

Study of the Impact of Educational Behavioral Interventions on Fatigue in Mothers in the Postpartum Period in the Groups of Face-to-Face and Electronic Training

Abstract

Background: Maternal fatigue in the postpartum period include factors that affect the quality of life and health of both the mother and newborn. This study aimed to investigate two educational approaches regarding mother's fatigue in the postpartum period. **Materials and Methods:** This experimental study was performed among 110 pregnant mothers during their postpartum care using random sampling. The participants were divided in three groups, namely, face-to-face, e-learning, and control groups. Interventions included individual meetings between the researcher and mothers in the face-to-face group and giving educational compact disc to the e-learning department to improve maternal fatigue. Personal information and fertility data was obtained (before training); the maternal fatigue questionnaire Fatigue Severity Scale (FSS) was completed before and after any type of (face-to-face, e-learning, and control) education. Obtained data were analyzed using one-way analysis of variance (ANOVA) and repeated-measures ANOVA. **Results:** Results showed that both face-to-face and e-learning methods had similar maternal fatigue scores. The average change on the maternal fatigue score in the second treatment was ($p = 0.02$) and the third treatment was ($p < 0.001$) among three groups that was indicative of significant statistical differences. Similarly, there was no statistically significant difference in the average maternal fatigue score between the two groups before the intervention and in the second and third groups after the intervention. Therefore, over time, the training was unaffected. **Conclusions:** The findings of this study indicate that both face-to-face and e-learning methods are effective to reduce maternal postpartum fatigue.

Keywords: Electronics education, face-to-face education, Iran, postpartum fatigue

Introduction

Becoming a mother is a crucial aspect of every woman's life and a sensitive period in which women are very vulnerable.^[1] In fact, postpartum period is a crucial stage causing stress associated with fatigue, mood changes, and sleep disturbance.^[2] Women in the postpartum period suffer from sleep deprivation, divided sleep, and significant fatigue mainly because of taking care of the infants who do not have regular sleep and wake up frequently during the night.^[3] Postpartum fatigue is a common problem that often cannot be solved spontaneously. Fatigue is one of the five main problems of women in western countries during the postpartum period.^[4] Rohi *et al.* reported that the prevalence of fatigue in Iran during the postpartum period was 23.6%.^[5] In addition to reducing mothers' ability in managing their daily activities, maternal fatigue during the postpartum period affects

certain daily activities such as the ability to breast-feed and sexual activity. It even causes high levels of fatigue-associated depression.^[6] Therefore, detecting fatigue among women in the postpartum period may be particularly important for correct identification of women at high risk of mental disorders.^[7] Participating in training courses plays an important role in improving women's quality of life during the postpartum period.^[8] There are several methods in patient training that include face-to-face training, lecture training, group training, and using electronic software.^[9] Face-to-face training (individual) is provided by an individual and offers an opportunity to exchange ideas and feelings through verbal and nonverbal methods between the trainer and learner. It also promotes relationships between individuals. Despite the numerous

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advantages of individual methods, constraints such as spending time, considerable costs and personnel, lack of free time, the need to find a lot of information in limited time, and problems in finding relatively quiet environment are among the disadvantages of this approach.^[10] Electronic training is another modern educational method, in which learners can achieve their educational goals based on their talents and in fact they learn how to learn.^[11] This type of training is learner-centered, which implies that learners can regulate their needs and requirements according to their time and location, speed, and content.^[12] Several studies have compared the effectiveness of different training methods, such as face-to-face and electronic training. Some have stressed the efficiency of the face-to-face method, whereas others confirmed the effectiveness of the electronic one; in some cases, significant differences were reported between the use of these different methods.

The study of Rajabi *et al.* on investigating the effects of education through multimedia software and face-to-face training on pregnant mothers' knowledge regarding the risk signs during pregnancy and after delivery showed that training with both the methods was equally effective in improving maternal knowledge regarding the risk signs.^[13]

The study by Mokhtari *et al.* on investigating the effects of face-to-face training and giving pamphlets regarding knowledge of nursing mothers showed that mothers' knowledge in face-to-face training groups was significantly more than the control group, and that the face-to-face training method was more effective.^[14]

Mohammadi *et al.* compared the efficacy of electronic training and booklet on satisfaction of nulliparous women and showed that electronic training increased the satisfaction levels of nulliparous women in the postpartum period.^[15]

