Original Article

Association between physical activity 3-12 months after delivery and postpartum well-being

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Abstract

Background: Postpartum time is a transient time for the mother and her family, in which mothers need psycho-physical and social adaptation. This study aimed to define the association between postpartum physical activity 3-12 months after delivery and postpartum well-being.

Materials and Methods: This is a historical cohort study in which based on the primary information obtained from the physical activity questionnaire, 91 mothers were divided into two groups of postpartum light activity and moderate/heavy activity. Then, postpartum well-being in both the groups was measured by using the physical activity questionnaire.

The subjects were selected from seven health care centers through purposive convenient sampling, and the obtained data were analyzed by descriptive and analytical statistical tests.

Results: The results showed that 74.7% (*n* = 68) of the subjects had light physical activity and 25.3% (*n* = 23) had moderate and heavy physical activity. There was no significant difference in these two groups concerning physical activity. Mean score of mothers' well-being in the group of light physical activity was less than that in moderate and heavy activity.

Conclusion: The findings showed that postpartum physical activity increases postpartum well-being and having a program in this regard can promote some of the health dimensions.

Key words: Iran, mothers' well-being, physical activity, postpartum, postpartum depression

Introduction

Postpartum period exposes the mother and her family to various demands. Most of the time, mothers can cope with taking care of their infants and adapt with its familial, socioeconomic, and social consequences.[1] This period is considered as a potentially vulnerable time for women's mental health.[2]

Mothers face numerous challenges in this period, which can affect their ability to enjoy and to be satisfied with taking care of their infants.[3]

Researches show that with regard to physical activities, women have less heavy physical activity or less time for physical exercises during pregnancy and postpartum periods. During pregnancy and postpartum periods, most of the reduction in physical activity may be due to the mothers' concern about the fetal growth and post-delivery physiologic changes as well as new responsibilities of child care, respectively.[4] Now, pregnancy and postpartum periods drive women to lower physical activity; thereby, in the first 20 weeks of pregnancy, compared to antepartum period, a reduction has been reported in their level of physical activity.[5]

Meanwhile, the experts believe that achieving physical fitness is possible during pregnancy and postpartum periods through appropriate physical activities.[6] In 2008, physical activity guideline, published in the US, recommended all pregnant women and those in postpartum period to have at least 150 min of moderate to heavy weekly aerobic physical activities. It also emphasizes that the healthy women who have physical activity before pregnancy should continue their routine physical activities during pregnancy.[7] Although postpartum education is based on the fact that most of the women can gradually start their physical activities 4-6 weeks post delivery, few women follow this recommendation.[8] On the other hand, some researchers showed that lack of physical activity in nonpregnant women is accompanied with signs of depression.[9] Postpartum depression is the most serious and prevalent psychological disorder which can lead to lower healthy infant-mother communication, a reduction in mother's health level eventually, and infant growth disturbances.[10] This sort of depression is not a short-term

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disorder and sometimes can last for a year or more.[11] There are evidences showing that physical activity increases mother's well-being and women's positive mood.[12] Women need adequate feeling of healthiness and well-being to be able to take care of themselves, their infant, and their families.[13]

Individuals' ability to live properly and accomplish their social duties appropriately depend on their status of health and well-being.[14] Mother's well-being is a positive sense and individual feeling of being that generally satisfied with life, families, friends, job, etc., This variable has various dimensions including enjoying delivery period experiences, assurance of self-ability in coping with motherhood duties, satisfaction with being a mother and taking care of an infant, spouse relationship quality, spouse's participation in taking care of infant, family's and friends' support in motherhood role, satisfaction with life conditions, etc.[15]

On the other hand, Dinner in his definition of well-being indicates to theory of activity and considers that as a function of personality and general attitude toward the environment and conditions. Mother's well-being contains two cognitive and emotional components. The cognitive dimension of well-being is individuals' cognitive assessment from their satisfaction with life and the emotional dimension is associated with being exposed to upmost positive emotion and the least negative emotion.[16] Blum *et al*. (2004) in a study on women in postpartum period found that the women who had preserved or increased their physical activity during pregnancy and in postpartum period had a better mother's well-being compared to those who had either left or decreased their physical activity.[12] Norman in a study with the goal of investigating the effect of physical activity, in addition to an educational program, on mother's well-being in postpartum period concluded that physical exercises are effective in promoting of mother's well-being in postpartum period, and if these programs go on conventionally, they may decrease of disorders such as postpartum depression.[17] With regard to the importance of well-being and mental health, various researches have shown that satisfied individuals gain more positive emotions and a more positive assessment from their surrounding events.[18] The importance of a pregnant women's health is more highlighted in pregnancy and postpartum periods and should promote their physical and psychological abilities to become a mother, compared to other stages of life.[19] There are numerous studies on the effect of physical activity on health promotion and diseases such as pregnancy diabetes, pregnancy hypertension, obesity, and depression, but the association between mother's well-being and various levels of physical activity (light, moderate, and heavy) in postpartum period, which is the goal of the present study, has not been investigated in Iran so far. On the other hand, previous studies reported that most of the women have less physical activity at this period as a result of different physiologic elements, beliefs, and lack of awareness. As there are no data available about physical activity among the women in the study population and the association between this variable and mother's well-being various dimensions was not clear, this study aimed to investigate the association between postpartum physical activity 3-12 months after delivery and postpartum well-being.

