Evidence Based Care Journal
http://ebcj.mums.ac.ir/

Effect of Breast Oketani-massage on Neonatal Weight Gain: A Randomized Controlled Clinical Trial

Mahsa Dehghani, Raheleh Babazadeh, Talat Khadivzadeh, Seyeheh Azam Pourhoseini, Habibollah Esmaeili

The online version of this article can be found at
http://ebcj.mums.ac.ir/article_11677.html

Evidence Based Care Journal 2018 08:57 originally published online 01 October 2018
DOI: 10.22038/ebcj.2018.32347.1817

Online ISSN: 2008-370X

Address: Mashhad Nursing and Midwifery School, Ebn-e-Sina St., Mashhad, Iran
P.O.Box: 9137913199
Tel.: (098 51) 38591511-294
Fax: (098 51) 38539775
Email: EBCJ@mums.ac.ir

Evidence Based Care Journal

Original Article

OPEN ACCESS JOURNALS

Effect of Breast Oketani-massage on Neonatal Weight Gain: A Randomized Controlled Clinical Trial

Mahsa Dehghani[1], Raheleh Babazadeh[2*], Talat Khadivzadeh[3], Seyeheh Azam Pourhoseini[4], Habibollah Esmaeili[5]

Received: 23/06/2018
Accepted: 08/10/2018

Evidence Based Care Journal, 8 (3): 57-63

Abstract

Background: The most important factor affecting weight gain after birth is the type and mode of neonatal feeding. The most suitable nutrition is exclusive breastfeeding. However, breastfeeding can be accompanied with some difficulties, such as breast engorgement, which results in neonatal feeding complications. Breast Oketani-massage therapy is proposed as a treatment for breast engorgement.

Aim: This study aimed to determine the effect of breast Oketani-massage therapy on neonatal weight gain among lactating women with breast engorgement.

Method: This randomized controlled clinical trial was conducted on 100 postpartum (i.e., on the first five days of childbirth) women admitted to the Midwifery Clinic and Gynecology and Obstetric Department of Imam Reza Hospital, Mashhad, Iran, due to breast engorgement from August to November 2016. The subjects were divided into two groups, namely Oketani massage and routine care training, through random block allocation. The data were collected regarding neonatal weight gain before and after the intervention and analyzed in SPSS (version 20) using repeated measures ANOVA.

Results: The results revealed no significant difference between the two groups in terms of neonatal weight gain on within days 1-5 day before the intervention (P=0.17). However, a statically significant difference was observed between the two groups in this regard 14 and 28 days post-intervention (P<0.001).

Implications for Practice: This study showed that breast Oketani-massage in comparison to the routine care increased the neonatal weight gain among lactating women with breast engorgement.

Keywords: Breast, Engorgement, Infant, Oketani-massage, Weight gains

1- Gonabad University of Medical Sciences, Gonabad, Iran

2- Assistant Professor, [a] Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Mashhad, Iran. [b] Department of Midwifery, School of Nursing and Midwifery, Mashhad University Medical of Medical Sciences, Mashhad, Iran.

3- Assistant Professor, [a] Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Mashhad, Iran. [b] Department of Midwifery, School of Nursing and Midwifery, Mashhad University Medical of Medical Sciences, Mashhad, Iran.

4- Assistant Professor, Department of Obstetrics and Gynecology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

5- Professor in Biostatistics, Department of Statistics and Epidemiology, Management and Research Center for Social Factors Affecting Health, Mashhad University of Medical Sciences, Mashhad, Iran

* Corresponding author, Email: babazadehr@mums.ac.ir

Downloaded from http://ebcj.mums.ac.ir/ at Mashhad University of Medical Sciences on October 01, 2018

Introduction

Breast milk is regarded as the most natural and important food that can be easily and readily made available to newborns (1). The breast milk composition is totally based on neonatal requirements and leads to neonatal growth and development in the best manner. Moreover, this nutriment is similarly known as the most complete food for the neonates in the first months of their life (2). Typically, newborns lose some weight on the first days of their lives. This weight loss may reach up to 10% of the neonatal birth weight. However, if the newborns are breastfed immediately after delivery, continuously kept aside their mothers, and nursed overnight, they usually lose less weight (3).