Giallo *et al.* conducted a study on the effectiveness of psychological interventions on fatigue among mothers in the postpartum period and reported that mothers in the intervention group had fewer symptoms of fatigue, depression, anxiety, and stress than the control group.^[16]

Considering midwives' duties and their role in promoting the health of women in different life cycles, addressing the postpartum period is of significant importance, which helps to solve the problems of women during this period. Finally, with regard to the importance of cognitive behavioral training regarding mothers' fatigue in the postpartum period as well as to improve their maternal health, considering the impact of women on the health of the society, the need for extensive training with different tools in the community is felt now more than ever. Therefore, given the importance of effective and appropriate training methods in postpartum care, various methods of training are being used in the society, especially in the field of healthcare in which the most frequently used methods are lectures and

pamphlets.^[17] Therefore, we decided to study the effects of two educational methods (electronic and face-to-face) in maternal postpartum fatigue.

Materials and Methods

The present study was a clinical trial conducted in three stages with the clinical trial code number IRCT2015062722939N1. The study population was mothers who were referred to the health centers of Isfahan University of Medical Sciences in May 2015. The study sample was 110 women who had given birth. Among all the files in these centers, 10 mothers who had given birth were randomly selected based on the inclusion criteria. Convenience sampling was employed in the three groups, and replacement was done by random assignment based on weekdays. On Saturdays and Tuesdays, face-to-face training was conducted; on Sundays and Wednesdays, electronic training was provided; on Mondays and Thursdays, the treatment for the control group was assigned. Then on each day, eligible individuals were enrolled into the study by convenience sampling. Inclusion criteria were as follows: Iranian nationality or married women and mothers who delivered alive, singleton, and healthy infants, breastfeeding mothers (or exclusive breastfeeding with formula feeding), lack of bleeding during and after delivery (through interviews with the mothers), maximum postpartum hospital stay of 3 days, absence of an underlying disease (asthma, kidney disease, congestive heart failure, etc.) causing sleep disorders, lack of depression during the study (this was done using the short version of the Edinburgh postnatal depression scale based on which individuals with scores less than 13 are not considered depressed and those with scores more or equal to 13 are considered depressed), absence of hazardous conditions during pregnancy. Exclusion criteria included unwillingness to cooperate in each research stage during the study, failure to fully and correctly complete the questionnaire in the three periods, namely the beginning of the study, as well as the second and third care), postpartum depression during the study (it was diagnosed by notifying mothers, according to their understanding symptoms at the beginning of the study), indication of any new disease or disorder during the study that have an impact on the mother's and baby's sleeping.

Data in this study were collected by a two-part questionnaire, with the first part assigned to the individual characteristics and fertility of the participants. The second part of the questionnaire was the fatigue severity standard completed before training on the 10 day after delivery, as well as the second and third care after delivery and after training. The Fatigue Severity Scale was used to measure the perceived level of fatigue in different situations. This scale consists of 9 questions to which the participants were asked to show their degree of fatigue about any statement on a six-point Likert scale from 1 (completely disagree) to 6 (completely agree). The fatigue rate was obtained by

calculating the average responses for each of the statements. In other words, the total score was calculated by dividing the sum score by 9. Then the mothers were divided into three groups in terms of fatigue: mild fatigue (less than 3), moderate fatigue (3-4), and severe fatigue (equal to and greater than 4).^[18]

Participants were asked to devote 30–45 minutes of their time when they were referred for postpartum care. This was done after obtaining required permission from the authorities and when the participants referred for usual care after delivery. In face-to-face training and on the 10th day after delivery (first care), the researcher provided mothers with necessary instructions regarding the health approaches, relaxation techniques, creating and developing appropriate expectations associated with mother's sleeping, and planning to maximize opportunities for rest, feeding, sleeping place, wearing appropriate clothing, and energy saving techniques. This was done using the sleep booklet by Stremler. In the electronic learning group, training materials were sent via Bluetooth on the individuals' phones (using multimedia software), or a compact disc (CD) was given to the mothers. This compact disc contained the same content as the face-to-face training group. After explaining how to use the CD, the mother was told that, after using this software, she was going to refer for postpartum second care (day 10–28) and third care (day 29–60 day) when she was asked to dedicate half an hour to answer the researcher's questions. In the control group, however, the participants were asked to complete questionnaires without providing any recommendations on the 10th day and second care (day 10–28) and third care (day 29–60). This procedure was followed at the same time with face-to-face and electronic training groups. Between the 10th day and the second and third postnatal care. Health messages were sent to face-to-face and e-learning groups. A phone number was given to the mothers in case they had any questions. Similar to the previous stages and before participants' next referral, they were conducted by telephone to make arrangements. The sampling was performed by the researcher and interviewers who were familiar with the interview procedure. The Fatigue Severity Scale is a standard questionnaire that can be used for the clinical assessment of fatigue during the first year after delivery. The validity of the questionnaire was approved by the Pag and Millikan in the United States. In Iran, the vitality and reliability of the questionnaire were approved by Neshat (2000) using Cronbach's alpha coefficient.^[19] Descriptive and inferential statistics [analysis of variance (ANOVA), repeated-measures ANOVA, central index, least significant differences (LSD) test]. Statistical Package for the Social Sciences SPSS (SPSS Inc., Chicago, IL, USA,) version 17 were utilized to analyze the data. A *p* value of less than 0.05 was considered significant.

