Research Article

The Effect of Slow-Stroke Back Massage on the Anxiety Levels of Iranian Women on the First Postpartum Day

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Abstract

Background: Anxiety disorder is common during the postpartum period. Back massage relaxation techniques are one of the most important nonpharmacological interventions to prevent and control postpartum-related anxiety.

Objectives: To determine the effectiveness of slow-stroke back massage on the anxiety levels of primiparous mothers in the first days after delivery.

Materials and Methods: This single-blind controlled clinical trial consisted of 100 primiparous mothers with normal deliveries. The mothers were randomly allocated to interventional (n = 50) or control (n = 50) groups using binary blocks. Both groups were followed up just before, immediately after, and the morning after the intervention. Data were collected using a demographic questionnaire and Spielberger's state anxiety inventory (STAI) questionnaire.

Results: The mean age of the mothers was 22 years. There were no significant between-group differences in age (P = 0.333), education (P = 0.427), and medication during labor and the postpartum period (P = 0.412). There was no statistically significant difference between the mean anxiety scores of the experimental (6.66 ± 35.48) and control groups (9.05 ± 37.42) before the intervention (P = 0.268). Immediately after the massage and the next morning, there was a significant between-group difference in the anxiety scores (P < 0.001).

Conclusions: The findings demonstrate that slow-stroke back massage is a simple, inexpensive, noninvasive, and effective method to reduce the anxiety levels of primiparous women during the first postpartum day.

Keywords: Anxiety, Postpartum, Massage

1. Background

The first few days after birth are a critical period for mothers (1). Childbirth is a significant life transition event, especially for primiparous women (2). In the postpartum period, mothers are faced with multiple biological, psychological, and social changes and the need to adapt to new problems and concerns (3). Some mothers are very stressed and anxious and experience difficulties adapting to their new lives and responsibilities (4).

The postpartum period is a critical time, during which mothers may feel very fatigued, exhausted, and anxious. Anxiety is one of the most common complaints in the postpartum period. In a previous study by Denis, 30% of mothers reported experiencing anxiety in the postpartum period (5). The prevalence of postpartum anxiety was reported to be 18% in a study in Maryland in the U.S. (6) and 12.7% in a study in South Australia (2). In Vancouver, Canada, the incidence of postpartum anxiety was reported

to be 14.2% in the first week after delivery, 12.1% in the fourth week, and 9.2% in the eighth week (5). In a study on the prevalence of anxiety and fear of childbirth in the postpartum period in Tehran, Iran, 14.7% of mothers reported mild anxiety, 26% had medium-to-low anxiety, 23% had above average anxiety, 27.3% had relatively severe anxiety, and 12.7% had severe anxiety (7). In another study in Shiraz, Iran, severe postpartum anxiety was observed in 85.5% of mothers, with 14% reporting mild anxiety (8). Studies in Ramsar (9), Mashhad (10), and West Azerbaijan, Iran (11), reported that the prevalence of anxiety was 36.4%, 35.7%, 29%, and 39%, respectively. These results point to a higher prevalence of anxiety among mothers in Iran compared to that in other countries.

Anxiety may delay or prevent the release of oxytocin during the breast-feeding period and potentially interfere with the breast milk letdown reflex (12). Anxiety may strengthen avoidance behavior of mothers, as well as negatively influence the emotional bond between the mother

and infant, putting the mother-infant attachment bond at risk (13). The latter may lead to adverse psychological problems in children. (14). In addition, anxiety is a very strong predictor of postpartum depression (15), which is usually observed at the same time (2, 16). As a diagnosis of postpartum anxiety can help prevent subsequent depression (15), interventions need to be designed to reduce this disorder.

Various methods have been used to reduce anxiety, with therapeutic touch and massage some of the oldest applications (17). The prevalence of anxiety and the cost of treatment in the U.S. has led half of patients to use supplementary and alternative medicine, including massage, so that massage was the fourth most applied therapy among patients with anxiety (5.2%) (18).