The most important factor affecting weight gain after birth is the type and mode of neonatal feeding. Moreover, the most suitable nutrition is exclusive breastfeeding that begins at the moment of birth and continues repeatedly throughout nights and days until the end of six months, during which no other food, even water, is needed.

To have a successful breastfeeding, newborns also require to establish a good communication with the breast. Breastfeeding can be accompanied with some difficulties, such as breast congestion, mastitis, breast abscess, and cracked nipples (nipple trauma). These complications can appear immediately after delivery or at any time during breastfeeding, which consequently lead to insufficient lactation, as well as nursing strike by the neonates in their early life (4).

The most common problem associated with breast is breast engorgement (5) that occurs in 40% of mothers after delivery, which is introduced as the third factor leading mothers to stop breastfeeding (6-8). Breast engorgement in mothers can be caused by several factors, including a sudden increase in the volume of breast milk in the postpartum period and lymph and vascular density, as well as a rapid rise in the breast connective tissues (9-11). The absence of timely treatments may result in the incidence of breast abscess that can lead to the discontinuation of breastfeeding and use of antibiotic therapies (10).

Neonates have the highest vulnerability on their early days of lives; moreover, due to being in the development stage with the highest growth rate, they are in great need of energy, protein, and other nutrients supply. Therefore, any events, such as breast engorgement, that could interfere with breastfeeding should be given special attention (12). Boskabadi et al. (2014) found that the sodium levels of the blood in the newborns of mothers affected with breast problems (e.g., breast engorgement, nipple fissures, and droopy nipples) were higher; however, the rate of urinary and fecal excretion was at lower levels. The range of neonatal weight loss in these newborns was higher than in those of mothers without any problems (4). These problems are uncomfortable, especially with regard to the high energy that mother should spend to fulfill neonatal demands (9).

Currently, there are different pharmaceutical and non-pharmaceutical methods to reduce breast engorgement during breastfeeding. Because of the side effects of chemical medications, medical science researchers are now seeking to find the easiest, the least complicated, and the most effective therapies. Therefore, they are resorting to complementary or alternative techniques (13), such as massage therapy (14).

Sotomi Oketani in Japan suggested a painless massage type (Oketani breast massage) to reduce breast pain, moderate its congestion, and correct the droopy, flattened, and cracked nipple. It was also argued that Oketani breast massage could aid in restoring normal breast functioning. During this massage, the space between the connective tissues of the breast and its pectoralis major muscle is separated which can increase the depth of the breast and improve the stretching of its base, resulting in softness and elasticity of this organ.

Besides, this massage does not have any pain or discomfort for an individual, prevents any injury to the nipples and mastitis, corrects breast abnormalities, boosts lactation, and gives the person a comfortable feeling (15). In this respect, Cho et al. (2012) conducted a clinical trial in Japan that showed an association between Oketani breast massage and a decrease in breast pain, which resulted in an increase in breast milk pH level and the speed of sucking in the neonate (16).

In another study conducted by Foda et al. (2004) in Japan on breast feeding mothers, it was revealed that breast massage therapy could totally improve the quality of breast milk and Oketani breast massage was likely to enhance neonatal growth and development (17). With this background in mind, the present study aimed to examine the effect of Oketani breast massage therapy on neonatal weight gain in Iran.

Downloaded from http://ebcj.mums.ac.ir/ at Mashhad University of Medical Sciences on October 01, 2018

Methods

This randomized controlled clinical trial was conducted on 100 postpartum women admitted to the Obstetrics and Gynecology Department of Imam Reza Hospital affiliated to Mashhad University of Medical Sciences, Mashhad, Iran with breast engorgement from August to November 2016. The sample size was determined based on a study performed by Cho, entitled as "Development and evaluation of breastfeeding for mothers with breast engorgement after Cesarean-section delivery" using a confidence interval of 95% and a test power of 80%. Breast changes before and after breast massage were considered as a dependent variable in the intervention and control groups.

