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The effect of oketani massage on breastfeeding success and breast engorgement in mothers delivering by cesarean section:Randomized controlled study

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Abstract

The aim of this study is to examine the effect of Oketani massage on breastfeeding success and breast engorgement in mothers who give birth by cesarean section. The study is a randomized controlled, two-group comparison, experimental study conducted in a city hospital in eastern Turkey between December 2022 and April 2023 and 116 women participated. The LATCH score was 9.25±1.25 in the massage group and 8.08±2.38 in the control group. breast engorgement scale score was 1.26±0.48 in the massage group and 1.45±0.53 in the control group. There was a statistically significant difference between the massage group and the control group in terms of LATCH score and breast engorgement scale mean score. In this study, it was found that Oketani massage reduces breast engorgement, which is an important problem for the continuation of breastfeeding, and positively affects successful breastfeeding. *(Afr J Reprod Health 2025; 29 [3]: 85-93).*

Keywords: Breastfeeding; engorgement; cesarean section; oketani massage

Résumé

L'objectif de cette étude est d'examiner l'effet du massage Oketani sur le succès de l'allaitement et l'engorgement mammaire chez les mères qui accouchent par césarienne. L'étude est une étude expérimentale randomisée contrôlée, comparative en deux groupes, menée dans un hôpital urbain de l'est de la Turquie entre décembre 2022 et avril 2023 et à laquelle ont participé 116 femmes. Le score LATCH était de 9,25 ± 1,25 dans le groupe de massage et de 8,08 ± 2,38 dans le groupe témoin. Le score de l'échelle d'engorgement mammaire était de 1,26 ± 0,48 dans le groupe de massage et de 1,45 ± 0,53 dans le groupe témoin. Il y avait une différence statistiquement significative entre le groupe de massage et le groupe témoin en termes de score LATCH et de score moyen de l'échelle d'engorgement mammaire. Dans cette étude, il a été constaté que le massage Oketani réduit l'engorgement mammaire, qui est un problème important pour la poursuite de l'allaitement, et affecte positivement la réussite de l'allaitement. *(Afr J Reprod Health 2024; 29 [3]: 85-93).*

Mots-clés: Allaitement; engorgement; césarienne; massage oketani

Introduction

Breast milk is the best food for a baby's growth and development. In addition, breast milk has excellent cognitive, sensory, and motor benefits, protects against infections and chronic diseases, and contains all the nutrients the baby needs[1,2].

Acording to UNICEF, despite all the benefits of breast milk, less than 1 in 2 (48%) babies aged 0-5 months worldwide are exclusively breastfed[3]. When newborns start consuming breast milk on the first day of birth, the risk of post neonatal death decreases by 45%[4]. It is normal for mothers to want to breastfeed their babies, but some issues can hinder optimal nourishment for the infant[5]. Failure in breastfeeding is generally caused by some factors such as maternal factor, infant factor, psychological factor, healthcare provider factor, and socio-cultural factor[4].

Regarding maternal factor, mothers usually encounter problems in expressing breast milk on the first day after delivery. Pain after delivery often makes the mother reluctant to breastfeed the baby[2]. Not giving breast milk in the first days can cause