Massage regulates the autonomic nervous system and therefore decreases the levels of cortisol, adrenaline, and noradrenalin. It can also adjust neural activity in the amygdale, frontal brain, and the control network. In addition, massage stimulates the sensory afferent c fibers in the skin, affecting the human body and mind. Intermittent pressure applied during massage increases blood circulation and lymphatic drainage (19), which causes changes in the heart rate and blood pressure (20). This type of therapy also causes muscle relaxation, leading to increased comfort, reduced pain, and eventually reduced anxiety (17). Relaxation in the postpartum period decreases the activity of the sympathetic nervous system and can prevent postpartum depression, and it can also increase effective mother-infant attachment (21). The use of complementary medicine in maternity care may reduce pharmacological interventions and their effects on infants (22).

2. Objectives

As noted earlier, there is a high prevalence of postpartum anxiety among Iranian mothers, with remarkable negative outcomes, and prevention strategies and interventions can minimize the incidence of mental disorders after childbirth and improve the developmental outcomes of infants in a timely manner. Thus, this study was designed to examine the effects of slow-stroke back massage on postpartum anxiety.

3. Materials and Methods

This single-blind randomized controlled clinical trial consisted of 100 primiparous mothers referred to the Shahidan Mobini hospital (Sabzevar, Iran) between July and September 2015. Shahidan Mobini hospital is a 91-bed governmental and referral hospital, with four wards. The proposal was approved by the ethics committee of Iran University of Medical Sciences (IR.IUMS.REC.1394.26109 94.3.3), and the study was registered with the Iranian registry of clinical trials (IRCT ID: N15 201506042248).

The inclusion criteria were as follows: being primiparous with a healthy baby, maternal age of 18 - 45 years, ability to read and write, and breastfeeding while in the hospital. The exclusion criteria included a history of chronic diseases, addiction, known mental health problems, facing a disaster in the last 6 months in their lives or their relatives' lives, infertility, use of analgesics or epidural anesthesia during labor or in the postpartum period, and the presence of any ulcer, infection, or any other lesion in an area that would prevent massage. The method of sampling was convenience. A dual-block randomization design was used to allocate the mothers to the two groups: massage (n = 50) and control (n = 50). In the dual-block two in one design, there were two possible sequences of AB and BA. A random number table was used to define the order of the blocks. Based on the list, each mother was assigned to the experimental or control group. To prevent the effects of postpartum fatigue and insomnia on the outcome of the study, the intervention was performed in the 4 - 18 hours postpartum period (23). The sampling was carried out from July to September 2015.

In this single-blind trial, the observer and mothers could not be blinded due to the nature of the study. However, the statistician was blinded to the group data. Based on the inclusion criteria, about 45% of mothers were not eligible to participate in the study due to muliparity. A total of 105 mothers met the study criteria and were included in the study. Only five mothers declined to take part in the study. The observer was a Master's student.

After providing the necessary clarifications in relation to the objectives of the study and obtaining written consent from the mothers, the participants completed a sociodemographic questionnaire. The mothers were then transferred to a quiet room, with a temperature of 27°C, soft light, and free of environmental stimuli. After the mothers were made comfortable on beds in the room, they completed Spielberger's state anxiety inventory (STAI).

In the experimental group, slow-stroke back massage was performed for 20 min, in a sitting position. Vaseline, an odorless ointment, was chosen for the massage because the smell of the mother is an important stimulus for infants (24) and is necessary for the development of attachment between the mother and infant. Using odorless Vaseline facilitated the massage, without interfering with bonding (25). The individual who performed the massage received training under the supervision of traditional medicine experts and earned a certificate to perform massage. In the control group, the researcher stayed with the mother for 20 min. After 20 min and again the following

morning, the mothers completed the STAI.

Using the following formula, the required sample size was estimated as 45 subjects, with a confidence level of 95%, power of 80%, and assuming that the effect of the massage on the level of maternal anxiety on the first postpartum data was significant:

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right) \times (s1^2 s2^2) \times}{d^2} \quad (1)$$

$$n = \frac{(1.96 + 0.84) \times 2\,(32.15)}{2^2} \quad (2)$$
$$= 45$$

Considering a probability of incomplete questionnaires of 10%, the sample size was determined as 50 for each group.

3.1. Instruments

The tools used in this study included a sociodemographic questionnaire and the STAI. The sociodemographic information included the mother's and father's ages, ethnicity, infant gender and birth weight, maternal education and occupation, economic and residence status, number of pregnancies and abortions, desirability of the pregnancy, the mother's and father's satisfaction with the infant's gender, and history of drug usage during the pregnancy and postpartum period.