Using the calculated sample size, 32 mothers and infants were considered in each group, and the results were

calculated and studied statistically. Z1: is a confidence coefficient of 95%; that is 1.96. Z2: is a test power factor of 80 %; that is 0.84. S: is an estimation of the standard deviation of fatigue scores in the three groups (e-learning, face-to-face training, and control). d: is the minimum difference between the mean fatigue scores in the two groups: face to face training and e-learning, which has showed a significant difference, and which is considered to be 0.7 s.

Ethical considerations

This study was approved by the ethics committee of Isfahan University of Medical Sciences with code number IR.MUI.REC.1394.3.301. The purpose and process of this study were explained to potential participants. After signing an informed consent form, participants were enrolled in the study. Additionally, participants were informed that they could withdraw from the study at any time without loss of benefits.

Results

A total of 120 mothers and their infants were selected and referred to health centers in Isfahan on their 10th day after birth and were divided into three groups of face-to-face (*n* = 40), electronic training (*n* = 40), and control (*n* = 40). In the second postnatal care, a number of participants from each group were excluded mainly because of lack of cooperation: 5 participants from electronic group, 2 participants from the face-to-face training group, and 2 participants from the control group. In the third postnatal care, one participant from the electronic training group was excluded because of the seizures of her baby. The final analysis was performed among the remaining 110 mothers and their babies. There were 34 participants in the electronic training group and 38 in the control and face-to-face training groups.

The results showed that most of the participants had education higher than high school diploma (86.50%). The spouses of most participants were also high school diplomas or higher (78.10%). Most of the participants were housewives (85.30%) and their husbands were mostly self-employed (67.00%). In terms of pregnancy type, the highest rate was related to wanted pregnancy (80.10%), and there was no history of infertility (94.30%). Most deliveries were by cesarean section (63.70%), and the results of the deliveries were girls (53.70%). In terms of the time of delivery, most mothers had given birth in the morning (54.60%), and the majority of them slept next to their babies (95.20%). In regards to the frequency of nighttime awakening, the highest percentage of women stated that they woke up 3–4 times a night (45.30%). In addition, the majority of women were supported by their husbands (98.20%) and family (91.90%). The majority of the participants stated that sometimes they managed their sleeping time with their infants (45.50%).

The average age for most of the participants was 29.00 with a standard deviation of 5.10. The mean age of infants was 1.50 weeks. The maximum number of pregnancy and childbirth was 2 times. The highest number of children for the participants was 2.

Discussion

The results of this study showed that using both face-to-face and electronic training methods reduced maternal fatigue after delivery, however, the mean fatigue score of mothers did not show any statistically significant difference between the two groups. This decrease was significant compared to the control group [Table 1]. The mean changes in the fatigue scores in the second ($p < 0.001$) and third ($p < 0.001$) times was significantly different among the three groups [Table 2], whereas the mean fatigue score between the two groups before and after the intervention in the second and third care after childbirth did not show any statistically significant difference; therefore, the passage of time did not affect training. We can say that none of these two educational methods is preferred over the other other, and using each of these methods had the same effect in reducing the fatigue score of the mothers in this study. Therefore, the results suggested mothers' lack of awareness can have a direct relationship with the fatigue score. In fact, mothers experienced less fatigue after training. The findings of the study were consistent with those of Giallo *et al.* on evaluating the effectiveness of psychological interventions on the fatigue of mothers in the postpartum period. In the abovementioned study, mothers in the intervention

group reported fewer symptoms of fatigue, depression, anxiety, and stress than those in the control group. In the intervention group, self-care behaviors were improved, which resulted in improving the symptoms of fatigue and mental health of mothers.^[16] The results of Hassanzadeh *et al.* study also showed that both face-to-face and video methods were equally effective in affecting the attitude of patients.^[20]

