Effectiveness of Different Massage Techniques for Breastfeeding Mothers to Increase Milk Production: A Systematic Review

Sasitara Nuampa, Sudaporn Payakkaraung*

Abstract: Insufficient milk production is cited as the important reason for early termination of breastfeeding. Massage is an effective and low-risk treatment choice for promoting milk secretion. However, previous systematic reviews of the literature have not addressed the methods of massage therapies in terms of effects on milk production among postpartum mothers. This systematic review identified and synthesized massage techniques to increase milk production among Asian mothers. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis statements was applied as a guideline for this review. PubMed, CINAHL, Science Direct, Scopus, SAGE Journal, BMJ Journals, and other breastfeeding sources were searched covering English publications from 2009-2020. Experimental research studies were included according to inclusion and exclusion criteria. Screening and data extraction were performed systematically. The methodological quality was assessed using standardized critical appraisal instruments for quantitative studies from the Joanna Briggs Institute.

Twenty-two studies from Asian countries were selected to review. Two groups of massage treatments consisted of partial body massage and breast massage. Combined massage techniques appeared to result in more milk volume, however, the existing studies were mostly of low and moderate quality due to unclear risks of bias and having heterogeneous data. The limitation of control group details, diversity of participants characteristics, and small sample size of the included studies prevented the combination of data across studies for meta-analysis. Further research is needed to improve the methodological rigor and standard measurements of milk volume for combining the overall effects of the interventions. Massage techniques can be an interesting choice for sustainable breastfeeding duration, however, massage skills need to be standardized for nurses and included in nurse education programs.

Pacific Rim Int J Nurs Res 2021; 25(1) 114-130

Keywords: Breastfeeding, Human milk, Massage, Nursing, Postpartum, Systematic review

Received 28 April 2020; Revised 24 June 2020; Accepted 24 July 2020

Correspondence to: Sasitara Nuampa, ** RN, PhD (Nursing), Lecturer, Department of Obstetrics and Gynecological Nursing, Faculty of Nursing, Mahidol University, Thailand. E-mail: Sasitara.nua@mahidol.edu*

Sudaporn Payakkaraung, *RN, PhD (Nursing), Associate Professor, Department of Pediatric Nursing, Faculty of Nursing, Mahidol University, Thailand. E-mail: sudaporn.pay@mahidol.ac.th*

Introduction

Breastfeeding can permanently affect individuals' life courses through the advantages of health consequences for child and mother. The benefits of breastfeeding have been distinguished as reducing childhood infections, increased intelligence and reduced incidence of non-communicable diseases in children.[1] Breastfeeding can also help prevent breast cancer, ovarian cancer and type 2 diabetes mellitus in lactating mothers.[1] Additionally, breastfeeding can provide financial advantages, because suboptimal breastfeeding relates to an economic loss of approximately $302 billion

annually.[2] Therefore, the WHO and UNICEF recommend that breastfeeding should be continued exclusively with no other foods or liquids for the first six months of life and continue with complementary feeding until at least 24 months of age. In recognition of this, the World Health Assembly has set a goal to increase the rate of exclusive breastfeeding to at least 70% by 2030. The overall rate of exclusive breastfeeding for infants under six months of age was 40% in 2016, which falls drastically below global targets.[3]

Inadequate milk production is often mentioned as an outstanding barrier for early weaning of breastfeeding.[4,5] The 491 women in this study who had stopped breastfeeding by nine weeks provided the most frequent reason to be insufficient milk supply, accounting for 46.6% of the responses.[4] For example, in an Indian study, inadequate milk secretion was a key reason for terminating exclusive breastfeeding.[6] However, an inadequate supply is difficult to accurately assess.[7,8] In practice, the root of low supply may involve multiple factors that it is difficult to identify a single cause.[9] Management and treatment options for this problem are essential to sustain breastfeeding duration and achieve global targets for exclusive breastfeeding.

Optimizing effective breastfeeding should be the essential management for enhancing milk production for mothers with full-term healthy infants. Accordingly, treatment options could be supported as a secondary option.[10] Pharmacological galactagogues are substances used to induce, maintain, and increase milk production.[11] Domperidone is frequently regarded as the drug of choice; however, it is not licensed for use in the USA,[11] but is marketed in the UK and Canada. In addition, there are a variety of botanical galactagogues, including many traditional cultures, foods and herbs, but there is a lack of logical clarification of the long-term effects of these on maternal and child health. There is insufficient evidence from published trials on any intervention to justify the safe implementation of these.[12]

Massage is an effective and low-risk treatment choice for promoting milk secretion. The scientific manipulation of massage therapy works through the soft tissues of the body with hands-on techniques increasing muscle relaxation and reducing stress hormones to boost the capacity of hypothalamic-pituitary-adrenal function.[13] When stress hormones are reduced, milk production may improve. The postpartum period is a particularly stressful time for women with common stressors such as sleep deprivation, physical exhaustion, hormone changes and anxiety on caring for newborns and adapting to a new parenting role.[14] These stressful conditions cause a delay in the onset of lactation and decrease milk production, [15] so massage therapy seems to be the outstanding alternative treatment to helping promote milk supply among postpartum mothers.

Several massage techniques are effective in increasing milk production, including Oketani breast massage,[16] oxytocin massage,[17] back massage,[18] aromatherapy massage,[19,20] Tuina massage[21] and acupoint massage.[22] However, massage techniques have not been systematically reviewed and their benefits on milk supply are not generally known. A variety of massage styles was explored in terms of how different styles were effective in enhancing milk production, how to perform different massage techniques, the magnitude of treatment and efficiency outcomes. The findings of this systematic review could be of benefit in promoting breastfeeding sustainability.

Study Aim

The aim was to synthesize the evidence regarding various massage techniques to increase milk production among postpartum mothers and their healthy infants.

Method

Data Sources: The Preferred Reporting for Systematic Reviews and Meta-Analysis (PRISMA) was used to report this systematic review, which was conducted from February to March 2020 using seven databases and four website sources. The databases were PubMed, CINAHL, Science Direct, Scopus, SAGE Journal, BMJ Journals, Google Scholar, and Proquest Dissertation & Theses. Website sources searched were

WABA, WHO, UNICEF and the Wellstart International. The medical subject heading (MeSH) terms consistent with the PICO of this study were used for the initial search strategy. Search terms were "postpartum mother*", "postpartum period", "puerperium", "postpartum women", "lactation mother*" "breast massage", "massage therapy", "massage technique" "massage" "breast milk quantity", "breast milk supply", "breast milk volume", "breast milk production" In addition, relevant bibliographies were scanned and relevant references added. The Internet was also searched for grey literature.