Moreover, the formula for comparing means from two independent samples was used to calculate the mean and standard deviation of breast changes in the intervention and control groups. Finally, the minimum sample size was calculated as 41 cases in each group; however, regarding 20% sample loss, 50 mothers were included in each group.

The inclusion criteria for mothers recruited in this study were: 1) development of breast engorgement on the first five days after birth, 2) a minimum score of 2 out of 19 in terms of breast congestion severity based on the Breast Congestion Checklist, 3) no use of drugs stopping breastfeeding, 4) absence of mastitis, 5) body temperature of < 38°C, 6) no breastfeeding inhibitions, 7) engagement in breastfeeding, and 8) willingness to participate in the study.

Moreover, mothers' gestational age at delivery was between 37 and 42 full weeks, and they had no history of breast surgery or high-risk pregnancy and childbirth. The criteria for the entry of the newborns into the study included: 1) singleton and healthy status, 2) normal birth weight (2500-4000 g), 3) possession of a sucking power, and 4) no bans on breastfeeding (e.g., prematurity and affliction with cleft lip and palate).

On the other hand, the exclusion criteria for the mothers were: 1) increased general temperature to over 38°C after the onset of the intervention, 2) use of or need to use anti-inflammatory drugs during the intervention, 3) unwillingness to continue cooperation, 4) previous receipt of intervention, 5) a time interval of more than 48 h between two Oketani breast massage sessions, and 6) infection with mastitis or breast abscess during the study. In addition, the newborns with specific problems, such as fever and lack of exclusive breastfeeding, were excluded from the study.

The data collection instruments included maternal demographic, fertility, and lactation characteristics form, the standardized Breast Congestion Checklist, and Newborn Weight Control Chart. According to the Breast Congestion Checklist, the severity of breast engorgement was measured using the total score of engorgement symptoms (e.g., skin inflammation, stretching, and breast pain). The lowest and highest scores were reported as 0 and 19, respectively.

The given checklist also included the assessment of skin inflammation, breast stretching, and breast pain (with 0 and 10 showing the lowest and highest severity levels, respectively). The skin inflammation involved redness in the breasts, partial redness in a limited region on the breasts, full redness in a limited region on the breasts, scaly glow and gloss in a limited region on the breasts, and glossy redness in most of the breast tissue, that were scored as 0, 1, 2, 3, and 4, respectively. Furthermore, breast stretching entailed the examination of completely soft and loose breast tissue, stiff and non-sensitive breast tissue, constricted and stretched breast tissue with low sensitivity, constricted and stretched breast tissue with moderate sensitivity, constricted and stretched breast tissue with high sensitivity, and very constricted and painful breast tissue, which were scored as 0, 1, 2, 3, 4, and 5, respectively.

The second research instrument was Newborn Weight Control Chart as a researcher-made tool developed to measure only neonatal weight. The validity of the questionnaires was confirmed by content validity method. To this end, after reading the relevant books and articles under the supervision of professors and advisors, initial forms were developed and they were given to 10 faculty members of the School of Nursing and Midwifery affiliated to Mashhad University of Medical Sciences, Mashhad, Iran. The final version of the research instrument used in the present study was developed following reviews and considering the suggestions and necessary comments of the given experts.

The standardized Breast Congestion Checklist with a confirmed reliability has been implemented by several previous researchers, such as Kvist (18). The reliability of this research instrument was also measured using parallel forms reliability method (r=0.87). In order to determine the breast engorgement severity, the first author had to be trained by a gynecologist (the fourth author) to be competent enough in terms of practical skills for diagnosing breast engorgement and other diseases in nursing mothers. To this end, five mothers suffering from breast congestion were recorded in the

Downloaded from http://ebcj.mums.ac.ir/ at Mashhad University of Medical Sciences on October 01, 2018

Breast Congestion Checklist by the first and the fourth authors. Kappa correlation coefficient of the responses for the severity of engorgement was approved as 0.87.