Materials and Methods

This is a historical cohort study conducted in 2012 in health care centers in Dezfoul (a city in southwest of Iran) due to the availability of these centers to the researcher. The sample size in this study was 91 subjects selected by convenient purposive sampling. Inclusion criteria were having an Iranian nationality, having the least literacy to read and write, being primiparous, breast feeding, 3-12 months post delivery, single birth, and having a live, healthy, and term infant. Exclusion criteria were being under physical activity restriction due to physical and mental diseases, smoking and taking tranquilizers, having a sedentary lifestyle, and being a professional athlete. In the present study, firstly, the subjects, based on the level of physical activity obtained by physical activity questionnaire, were categorized into two groups of women with light physical activity [1.5-3 metabolic equivalent (MET)] and women with moderate and heavy physical activity (≥3 MET), and then, mothers' well-being was investigated. Data collection tool was a three-section questionnaire. The first section contained questions on subjects' demographic and fertility characteristics, and the second section included physical activity standard questionnaire based on which physical activity was divided into five groups of home activity, walking, sport activity, occupational activity, and total activity, calculated based on hours in a day or a week. Activity intensity was calculated based on MET, which is a unit to estimate metabolic expenditure. In order to calculate intensity of the activity, the number of MET of each activity was multiplied by its related consumed time in a day or a week, and the level of activity was calculated through summing up the activity intensity during a day or a week. Activity <1.5 MET was considered as no activity (which was among the exclusion criteria in the present study), activity of 1.5 < MET < 3 as light activity, and activity of ≥3 MET was considered as heavy.[20] In the present study, with regard intensive activity has seen rarely among participant according to physical activity questionnaire, firstly, for a more observable activity score in all subgroups, the activity score was numbered as 0-100, and then based on this scoring system, the group allocation was conducted.

The individuals with a score of ≤30 were assigned to light activity group and those with a score of >30 were assigned to moderate and heavy activity. The individuals with

sedentary lifestyle were left out of the study. The third section was the researcher-made questionnaire related to mother's well-being, which had been designed and prepared based on scientifically valid references containing 43 questions in seven dimensions of mother's well-being. They included "enjoying delivery period experiences," "assurance of self-ability in coping with motherhood duties," "satisfaction with being a mother and taking care of an infant," "spouse relationship quality," "spouse's participation in taking care of infant," "satisfaction with life conditions," and "family's and friends' support in motherhood role." Reliability of the standard questionnaire of physical activity was calculated and confirmed by Chasan (2004).[21] In a study conducted by Kazemi *et al.* (2006) in Isfahan University of Medical Sciences on the association between physical activity in the first 20 weeks of gestational age and the incidence of pregnancy hypertension, its reliability was revised and confirmed by Cronbach's alpha of 80% in a pilot study on 20 qualified women.[22] Mother's well-being questionnaire, with background of Blum *et al.*'s (2004) study, has the seven aforementioned dimensions.[12] After preparation of a 123-question source through factor analysis, and face and content validity tested based on the viewpoints of a panel of five experts, a questionnaire containing 43 questions was designed. Through factor analysis method, the questions with impact factor lower than 0.35 and the questions whose deletion increased Cronbach's alpha > 0.1 were deleted.

A reason to re-construct this scale was the needed ecologic validity with regard to Iranian society demographic conditions such as the role of spouse in Iranian community and its comparison with sexual partners in international studies. Descriptive and analytical statistical tests (independent *t*-test, Pearson and Spearman correlation coefficients, and logistic regression test) were adopted to analyze the data in SPSS version 17. In the present study, physical activity 3-12 months post delivery was considered as an independent variable, mother's well-being as a dependent variable, and age, education, occupation, and the time of postpartum period (months) or infant's age were considered as the confounding variables.

