



## The Impact of Baby Massage Training on Awareness, Perceived Stress and Breastfeeding Self-Efficacy of Mothers with Hospitalized Neonate

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### Abstract

**Background:** Despite the positive and remarkable effects of baby massage on both mothers and infants, mothers are less likely to use this health behavior. This study was designed to evaluate the impact of baby massage training on awareness, perceived stress and breastfeeding self-efficacy of mothers with hospitalized neonate.

**Materials and Methods:** This study, as a quasi-experimental design, was carried out on 120 mothers with hospitalized neonates (60 in the experimental group, 60 in the control group). Data were collected using a valid and reliable four -part instrument including Social-demographic information, Awareness's scale about baby massage, Cohen's Perceived Stress Questionnaire (PSS), and the Breastfeeding self-efficacy scale (BSES). Baby massage training was conducted on the intervention group for 3 days by a trained midwife, and changes were compared in two groups using suitable statistical tests three days after educational intervention.

**Results:** Before education, the mean score of awareness, perceived stress, and breastfeeding self-efficacy of intervention group were  $6.47 \pm 2.23$ ,  $33.42 \pm 6.85$ ,  $131.50 \pm 19.34$ , respectively. After education, the mean scores of the above variables were orderly changed into  $8.33 \pm 1.28$ ,  $27.10 \pm 1.85$ ,  $145.77 \pm 15.80$ , and these changes were statistically significant ( $P < 0.01$ ); while, no statistical significant difference was observed in awareness, perceived stress, and breastfeeding self-efficacy in the control group after the intervention ( $P > 0.05$ ). In addition, there was a significant difference between groups ( $p < 0.05$ ).

**Conclusion:** The results of the study indicated that baby massage training (BMT) is effective in increasing the mothers' awareness, breastfeeding self-efficacy, and in decreasing their perceived stress. Therefore, applying this approach to improve mothers' stress and breastfeeding self-efficacy was recommended and emphasized.

**Key Words:** Awareness, Breastfeeding, Infant massage, Mothers, Self-efficacy Stress.

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## 1- INTRODUCTION

Proper feeding in infancy and early childhood periods is essential to ensure the growth, health and development of children (1). Evidence has indicated that breastfeeding is beneficial for both mother and baby, and exclusive breastfeeding is considered as the best source of food (2). Breastfeeding also acts as a key protective factor against common infectious diseases in childhood and has short and long term positive health outcomes for both children and mothers (3). The World Health Organization (WHO) recommends to mothers of throughout the world exclusively breastfeeding of babies up to the first six months of the year to achieve optimal growth, development and well-being (4-6). However, global estimates suggest that only 36 percent of newborns born in 2015 were breastfed exclusively (6). Breastfeeding is a learning skill that its initiation and continuity are influenced by physiological and psychological factors, knowledge and attitude of women toward breastfeeding (7).

Known barriers to breastfeeding include socio-cultural factors, poor health education, and inaccurate information about the benefits of dry milk (8, 9). Breastfeeding will be very different when infants are hospitalized due to different illnesses and health problems. In the other words, hospitalization of the baby due to a disease, physical abnormality and immaturity may impair the onset of breastfeeding and its continuation in mothers. Eliminating barriers to exclusive breastfeeding and encouraging women to feed infants with their milk are correlated with promoting health of babies. In addition, the support of mothers with premature infants may increase the tendency for exclusive breastfeeding in mothers (9). Whenever a neonate is admitted to the intensive care unit (ICU), ward staff must encourage her/his mother to start and continue breastfeeding of baby

and eliminate barriers of breastfeeding (10). The most important factor influences breastfeeding behavior is the education of mothers. Other factors also affect the length of lactation, including: mother's education and age, family income, family support, prenatal actions, decision-making time for the first lactation, the time of the first feeding, as well as the skill and self-efficacy of breastfeeding (11). Self-efficacy for lactation, as a construct of social cognitive theory of Bandura, is the belief and confidence of a woman in her ability to behave exclusive breastfeeding (12). Self-efficacy is affected by four main sources of information:

1. Mastery experiences, the most effective way of developing a strong sense of efficacy is through mastery experiences. Performing a task successfully strengthens our sense of self-efficacy,
2. Social modeling, for example seeing people similar to oneself succeed by sustained effort raises observer's beliefs that they too possess the capabilities to master comparable activities,
3. Verbal persuasion, Bandura also asserted that people could be persuaded to believe that they have the skills and capabilities to succeed. Getting verbal encouragement from other people such as friends, family can accelerate sense of individual self-efficacy, and
4. Physiological responses, our own responses and emotional reactions to situations also play an important role in self-efficacy. Moods, emotional states, physical reactions and stress levels can all impact on how a person feels about their personal capabilities to a particular situation (12).