The reliability of neonatal weighing instrument (a neonatal weighing scale) was tested prior to each measurement using a half-kilogram weight. The eligible mothers were randomly assigned into two groups after delivery. The random allocation was performed to administer two treatment methods of Oketani breast massage and routine breast care (i.e., correct breastfeeding techniques training, breast massages, and warm compresses) based on double blocks considering the mode of delivery.

The study population was assigned into two groups of control (n=50) and intervention (n=50). Each group included 25 cases with Cesarean-section and 25 cases with normal vaginal delivery. Numbers 0-4 were written on papers A and B and numbers 5-9 were written on papers B and A, so that if the first person was entered into group B, the second person was allocated into group A.

The measures taken in the control group included normal activities for breast congestion (i.e., correct breastfeeding techniques training, frequent breastfeeding, and warm compresses). On the other hand, the intervention group were subjected to normal activities for breast congestion, along with Oketani breast massages, by one of the researchers on both breasts lasting for 30 min once a day for two consecutive days. Totally, Oketani breast massage included eight manual techniques performed within 60 sec and repeated for 15-20 min. Levels 1-3 of the given therapy were associated with the detachment of the bottom of the breast from its pectoralis major muscle. Furthermore, levels 4-6 involved pulling the whole breast with two thumbs down and to both sides by both hands. Additionally, level 7 included rotating the breast gently clockwise with stretching of its base, and level 8 was about milking the breast in four different directions (15).

Breast massage and routine care activities continued for two consecutive days. Moreover, massages were taught to mothers to be performed personally after two days if breast engorgement continued. During the massage intervention, the neonates were kept in a room and breastfed upon demanding.

Prior to the implementation of the intervention, the last author initially introduced herself and provided a brief explanation regarding the research objectives and methodology if desired by the participants. Then, she completed the sample selection form through interviews and obtained written informed consent from all mothers meeting the inclusion criteria.

The research procedure was continued by the completion of the maternal demographic, fertility, and lactation characteristics form via an interview, followed by filling out the Breast Congestion Checklist through observations and examinations conducted by the last author. Prior to the study, general temperature was controlled with a mercury thermometer using a sublingual method. Subsequently, training was provided in the form of interventions to the study participants.

The scores of the congestion severity were then recorded using the standardized Breast Congestion Checklist on the first day, before and after the intervention, and also on the second day of the intervention (one day after the first intervention) by the last author. Neonatal birth weight was also recorded at the beginning of the study and 14 and 28 days after delivery in the intervention and control groups with the Beurer Baby Scales BY20 () and also checked with the sinker before weighing by the assistant researcher.

After obtaining written informed consent from the study subjects, they were informed about the research objectives. Furthermore, they were ensured about the possibility of study withdrawal whenever they were unwilling to continue cooperating without any effects on their health services.

At the end of the study, two subjects in the intervention group were excluded due to unwillingness to continue cooperation. Additionally, four participants in the control group were removed because of reluctance to continue cooperation (n=2) and receipt of intervention previously (n=2). Therefore, the study was continued with 48 and 46 participants in the intervention and the control groups, respectively.

Data analysis was performed in SPSS (version 20) at the significance level of 0.05. To examine the normality assumption of the quantitative variables, such as maternal age, number of deliveries, and birth weight, Kolmogorov-Smirnov test was employed. In addition, the Chi-square test (qualitative variables), independent t-test (quantitative variables with normal distribution), and Mann-Whitney U test (non-normally distributed quantitative variables) were utilized to investigate the homogeneity of both groups in terms of confounding and underlying variables.