Study selection: This was carried out in two phases. First, each researcher independently screened the relevance of the titles. The following inclusion criteria applied to the studies: 1) quantitative research design using randomized control trials (RCT) or quasi-experimental designs; 2) sample of postpartum mothers without breast-related problems; 3) breastfeeding mothers with healthy infants; 4) massage techniques using hands and/or traditional or modern equipment; 5) outcomes related to milk production; 6) English language content and 7) original research articles published from 2010- March 2020. Non-peer reviewed articles, abstracts, letters to editors, dissertations, literature review articles and book chapters were excluded from this review. Secondly, when papers appeared to meet the inclusion criteria, the researchers obtained the full text and two researchers independently screened them. Disagreements were resolved by discussion and consensus. The process of the systematic review is summarized in the PRISMA flow diagram (**Figure 1**).

Data extraction: The review matrix method was used to extract relevant information from each article.[23] The important characteristics of the included articles are identified in **Table 1** (author(s) name(s), year of publication, country, objectives, design, sample, intervention type, timing, outcome measurement, selected results and quality rating).

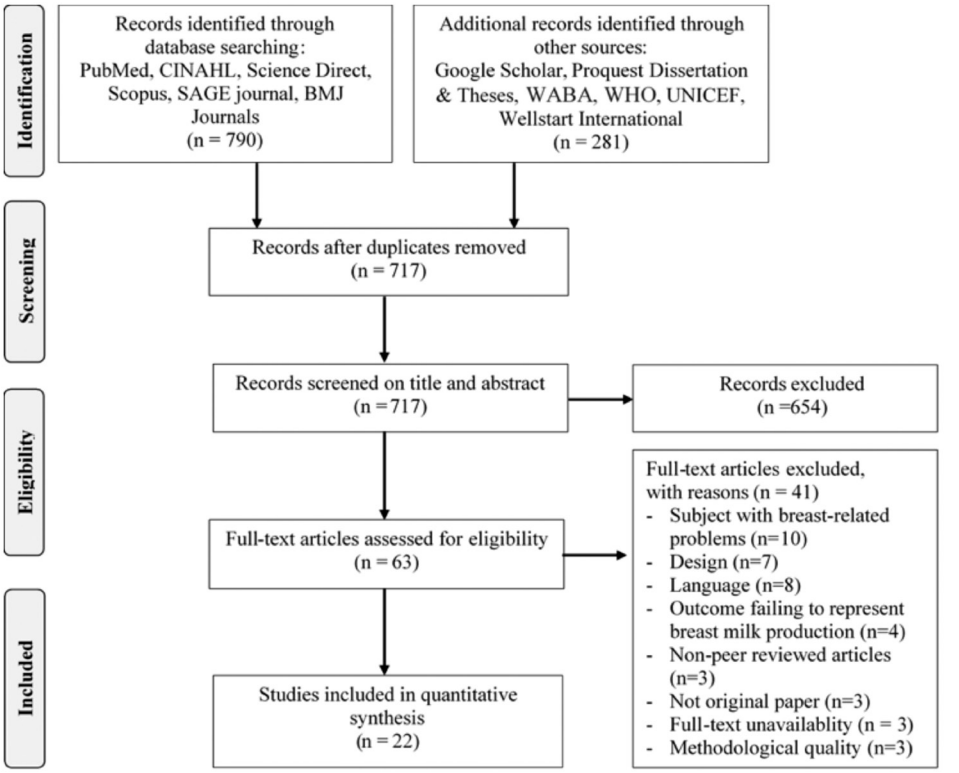

Figure 1 PRISMA flow diagram

Assessment of methodological quality: Critical appraisal of all studies selected for inclusion was undertaken independently by two reviewers using standardized critical appraisal instruments from the Joanna Briggs Institute (JBI): the JBI Critical Appraisal Checklist for Quasi-Experimental Studies (non-randomized experimental studies) with 9 items and the JBI Critical Appraisal Checklist for Randomized Controlled Trials with 13 items.[24] There were no disagreements between the reviewers during the critical appraisal process.

Results

A total of 1,071 articles were identified in our initial database search with 717 articles remaining after duplicates were removed. Of these, 654 were excluded after an initial screening of titles and abstracts was done and independently screened by two researchers based on the inclusion criteria. Sixty-three full-text studies were then assessed in detail, and 41 studies were excluded due to unmet criteria. See **Figure 1** which shows the search and selection process. Twenty-two studies meeting the inclusion criteria were selected to review and synthesize. No disagreements arose between the reviewers regarding study selection.

Study Characteristics: A description of the intervention characteristics of the included studies is shown in **Table 1**. Twenty-two studies were reviewed, with a combined total of 1,367 postpartum mothers. The included studies were published between 2013 and 2020. Five of the included studies used an RCT design;[21,22,25-27] 17 studies had quasi-experimental designs, including pretest-posttest and control group designs (n=10),[16,17,20,28-34] post-test only approaches (n=2),[35,36] non-equivalent control group designs (n=2),[19,37] static-group comparisons (n=1),[38] time series with a comparison group,[18] and one-group pre-posttest design.[39]

Seventeen of the 22 studies were conducted in Indonesia while three were published in India[31-33] and two in China.[21,22] The majority of the studies (n=11) did not identify the mode of delivery, while three studies were conducted in mothers after caesarean section only,[22,31,39] five studies were conducted in mothers who had a vaginal delivery,[19,29,32,33,37] and three studies were conducted in both groups.[27,28,35] The mothers' ages ranged from 15-47 years. Regarding parity, seven studies included primigravida mothers,[19-22,32-34] nine were conducted with both multipara and primipara mothers,[16-18,25,27,30,35,37,39] while six did not identify parity.[26,28,29,31,36,38] All studies involved full-term infants with birth weights >2500 grams and the mothers did not have any postpartum complications.