3.2. STAI

The STAI is a standard questionnaire containing 20 items, which are designed to check the status of fear, tension, unrest, and anxiety feelings of individuals in the current situation and the moment. There are four possible responses to each statement: with 1 denoting never, 2 denoting sometimes, 3 denoting high, and 4 denoting very high. Each statement is assigned a score of between 1 and 4, with 4 indicating a high level of anxiety. The total score of the scale is between 20 and 80, with a score of 20 - 31 indicating mild anxiety, 32 - 42 signifying moderate anxiety, and 43 - 53 denoting moderate-to-severe anxiety. Scores of 54 - 64 denote relatively severe anxiety, whereas scores of 65 - 75 mean severe anxiety. Scores of more than 76 are suggestive of very severe anxiety [25]. The validity and reliability of this questionnaire have been demonstrated previously in research conducted in Iran. Furthermore, its scientific reliability was confirmed in 1993 by Mahram (Cronbach's alpha in the norm society and in the criterion community were 0.945 and 0.941, respectively) [26]. In studies by Kordi et al. [27] and Dareshouri Mohammadi [28], the reliability of the STAI was reported to be r = 0.82 and r = 0.92, respectively.

3.3. Slow-Stroke Back Massage

Slow-stroke back massage was originally described by Elizabeth [29] as a slow rhythmic light touch with the hands. In the present study, the procedure of the massage consisted of the following steps: The mother was seated on the edge of the bed. Then, the researcher grasped the top of the mother's shoulders with both hands and placed the thumbs of each hand just below the base of the skull, making tiny circular movements on the upper neck. In the next stage, the researcher placed the palm of one hand at the base of the skull and made a long and smooth stroke all the way down the patient's spine to her waist. The second hand followed the first at the base of the skull and stroked down the spine as the first hand returned to the base of the skull. Next, the researcher placed her hands on either side of the mother's neck under the mother's ears and stroked down and over the mother's collarbones with her thumbs just over the shoulder blades and repeated the motion several times. Then, she placed the thumb of each of her hands beside the spine, beginning with the shoulders, and moved the thumbs down the spine to the waist and repeated this movement several times. Finally, she completed the procedure by placing her palms on each side of the mother's neck and making continuous, long, sweeping strokes down the neck, across each shoulder, and down the back near the spine and repeated the entire process several times [30].

3.4. Statistical Analysis

SPSS, version 22 software was used to analyze the data. To compare the demographic variables of the control and experimental groups, chi-square and t-tests were used. A repeated measures analysis of variance was used to compare changes in the anxiety levels before and after the intervention. Statistical significance in the tests was considered as $P < 0.05$.