Since stress, as one of the most important issues studied in mental health, has negative effect on the physiological function of human beings (13). In addition, the stress experienced by the mother during pregnancy, delivery, and postpartum period can significantly influence lactation self-efficacy in women

(14). The birth of a healthy baby is the best divine gift for a mother, while encountering a hospitalized baby causes a severe mental disaster for parents. New reproductive technologies, high maternal age, and improvements in care during and after pregnancy have led to an increase in the birth rate of premature infants and babies with severe anomalies in industrialized countries (15). Most parents are unaware of complicated problems caused by premature infant. Hence, the lack of a clear understanding of the future condition of the baby and the uncertainty about recovery of infant are considered the most important stressors for parents (16).

When the baby hugs a mother with anxiety and cardiac palpitations, she/he feels inconsequent and thinks that the source of anxieties and cardiac disorders of mother is her/his own, in turn it creates an unbelievable feeling in infant (17). Therefore, the medical and nursing staff should prevent interruption of communication between the mother and the baby and provide comprehensive information to mothers on the care of the infant to contribute improved and health of the infant (18). Caring for infants admitted to the neonatal intensive care unit (NICU) should perform based the needs of the infant, and if the mother is not considered as member of the care team, she feels high deprivation (19).

Support of mothers has an indirect positive effect on care of the baby (20). Providing the care needs of hospitalized babies, improves their health and well-being, and as a result reduces the stress of mothers (21). Therefore, it seems that training and supportive interventions can play an important role in reducing stress and improving the self-efficacy of breastfeeding in mothers with newborns. One of these methods which can be used by health care providers to solve the mother's stress is teaching infant massage to parents. Studies have shown that infant

massage can improve weight gain, sleep patterns, and the development of the baby (22, 23). On the other hand, the contact between the parents and the infants through the touch (massage) increases care, attention, self-efficacy of parents and stabilizes the biological relationship between them (24). In addition, the massage of premature babies by their mothers on a daily basis can strengthen and maintain a feeling of dependence between mother and baby (25). Therefore, the purpose of this study was to determine the effect of infant massage training program on awareness, stress and breastfeeding self-efficacy of mothers with hospitalized neonate.

## **2- MATERIALS AND METHODS**

### **2-1. Study design and population**

This research work was a quasi-experimental study which carried out on a sample of mothers with hospitalized babies in Shahid Motahhari Hospital in Urmia, North West of Iran. The aim of this study was to investigate the effect of baby massage training on awareness, perceived stress and breastfeeding self-efficacy of mothers. The research population included all mothers with hospitalized neonates who had delivery (normal, cesarean, or with forceps), and criteria for entering the research.

### **2-2. Methods**

The sample size was calculated using the t-test statistical formula for the difference between two independent means with regard to the results of the previous study (26), and the assumptions of the following inputs: confidence interval=95%,  $\alpha$  error = 0.05, power (1-  $\beta$  error) = 0.8. The initial sample size was estimated at 50 mothers with hospitalized neonate for each group. However, after accounting for a 20% non-response rate, the final sample size was increased to 60 mothers.

Eligible samples were selected by using convenience sampling method. After coordination with the hospital authorities, researchers daily referred to neonatal wards of the hospital, 60 eligible mothers were selected as the control group during a first month. The control group completed the study questionnaire two times through interview (the time of admission and time of discharge of newborns. In second month, samples of intervention group (60 subjects) were selected and entered to the study.

