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Effect of Infant Massage Therapy with Field Technique by Mother on the Level of Attachment of Primiparous Mothers and Infant Behavior

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Abstract

Aims: Breast milk is the best nutrition for the baby because it has numerous health benefits for the mother and baby. Massage is used as a routine part of infant care in many cultures. This study aimed to investigate the effect of massage therapy with field technique by the mother on the level of maternal attachment and infant behavior in infants.

Instrument & Methods: This clinical trial was performed in 2016 on 54 primiparous women with vaginal delivery referring to Imam Reza (AS) and Umm ul-Banin (AS) hospitals in Mashhad. Mothers who underwent the intervention from the first to ten first days after delivery used to massage their babies for 15 minutes every day. The control group received no intervention. Maternal and neonatal attachment levels and neonatal infant behavior after delivery in the first and tenth days after delivery were assessed in both intervention and control groups.

Findings: The mean attachment score in the intervention group on the tenth day after delivery was higher than in the control group (p=0.001). Changes in infant behavior in infants were 16.24 in the massage group and 10.74 in the non-massage group. Using the Wilcoxon test, changes in infant behavior between the two groups were statistically significant, and changes in infant behavior in infants in the massage group were better (p=0.001).

Conclusion: Massage of the baby by the mother increases the degree of attachment between mother and baby after delivery and is effective on the frequency and duration of breastfeeding.

Keywords
Massage [https://www.ncbi.nlm.nih.gov/mesh/68008405];
Infant [https://www.ncbi.nlm.nih.gov/mesh/68007223];
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Introduction

Pregnancy and motherhood are considered enjoyable and evolutionary events in women's lives that are associated with physiological changes and adaptations and psychological adaptations for the mother and require special attention. The first relationship between mother and fetus before birth is called maternal attachment to the fetus and is an abstract notion that potentially exists before birth and is related to cognitive and emotional ability to conceive of another human being [1]. Attachment increases with the sensation of fetal movement and increases after birth, and the mother's skin-to-baby contact and kangaroo care immediately after birth increase the mother's attachment to the baby [2]. There is ample evidence that emotional separation combined with physical separation from the mother can disrupt the natural process of emotional bonding between mother and baby. When the infant is sick, it seems that physical separation combined with emotional separation from the parents causes a feeling of inadequacy in the mother because touching is the first means of communication between mother and baby. Many people who have just become mothers tend to touch their babies [3]. According to reports, about 30% of women who have recently become mothers have difficulty establishing an emotional bond with their baby [4]. Postpartum care is very important in the process of creating an attachment between mother and baby, and creating a healthy attachment is very important in determining the personality and habits of the baby. Defects in the formation of attachment lead to severe physical and psychological problems in the child [5]. Loving contact and massage of the baby by the mother and including this in the baby care program increases the mother's love and affection for the baby and also develops the baby's social, language and awareness skills [6].

Silent touch or non-verbal communication is a physiological sensation that results from the reception of tactile receptors in the skin and its analysis in the brain [7]. Massage for infants and children has been an important part of the care in the tradition of various societies, especially in India, and is one of the interventions that, in addition to helping growth and development, has many other benefits for both infants and parents [8]. The baby massage program gives the mother the opportunity to have a pleasant interaction with her baby and to establish a deep relationship with her through frequent eye contact. Researchers believe that the first effect of this issue is to improve the mother-child relationship, which in turn will improve the mother's mental state and increase the mother's self-confidence and, consequently, her adaptation to stress and anxiety [9]. Kohestani *et al.* showed that infant massage is effective in reducing the severity of postpartum grief [5]. Grohl *et al.* assessed 120 mothers in Turkey and found that the dependence of mothers who massaged their infants once a day for one month was significantly higher than the control group [10].

Infants are the most sensitive and vulnerable group in society and are the foundation of society, and maintaining their physical and mental health requires special attention. Breast milk in the first six months of life, meets all the nutritional needs of the baby and plays a very important role in maintaining the health of children in the world. Breast milk contains several unsaturated fatty acids that are essential for the growth of the brain and nerve cells in childhood [11]. Benefits of breast milk include its constant availability, reduction of mortality, reduction of incidence of diarrhea and intestinal bleeding, and reduction of abdominal colic [12].