Methodological Quality Assessment: See **Table 1.** Based on JBI assessment tools, nine of the studies received a quality rating of low (40.9%),[18,25,27,28,30,31,36,38,39] while 13 studies were moderate (59.1%).[16,17,19-22,26,29,32-35,37] Common threats to validity and reliability included: 1) lack of a control group due to a one-group design[39] and unclear the identification of a control group;[31,32] 2) limited information in usual care;[18-20,22,26-29,33-35,37,38] 3) lack of details of the characteristics of participants and comparison between treatment groups;[18,28,30,31,33,35,36,38] 4) lack of clarity about followup or missing cases;[34] 5) no explanation about instrument reliability;[18,25,28,30-34,36-38] 6) lack of details on treatment magnitude;[18,26-31,34-36,38] 7) lack of clarity in treatment delivery blinding to treatment assignment;[20-22,25,27,28] and 8) lack of outcome assessors blind to treatment assignment.[20-22,25,27,28]

Treatment Initiation: Nearly all of the studies started interventions within the first three days after childbirth. In other words, 14 of the studies were initially conducted on the first day postpartum,[17,18,21,24-27,29,32-34,37,39] three on Day 2 postpartum[22,30,31] and one each on Day 3 after birth[19] and on Day 7.[20] One study started treatment during the first six months postpartum among working mothers,[28] however, two did not identify the exact starting time of the intervention.[36,38] Focusing on mothers after caesarean section the variety of initial times include 6 hours,[35] 12 hours,[16] after 24 hours[39] and 48 hours post C/S.[22,31]

Treatment Duration: Most studies had short treatment durations within the first week after childbirth and ten were conducted with continual treatment for three days (45.5%),[16,17,21,25,26,28,31,33,37,39] while short durations of one day (n=1, 4.5%),[35] two days (n=2, 9%),[19,22] six days (n=1, 4.5%)[30] and seven days (n=1, 4.5%)[34] were conducted continuously. The mean duration of treatment was 6.11 days (SD 3.46). The average frequency of treatment was 1.96 times per day (SD 0.83). The total frequency of treatment through the study ranged from 1 to 28 times with a mean of 7.11 times (SD 2.82). Moreover, the mean treatment duration per time was 26.6 minutes (SD 11.73). Details are presented in **Table 1.**

Qualification Requirements of Massage Providers: Most studies did not clarify details about how to train the massage therapist or the qualifying necessary skills for doing massage techniques and only three studies described who conducted the massage intervention.[16,18,37] The Oketani massage intervention was provided by a researcher who was trained and certified as Oketani lactation management expert,[16] while oxytocin massage was done by a breastfeeding counsellor.[37] Back massage was described as a simple method that could be implemented by healthcare personal.[18]

Massage Techniques: There were many techniques to increase milk volumes, including oxytocin massage (n= 11, 50%),[17,18,26-30,35-37,39] back massage (n=3, 13.64%),[31-33] neck massage (n=1, 4.55%),[25] full-body massage (n=2, 9.09%),[19,20] Oketani breast massage (n=1, 4.55%),[16] Woolwich massage (n=1,4.55%)[38] and traditional Chinese massage (n=3, 13.64%).[21,22,34] Similarly, two groups of massage treatments consisted of partial body massage (oxytocin massage, back massage, neck massage and full-body massage) and breast massage (Oketani massage and traditional Chinese massage).

Regarding partial body massage, most studies manipulated oxytocin massage with 669 postpartum mothers.[17,18,26-30,35-37,39] The massage was often administered over three consecutive days, twice a day.[17,26,28,37,39] However, the massage time was diverse from 2-3 minutes[37] to 20 minutes[28] with a mean of 12.5 minutes per time (SD 5.0). Oxytocin massage was done along the spine to the fifth and sixth ribs by pressing vigorously to form a circular motion in small areas with the thumbs. This massage technique is an attempt to stimulate the hormones prolactin and oxytocin after delivery and to calm the mother, so milk can flow.[37] Six studies involved a single treatment of oxytocin massage (n=6, 46.2%).[18,28,30,35,37,39] Two studies used massage equipment by using a digital massager of oxytocin (DMO), applying the electrodes on the first intercostal of BL-17 and BL-18 acupoints.[28,35] Two studies applied natural essential lavender oil or virgin coconut oil combined with oxytocin massage.[18,30] Additionally, four studies combined two treatments of oxytocin massage and breast care (n=4, 36.36%).[17,26,29,36] Breast care was one technique of tactile stimulation aimed at expediting blood circulation and preventing blockage of milk production ducts by facilitating the expenditure of breast milk.[29] However, one of the studies compared two or three treatments, including oxytocin massage, breast care, and the Marmet technique,[36] while one study conducted 2 weeks of interventions and provided a guide booklet at home.[29] One study combined treatments with oxytocin massage and the Marmet technique (n=1, 9.09%), a technique involving manual expression and assisting the milk ejection reflex.[36] Finally, one treatment combined oxytocin massage and hypno-breastfeeding, which is a relaxation technique involving direct contact with the subconscious mind.[27]

Second, three studies examined back massage[31-33] and one examined neck massage.[25] Back massage is the technique of exposing the back of the mother from the neck to the loin, the moving "to" and "fro" from neck to buttocks and back to the neck. All of the studies involved single back massage but might have had different concentrations. Two studies involved back massage with mothers after normal delivery

having the initial treatment at 2 hours postpartum,[32,33] while caesarean section mothers had back massage started at 48 hours post C/S.[31] Moreover, the total frequency of back massage treatments was 9-12 times with 10-15 minutes each time. For neck massage, this study compared treatment between neck and pectoralis muscle massage; however, the treatment details were not explained. The neck massage was initial on the first day with total frequency of treatment being three times for 15 minutes each.[25]

Third, two studies administered full body massage and aromatherapy in 96 mothers postpartum.[19,20] Massage treatments were initially administered at different time points on Day 3[19] and Day 7[20] postpartum. Both studies had the same total of treatment frequency at four times with durations ranging from 30 to 50 minutes (mean 43.75); one study administered treatment two times a day for two days[19] and once a week for four weeks.[20] Similar treatments were provided in both studies in which three groups of interventions were conducted, including a single intervention of full body massage or aromatherapy or a combination of both. Agustina et al. (2016) provided a full body massage by using sun essential oil, while another study administered loving massage, a technique that combines massage with effleurage techniques, petrissage, acupressure and love kneading by using sunflower oil.[20] Two studies also applied aromatherapy by using inhalation of fennel and jasmine oils.[19,20]