failure to achieve exclusive breastfeeding, while breast engorgement, mastitis, nipple problems, and inappropriate breastfeeding techniques can also lead to failure in breastfeeding[2,4]. Cesarean births are also an important factor in breastfeeding failure. Due to separation from their babies, weakness caused by anesthesia, the mother's surgical incision, lack of skin-to-skin contact, and the mother's pain, mothers experience problems with breastfeeding need, breastfeeding success, and breastfeeding self-efficacy[6,7]. Considering the problems that mothers who have undergone cesarean delivery face in terms of breastfeeding, intervention measures need to be taken to reduce these problems and improve breastfeeding[6]. Breast massage is a treatment technique applied worldwide to address breastfeeding problems. Various breast massage techniques, such as Oketani massage, Gua Sha therapy, and general breast tissue massage, can be used to treat breastfeeding problems[8]. Oketani massage is a unique breast massage technique created in Japan by Ms. Sotomi Oketani in the 1980s[6]. It has been widely practiced in Japan for over 30 years and helps breastfeeding mothers overcome some of the difficulties they face while breastfeeding their babies. Oketani massage stimulates the pectoralis muscle to increase milk production and makes the breasts softer and more elastic to facilitate the baby's suckling. Studies have shown that Oketani massage is highly effective in reducing breast pain, preventing breast engorgement, increasing the pH of breast milk and the sucking reflex of the newborn, and has a positive effect on breastfeeding success, breastfeeding duration and breastfeeding self-efficacy[5-7,9-12].

The increasing rate of cesarean section births worldwide is expected to have negative effects on breastfeeding. In Turkey, the rate of cesarean section births is among the highest in the world (57.3%)[13]. Therefore, it is important to ensure the continuity of the breastfeeding process in all cases.

The main objective of this study is to examine the effect of Oketani massage on breastfeeding success and breast engorgement in mothers who give birth by cesarean section.

Research hypotheses

H1: Breastfeeding success is higher in women who receive Oketani massage than in women who do not.
H1: Women who have Oketani massage have less breast engorgement than women who do not have it

Methods

Study design

It is a randomized controlled, two-group comparison, experimental study.

Setting

The research was carried out between December 2022 and April 2023 in the gynecology service of the provincial hospital in eastern Turkey. In Turkey, the rate of cesarean section births is among the highest in the world (57.3%)[13] and the rate of exclusive breastfeeding for the first six months is 41%. The province where the hospital where the data is collected is located is among the top 5 provinces in Turkey in terms of total fertility rate. There are approximately 4300 births per year in the hospital. The rate of delivery by cesarean section at the hospital is 41% according to 2022 data. Considering breastfeeding rates and cesarean section rates, breastfeeding problems are among the frequently encountered problems.

Participants

The population of the research consisted of mothers who gave birth by caesarean section and were hospitalized in the gynecology service of a hospital located in the eastern part of Turkey between December 2022 and April 2023. Giving birth by cesarean section, giving birth to a single live baby, giving birth between 38-40 weeks of gestation, babies weighing between 2500-4000 grams, not having a mental or physical disability in breastfeeding, not needing a neonatal intensive care unit for the baby, not having a situation that prevents the baby from breastfeeding, sharing the same room with the baby, working agreeing to participate constitutes the inclusion criteria of the study.

The exclusion criteria of the study were not agreeing to participate in the study, having a vaginal birth, having a premature birth, having a mental or physical disability that prevents breastfeeding, being 18 years of age or younger, the baby being transferred to the neonatal intensive care unit, and the baby having a condition that prevents breastfeeding.

Open Epi calculation tool was used to determine the sample of the study. The sample calculation was based on the average score differences of the LATCH scores of the study and control groups in the study of Mahdizadeh-Shahri *et al*[6] in Open Epi info program. Accordingly, it was calculated that 106 mothers, including 53 control and 53 massage groups, should be included. Considering the sample loss that may occur during data collection, a total of 116 mothers, including 58 control and 58 massage groups, were included in the study.

After determining the sample size of the research, randomization of the participating groups was carried out as simple randomization using www.random.org. During the data collection dates of the research, 320 caesarean births took place. Of these births, 141 participants who met the inclusion criteria were included in the study. Ten mothers' babies were excluded from the study due to intensive care, and five mothers were excluded because they did not want to participate in the study. Randomization was performed among 126 participants. During the data collection period, three mothers from the perineal massage group did not want to continue with the massage application, and two mothers were discharged early. In the control group, five mothers were excluded from the study because they were discharged early (Figure 1).

Data collection tools

In order to collect research data, identifying characteristics questionnaire, oketani massage follow-up form, breast ergorgement assessment scale and LATCH breastfeeding identification measurement tool were used.