4. Results

This study consisted of 100 primiparous women assigned to a massage therapy group (n = 50) or a control group (n = 50). The consort flowchart of the study is presented in Figure 1. The average age of the mothers was 22 years. About 46% of the mothers had a secondary education, and 94% were homemakers. In terms of economic status, 81% of the mothers had an adequate family income, and 9% belonged to low-income families. The ethnicity of the majority of the mothers in both groups was Fars, Iranian. There were no missing values, as the number of items that the mothers had to complete was low.
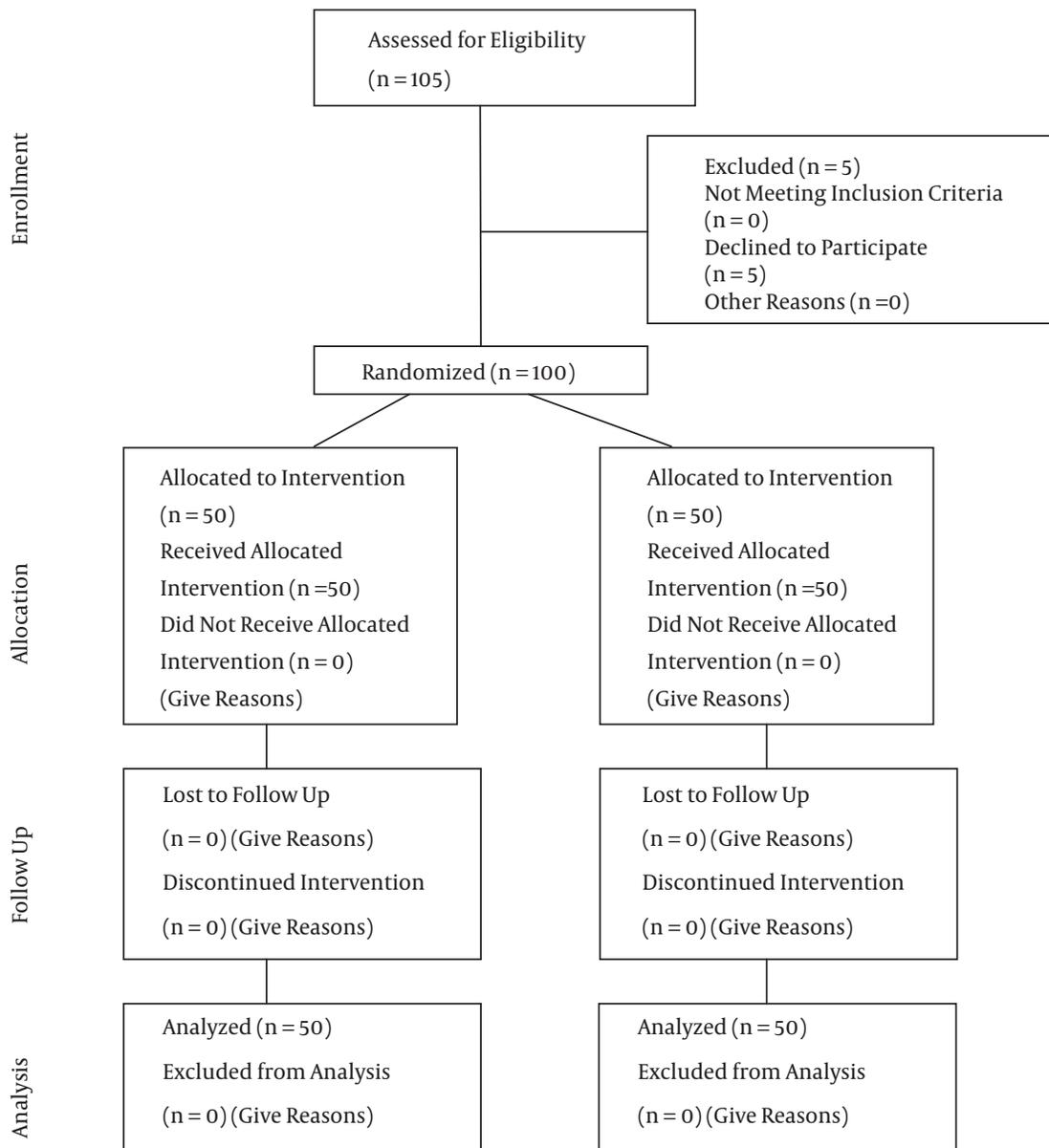
Figure 1. Consort Flowchart of the Study

The results indicated that the two groups were matched in terms of socio-demographic characteristics (Table 1). There was no significant difference between the average anxiety level of the control group at the pretest and post-test stages and the next morning (P = 0.973). In the experimental group, there was a significant difference between the average state anxiety before and immediately after the massage and the next morning (P < 0.001), with

the mean anxiety score reduced in this group (Table 2). There was no significant difference between the average state anxiety of the mothers in the two groups before the massage (P = 0.268), whereas there was a significant between-group difference after the massage (P < 0. 001) (Table 3).
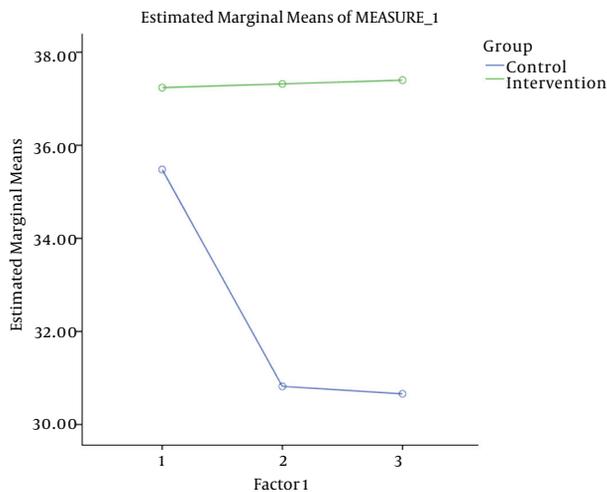