Regarding massage at the breasts, one study applied Oketani breast massage with 36 mothers post-cesarian section. Their treatment started during the first 12 hours postpartum for three consecutive days, twice a day and 45 minutes per session.[16] This study combined two treatments of Oketani breast massage and the rolling technique. Oketani breast massage was aimed at manual separation of adhesions between the breast base and the major fascia of the pectoral muscles, thereby helping to restore and maintain natural breast contour and normal breast function by using 8 hand techniques.[40] Another study administered breast massage treatment involving Woolwich massage with 36 postpartum mothers. Woolwich massage involves massage at the lactiferous sinus area at 1-1.5 cm above the areola for approximately 15 minutes per time to express breast milk. However, this study did not describe any magnitude of treatment.[38]

In traditional Chinese massage, 3 studies applied the massage technique at acupuncture points with 196 postpartum mothers.[21,22,34] Two studies started the treatment 24 hours after delivery,[21,34] while one study administered treatment during the initial period at 48 hours after caesarean section.[22] The treatment duration had a mean of four days with 1.49 times/day for 30 minutes. Pressure was applied at the acupuncture point and consisted of Lactapuncture massage,[34] the Tuina technique[21] and Acupoint-Tuina therapy.[22] The Lactapuncture technique was applied 2-3 times for 7 consecutive days. This technique combined acupuncture and suggestions for placing pressure on the acupuncture points by using a finger with cream, lotion or massage oil. However, there were no explanations about the acupuncture points.[34] Moreover, the Tuina technique was given once per day for 30 minutes on three consecutive days.[21] In another study, Acupoint-Tuina therapy was administered 48 hours after delivery once daily for two days and 30 minutes per session.[22] The massage points of 2 studies had similar techniques and points, including eight[21] and nine[22] acupuncture points with the same seven points around the face, legs (two points), breasts and anterior thorax (five points).

Control Condition: Most studies (n=13, 59.09%) provided standard care in the control groups. However, most of them did not explain in any detail the of standard care.[18-22,26-30,35,38] The control groups could be an additional routine (n=4, 18.18%). Three studies used breast care techniques in the control group,[16,17,36] while one study administered pectoralis major muscle massage for 15 minutes once a day for 3 consecutive days.[25] However, one study did not have a comparison group due to the design,[39] and three studies did not identify any details about the comparison group.[31,32,34]

According to data analysis, the variation of results and measurement, particularly the direct effect, were inconsistent. In addition, the limitation of control group details, diversity of participants characteristics, and a small sample size led to high heterogeneous data. These reasons were barriers to combine data across studies using meta-analysis.[41] Therefore, this study was analyzed systematically and presented as narrative summaries.

Review Findings: The quantity of milk supply was reported in seven categories of outcomes: the amount of milk (n=10, 45.5%),[17,19,21,22,25,28,34,37] let-down reflex (n=1, 4.5%),[31] milk smoothness (n=2, 9%),[30,36] infant weight gain (n=2, 9%),[16,29] infant number of urinations (n=2, 9%),[33,36] prolactin levels (n=7, 31.8%)[16,20,21,22,34,35,39] and oxytocin levels (n=1, 4.5%).[35] However, six studies measured the quantity of milk supply with two results.[16,21,22,34-36]

Milk Volume

Most of the milk volumes in the studies were assessed using milk expression/pumping before and after the intervention and comparing with a control group,[19,17,22,25-28] while two studies measured milk production by weighing the baby before and after feeding (converted into units of volume).[19,37] Only one study used an instrument to score lactation volume from of Grade 0 (no lactation) to Grade to 3 (enough lactation volume in 24 hours), which is an integral evaluation of milk capacity in six categories.[21] Six studies reported the average volume of milk before and after treatment per feeding,[22,26-28,34,37] while two studies described the total volume of milk per day,[17,19] and one study reported mean milk volume per day during days 1-3 postpartum,[25] as shown in **Table 2.**

Let-down Reflex

Let-down reflex is an automatic natural reaction that is triggered by prolactin and oxytocin hormones. Only one study of back massage treatment measured a let-down reflex representing the quantity of milk using an observation checklist on Day 3 postpartum, a poor let-down reflex (score: 0-1 points), a good let down reflex (score: 2-3 points), and excellent letdown reflex (score: 4 points). The results showed that the treatment group had an average change score of 1.8 (SD±0.7), while the control group that did not identify any details had an average change score of 0.05 (SD±1.3), with a difference of more than 1.75 points (t=3.8, p=0.001).[31]

Smoothness of Milk Production

Two studies measured the signs of milk smoothness for the quantity of milk volume but did not identify the details of instrument and assessment.[30,31] However, Suyati et al[42] described smooth milk production which was assessed by six indicators: milk leakage, full breasts, infant urination, sleep, skin turgor and muscle tone, and weight gain. The smooth milk production had to meet all indicators. One study compared the average milk smoothness for three different massage techniques, namely Marmet massage, oxytocin massage and breast care, while the control group used breast care only. The outcomes showed that a combination of the three massage techniques had the highest score for average milk production at 13.4 points, which was higher than breast care only at 1.67 points (p=0.000). The score for oxytocin massage and breast care was 12.87 points (p=0.005) and the score for Marmet and breast care was 12.47 (p=0.025).[36] The study of Kurniyati et al (2019) illustrated that smooth production of milk could be assessed based on a baby's weight loss of no more than 10% during the first week of life. A study examining oxytocin massage and applying lavender essential oil for six consecutive days resulted in the smooth category at 84.4% in the treatment group and 75% in the control group with a difference of 9.4% higher than the control group (p<0.05).[30]

Infant Weight Gain

Six studies measured the quantity of milk volume by using infant weight gain,[16,29,32,33,38,39] as shown in **Table 3.** Regarding partial body massage, two studies on back massage treatment were conducted similarly with total treatment durations of 180 minutes[32] and 90 minutes,[33] while the outcome of infant weight gain was measured at day 3. Moreover, the treatment of

Table 2 Review of Findings about Milk Volume (n=10)