On the other hand, the results of Mokhtari *et al.* showed that mothers' knowledge in the face-to-face and pamphlet training groups was significantly more than that of the control group.^[14] These results are not consistent with the results of the present study. It seems that in the study reported by Mokhtari's, face-to-face training, which is the most effective way of training, was compared with the pamphlet that is a weaker method; in this regard, it has been shown to be more effective. Nevertheless, in this study, similar to that of Hassanzadeh, face-to-face training was compared with more recent and effective training approaches. In this regard, results were identical in comparison with the two methods.

The study by Mohammadi Rizi *et al.* study also showed that electronic training can increase the satisfaction levels of nulliparous women in the postpartum period. This satisfaction was significantly higher than the control group ($p = 0.014$). In this study, postpartum satisfaction was also seen in the control group, however, this satisfaction was higher in the electronic training group. Therefore, statistically significant differences were observed between the two groups after intervention ($p = 0.010$).^[15]

Table 1: The mean and standard deviation of maternal fatigue score in three group in the first, second, and third postpartum periods

Time	E-learning	Face to face training	Control	ANOVA test	
	Mean (SD)	Mean (SD)	Mean (SD)	F	p
First care (The tenth day)	3.89(0.59)	4.00(0.62)	3.87(0.83)	0.35	0.70
Second care (up to thirtieth day)	3.41(0.46)	3.58(0.50)	3.84(0.57)	6.42	0.002
Third care (up to Sixtieth day)	3.17(0.47)	3.20(0.30)	3.72(0.59)	16.31	0.001>
Variance analyzed with repeated observations					
F	16.77	28.42	1.28		
p	<0.001	<0.001	0.29		

The results of the comparisons between each group by LSD

Groups	Second care p	Third care p
Control with e-learning	0.001	<0.001
Control with face-to-face	0.03	<0.001
Face to face with e-learning	0.16	0.78

Table 2: The mean and standard deviation of maternal fatigue score variation in the second and third care than before intervention in three group in the first, second, and third postpartum periods

Change score before and after intervention	E-learning	Face to face training	Control	ANOVA	
	Mean(SD)	Mean(SD)	Mean(SD)	F	p
Second care	-0.47(0.96)	-0.41(0.99)	-0.02(0.15)	0.01	4.08
Third care	-0.72(0.12)	-0.79(0.10)	-0.14(0.14)	<0.001	8.17

In the routine postpartum care of community health centers, there is less attention on mother's fatigue. In addition, lack of training about fatigue and seizing training opportunities for mothers can be one of the reasons for the differences in the obtained results between face-to-face training and electronic training, and it seems that there is a need for further study.

To reduce fatigue after childbirth, other practices have been cited in other studies, such as athletic training in Mohammadi *et al.* and Ashrafi *et al.* and foot massage in Bastani *et al.* and Ku *et al.*^[21-24] All these studies were influential. However, to understand which of these methods is more effective requires further investigation.

The results of this study showed that most of mothers suffered from moderate and severe fatigue. In addition to the listed trainings provided for mothers indicating reduction in maternal fatigue, investigating the reasons for various physical and mental fatigue, the techniques for reducing and resolving the fatigue were also taught to mothers. The limitation of this study was the lack of educational content in the health care for the face to face training.

Conclusion

This study showed that teaching with both methods was effective in reducing mothers' fatigue in the postpartum period. The results of this study and other studies indicated that mothers need training. Nevertheless, it was revealed that, when such methods were accessible and easier to use, they can be more effective. Furthermore, communication of service providers with the mothers is among mothers' individual needs after childbirth. Face-to-face training can be used when there is a need for long-lasting effects of education. This can be done along with the software. Mothers need to be advised to review the instructions during referral to postpartum care. This can be used to increase the effects of training longevity for a long time. In this respect, both methods can reduce postpartum maternal fatigue, and hence, it is recommended that service providers use these methods of training to solve the problems mothers' face, including postpartum fatigue.

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Conflicts of interest

There are no conflicts of interest.

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