Identifying characteristics questionnaire: Developed by researchers to assess women's socio-demographic information, this form consists of 34 questions, including 14 questions related to socio-demographic characteristics, 14 questions related to obstetric characteristics, and 6 questions related to breastfeeding.

Oketani massage follow-up form: This form, developed by the researchers by reviewing the literature, includes information about the time and duration of the massage for the mothers in the Oketani massage group, the reasons for not applying the massage, and the person applying the massage[4,5,6].

Breast ergorgement assessment scale: Developed by Pamela Dee Hill and Sharron Smith Humenick in 1994, this scale is scored from 1 to 6. A score of "1" indicates no soft changes, while "6" indicates very hard and very sensitive. A score of 4 or higher indicates the presence of breast engorgement. The validity and reliability analyses of the scale were carried out according to the World Health Organization's scale adaptation steps. The Turkish adaptation of the scale was done by Özkaya and Körükçü[15].

LATCH breastfeeding identification measurement tool: The LATCH Breastfeeding Identification Measurement Tool was developed in 1986 by health workers or researchers in clinics to observe breastfeeding and identify potential problems. LATCH is a breastfeeding scheduling system that provides assessments to gain insight into individual breastfeeding sessions. The LATCH charting system consists of five basic breastfeeding components: LATCH, abbreviation for 'L', for how well the baby is latched on to the breast, 'A' for the amount of audible swallowing noted, 'T' for nipple type, 'C' for the mother's comfort during breastfeeding, and 'H' for the amount of assistance the mother needs to latch her baby to the breast. It is a quick and easy assessment tool, and scoring is done between 0 and 2, with a maximum score of 10. In this measurement tool without a cut-off point, a high score indicates successful breastfeeding. By using LATCH, midwives can evaluate the variables of breastfeeding for the mother and the baby and contribute to the healthy continuation of breastfeeding by intervening. The reliability study was conducted by Adams and Hewell in 1997[16]. The Turkish reliability study of the scale was conducted by Yenal and Okumuş, and the Chronbach alpha value was determined to be 0.95[17].