Authors/year	Intervention	Duration of treatment					Measurement	Milk volume (ml)		Different volume (ml)	P-value
		Onset at day	Frequency (time/day)	Duration per Session (minute)	Period (day)	Total duration (minute)		Treatment (±SD)	Control (±SD)		
Sulaeman et al[36] 2016	**Tx:** Oxytocin massage **Con:** Standard care	1	2	2-3	3	18	Infant weight gain converted to ml (volume per time)	9.62±1.78	4.47±1.78	5.15	0.005
Anggorowati et al[27] 2016	**Tx:** Digital massager of oxytocin **Con:** Standard care	The first 6 months	N/A	20	3	N/A	Hand expression (volume per time)	20.76±19.31	3.62±6.04	17.14	0.01
Rahayuningsih et al[25] 2016	**Tx:** Oxytocin massage & breast care **Con:** Standard care	1	2	N/A	3	N/A	Milk expression (volume per time)	17.37±9.7	1.58±1.69	15.79	<0.001
Hesti et al[16] 2017	**Tx:** Oxytocin massage & breast care **Con:** Breast care	1	2	15-20	3	120	Milk expression by pump (total volume per day)	203.82±54.33	54.9±28.95	148.94	<0.05
Sari et al[26] 2017	**Tx:** Oxytocin massage & hypno-breastfeeding **Con:** Standard care	1	N/A	N/A	N/A	N/A	Milk expression (median) (volume per time)	10.0±10.36 (median)	4.5±4.21 (median)	5.5	<0.001
Damanik[24] 2018	**Tx:** Neck massage **Con:** Pectoralis major muscles	1	1	15	3	45	Milk expression by using pump (average per day)	39.44	15.56	23.88	<0.05
Agustina et al[18] 2016	**Tx:** 3 groups; Tx1: full-body massage Tx2: Aromatherapy Tx3: full-body massage & Aromatherapy **Con:** Standard care	3	2	Massage: 45-50 Aroma: 30	2	200	Infant weight gain converted to ml or hand expression (total volume per day)	Tx1:172.18±12.42 Tx2:166.36±16.85 Tx3:190±20.94	131.82±25.34	Tx1: 40.36 Tx2: 34.54 Tx3: 58.18	<0.005
Patimah et al[33] 2019	**Tx:** Lactapuncture massage **Con:** Standard care	1	2-3	N/A	7	N/A	N/A (volume per time)	9.36±0.71	7.39±0.23	1.97	<0.001
Lu et al[21] 2019	**Tx:** Acupoint-Tuina therapy **Con:** Standard care	3	1	30	2	60	Milk expression by using pump (volume per time) at Day 5	51.25±48.51	5.68±10.05	45.57	0.000
Zheng et al[20] 2012	**Tx:** Tuina technique **Con:** Standard care	1	1	30	3	90	Lactation volume scale (Grades 0-3) and milking capacity in 6 categories (total volume per day by using grading)	2.88±1.17 (general to enough lactation volume)	1.5±0.53 (not enough to general lactation volume)	1.38	<0.001

Tx = treatment/intervention group, Con= Control group, N/A = Not applicable, SD = Standard deviation, ml = milliliter

Table 3 Review of Findings about Infant Weight Gain (n=6)

Authors/ year	Intervention	Duration of treatment					Measurement	Infant weight gain (gram)		Difference of infant weight gain (gram)	P-value
		Onset at day	Frequency (time/day)	Duration per Session (minute)	Period (day)	Total duration (minute)		Treatment (±SD)	Control (±SD)		
Yuliati et al[15] 2017	**Tx:** Oketani massage & rolling technique **Con:** Breast care	1 (12 hr.)	2	45	3	270	Average infant weight gain (before and after treatment)	264.27	131.75	132.52 (44.17 g/day)	<0.05
Nurvitasari et al[37] 2019	**Tx:** Woolwich massage **Con:** Standard care	8	N/A	15	6	N/A	Average infant weight gain (before and after treatment)	405.5	238.88	166.62 (27.77 g/day)	<0.05
Patel et al[31] 2013	**Tx:** Back massage **Con:** N/A	1 (2 hr.)	4	15	4	180	Average infant weight gain at Day 3	36.84±5.84	30.16±7.58	6.68	<0.05
Khanal et al[32] 2016	**Tx:** Back massage **Con:** Standard care	1 (2 hr.)	3	10	3	90	Average infant weight gain at Day 3	13.83±2.4	9.0±2.27	4.83	0.001
Gustirini, Anggrain[28] 2020	**Tx:** Oxytocin massage & breast care **Con:** Standard care	1	2	N/A	14	N/A	Number of infants who had weight gain at Days 6 & 9	Day 6: 73.3% Day 9: 100%	Day 6: 40% Day 9: 56.7%	Day 6: 33.3% Day 9: 43.3%	<0.05
Nurdiana et al[38] 2016	**Tx:** Oxytocin massage	1	2	10	3	60	Average Infant weight (Pre-posttest Tx. group)	3,461	3,747	286	<0.05

Tx = treatment/intervention group, Con= Control group, g = gram, N/A = Not applicable, SD = Standard deviation, g = gram, hr = hour

oxytocin massage and breast care reported infant weight gain at days 6 and 9,[29] while techniques such as Woolwich and Oketani massage were measured by average infant weight gain before and after treatment.[16,38] When breast massage[16,38] and back massage[32,33] were compared, the results showed that breast massage could increase milk volume more than back massage (average mean difference; 35.97 ml vs. 5.75 ml). However, the issues of standard care remained a concern.

Urination Frequency

Two studies measured the number of infant urinations per day at day 3[32] and day 14[18] of the postpartum period. Treatment with oxytocin massage and application of virgin coconut oil was initially administered at 3 hours after birth 2 times/day for 14 consecutive days. The numbers of urinations recorded on the final day were 9.73 (SD±1.4) in the treatment group and 7.87 (SD±1.0) in the control group with a different of 1.86 ($p=0.0001$).[18] Also, the treatment of back massage was started within two hours after birth for three consecutive days four times daily, or approximately 180 minutes of treatment. The number of urinations was recorded on the final day were 7.19 (SD±1.19) in the treatment group and 6.08 (SD±1.32) in the control group for a difference of 1.11 ($p<0.05$).[32]