### 2-3. Measuring tools

To collect the study data, researchers applied a four-part questionnaire. 1. Social-demographic information included age, education, mothers' occupation, family income, birth weight, and type of delivery. 2. Awareness scale with 10 items evaluated mothers' awareness about the importance of breastfeeding, the concept of baby massage and their effects on both mother and baby. On this scale, each correct response was scored 1, and each incorrect response, 0, with the response category ranging from 0 to 10. Validity of this scale was assessed and confirmed by a panel of experts, and its Cronbach's alpha value was 0.78.

3. Cohen's Perceived Stress Questionnaire (PSS) that its validity and reliability were confirmed by Maroufizadeh et al. (2014) in Iran (27), and its Cronbach's alpha value was 0.90. It included 14 items, which determine the individual's assessment of stressful situations of life. On this scale, people's answers are categorized from 0 (never) to 4 (most often) and its total score ranges from 0 to 56. 4. The breastfeeding self-efficacy scale (BSES) is a standard questionnaire, designed by Bandura in 1997 and used by Fax and Dennis (2003) for the first time. In addition, reliability and validity of this scale has been assessed and confirmed for Iranian population (2010) (28), and its Cronbach's alpha value was 0.82. This questionnaire included 33

items; all questions were presented positively and started with the phrase "I can always". Items were rated on a 5-point Likert scale and their score range from 1 "never or at all unsafe" to 5 "always or absolutely certain", and the range of lactation self-efficacy score was from 33 to 165. The highest score represents the highest self-efficacy to engage in breastfeeding and vice versa.

### 2-4. Intervention

The study questionnaires were completed by a trained midwife using formal interview. Then, the educational needs of intervention group were assessed based on the questionnaire information, and appropriate educational intervention was designed for the group. In later stage, the designed educational program (three sessions) was implemented on intervention group by the trained midwife within three days of infants' hospitalization. Three educational sessions were held at the education room located in children ward for 60 minutes daily for three days. This educational program was based on a variety of educational methods and techniques involving counseling, demonstration, and video.

At the first session, the importance of exclusive breastfeeding of infants and its positive health outcomes have been presented to the participants and educator answered to their questions regarding breastfeeding at the end of each session. In the second session, for increasing awareness of mothers about the concept of baby massage and its importance, a one-hour educational video has been shown to them. At the third session, a number of the intervention group practically performed and showed the massage of the infant, and finally was responded to the participants' questions by educator. During classes, participants were encouraged to speak freely, ask their questions, express their feelings, exchange their own experiences and receive feedback from the group

members and instructor. In time of discharge of babies, participants were asked to fill out the instrument in order to determine the effects of the intervention program on the study dependent variables.

### 2-5. Ethical consideration

This investigation was performed after receiving approval from The Ethical Committee of Urmia University of Medical Sciences, explaining the aims of study for participants, and getting their informed consent.

### 2-6. Inclusion and exclusion criteria

The inclusion criteria were as follows: 1. Mothers living in Iran, 2. Mothers who had a living child without any abnormalities, 3. Mothers had the baby with weight lower than 2,500 grams, 4. Mothers who were able to breastfeed, 5. Mothers who were admitted to the hospital after delivery and were able to complete the written or oral questionnaire, 6. Mothers who had no history of physical and psychological diseases, and addiction to cigarettes, alcohol and drugs. Mothers, who had no willing to participate in the study, were excluded.

### 2-7. Data Analyses

After collecting data, descriptive (frequencies, percentages, means, and standard deviations) and inferential statistics (Chi-square test, independent t-test, and paired t-test) were used to analyze the data. In this study,  $p < 0.05$  was considered significant in all statistical analyses.

## 3- RESULTS

One-hundred and twenty mothers with hospitalized babies were analyzed (60 in intervention group and 60 in control group). There was no significant difference between the two groups in terms of mothers' age ( $P = 0.202$ ), mothers' education ( $P = 0.186$ ), mothers' occupation

( $P = 0.243$ ), family income ( $P = 0.430$ ), infants' weight ( $P = 0.449$ ), and type of delivery ( $P = 0.581$ ). In addition, the two groups were similar in terms of awareness, perceived stress and breastfeeding self-efficacy before intervention. In addition, the results showed that there was no significant deference between the study groups in terms of mothers' awareness, perceived stress, and breastfeeding self-efficacy before intervention ( $p > 0.05$ ).