Figure 2. Line Graph Showing the Differences in Anxiety Levels in the Control and Intervention Groups on the First Postpartum Day
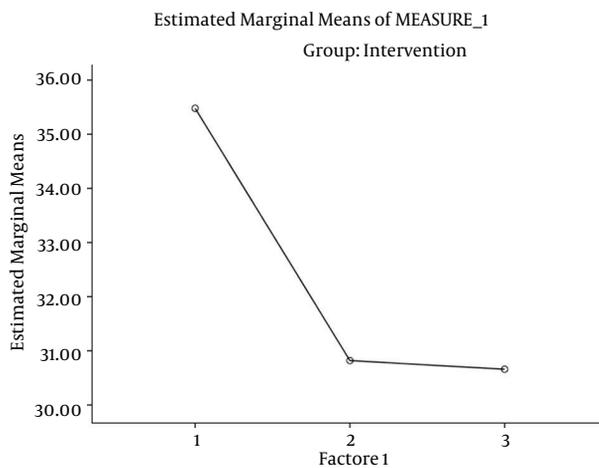

Figure 3. Line Graph Showing the Differences in Anxiety Levels Before Massage, After Massage, and the Morning After Massage in the Intervention Group on the First Postpartum Day
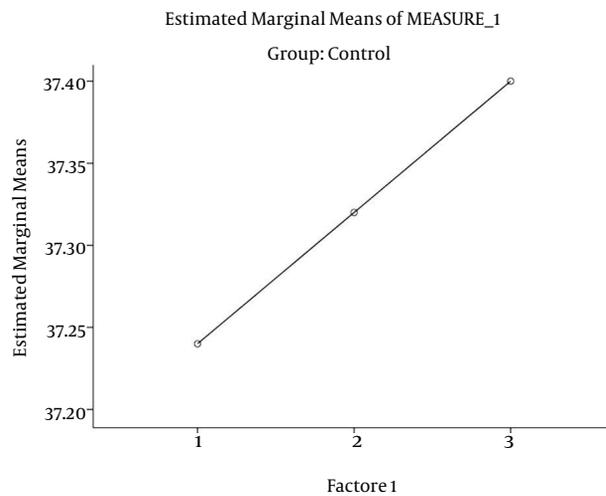

Figure 4. Line Graph Showing the Differences in Anxiety Levels Before, After, and the Morning After in the Control Group on the First Postpartum Day

5. Discussion

This study is the first to assess the effect of massage on anxiety levels in the postpartum period. The aim of this study was to evaluate the effect of slow-stroke back massages on the anxiety of primiparous women on the first postpartum day. The results showed that slow-stroke back massage was an effective intervention to reduce anxiety levels on the first postpartum day in primiparous women.

In this study, after receiving the massage, the anxiety level of the experimental group was significantly reduced (P < 0.001), and the difference in the anxiety scores of the two groups was significant (P < 0.001), with the scores in the intervention group significantly reduced compared to those of the control group. This represents a higher improvement of the anxiety in the intervention group than the control group after the intervention. Research on mothers on the first day after labor (23), third day after labor (31) and second day after birth (32) reported similar results. The results of the present study revealed that the level of anxiety in the control group did not change after the intervention (P = 0.973). This result was not consistent with the results of Karagozoglu's (33) and Bazrafshan's (34) studies, who reported increased anxiety. This may be due to differences in the taking care method of the control group in the two studies. In the present study, the researcher remained with the mother for 20 min in a calm room, which was different from ordinary hospital rooms.

In the present study, the average anxiety score in the two groups before the intervention was moderate (32 - 42). In other studies of pregnant women in Iran (34) and In-

Table 1. Demographic Characteristics of the Sample

Variables	Control Group	Massage Therapy Group	P Value
Mother's age, y	3.74 ± 22.98	3.65 ± 22.26	0.333
Husband's age, y	27.06 ± 3.82	27.60 ± 4.36	0.512
Gravidity	1.14 ± 0.49	1.14 ± 0.40	> 0.999
Hemoglobin	11.15 ± 0.94	11.40 ± 0.99	0.199
Hematocrit	34.82 ± 2.80	35.52 ± 2.45	0.188
Ethnicity, %			0.803
Fars	90	84	
Turk	6	12	
Kurd	2	2	
Mother's education, %			0.427
Middle school and lower	26	32	
High school	42	50	
University degree	32	18	
Husband's education, %			0.679
Middle school and lower	42	48	
High school	34	34	
University degree	24	18	
Mother's occupational status, %			> 0.999
Housewife	94	96	
Working	6	4	
Wanted pregnancy, %	94	94	
Husband's occupational status, %			0.670
Unemployed	2	2	
Employed	16	28	
Self-employed	66	56	
Employee	16	14	
Economic status, %			0.399
Good	6	12	
Moderate	72	74	
Poor	22	14	