Prolactin Level

Seven studies measured the prolactin level relating to milk supply with the administration of oxytocin massage,[35,39] Oketani breast massage,[16] traditional Chinese massage[21,22,34] and full-body massage with aromatherapy.[20] Three studies showed the prolactin levels increased with statistical significance between pre- and post-test treatment[39] and comparison of post-test means with the control group.[16,20] Single oxytocin massage treatment was administered in a one-group, pre-post test design for 60 minutes of treatment and was able to increase prolactin levels at 76.55 ng/ml (261.08 vs 337.63 ng/ml) ($p<0.05$).[39] Similar to full body massage, the results found that loving massage (full-body massage) and aromatherapy once a week during the first four weeks after birth yielded the highest prolactin level after treatment compared to the control group receiving standard care only at 109.94 ng/ml (278.48±58.93 vs. 168.54±73.22) ($p<0.05$). On the other hand, a single treatment of loving massage increased prolactin levels at 80.25 ng/ml (248.79±87.16 vs 168.54±73.22), while aromatherapy only yielded 32.14 ng/ml (200.68±102.69 vs. 168.54 ±73.22) ($p<0.05$).[20] Interestingly, high levels of the prolactin hormone in this study were yielded over a long period of 4 weeks and prolactin levels were measured at months after treatment.[20] However, other studies measured the outcome on day 3 postpartum.[16,39] Regarding breast massage, the Oketani breast massage and rolling techniques administered for 270 minutes per treatment showed an average posttest prolactin level of 235.64 ng/ml (SD±20.87) in the treatment group and 225.89 ng/ml in the standard breast care only group (SD±20.05) for a difference of 9.75 ng/ml ($p=0.000$).[16]

However, four studies presented non-significant statistical results for prolactin levels in which two studies reported decreasing prolactin levels at 7.14 ng/ml ($p=0.845$) and 34.72 ng/ml ($p=0.139$) in the engineered massage of oxytocin[35] and 18.56 ng/ml ($p>0.05$) in the Tuina technique.[21] At the same time, studies of Lactapuncture massage had a mean posttest prolactin level of 313.8 ng/ml (SD±45.54) in the treatment group and 292.09 ng/ml (SD±97.87) in the control group for a difference of 21.71 ng/ml ($p=0.428$).[34] Similarly, treatment with Acupoint-Tuina therapy had the mean posttest prolactin level of 345.62 ng/ml (SD±109.75) in the treatment group and 329.33 ng/ml (SD±96.35) in the control group for a difference of 16.29 ng/ml ($p=0.605$).[22]

Oxytocin Level

One study reported that oxytocin level was related to the quantity of milk production. The engineered massage of oxytocin initially administered within the first six hours after childbirth was compared between two groups, one with treatment administered once a day (Treatment 1) and another with treatment

administered twice a day (Treatment 2) for one day and comparison with a control group receiving standard care only.[35] However, the results of this study showed a non-significant statistical difference in oxytocin levels after treatment in which the oxytocin level was reported at 341.11 ng/ml in Treatment Group 1 compared with 346.05 ng/ml in the control group for a decrease of 4.94 ng/ml (p=0.491). Similarly, the oxytocin level was 372.42 ng/ml in Treatment Group 2 compared with 346.05 ng/ml in the control group for a decrease of 34.72 ng/ml (p=0.678).[35]

Discussion

The purpose of this systematic exploration of massage techniques was to examine if these improved milk production. Overall, the 22 studies included in this synthesis found an increase in milk production, however, there were many methodological limitations. This was due to small sample sizes, a lack of demographic data, reliability and validity of measurements, various outcomes of milk volume, lack of clarity in describing control groups and qualifying criteria for massage therapists, and inadequate details on the intervention doses.

Interestingly, all of the studies administering massage therapy to promote milk supply were conducted in Asia. In particular, 77.3% of studies were conducted in Indonesia (n=17). According to the cultural background, massage treatments were tailored to the contexts of each country. Thus, partial/full body massage (oxytocin massage, neck massage, full-body massage) and aromatherapy were administered in Indonesia; back massage was studied in India, and the Tuina/acupoint techniques were described as a traditional massage in China. In Asian countries, massage has been a cultural treatment since early 3000 BC, particularly in China. Furthermore, massage therapy is beneficial in reducing stress, increasing lymph flow, decreasing pain, promoting sleep, reducing swelling, enhancing relaxation, lessening depression and relieving anxiety.[13] Moreover, massage can be a low-risk, effective and less expensive alternative method for increasing milk transfer and production.[21,22,28,32,43]

The target participants for each of the included studies differed in terms of maternal age, mode of delivery and parity, while the postpartum mothers without complications and healthy term infants were homologous in all studies. Most studies assessed milk production during the first 3 days postpartum as the period of lactogenesis II. To illustrate, a variety of factors have been identified as being able to delay lactogenesis II such as older maternal age,[43] cesarean delivery and primiparity.[44] For instance, delayed lactogenesis II occurred in 18.8% (n = 42) of the participants and was significantly associated with the age of the mothers (IRR: 1.081, 95% CI [1.039, 1.125]).[45] In a Japanese study primiparous mothers aged ≥35 years showed the lowest initiation of exclusive breastfeeding (EBF) at discharge (OR 5.9, 95%CI: 3.0-11.9) and one month (OR 2.2, 95%CI: 1.4-3.4) referent to multiparous mothers aged <35 years.[46] On the other hand, adolescent mothers had unique characteristics and physical changes according to their developmental ages which caused them to suffer milk supply overflow leading to lack of freedom to socialise and insufficient sleep resulting in early weaning from EBF.[47,48] The differences across study samples and participant characteristics reviewed could have contributed to bias and limited the possibilities for generalizing the findings and combining the intervention effects. Moreover, milk production in lactogenesis II and III could be interrupted by several factors, including delayed initiation of breastfeeding, ineffective positioning and latching, inadequate frequency and duration of breastfeeding, supplementation or medical conditions.[49] These factors could have interfered with milk production and thereby affected the validity of the study which would be a concern in further study.

The interventions could be separated into two main massage techniques consisting of full or partial

body massage (oxytocin massage, back massage, full body massage) and breast massage (Oketani, Woolwich and Marmet massage). Unfortunately, the effectiveness of milk production could not be compared for all types of massages due to differences in participant characteristics, standard nursing care and outcome measurements. Most studies mentioned partial body massage such as back, neck, or full body massage with similar physiological explanations. During the early postpartum period, breastfeeding mothers encountered acute physical or emotional stress resulting from pain, fatigue, difficulties in the initiation of breastfeeding causing neuroendocrine dysregulation leading to irregularities in the hypothalamus pituitary-adrenal axis function leading to delayed onset of milk production and insufficient milk volume.[50] Thus, the various techniques of massages had similar aims to increase relaxation and comfort in addition to decreasing stress and trying to stimulate areas of the body that trigger the secretion of oxytocin and prolactin.[19,28,32] The WHO recommends using oxytocin massage by stimulating the oxytocin reflex in mothers who are obstructed in early breastfeeding experiences.[51]