To compare and test the main variables before and after the intervention (within-group comparison), paired t-test was run. The Chi-square test and the independent t-test were also employed for nominal variables and between-group comparisons, respectively. The repeated measure analysis of variance

Downloaded from http://ebcj.mums.ac.ir/ at Mashhad University of Medical Sciences on October 01, 2018

(ANOVA) was also used to measure the weight of the neonates at different times.

Results

The findings on the effect of Oketani breast massage on breast congestion severity were detailed in another article (12). In the present study, no statistically significant difference was found between two groups in terms of maternal demographic, fertility, and lactation characteristics (P>0.05). As indicated in Table 1, the results of the independent t-test showed no significant difference between the two study groups in terms of height (P=0.49), weight (P=0.18), and head circumference (P=0.43) at birth. In other words, the two groups were homogeneous regarding this variables.

Based on the results of the independent t-test, there was no significant difference between the intervention and control groups regarding neonatal weight 1-5 days before the intervention (P=0.17). The majority of deliveries (59.66%) in this study were vaginal, and the most of the newborns (53.19%) were male. Moreover, no statistically significant difference was found between the intervention and control groups in terms of the above-mentioned variables.

However, the results of the independent t-test showed a significant difference between the intervention and control groups in terms of neonatal weight both 14 (3778±45 vs. 3358±33) and 28 (4527±520 vs. 3857 ±353) days after the intervention (P<0.001). Furthermore, the repeated measures ANOVA indicated main effect (P<0.001), group effect (P<0.001), time effect (P<0.001), as well as interaction effect of group and time (P<0.001) on the mean weight of the newborns (Table 2).

Table 1. Comparison of demographic indicators between the newborns in the intervention and control groups

Variable	Group		
	Intervention n=48	Control n=46	
	Mean±Standard deviation	Mean±Standard deviation	
Weight at birth (g)	3180±4	3070±2	*P=0.18
Height at birth (cm)	48.89±2.2	48.60±1.7	*P=0.49
Head circumference at birth (cm)	34.40±1.6	34.18±1.06	*P=0.43
Type of delivery	N(%)	N(%)	
Vaginal	27 (56.25)	29 (63.04)	0.64=P**
Cesarean-section	21 (45.75)	17 (66.96)	
Gender			
Female	22 (45.13)	28 (60.86)	P=0.21**
Male	26 (54.17)	18 (39.14)	

* Independent t-test, **Chi-square test

Table 2. Comparison of mean neonatal weight in two groups of intervention and control at different times

Neonatal weight	Group		
	Intervention n=48	Control n=46	
	Mean±Standard deviation	Mean±Standard deviation	Independent t-test
Days 1-5 after birth and before intervention	3150±4	3046±2	P<0.17
14 days after intervention	3778±4	3358±3	P<0.001
28 days after intervention	4527±5	3857±3	P<0.001
Changes on day 14, compared to baseline	627±1	311±1	P< 0.001
Changes on day 28, compared to baseline	1376±3	810±2	P<0.001
Repeated measure ANOVA:			
Main effect	P<0.001	F=81.3	
Interaction	P<0.001	F=76.4	
Group	P<0.001	F=43.8	
Time	P<0.001	F=52.7	

Discussion

The results of the study showed a rise in the mean weight of the neonates in both intervention and control groups 14 and 28 days after birth. The two groups were significantly different in terms of the mean weight gain between the two study groups. In this regard, neonatal weight gain in the group with Oketani breast massages was significantly higher than that in the control group.

Downloaded from http://ebcj.mums.ac.ir/ at Mashhad University of Medical Sciences on October 01, 2018

Oketani breast massage therapy detaches the space between the connective tissues of the breast and its pectoralis major muscle which could increase the depth of the breast and improve the stretching of its base. This technique causes softness and elasticity of the breast and the nipples which could improve the latching, thereby increasing lactation and reducing congestion (15). Furthermore, pressure on the areola could reduce its resistance, which increases during congestion, and also soften it by moderating the fluid between tissue. This improves2 the placement of the mother's nipple in the neonatal mouth, which could lead to satisfactory sucking by the neonate (19).