The World Health Organization estimates that out of 94 countries, only 35% of infants are breastfed by the age of four months, with a prevalence of 35.1% in Uganda, 27.3% in Saudi Arabia, and 42.2% in Japan in the first month [13]. In Iran, in 2011, the rate of breastfeeding was 84.1% up to one year and 51.1% up to two years, which has decreased compared to previous years and in many industrialized countries, a significant reduction in the process of breastfeeding has been observed, which has now become a serious problem [14]. Despite global measures to increase breast milk selection and increase the duration and frequency of breastfeeding, women still report problems that lead to the abandonment of breastfeeding in the postpartum period and at home [15].

Separation of mother and baby, even in the short term, can reduce the success of breastfeeding. Hawke-Bruce and Anderson showed that skin-to-skin contact between mother and infant increases the duration of breastfeeding from the first one to six months of the baby's life [16]. Mother-infant contact through complex mechanisms, in addition to a positive effect on the infant's physical development, causes the infant's body to adapt and attach to the mother and infant and increases milk production [17]. Touch, massage, silent speech, or non-verbal communication is a physiological sensation that occurs as a result of receiving tactile receptors in the skin and analyzing it in the brain [7].

Massage for infants and children, which has been an important part of care in the tradition of various societies, especially in India, and is one of the interventions that in addition to helping growth and development, has many other benefits for infants and parents [8]. Also, one of the methods that can be used by health care providers to solve the existing problem is teaching massage to infant parents. In some countries, massage training in the first few months of an infant's life is part of routine care [15]. The baby massage program gives the mother the opportunity to have a pleasant interaction with her baby and to establish a deep relationship with her through frequent eye contact. Researchers believe that the

first effect of this issue is to improve the mother-child relationship, which in turn will improve the mother's mental state and increase the mother's self-confidence and, consequently, her adaptation to stress and anxiety [9].

Reisi Dehkordi *et al.* showed that massage affects the frequency and duration of breastfeeding and improved it [15]. On the other hand, Carfott *et al.* stated that skin-to-skin contact between mother and infant, including infant massage by the mother, does not increase the success of breastfeeding [18]. Given that one of the most important needs of infants is an emotional need that must be met from the first hours after birth, otherwise, the process of mother-infant attachment is disrupted and impairs the development of the infant and the mother's ability to care for the infant, and given that one of the most important aspects of public health, in which midwives play a role, is increasing milk intake by the infant, The aim of this study was to investigate the effect of infant massage therapy with field technique by the mother on the level of maternal attachment and infant behavior.

Instrument and Methods

This clinical trial study was performed in 2016 in primiparous women with vaginal delivery in Mashhad. The sample size was estimated to be 22 people in each group using the study by Glover *et al*., considering the confidence level of 99% and the power of 90%, and using the formula for estimating the sample size, which increased to 35 people in each group for more accuracy and possible attrition. Inclusion criteria were no history of mental disorders and severe stress, giving birth to a full-term and healthy baby, not using pain relief methods during childbirth and no dystocia during childbirth. Hospitalization of the mother or infant for any reason during the study, failure to perform massage for two consecutive days, and disturbance of the stability of life and general condition of the mother or infant in such a way as to prevent massage were exclusion criteria.

Data collection tools were questionnaires for selection of samples, demographic characteristics, midwifery and fertility information, mother attachment to the baby and review of work in infants, and checklists of daily massage by the mother and mother empowerment in performing baby massage. After making the questionnaire for selecting the samples, the questionnaire of personal characteristics and fertility information and the characteristics of midwifery, the checklist for daily massage by the mother, and the checklist for empowering the mother to perform the baby massage, by reviewing the existing questionnaires and correcting and approving the supervisor and consultant, the content validity of the tools was evaluated by sending to seven professors of the School of Nursing and Midwifery and Medical Education and after considering their suggestions and corrections, the final form was prepared.

Sample Selection questionnaire: this scale contained clear questions and was approved in terms of reliability.