In addition, different massage techniques had a specific purposive treatment. For example, the Oketani method aims to restore and maintain natural breast contour and normal breast function via manual separation of adhesions between the breast base and the major fascia of the pectoral muscles,[40] while Woolwich massage is done at precisely the milk ducts under the areola to initial sensory feedback which triggers the letdown reflex.[38] Regarding Chinese medicine, Acupoint-Tuina is an ancient form of medical massage with pressure to points that are putatively sensitized by organ impairment.[22] Moreover, some studies made comparisons between single oxytocin massage and breast care, the Marmet technique[36] and full body massage with aromatherapy,[19,20] which combination treatments to be more effective than single treatments to increase the quantity of milk outcomes. However, the limitation of most studies in this review was a lack of information about how to be trained in massage techniques for researchers. Only a few studies provided a slight description of the qualifying characteristics of massage providers.[16,18,37] The massage knowledge and skills of treatment providers are important for the intervention outcomes and success. Qualifying therapists could increase the validity of these studies. Further study needs to address the magnitude, duration, and qualifications of massage providers. A massage therapist must have proper, medically-based massage education, as well as hands-on experience, to meet the highest possible standards as set by the medical profession.[52] Current lactational massage training is different and little or no standard training or credentials for massage. The programs for the massage therapy profession need to contain the necessary foundations for knowledge and skills to provide safe and effective massage.

The dose of intervention is an essential issue that should be emphasized within effective interventions. Variations were observed in three components associated with doses, namely amount, frequency and duration.[53] This systematic review found that the included studies had various intervention doses, while some studies did not clarify the details. Most studies initiated the massage intervention during the first day after birth and continued treatment for 2-4 days. The period of lactogenesis II is described as the onset of copious milk production occurring between 32 and 96 hours postpartum.[43] The prevalence of delayed onset of lactation in primiparas is common and ranges from 33% to 44%. The odds of any breastfeeding at 6 weeks postpartum are nearly fivefold higher in women with timely onset of lactation compared with those who have a delayed onset of lactation.[54] Although most of the treatment durations were similar, the total treatments hours varied from 18 to 270 minutes, while several studies could not identify their durations. These differences may have contributed to the clinical heterogeneity among the studies.

Regarding measurement type and time, there were several types of milk quantity assessments in the included studies such as milk expression, infant

weight gain, let-down reflex, milk smoothness, number of urinations, oxytocin level and prolactin level, which created a barrier to summarizing over the studies. To date, the best practice for evaluating milk volume has not been established. The breast is the only organ in the body that does not have a diagnostic test to measure its adequacy. Simply observing the baby at the breast may give an inaccurate indication of the mother's milk supply.[55] The difficult task is presented to clinicians by using indirect measures to determine lactation sufficiency.[56] Test-weighting procedures are an important diagnosis and management tool in early management of suspected delayed or failed lactogenesis II, and are essential in determining the infant's ability to transfer available milk during breastfeeding and manage extra milk feedings.[57] Moreover, objective measurements such as doing test weights and having the mothers pump any residual milk are more accurate. The total that the baby transfers plus the pumped milk would be the mother's potential supply for that feeding.[55] For measurement times, most studies assessed the average milk quantity on Day 3 after birth, while many studies had a variety of measurement time points. To prevent further lactation insufficiency, a delay in the onset of lactogenesis II warrants early recognition to provide timely support. Early follow-up during the first week postpartum allows for the assessment of adequate milk intake and identification of possible signs of ineffective breastfeeding.[56]

Regarding the standard care provided, the control conditions were described as receiving standard nursing care. However, these procedures were not described in any detail among the studies. The standards nursing care of the three countries recruited in this review might be different in terms of context, particularly concerning the design of the Baby-Friendly Hospital Initiative (BFHI). The systematic review of Pérez-Escamilla et al[58] 2016 showed that adherence to the ten steps of BFHI had a positive impact on short-term, medium-term and long-term breastfeeding outcomes. Avoiding in-hospital supplementation is a key step in breastfeeding success, thereby reflecting the adequate implementation of the remaining ten steps. However, the three countries in this review had different percentages of ever-designated BFHI with national statistical reports in 2010 at 55% in China, 25% in India and 5% in Indonesia.[59] Therefore, the variances in the standard nursing care delivered in each study hospital probably created the issue of clinical heterogeneity among the studies.

The above mentioned issues indicate that the existing studies were not sufficient in design or clinically homogeneous enough in the methodological and essential characteristics. As a result, it may be not suitable to combine the overall effects of the massage interventions on the milk quantity by using a meta-analysis.

Conclusion

The massage technique is a simple method to increase milk production among postpartum mothers. In previous reviews, the massage techniques to promote milk volume were not reviewed systematically. This systematic review approach including 22 eligible studies reveals that the interventions were different in terms of standard nursing practice, the dose of intervention given, and measurement type and time. Overall illustrations of studies and massage techniques to promote milk supply had several methods according to the cultural context, particularly in Asia. However, this systematic review was not able to compare the results across studies due to inadequate homogeneity of methodological and essential characteristics. A recommendation, therefore is that studies need to be conducted on the effects of massage therapy promoting milk supply, using rigorous methodological designs concerning the similarities of the substantive characteristics between trials and applying standard measurements of milk volume for the sake of being able to combine the overall effects of the interventions. Moreover, interventions should include follow-up and examination of the relationship of breastfeeding duration. An implication

for nursing and midwifery practice is that massage techniques may be the alternative method for increasing milk production, especially during early postpartum women. Nurse professionals should recognize however the maternal authority for breastfeeding practices. Although maternal-infant attachment is the greatest practice for promoting breastfeeding, massage technique can be an interesting choice for sustainable breastfeeding duration. Nurses should be trained in massage techniques, while mothers and significant family members can be trained in simple breast massage. However, massage techniques in late postpartum need further exploration regarding their effects on milk production.