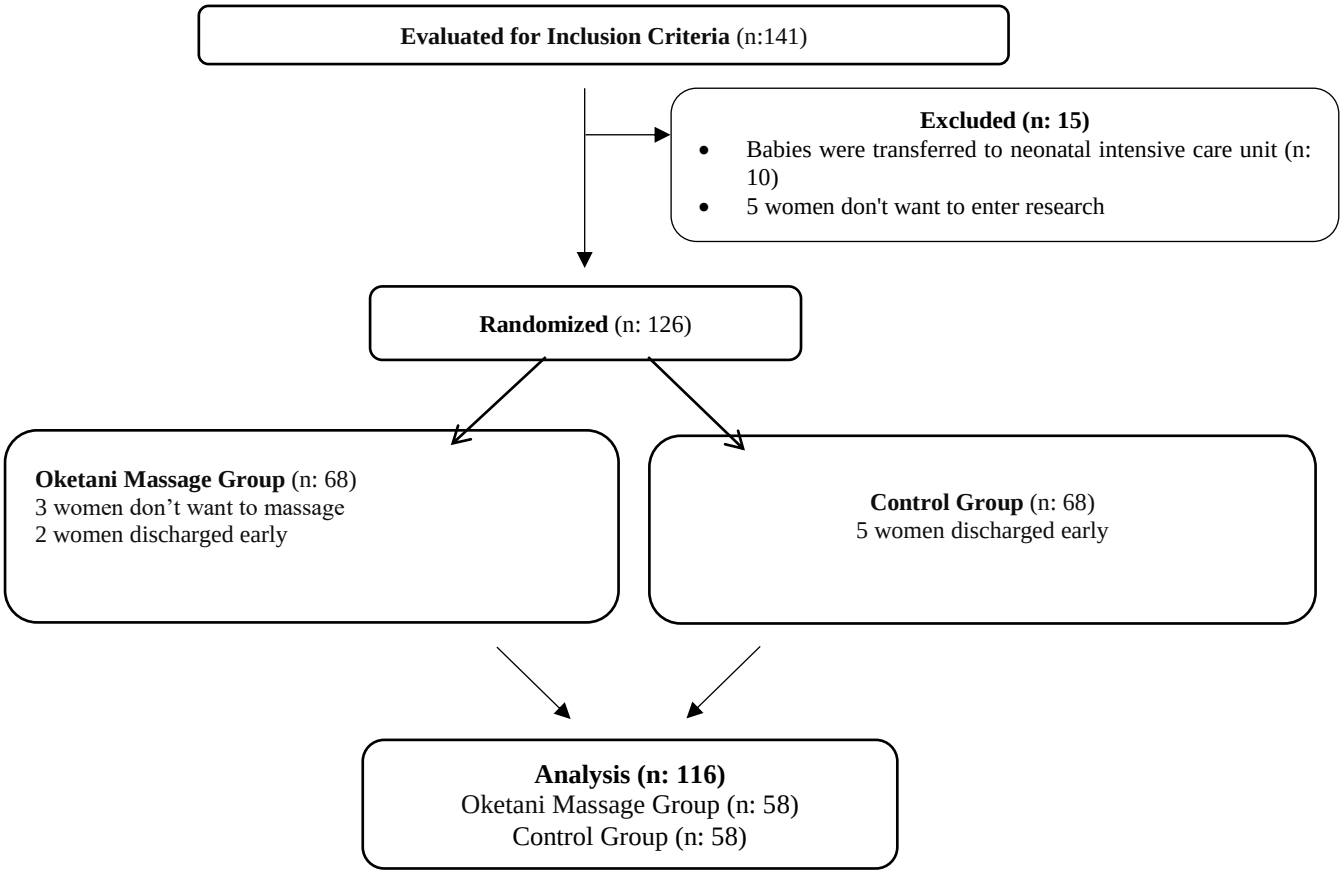


Figure 1: The participant's selection flowchart

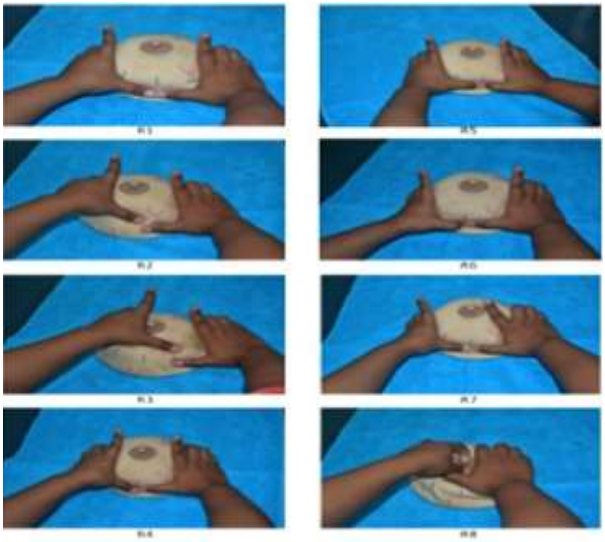
Data collection

Data were collected between December 2022 and April 2023. Written informed consent was obtained from women during the data collection phase. The research was conducted in two groups: the Oketani massage group and the control group. The service where the data of the study was collected consists of two separate units and there are double rooms in the unit. To avoid contamination bias, people in the same room were not included in the massage group or control group, only one participant from each room was included in the massage group or control group. In the study, the participants were included in the massage group and control group, the massage application was made by the midwife working in the clinic, and the post-intervention evaluation after the massage was made by the lactation consultant of the clinic, which was independent of the research. The massage midwife was not blind to which group the participants were in, but the lactation consultant who made the final assessment was blind to which group the participants were in. Participants were not given any compensation. Interview and abstraction data securely stored by researchers.

