;118:1455-63.
26. Poyatos-León R, García-Hermoso A, Sanabria-Martínez G, et al. Effects of exercise-based interventions on postpartum depression: A meta-analysis of randomized controlled trials. *Birth*. 2017;44:200-8.
27. Currie JL, Develin E. Stroll your way to well-being: A survey of the perceived benefits, barriers, community support, and stigma associated with pram walking groups designed for new mothers, Sydney, Australia. *Health Care Women Int*. 2002;23:882-93.
28. McCurdy AP, Boulé NG, Sivak A, et al. Effects of exercise on mild-to-moderate depressive symptoms in the postpartum period. *Obstet Gynecol*. 2017;129:1087-97.
29. Craike MJ, Coleman D, MacMahon C. Direct and buffering effects of physical activity on stress-related depression in mothers of infants. *J Sport Exerc Psychol*. 2010;32:23-38.
30. Da Costa D, Lowensteyn I, Abrahamowicz M, et al. A randomized clinical trial of exercise to alleviate postpartum depressed mood. *J Psychosom Obstet Gynecol*. 2009;30:191-200.