**Table.1** presents more details about the study variables. To decide and select appropriate inferential statistics tests for analyzing the data, we utilized the results of Kolmogorov-Smirnov test. Due to normal distribution of the data based on the results of this test, the data were analyzed using parametric tests. After education in intervention group, remarkable changes took place in awareness, perceived stress, and breastfeeding self-efficacy of mothers and these changes statistically were significant. As before education, the mean scores of awareness, perceived stress and self-efficacy in intervention group were  $6.47 \pm 2.23$ ,  $33.42 \pm 6.85$ ,  $131.50 \pm 19.34$ , respectively. But after education, the above scores changed into  $8.33 \pm 1.28$ ,  $27.10 \pm 1.85$ , and  $145.77 \pm 15.80$  ( $p < 0.01$ ).

In case, in control group, remarkable increase was not seen in score of awareness, stress, and self-efficacy of participants before and after intervention ( $p > 0.05$ ). **Table.2** presents more details about the mean scores of the study variables. **Table.3** depicts the mean scores of awareness, stress, and self-efficacy between two groups before and after intervention. The findings indicated that there is a statistically significant deference between the groups in terms of awareness, stress, and self-efficacy ( $p < 0.01$ ).

**Table-1:** Comparing the two groups in terms of characteristics, awareness, perceived stress, and breastfeeding self-efficacy before intervention

Variables	Intervention	Control	P- value
	Number (%)	Number (%)	
<b>Categorical variables</b>			
Education level			0.186
High school and lower	49(81.7)	47(78.3)	
Associate's degree	2(3.3)	0(0)	
Bachelor's degree	9(15)	9(15)	
Master's degree and higher	0(0)	4(6.7)	
Mothers' occupation			0.243
Housekeeper	55(91.7)	58(96.7)	
Employed	5(8.3)	2(3.3)	
Family income			0.430
Low	16(26.7)	19(31.7)	
Moderate	29(48.3)	22(36.7)	
Much	15(25)	19(31.6)	
Type of delivery			0.581
Normal delivery	28(46.7)	25(41.7)	
Cesarean section	32(53.3)	35(58.3)	
<b>Continuous variables</b>			
	Mean ± SD	Mean ± SD	P- value
Mothers' age(years)	26.58±4.80	27.50±5.00	0.202
Infant weight(gr)	2950±778	2820±960	0.450
Mothers' awareness	6.47±2.23	7.47±1.33	0.171
Mothers' perceived stress	33.42±6.85	34.42±5.85	0.214
Mothers' breastfeeding self-efficacy	131.50±19.34	129.40±18.34	0.123

SD: Standard deviation.

**Table-2:** The mean score of awareness, perceived stress, and breastfeeding self-efficacy within the two groups before and after intervention

Group	Intervention		P- value	Control		P- value
	Pre-test	Post-test		Pre-test	Post-test	
	Mean ± SD	Mean ± SD		Mean ± SD	Mean ± SD	
Mothers' awareness	6.47±2.23	8.33±1.28	0.009	7.47±1.33	7.33±1.08	0.149
Mothers' perceived stress	33.42±6.85	27.10±1.85	0.001	34.42±5.85	34.70±4.58	0.180
Mothers' breastfeeding self-efficacy	131.50±19.34	145.77±15.80	0.002	129.40±18.34	129.77±16.80	0.187

SD: Standard deviation.

**Table-3:** The mean score of awareness, perceived stress, and breastfeeding self-efficacy between the two groups before and after intervention

Group	Intervention		Control		P- value
	Pre-test	Post-test	Pre-test	Post-test	
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	
Mothers' awareness	6.47±2.23	8.33±1.28	7.47±1.33	7.33±1.48	0.000
Mothers' perceived stress	33.42±6.85	27.10±1.85	34.42±5.85	34.70±4.58	0.003
Mothers' breastfeeding self-efficacy	131.50±19.34	145.77±15.80	129.40±18.34	129.77±16.80	0.001

SD: Standard deviation.