Oketani massage group: According to the Ministry of Health in Turkey, the follow-up period for mothers after caesarean section is 48 hours. Within the 48-hour period that the mothers stayed in the hospital, before starting to breastfeed, an average of 3 times of Oketani massage was applied, lasting 32.60 minutes and 4.85 minutes (min: 25, max: 55), to the mothers in the massage group. The massage was performed by a midwife working in the clinic and the evaluation after the massage was made by the breastfeeding consultant (Midwives with a bachelor's degree can perform massage in Turkey). The massage group was informed about the technique and application time of Oketani

massage. Information about the effects of massage was given when the final evaluation was made. Before discharge (at the 48th hour), the mothers' breast engorgement and breastfeeding status were evaluated by the lactation consultant using a breast engorgement assessment scale and the LATCH breastfeeding identification scale.

Oketani massage technique; The part between the breast and the base of the lower pectoral muscle is called the "oketani". It is a manual massage technique developed to encourage breastfeeding in breastfeeding problems such as insufficient milk production and mastitis. It is a massage that stimulates the breast, relaxes it and is painless. There are 8 different stages in massage (Picture 1). Each set lasts 1 minute, and the massage continues for 15-20 minutes)[5].



Picture 1: Oketani massage[5]

In control group: No intervention was made in the control group and routine follow-up of mothers and babies will be performed after cesarean section. No intervention was made regarding the breastfeeding process of the mothers, other than the breastfeeding counseling given by the breastfeeding consultant according to the hospital protocol. Before the mothers were discharged (at the 48th hour), the breast engorgement and breastfeeding status of the mothers were evaluated by the lactation consultant using the breast engorgement assessment scale and the LATCH breastfeeding diagnostic scale. After the final evaluation, the control group was also informed about the oketani massage.

Data analysis

The data obtained in the study were analyzed using the SPSS (Statistical Package for Social Sciences) for Windows 22.0 program. Descriptive statistical methods such as number, percentage, mean, and standard deviation were used to evaluate the data. The normal distribution of the variables in the study was evaluated using the Kolmogorov-Smirnov test. Student-t test was used for comparing data between two independent groups, and One-Way ANOVA test was used for comparing data among more than two independent groups. Statistical evaluation with $p<0.05$ was considered significant.

Ethics approval and consent to participate

Ethical approval was obtained from the Scientific Research Ethics Committee of a University (decision no. 234) of 8 November 2022 in order to conduct the research. Informed consent was obtained from the women during the data collection phase**.** The study is registered at clinicaltrials.gov (ClinicalTrials.gov ID: NCT05903846)

Results

The mean age of the women in the massage group was 27.60±4.65 (min:19, max:40), and the mean age of the women in the control group was 27.70±5.60 (min:16, max:42). The birth week of the massage group was 38.38±1.34 (min:36, max:43), and the control group was 38.33±1.23 (min:36, max:41). The findings regarding the descriptive and obstetric characteristics of the participants are given in Table 1.

The LATCH score was 9.25±1.25 (min:5, max:10) in the massage group and 8.08±2.38 (min:1, max:10) in the control group. Breast engorgement scale score was 1.26±0.48 (min:1,max:3) in the massage group and 1.45±0.53 (min:1, max:3) in the control group. It was determined that there was a statistically significant difference between the massage group and the control group in terms of the LATCH score and the breast engorgement scale mean score, and that