Table 2. Comparison of the Anxiety Scores of the Massage Therapy and Control Groups

Group	Before the Intervention	After the Intervention	Morning After the Intervention	P Value
Control group	37.42 ± 9.05	37.32 ± 9.01	37.40 ± 8.29	0.973
Massage therapy group	35.48 ± 6.55	30.82 ± 6.22	30.66 ± 7.19	< 0.001[a]

[a]P < 0.001.

dia (35), the average level of anxiety before the intervention (43 – 53) was high. Unlike the present study, the afore-mentioned studies were carried out during pregnancy, in which the level of anxiety and depression may be high. This

Table 3. Anxiety Scores Before and After the Intervention and the Next Morning

Time	Control Group	Massage Therapy Group	P Value
Before the intervention	37.42 ± 9.05	35.48 ± 6.55	0.268
After the intervention	37.32 ± 9.01	30.82 ± 6.22	$< 0.001^a$
Morning after the intervention	37.40 ± 8.29	30.66 ± 7.19	$< 0.001^a$

[a] $P < 0.001$.

may explain the differences in the level of anxiety between those studies and the present one. The results of two studies in Iran showed that the maternal psychological state (36) and well-being index (37) of mothers improved in the postpartum period (36, 37).

Thus far, studies have reported positive effects of massage on anxiety in patients undergoing colorectal surgery (38), patients with heart failure (39), elderly individuals (40), patients prior to labor (41), patients undergoing eye surgery (42), and patients with generalized anxiety (18). The results of the present study are consistent with the results of the previous studies and indicate that massage can decrease postpartum anxiety. The findings of this study showed that slow-stroke back massage in the first few days after birth reduced the mother's anxiety level. Therefore, it is recommended that midwives and nurses use massage in the early days after labor to help the mother achieve relaxation. With the current facilities in Iran, it seems that using simple and safe methods, such as massage, is appropriate action to reduce anxiety after labor and its consequences.

Although providing these services and psychological support may seem difficult for the midwifery and nursing staff and broaden their duties, taking these actions and supplying sufficient human resources in hospitals seems essential to improve the mental health of mothers and to reduce the problems caused by it. In addition, a mother's close relative or husband could be taught the procedure and asked to apply it in the hospital and during the first postpartum weeks.

In this study, the STAI was used. However, this screening test only reveals the anxiety of the subjects. To improve the assessment, we recommend that in the future, study assessment be done by interviews and that maternal satisfaction with the procedure be assessed. In addition, we recommend that maternal well-being should be evaluated during the 2-month postpartum period in future studies to determine whether the effects of the intervention are prolonged.

5.1. Conclusion

During the postpartum period, mothers may be very anxious due to insomnia, pain, fatigue, and breast-feeding initiation problems. No treatment is available for these problems in the early postpartum period. Although the family is close to the mother, they always care for the baby, and they really do not know how they can help improve maternal well-being. This study showed that slow-stroke back massage is an effective, simple, inexpensive, and non-invasive intervention to reduce the anxiety level on the first postpartum day in nulliparous women. As Mobini hospital is the only obstetric and gynecologic center in Sabzevar city, and all pregnant mothers are referred to this center, the results can be generalized to all Sabzevarian mothers.

5.2. Limitations and Strengths of the Study

This study did not evaluate some interfering factors, such as satisfaction with the behavior of the hospital staff, the enjoyment level of the social protection, and other life stressors during the past year. The aforementioned items may have affected the anxiety levels of the mothers. It is also possible that the random allocation of the mothers to two groups buffered the effects of those variables on the study outcome. The second weak point of the study is that postpartum fatigue may be a confounder, which we could not assess, as there is no validated instrument for fatigue assessment in the postpartum period in Iran. The first strong point of the study is that the mothers cooperated fully with the study and filled out the STAI correctly. The second one is that the same researcher performed all the massage procedures on all the mothers. This increased the internal validity of the results.

Acknowledgments

Footnotes

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