Personal characteristics, midwifery, and fertility information Questionnaire:

Mother-to-Child Attachment Questionnaire: It was first used by Nagata *et al.* and consists of 15 questions [19]. This questionnaire, which was completed by the samples at the beginning of the study (first day) and the tenth day after delivery, is scored on a Likert scale with 4 options consisting of "always", "often", "sometimes", and "not at all". Scoring decreased for positive emotions from right to left and for negative emotions from left to right. The validity of the Persian version of the questionnaire has been confirmed by Nematbakhsh *et al.* using the content validity method [20]. The reliability of the questionnaire was confirmed by Nematbakhsh *et al.* [20] and in the present study, Cronbach's alpha was 0.74.

Breastfeeding behavior Questionnaire: This is a standard tool that has been validated by Nijist *et al.* to assess breastfeeding behavior in term infants [21]. It has six subgroups of searching (score 2-0), getting breast areola (score 3-0), strong baby contact with mother (score 3-0), sucking reflex (score 4-0), consecutive sucking (6-0) and swallowing (score 2-0), based on which the minimum score is zero and the maximum is 20. A higher score indicates better breastfeeding behavior. The validity of the Persian version has been confirmed by Khazaei *et al.* using the content validity method. The reliability of this questionnaire was determined by Khazaei *et al.* using the equivalent method (r = 0.8). In the present study, Cronbach's alpha was 0.71.

After obtaining the necessary permits and confirming the research by the Mashhad Ethical Drug Ethics Committee, in order to perform sampling, the researchers referred to the postpartum ward (those with normal delivery) of Umm ul-Banin and Imam Reza hospitals. Samples were selected by the available sampling method. The objectives and methods were explained to the samples and they were informed that they are allowed to leave the research at any stage of the research. After completing the informed consent form, demographic information questionnaire, attachment questionnaire, and breastfeeding behavior questionnaire, the samples were randomly divided into one of two intervention or control groups.

For those in the intervention group, first, an introduction was given about the benefits of infant massage, then face-to-face infant massage with field technique was performed by the researcher at least 4 hours after delivery. The samples were advised to massage the infant between two feedings and at least one hour after feeding when he is healthy, and at a room temperature where the mother does not feel

cold or hot (about 21 degrees Celsius). To control the room temperature, mothers were given a mercury thermometer and it was recommended to wash their hands first according to the World Health Organization's hand hygiene protocol, and after drying their hands, rub their hands several times and warm hands, followed by pouring olive oil on the palms and massage. Each massage consists of three stages of 5 minutes and a total of 15 minutes. In the first and third stages, the baby is placed in a supine position and the massage will be performed in this way; 1) from the top of the head to the neck and vice versa, 2) from the neck to the shoulders, and vice versa, 3) from the top of the back to the waist and vice versa, 4) from the shoulders to the hands and then back in both hands, 5) from the thighs up to the ankle and then back in both feet. Gentle pressure massage in each of the mentioned areas should be done in 12 movements of 5 seconds. In the second stage, the infant is in the supine position and the inactive movements of flexion and extension of the arms and legs are performed separately and both legs together in five one-minute steps, each step consisting of six movements of 10 seconds. After providing theoretical training, the samples were practiced on the model in the presence of the researcher, and the mother was asked to massage the baby according to the training after practicing on the model. Then, based on the mother's empowerment checklist, the researcher checked the ability of the mother's ability. On the first day after delivery, the researcher re-examined how the infant was massaged by the samples and completed the checklist of the mother's empowerment for infant massage. To remind the baby massage, a training pamphlet and the educational CD indicating how to do the massage in order to perform the correct massage technique were presented to the mothers according to the field technique. Finally, the samples of the intervention group were asked to massage their baby once a day for 15 minutes according to the provided training until the tenth day after delivery (for 9 days). The researcher's telephone number was given to the samples to contact the researcher if needed. They were asked to go to the health center on the tenth day for mother and infant care and to complete the questionnaire of mother attachment to the infant and the breastfeeding behavior questionnaire. Also, to remind the daily massage and to remind the samples to attend the clinic on the 10th day after delivery, a telephone follow-up was done by the researcher. In the end, the infant massage training pamphlet along with the CD on how to perform infant massage was presented to the control group.

Statistical analysis was performed using SPSS 16 software ad Mann-Whitney, Fisher's exact, and Chi-square tests.