Table 1: Descriptive and obstetric characteristics of the participants

	Massage Group		**Control Group**		**Total**		**Statistical Value F/X^2**	**P**
Variables	**n**	**%**	**n**	**%**	**n**	**%**		
Age group								
24 years and under	17	29.3	18	31.0	35	30.2		
25-29	14	24.1	24	41.4	38	32.8	1.857	0.176
30 years and older	27	46.6	16	27.6	43	37.1		
Education								
Elementary and below	42	72.4	47	81.0	89	76.7		
High school	7	12.1	8	13.8	15	12.9	2.435	0.121
Bachelor and above	9	15.5	3	5.2	12	10.3		
Working status*								
Yes	5	8.6	2	3.4	7	6.0	1.368	0.438
No	53	91.4	56	96.6	109	94.0		
Health insurance								
Yes	38	65.5	36	62.1	75	63.8	0.149	0.699
No	20	34.5	22	37.9	42	36.2		
Planned Pregnancy[a]								
Yes	55	94.8	53	91.4	108	85.7	0.537	0.358
No	3	5.2	5	8.6	8	14.3		
Cause of Caesarean section								
Old cesarean section	25	43.1	25	43.1	50	43.1	0.000	1.000
Fetal causes	33	56.9	33	56.9	66	56.9		
Cesarean section type of anesthesia								
General	11	19.0	11	19.0	22	19.0	0.000	1.000
Spinal	47	81.0	47	81.0	94	81.0		
Breastfeeding status of previous babies [a,b]								
Yes	44	91.7	37	100	81	69.8	3.236	0.096
No	4	8.3	0	0	4	3.4		
Status of receiving breastfeeding education								
Yes	28	48.3	27	46.6	55	47.4	0.035	0.852
No	30	51.7	31	53.4	61	52.6		
Place of breastfeeding education								
Midwife	16	57.1	19	70.4	35	63.6		
Nurse	2	7.1	3	11.1	5	9.1		
Doctor	2	7.1	1	3.7	3	5.5	1.637	0.206
Family elders	7	25.0	3	11.1	10	18.2		
Written/visual press	1	3.6	1	3.7	2	3.6		
Total	**58**	**100**	**58**	**100**	**116**	**100**		

[a]Fisher's exact test, [b]Mothers who gave birth before responded.

Table 2: Comparison of LATCH and breast engorgement assessment scale mean scores of mothers who did and did not receive oketani massage

Variables	**Massage Group Mean±SD**	**Control Group Mean±SD**	**Statistical Value/t[a]**	**P value**
LATCH score	9.25±1.25	8.08±2.38	3.314	0.001
Breast engorgement scale score	1.26±0.48	1.45±0.53	-2.009	0.004

[a]T-test in independent groups

while the LATCH scores were statistically significantly higher in the oketani massage group, the breast engorgement scale mean scores were statistically significantly lower ($p<0.05$) (Table 2)

Discussion

Breastfeeding is a universally recommended evidence-based nutrition method for newborns to sustain their nutrition and life[18]. Many women living in developing countries cannot achieve the ideal breastfeeding process due to various factors that will interrupt breastfeeding. Among these factors, the negative effects of cesarean section on breastfeeding cause concern worldwide. Delayed breastfeeding occurs due to breast engorgement after cesarean section, the mother's pain or not wanting to hold the baby in a position close to the incision. Painful conditions that occur after breast engorgement cause problems in the effective continuation of breastfeeding[19,20]. It is reported in the literature that therapeutic breast massage during lactation has significant effects on milk drainage and pain reduction[21-23].

One of the important techniques to be used in solving practices that will interrupt breastfeeding during this process is Oketani massage. In this study, the effect of Oketani massage on breastfeeding success and breast engorgement in mothers who gave birth by cesarean section was examined. As a result of our study, breast engorgement was found to be lower in the group where Oketani massage was applied compared to the group where Oketani massage was not applied. Choi *et al.* found that pectoralis major myofascial relaxation massage reduced breast pain and engorgement in breastfeeding mothers, as well as decreased the need for supplementary formula and increased the newborn's intake of breast milk[24].