#### 4- DISCUSSION

The aim of the present study was to investigate the impact of infant massage-based training on awareness, perceived stress and breastfeeding self-efficacy of mothers with hospitalized infants. Previous massage studies found the positive impacts on mother–infant interactions as well as infant development and mother’s psychological well-being in relation to infant massage (23). Awareness of mothers about health enhancing behaviors can protect them and their infants against several health problems. For instance, if mothers with hospitalized neonates figure out the concept of infant massage and its positive health outcomes, they will enter it in infant care program as an important care element. According to results of the present study, the mothers of interventional group had moderate awareness levels before training, which improved to good knowledge after the educational sessions.

No studies were found regarding maternal awareness about infant massage. However, some studies have evaluated the effect of education on mothers’ knowledge regarding infant care. For instance, findings of Kermani et al were consistent with our findings. This study denoted that mean score of maternal knowledge was 9.5 before a workshop, which increased to 14.4 after the workshop (29). The study of Bagheri et al. indicated that maternal awareness of infant care was poor before training, which changed into moderate after the educational sessions (30). In the study of Jarosz et al. (31), the best way to educate mothers, especially those with low educational levels, was reported to be training programs. On this note, Sword highlighted the importance of maternal education during hospital stay, especially in mothers with low socioeconomic status (32). Furthermore, world health organization (WHO) has emphasized the importance of raising parental awareness

regarding infant care. All the aforementioned studies confirmed and supported this part of our findings. It was concluded that the raising of mothers awareness is an important factor in all children care programs. Infant massage education (IME) can not only influence awareness of mothers but also it is effective on their other cognitive and psychological factors. The findings showed that IME affected mothers stress comes from hospitalization of their infants. As the mothers of interventional group had high stress level before training, this inclined to remarkable level after training. This means that if mothers feel less stress and anxiety, they better manage and care from their children. The findings of most studies were in line with this part of results of our study. The study of Holditch-Davis et al. highlighted that mothers who provided a form of massage for their preterm infants had a more rapid decline in depressive symptoms, and less parenting stress compared to the other groups (33).

Matricardi et al. in your study found that the intervention of infant massage was effective in the reduction of stress-role alteration in mothers with very preterm infants in a neonatal intensive care unit (34). The investigation of Oswald et al. showed that adolescent mothers trained in infant massage had significantly lower depression scores than teen mothers without massage training, and they reported significantly more adaptive temperament of their infant than those in the control group (35). In addition, the kinds of infant massage can have a major role in the breastfeeding self-efficacy of mothers. Before training, the results of the present study revealed that the average score of breastfeeding self-efficacy of mothers in intervention group was low, but after training, self-efficacy score increased significantly. This increase can be attributed to the role of baby massage training to mothers.

It seems that the mother may feel lower stress and anxiety after receiving information regarding infant massage, in turn low stress of mother tends to increase her abilities in caring infant. Although there were no studies fully the same, but the results of some similar studies confirm and reinforce the results of our study. Thukral et al. and Srivastava et al. both found similar effect of early skin-to-skin contact (SSC), as a type of infant massage, on exclusive breastfeeding (EBF) at 6 week postpartum(36, 37). The SSC is found to be associated with greater level of maternal breastfeeding self-efficacy, satisfaction and confidence in mother's ability to breastfeed and care for her infant (37, 38). Aghdas et al., also found an enhanced maternal breastfeeding self-efficacy from SSC (39).

In another study by Carfoot et al., mothers enjoyed the experience of SSC and preferred it for future pregnancy (40). There are several limitations to our study, namely that (a) mothers were not randomized to the experimental and control groups, (b) mothers in the control group may have applied baby massage to their child following other sources of information, and (c) the results cannot be generalized beyond the study sample and therefore can be generalized only to populations with similar features. The results of this study provide some support for the usefulness of infant massage teaching to mothers as a way of decreasing parental stress, increasing maternal self-efficacy and facilitating optimal infant growth.

## 5- CONCLUSION

Infant massage is one of the oldest touch ways. It has been widely used for many conditions. The findings of the present study highlighted that holding educational sessions regarding infant massage was effective and helpful for mothers. As infant massage training

improved awareness level, perceived stress, and breastfeeding self-efficacy in mothers. Therefore, it is essential to consider this educational approach (baby massage training) when designing educational interventions to improve awareness and knowledge level, stress and anxiety level, and breastfeeding self-efficacy in mothers with hospitalized neonates.

**6- CONFLICT OF INTEREST:** None.

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