Findings

The age range of mothers was 18 to 35 years and fathers 21 to 50 years. The two groups of intervention (n = 29) and control (n = 25) were not statistically significant and homogeneous in terms of all personal information (mother's age, father's age, mother's education, father's education, mother's job, father's job, and family income) and pregnancy (P>0.05; Table 1).

Table 1) Comparison of absolute and relative frequency (numbers in parentheses are percentages) of pregnancy information in intervention and control groups

Variable	Intervention	Control	P-value
Taking contraceptive pills			
No	28 (96.66)	25 (100)	0.536
Yes	1 (3.33)	0	
Marital satisfaction			
Very high	6 (20.75)	13 (52)	0.082
High	16 (55.21)	9 (36)	
Somehow	6 (20.77)	2 (8)	
Very low	1 (3.26)	1 (4)	
Gender of the baby			
Boy	13 (44.80)	8 (32)	0.247
Girl	16 (55.19)	17 (38)	
Mother's satisfaction with the gender of the baby			
No	1 (3.48)	2 (8)	0.443
Yes	28 (96.52)	23 (92)	
Satisfaction with vaginal delivery			
No	0	1 (4)	0.463
Yes	29 (100)	24 (96)	

Table 2) Comparison of mother attachment to infant and infant breastfeeding behavior between intervention and control groups after intervention

Variable	Intervention group	Control group	P-value
Mother attachment to infant			
First day	24.41±5.69	23.88±2.81	0.672
Tenth day	30.27±4.72	26.84±4.32	0.008
Infant breastfeeding behavior			
First day	10.62±2.63	10.88±2.20	0.669
Tenth day	16.20±1.14	16.28±0.93	0.947

There was no significant difference between mother attachment to an infant between the two groups on the first day (p = 0.672). But after the intervention, there was a significant increase in the intervention group compared to the control group. There was no significant difference in infant behavior on the first day between the two groups (p = 0.699), and the intervention did not cause a significant difference (Table 2).

Discussion

The aim of this study was to investigate the effect of infant massage therapy with field technique by the mother on the level of maternal attachment and infant breastfeeding behavior after delivery. Findings of this study showed that the degree of maternal

attachment to the infant in the experimental group compared to the control group after massage significantly increased, which indicates the positive effect of infant massage on increasing the dependence and interaction between mother and infant after delivery. Grohl and Polat also reported that daily infant massage was effective in increasing mother-infant attachment [10].

Sohrabi *et al.* reported that daily massage of the infant admitted to the intensive care unit had increased the attachment of mother and infant [6]. In a study conducted by Saatzaz *et al.*, daily massage of infants 2 to 6 months of age improved mother-infant interaction [9]. Tusi *et al.* also conducted a study on the effect of special training, including attachment during pregnancy, on maternal and fetal attachment. They concluded that the experimental group had more attachment than the control group and this increase in attachment was also obtained in the present study [22].

Baby massage helps to attach sooner and encourages parents to touch their baby. The positive touch of the baby by the mother is the most important part of creating attachment. Keeping parents away from negative behaviors, such as verbal violence as well as a positive interaction between parents and their child builds attachment and positive touching and massage help parents think about playing a parenting role in positive ways [23]. The studies done by Grohl and Polat [10], Sohrabi *et al.* [6], Saatsaz *et al.* [9], Tusi *et al.* [22] were consistent with the present study. However, in a study by Higgins *et al.* [24] on 96 primiparous women in the fourth week after delivery, daily maternal massage by the mother did not improve mother-infant interaction in depressed mothers. This may depend on the mood of the depressed mother compared to the healthy mother because the mothers in the present study were mostly healthy and had severe symptoms of sadness and depression but the women in the study by Higgins *et al.* had clinical signs of depression.

Comparing the level of maternal attachment to the infant on the tenth day compared to the first day after delivery, in both intervention and control groups, the mean score of attachment of mothers on the tenth day of the intervention group was higher than the mean score of attachment on the tenth day of the control group. The findings of the present study indicated that the level of attachment of mothers who massaged their infants was significantly higher than other mothers. Also, the level of attachment in the mothers of the control group increased compared to the attachment on the first day after delivery, which was not significant between the two control times. In the study by Sohrabi *et al.*, the level of attachment on the fifth day after the start of massage in mothers who massaged their infants was significantly higher than mothers in the control group and the degree of attachment in the mothers of the control group did not show a difference from the beginning of the study [6].