Cho *et al*. reported that Oketani massage reduced breast pain in another study[9]. In another study, Oketani massage was mentioned as an alternative method for resolving engorgement in women[11]. In a study examining the effect of Oketani massage on engorgement, a significant decrease in the severity of engorgement was observed in the experimental group where Oketani massage was applied compared to the control group. As a result of the study, it was stated that Oketani massage has a higher effect on reducing breast engorgement in the first days after childbirth compared to traditional care[10]. Ngestiningrum and Setiyani stated that the combination of Oketani and back massage is effective in preventing engorgement[4].

In many studies similar to our study, it has been concluded that Oketani massage is effective in preventing engorgement[4,25-27]. Oketani massage is known to stimulate the pectoral muscles and make the breasts softer and more elastic[2]. It is believed that Oketani massage has a positive effect on breast engorgement, along with its healing effect on milk secretion[5].

It is known that breastfeeding problems are high in the early postpartum period. LATCH provides a systematic evaluation of early breastfeeding problems and offers a chance to intervene and improve breastfeeding problems in a timely manner[28]. In many studies, it has been stated that cesarean delivery has a negative effect on LATCH scores[29-31]. Cesarean delivery delays the initiation of breastfeeding compared to vaginal delivery and reduces the rate of exclusive breastfeeding. Mothers who undergo cesarean delivery must be supported with breastfeeding attempts[32]. One of the complementary practices to increase the duration and quality of breastfeeding is Oketani massage. In our study, the LATCH breastfeeding score was found to be higher in the group that received Oketani massage compared to the group that did not receive Oketani massage. In the study conducted by Mahdizadeh-Shahri *et al.*, it was found that mothers in the group who received Oketani massage after cesarean section had less need for breastfeeding support according to LATCH. According to the study, Oketani massage has a positive effect on breastfeeding success, breastfeeding duration, and breastfeeding self-efficacy[6]. Roy et al. also stated that Oketani massage is a useful technique to establish trust and improve milk secretion among mothers experiencing difficulties during the breastfeeding period[5]. Similarly, Sukmawati *et al*. suggested that Oketani massage could be a solution/alternative to speed up the breastfeeding process for nursing mothers[12]. Akter *et al.* stated that Oketani massage is an effective method to increase the rate of exclusive breastfeeding and ensure proper feeding of babies[33]. Oketani massage makes the areola and

nipples more flexible, making the breast more suitable for the baby to suckle. It has a positive effect on the breastfeeding process by increasing levels of oxytocin and prolactin[2, 34]. Oketani massage has a positive impact on each of the LATCH assessment criteria, making the study results significant

Limitations

The difficulties of the study were; women did not want to participate in the study because they did not want to expose their breasts during the data collection process and due to privacy concerns, they did not want to have a massage because they thought the massage might be painful, the number of massages could not be completed on the second day after birth due to their desire to be discharged early and therefore the data collection process took a long time, and the limitations of the study were that the study was conducted in a single region and on a specific sample.

Conclusion

The rate of childbirth by cesarean section continues to increase worldwide and negatively affects breastfeeding processes. Complementary practices are important for breastfeeding to progress positively after a cesarean section. In this study, it was found that Oketani massage reduces breast engorgement, which is an important problem for the continuation of breastfeeding, and positively affects successful breastfeeding. It is important for the complementary application of breast massage techniques that play a role in breastfeeding to be included in the in-service training plan. Since Oketani massage has a positive effect on breastfeeding and encourages effective breastfeeding, it is recommended that midwives apply it prophylactically after cesarean section; breast massage techniques should be applied especially for women who experience breast problems after cesarean section, and awareness of midwives and women in this regard should be increased.

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Contribution of authors

All authors participated in the study. Conceptualization, ESÇ, RT, RB; methodology, ESÇ, RT, ES; formal analysis, ESÇ, RT; research, ESÇ, RT, ES, RB, EE; writing-original manuscript, ESÇ, ES; reviewing and editing of the manuscript, ESÇ, ES; supervision, ESÇ; project management, ESÇ, RT. Finally, all authors revised and approved the final manuscript.

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