Results

The obtained results showed that in light activity group, 44.1% of the subjects had university and 1.5% had primary school education. In the group of moderate and heavy activity, 56.5% of the subjects had university and 13% had primary school education. In light activity group, 22.1% were employees and 77.9% were homemakers, and in moderate and heavy activity group, 13% of the subjects were employees and 87% were homemakers. The findings showed that the highest activity mean was for home activities and the lowest activity mean was for physical and recreational activities in both the groups. The results also showed that most of the subjects were in the group of women with light activity and a lower number belonged to moderate and/or heavy activity group. Mean score of mothers' well-being was significantly higher in moderate and heavy activity group compared to light activity group [Table 1]. Mean score of mothers' well-being dimensions in both the groups showed that mean scores of mothers' well-being in the dimensions of "spouse relationship quality," "spouse's participation in taking care of infant," and "family's and friends' support in motherhood role" showed no significant difference in both the groups, but in "enjoying delivery period experiences," "assurance of self-ability in coping with motherhood duties," "satisfaction with being a mother and taking care of an infant," and "satisfaction with life conditions," the mean score was significantly higher in moderate and heavy activity group compared to light activity group [Table 2].

Table 1: Mean scores of physical activity (out of 100) based on the type of activity in the two studied groups

Activity	Light activity		Moderate and heavy activity		*P* value
	M	SD	M	SD	
Home activity	34.7	6.9	51.6	5.7	<0.001
Walking	24.1	14	32.1	19.8	0.02
Physical and recreational activities	9.8	2.4	12.7	4.8	<0.001
Occupational activity	25.9	11.3	38.3	22.4	0.04
Total	23.2	4.2	34	2.8	<0.001

SD: Standard deviation

Table 2: Comparison of mean scores of mothers' well-being dimensions in the two studied groups

Group dimensions of mothers' well-being	Light activity		Moderate and heavy activity		*P* value
	M	SD	M	SD	
Enjoying delivery period experience	22.2	4	25.5	3.1	0.001
Assurance of self-ability in coping with motherhood duties	18.1	3.2	21.3	3	<0.001
Satisfaction with motherhood and taking care of infant	22.3	3.3	24.7	3.2	0.003
Spouse relationship quality	20.8	4.5	22.8	4.8	0.07
Spouse's participation in taking care of infant	19.9	5	21.5	5.7	0.19
Family's and friends' support in motherhood role	18	4.7	18.6	4.8	0.57
Satisfaction with life conditions	24.5	3.8	26.6	4.7	0.03

SD: Standard deviation

Discussion

The results of the present study showed that there was no significant difference between the highest and lowest mean scores concerning the type of physical activity in both the groups, so the highest was for home activities and the lowest for physical and recreational activities. These results are in line with study results of Kazemi *et al*. (2006) on physical activity in the first 20 weeks of pregnancy and the incidence of pregnancy hypertension.[22] These results show that in the population studied, the increase in women's physical activity in postpartum period was for home activities and not for physical and recreational activities (leisure time), while all individuals, especially mothers in postpartum period, are expected to increase their regular and leisure time activities to promote their health. In fact, paying attention to leisure time is paying attention to individual's health and promotion of their quality of life which, based on researcher's idea, is not highlighted and of low importance in Iranian mothers' community. It may be due to various reasons as doing motherhood duties is counted as a holy issue, which is surely true, but mothers should also pay attention to their own health and never ignore it. With regard to the obtained results and those of other studies, paying attention to this issue in Iranian health care system is essential. Bolum's study (2004) showed that the mothers who had preserved or increased their physical activity from pregnancy to postpartum period had a better well-being compared to those who had either lowered or left their physical activity. Bolum reported that the mothers with infants $\geq$ 6 months of age had significantly more home activities compared to those with infants $<$ 6 months of age.[12]

In the present study, home activities had the highest mean in all subjects and in both the groups. The effect of infants' age (between 3 and 12 months postpartum) was also assessed and no significant difference was observed in both the groups concerning physical activity, so most of the activities were home activities. This finding is not consistent with Blum's results and shows that Iranian mothers did not change their lifestyle or physical activities until 1 year after delivery (the time interval studied in the present study), but in Blum's study, mothers had more support and help in the first 6 months of postpartum period compared to our study population and returned to their routine and daily work after 6 months. The other reason for the inconsistency can be the higher percentage of working mothers in Blum's study compared to the present study.

With regard to the prevalence of low physical activity, 40% of Iranians face the problem of low activity[23] for which the obtained results unfortunately show a higher percentage, possibly because the women in our study population were in their first year of postpartum period and may have had less time to have regular physical activities and paid more attention to do their child care duties correctly. On the other hand, in private and governmental centers in Iran, newly delivered mothers are rarely encouraged to have regular physical activities as most of the education is related to breast feeding, child care, prevention of new pregnancies in breast feeding period, and so on.