According to Kabir et al. (2010), the effectiveness of areola and total breast massages in decreasing congestion severity not only can be sought in terms of the impact of massages on blood flow and lymph nodes in the target region but also can be used to stimulate milk leakage reflux. Pressure on the nerves concentrated at the center of the areola ad the nerves present in the nipple congestion point can also cause the milk to flow (15).

In a study conducted by Foda et al. (2004) in Japan on milk samples obtained within the periods of early breastfeeding (1-90 days post-delivery) and late breastfeeding (91-320 days after birth), it was concluded that breast massages could boost the quality of breast milk, and that Oketani breast massage was likely to improve neonatal growth and development (17). Cho et al. (2012) in a study entitled as "Investigating the effect of Oketani breast massage on milk pH level, infant's sucking speed, and breast pain in Japan" also demonstrated that Oketani breast massage led to the reduction breast pain, enhancement of maternal milk pH level, and acceleration of latching by the neonate. They also reported that this method could be used as an independent nursing intervention to increase neonatal growth and development (16).

Moreover, Ahn et al. (2011) showed that breast massage reduced breast pain and breast milk, and consequently improved sucking by the newborn (20). In addition, Foda et al. (2008) measured the effect of breast massage on breast milk protein. To this end, they examined 39 milk samples obtained from healthy breastfeeding mothers. They demonstrated an increase in milk protein richness following breast massage therapy (21).

In this regard, in the present study, the reason behind neonatal weight gain in the group receiving Oketani breast massages could be the fact that the reduction of congestion in this group facilitated sucking by the newborn, and also increased milk pH level resulting in having sweetener milk. This boosted the neonatal tendency to have more milk; moreover, the milk protein content is elevated as a result of massages, which is in line with the results reported by Foda et al. (2008).

Among the limitations of this study was the lack of mothers' referrals for the second phase of the intervention and the need to attend their homes to follow up and complete the study intervention. Furthermore, no accurate supervision was executed over the home self-cares performed by mothers, and researchers only trusted in the responses presented by the study participants. In addition, the study of spousal support for breastfeeding was out of researchers' control. Another limitation of this study was the non-examination of the quality of breast milk owing to the financial constraints.

Implications for Practice

As the findings of the present study indicated, Oketani breast massage could be used as an easy-to-method. This alternative method can be also recommended for mothers suffering from breast engorgement. It is recommended to investigate the effect of Oketani breast massage therapy concurrently on the quality of breast milk and neonatal weight gain among mother with breast engorgement.

Acknowledgments

This study was a research project submitted in partial fulfillment of the requirement for the degree of Master of Science in Midwifery with the code number of 941724. Our research was approved by the Student Research Ethics Committee at the School of Nursing and Midwifery affiliated to Mashhad University of Medical Sciences. This study was registered in the Iranian Registry of Clinical Trials with the code number of IRCT2016062728669N1.

Conflicts of Interest

The authors have no financial or other interest in the article.

Downloaded from http://ebcj.mums.ac.ir/ at Mashhad University of Medical Sciences on October 01, 2018