In general, the results of the present study showed that daily massage of the baby by the mother, in the first to tenth days after normal delivery, is able to increase the degree of attachment between mother and baby after delivery. Considering the important mission of midwives in realizing maternal health and providing first-level health care in order to prevent disease and also considering the adverse effects of maternal grief on mother and baby, it is recommended that the daily massage program of the baby by the mother, as an easy, low-cost, affordable and useful technique, be considered as part of routine care in the first 10 days after delivery and taught to mothers.

Findings of this study showed that infant breastfeeding behavior changes in infants (including search reflex, getting a brown halo of breast color, being in strong contact with the breast and staying on the breast, continuous sucking reflex, swallowing), were statistically different between the two groups and behavioral changes of infants were better in the infants of the intervention group (massage). In the literature review, no study was found to investigate the effect of infant massage therapy on the incidence of breastfeeding behavior in infants.

In the study by Raisi Dehkordi *et al.* entitled "The effect of massage therapy on the frequency and duration of infant feeding", the results showed that massage was effective on the frequency and duration of infant feeding and improved it and the frequency of breastfeeding in the first month of birth was every 1-3 hours and on average 8-12 times (in 24 hours), in 4-2 days after birth. Also, the duration of breastfeeding in the first month of birth was 20-45 minutes [15]. Iqbal et al. showed that early contact has a role in the success of starting and continuing breastfeeding [25].

Karimi et al. showed that the success rate of breastfeeding was significantly higher than in normal postpartum care [26]. Ward et al. also stated that skin-to-skin contact increased the success rate of exclusive breastfeeding by 22% [27]. Falking *et al.* stated that skin-to-skin contact with any duration from a few minutes to a few hours has positive effects on breastfeeding [28], and these results are consistent with the present study. Kerfoot *et al.* stated that skin-to-skin contact between mother and infant, including maternal massage by the postpartum mother, does not increase breastfeeding success and continued breastfeeding until the fourth month after delivery [18]. Perhaps one reason for the success of breastfeeding in the skin-contact method is the high motivation of the mother. Raisi Dehkordi *et al.* stated that one of the most important reasons for shortness of sucking and lack of proper nutrition in the first month of birth is infant sleepiness [15].

Because skin-to-skin contact between mother and

infant leads to neurohormonal changes in the infant, including decreased levels of stress hormones, such as cortisol, endorphins, and adrenaline; it is likely that the infant's sleepiness is due to sudden changes in the level of catecholamines and stress hormones in the bloodstream, which skin contact modulates these hormones to reduce infant sleepiness and leads to alertness and readiness of infants to breastfeed [13].

One of the limitations of the present study was to measure the degree of attachment on the tenth day after delivery. This lack of referral caused the samples to fall and another limitation of this study was the ability of different people to learn infant massage, which the correct way of massaging the infant by the mother was partially controlled by the mother's empowerment checklist.

Daily massage of the baby by the mother, in the first to tenth days after normal delivery, can increase the degree of attachment between mother and baby after delivery and increase the incidence of infant behavior in the baby. Considering the important mission of midwives in realizing maternal health and providing first-level health care in order to prevent disease and also considering the adverse effects of maternal grief on mother and baby, it is recommended that the daily infant massage program be considered by the mother as an easy, low-cost, affordable and useful technique, as part of routine care in the first 10 days after delivery, and taught to mothers.

Conclusion

Daily massage of the baby by the mother, in the first to tenth days after normal delivery, can increase the degree of attachment between mother and baby after delivery and increase the incidence of infant behavior in the baby. Considering the important mission of midwives in realizing maternal health and providing first level health care in order to prevent the disease and also due to the adverse effects of maternal grief on mother and baby, it is recommended that the daily massage program of the baby by the mother as a technical Easy, low cost, affordable and useful, as part of routine care in the first 10 days after delivery and educate mothers.

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Conflicts of Interests: None declared.

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