Therefore, it is not surprising to see high prevalence of low physical activity among this community group which needs efficient strategies to amend. As indicated earlier, proper planning in child care can encourage the mothers not only to take care of their child adequately but also to have enough time to promote their own health. In this way, mothers can have a better quality of life and enjoy being a mother.

There are probably fewer domestic studies conducted in this field and further research is needed. The mothers who claim not to have enough time or energy to do physical activity should be recommended to take strategies such as getting help from their friends or family members to take care of their infants. Spouse's participation can be also helpful provided that their knowledge, awareness, and attitude concerning child care are enhanced. There are firm evidences revealing the effect of physical activity on lifting the spirit and reducing depression signs.[23] With regard to the importance of mothers' health in postpartum period and their need for health promotion in its all dimensions to cope with their new motherhood duties and to accept parental role, physical activity should be structurally designed to be able to be effective on the promotion of mothers' well-being.

The obtained results showed that mean score of mothers' well-being in the group of mothers with light activity was less than in the group of mothers with moderate or heavy activity. These results are consistent with those of Blum (2004) and Norman (2010). In Blum's study, generally, the subjects who had preserved or increased their physical activity from antepartum until postpartum period had higher scores in "spouse relationship quality," "spouse's participation in taking care of infant," and "family's and friends' support in the role of motherhood" (from dimensions of mothers' well-being) compared to those who had lowered their physical activity, which reveals better well-being of those mothers. These results are consistent with those of Sampselle *et al*. Their results showed that the subjects who did heavy exercises had better well-being in the 6 weeks of postpartum period compared to those who did not do any exercise.[24] On comparing the mean scores of various well-being dimensions, *t*-test showed that in the dimensions of

"spouse relationship quality," "spouse's participation in taking care of infant," "and "family's and friends' support in motherhood role," there was no significant difference in the two groups, but in the dimensions of "enjoying delivery period experiences," "assurance of self-ability to cope with motherhood duties," "satisfaction with being a mother and taking care of an infant," and "satisfaction with life conditions," mother's well-being score was significantly higher in the group of moderate and heavy activity compared to the group of light activity. It seems that mean scores of dimensions, in relation with the subjects themselves, have been promoted by increase of physical activity, while in dimensions related to others like "spouse's participation in taking care of infant" and "family's and friends' support in motherhood role," there was no difference between the two groups, which is also expected. Logistic regression test showed that the most important predicting factors for physical activity were the well-being dimensions of "assurance of self-ability in coping with motherhood duties," "enjoying delivery period experiences," and "family's and friends' support in motherhood role." In Bolum's study, the significant factor was related to perseverance or increase of physical activity, and family's, friends', and spouse's support. Meanwhile, in the present study, the most significant factor was "assurance of self-ability to cope with motherhood duties." This issue reveals the fact that although in the Iranian society there is much support from the side of spouse and family for newly delivered mothers, self-confidence to accept the new role and coping with new duties in life are more important factors among mothers. This point indicates that we can improve mothers' self-confidence in postpartum period through necessary education about the benefits of regular physical activity, as by increase of knowledge, not only can the family make informed decisions based on their needs and values, but also this can reduce anxiety, enhance abilities, and consequently bring about adaptation to new situations.[25] This issue can be recommended during pregnancy education (pregnancy preparation classes) and postpartum care. Results of Blum (2004) and Clapp (2000) show that the effect of regular physical activity during pregnancy and within the first postpartum year is so much and a supportive system for women during postpartum period is essential to preserve their physical activity habits.[26] Borodulin's[27] results showed that women should be encouraged to have physical activity with appropriate length and intensity in postpartum period to promote their health. Based on the existing evidences, low physical activity is associated with poor mood and mental conditions.[28] The findings of the present study showed a significant association between mother's well-being and physical activity during 3-12 months post delivery, as the mothers with moderate and heavy physical activity had higher well-being score. In this regard, planning can promote the dimensions of health. As the data were mostly based on mothers' remarks in the present study, the results could have been biased to some extent by their absent-mindedness or irrelevant remarks. The researcher tried to control this restrictive factor through designed conditions, inclusion and exclusion criteria, making proper communication with mothers, and respecting their requests during sampling.

Conclusion

Authors of the current paper show that achieving physical activities during pregnancy unfold maternal well being, especially the surprising finding that moderate /heavy activity more associated with maternal well being relative to light activity . based on findings researchers recommend women continue to have their activities in pregnancy period

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