References

1. Rahimzadeh M, Hosseini MO, Mahmoodi M, Mohammad KA. A survey on some effective factors on the duration of breastfeeding using survival analysis (Mazandaran province). Koomesh. 2007;8(3):161-70. (Persian)
2. Ekhtiari A, Emami P. Comparison of success rates in breastfeeding after vaginal delivery and cesarean section. Med Sc J Islamic Azad Univ Tehran Med Branch. 2008;18(1):51-4. (Persian)
3. Cunningham FG, Leveno KJ, Bloom SL, Spong CY, Dashe JS, Hoffman BL, et al. Obstetrícia de Williams. New York: McGraw Hill Brasil; 2016.
4. Boskabadi H, Ramazanzadeh M, Zakerihamidi M, Omran FR. Risk factors of breast problems in mothers and its effects on newborns. Iran Red Crescent Med J. 2014;16(6):e8582.
5. Mirahmadizadeh A, Zare P, Moradi F, Sayadi M, Hesami E, Moghadami M. Exclusive breast-feeding weaning pattern and its determinant factors in Fars province in 2010. Daneshvar. 2012;19(99):11-22.
6. Fu JC, Long CY, Lin HS. Factors influencing breast symptoms in breastfeeding women after cesarean section delivery. Asian Nurs Res. 2011;5(2):88-98.
7. Cash JC, Glass CA. Family practice guidelines. New York: Springer Publishing Company; 2017.
8. Keramat A, Masoumi SZ, Shobeiri F, Raei M, Andarzgoo M, Babazadeh R. Effectiveness of educational program related to persuade women for breast feeding based on theory of planned behavior (TPB). Sci J Hamadan Nurs Midwifery Facul. 2013;21(2):21-31. (Persian)
9. Mangesi L, Dowswell T. Treatments for breast engorgement during lactation. Cochrane Database Syst Rev. 2010;9:CD006946.
10. Kamali Moradzade M, Ahmadi M, Heshmat R, Akbarzade Baghban A. Comparing the effect of acupressure and intermittent compress on the severity of breast hyperemia in lactating women. Horizon Med Sci. 2013;18(4):155-60.
11. Arora S, Vatsa M, Dadhwal V. A comparison of cabbage leaves vs. hot and cold compresses in the treatment of breast engorgement. Indian J Community Med. 2008;33(3):160-2.
12. Dehghani M, Babazadeh R, Khadivzadeh T, Azam Pourhosseini S, Esmaeili H. Effect of breast oketani-massage on the severity of breast engorgement. Iran J Obstet Gynecol Infertil. 2017;20(5):30-8. (Persian)
13. Chiu JY, Gau ML, Kuo SY, Chang YH, Kuo SC, Tu HC. Effects of Gua-Sha therapy on breast engorgement: a randomized controlled trial. J Nurs Res. 2010;18(1):1-10.
14. de Sousa L, Haddad ML, Nakano AM, Gomes FA. A non-pharmacologic treatment to relieve breast engorgement during lactation: an integrative literature review. Rev Esc Enferm USP. 2012;46(2):472-9.
15. Kabir N, Tasnim S. Oketani lactation management: a new method to augment breast milk. J Bangladesh Coll Phys Surg. 2009;27(3):155-9.
16. Cho J, Ahn HY, Ahn S, Lee MS, Hur MH. Effects of oketani breast massage on breast pain, the breast milk pH of mothers, and the sucking speed of neonates. Korean J Women Health Nurs. 2012;18(2):149-58.
17. Foda MI, Kawashima T, Nakamura S, Kobayashi M, Oku T. Composition of milk obtained from unmassaged versus massaged breasts of lactating mothers. J Pediatr Gastroenterol Nutr. 2004;38(5):484-7.
18. Kvist LJ, Hall-Lord ML, Rydhstroem H, Larsson BW. A randomized-controlled trial in Sweden of acupuncture andcare interventions for the relief of inflammatory symptoms of the breast during lactation.Midwifery.2007; 23: 184–195
19. Ramezandadeh M. The effect of softening the areola reverse massage with cold compresses on the severity of breast congestion in the postpartum period. [Master Thesis]. Iran. Mashhad: Nursing and Midwifery School of Mashhad University of Medical Sciences; 2011. (Persion)
20. Ahn S, Kim J, Cho J. Effects of breast massage on breast pain, breast-milk sodium, and newborn suckling in early postpartum mothers. J Korean Acad Nurs. 2011;41(4):451-9.
21. Oku MF. Changes in milk protein of lactating mothers following breast massage. Int J Dairy Sci. 2008;3(2):86-92.

Downloaded from http://ebcj.mums.ac.ir/ at Mashhad University of Medical Sciences on October 01, 2018