References

1. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet. 2016 387:475-90. doi: https://doi.org/10.1016/S0140-6736(15)01024-7.
2. Rollins NC, Bhandari N, Hajeebhoy N, Horton S, Lutter CK, Martines JC, et al. Why invest, and what it will take to improve breastfeeding practices? Lancet. 2016 387:491-504. doi: 10.1016/S0140-6736(15)01044-2.
3. United Nations Children's Fund, World Health Organization. Global breastfeeding scorecard, 2017: tracking progress for breastfeeding policies and programmes [Internet]. New York: United Nations Children's Fund; 2017 [cited 2020 Feb 20]. Available from:https://www.who.int/nutrition/publications/infantfeeding/global-bf-scorecard-2017.pdf
4. Hauck YL, Fenwick J, Dhaliwal SS, Butt J. A Western Australian survey of breastfeeding initiation, prevalence and early cessation patterns. Matern Child Health J. 2011; 15(2):260-8. doi:10.1007/s10995-009-0554-2.
5. Stuebe AM. Enabling women to achieve their breastfeeding goals. Obstet Gynecol. 2014; 123(3):643-52. doi: 10.1097/AOG.0000000000000142.
6. Suresh S, Sharma KK, Saksena M, Thukral A, Agarwal R, Vatsa M. Predictors of breastfeeding problems in the first postnatal week and its effect on exclusive breastfeeding rate at six months: experience in a tertiary care centre in Northern India. Indian J Public Health. 2014; 58(4):270-3. doi: 10.4103/0019-557X.146292.
7. Naylor AJ, Wester RA. Lactation management self-study modules: Level I [Internet]. Vermont: Wellstart International; 2013 Mar [cited 2020 Feb 2]. Available from: https://www.wellstart.org/Self-Study-Module.pdf
8. Cassar-Uhl D, Liberatos P. Use of shared milk among breastfeeding mothers with lactation insufficiency. Matern Child Nutr. 2018 14:e12594. doi: 10.1111/mcn.12594.
9. West DDL, Marasco L. Breastfeeding mother's guide to making more milk. McGraw-Hill; 2009.
10. Kent JC, Prime DK, Garbin CP. Principles for maintaining or increasing breast milk production. J Obstet Gynecol Neonatal Nurs. 2012; 41(1):114-21. doi: 10.1111/j.1552-6909.2011.01313.x.
11. Bazzano AN, Hofer R, Thibeau S, Gillispie V, Jacobs M, Theall KP. A Review of herbal and pharmaceutical galactagogues for breast-feeding. Ochsner J. 2016; 16(4):511-24.
12. Foong SC, Tan ML, Marasco LA, Ho JJ, Foong WC. Oral galactagogues for increasing breast-milk production in mothers of non-hospitalised term infants (protocol). Cochrane Database Syst Rev. 2015; 4. doi: 10.1002/14651858.CD011505.
13. Salvo SG. Massage therapy: Principles and practice. 5th ed. Louis: Elsevier; 2016.
14. Ward S, Hisley S. Maternal-child nursing care: optimizing outcomes for mothers, children, & families. 2nd ed. PA: F.A. Davis Company; 2016.
15. Dimitraki M, Tsikouras P, Manav B, Gioka T, Koutlaki N, Zervoudis S, et al. Evaluation of the effect of natural and emotional stress of labor on lactation and breast-feeding. Arch Gynecol Obstet. 2016; 293(2):317-28. doi: 10.1007/s00404-015-3783-1.
16. Yuliati ND, Hadi H, Rahayu S, Pramono N, Mulyantoro DK. The impact of combination of rolling and oketani massage on prolactin level and breast milk production in post-cesarean section mothers. BNJ. 2017; 3(4):329-36. doi: https://doi.org/10.33546/bnj.150.
17. Hesti KY, Pramono N, Wahyuni S, Widyawati MN, Santoso B. Effect of combination of breast care and oxytocin massage on breast milk secretion in postpartum mothers. BNJ. 2017; 3(6):784-90. doi: https://doi.org/10.33546/bnj.293.
18. Widiastuti NMR, Widiani NNA. Improved breastfeeding with back massage among postnatal mothers. Int J Res Med Sci. 2020; 8(2):580-3. doi: http://dx.doi.org/10.18203/2320-6012.ijrms20200239

19. Agustina C, Hadi H, Widyawati MN, editors. Aromatherapy massage as an alternative in reducing cortisol level and enhancing breastmilk production on primiparous postpartum women in Semarang. ASEAN/Asian Academic Society International Conference Proceeding Series; 2016.
20. Widyawati MN, Hadisaputro S, Anies A, Soejoenoes A. Effect of massage and aromatherapy on stress and prolactin level among primiparous puerperal mothers in Semarang, Central Java, Indonesia. BNJ. 2016; 2(4):48-57. doi: 10.33546/bnj.19.
21. ZHENG J-j, Yi Z, Ping L, WANG X-y. Effect of Tuina at the breasts on postpartum lactation. World J Acupunct Moxibustion. 2012; 22(4):5-8. doi: https://doi.org/10.1016/S1003-5257(13)60019-7
22. Lu P, Ye Z-q, Qiu J, Wang X-y, Zheng J-j. Acupoint-tuina therapy promotes lactation in postpartum women with insufficient milk production who underwent caesarean sections. Medicine. 2019; 98(35). doi:10.1097/MD.0000000000016456.
23. Garrard J. Health sciences literature review made easy. Burlington: Jones & Bartlett Learning; 2016.
24. Joanna Briggs Institute. Critical appraisal tools [Internet]. Adelaide: Joanna Briggs Institute; 2019 [cited 2020 Feb 2]. Available from: https://joannabriggs.org/ebp/critical_appraisal_tools
25. Damanik LPU. The effectiveness of neck massage in increasing puerperal mothers' breast milk quantity from day one to day three in Bantul. Health Sci J. 2018; 12(6): 1-4. doi:10.21767/1791-809X.1000599.
26. Rahayuningsih T, Mudigdo A, Murti B. Effect of breast care and oxytocin massage on breast milk production: a study in Sukoharjo provincial hospital. Matern Child Health J. 2016; 1(2):101-9. doi: 10.26911/thejmch.2016.01.02.05.
27. Sari LP, Salimo H, Budihastuti UR. Optimizing the combination of oxytocin massage and hypnobreastfeeding for breast milk production among post-partum mothers. Matern Child Health J. 2017; 2(1):20-9. doi: 10.26911/thejmch.2017.02.01.03.
28. Anggorowati A, Sutadi H, Setyowati S, Koestoer RA. Effects of acupoint stimulation with digital massager of oxytocin on the breast milk production of working mothers. Nurse Media J. 2016; 6(2):91-100. doi: https://doi.org/10.14710/nmjn.v6i2.11726.
29. Gustirini R, Anggraini IA. Combination of breast care and oxytocin massage of breastfeeding mothers in infant weight gain. Jurnal Kesehatan Prima. 2020; 14(1):24-30. doi: 10.32807/jkp.v14i1.287.
30. Kurniyati, Bakara DM, Susanti E. The effect of oxytocin massage method using lavender essential oils on the smooth production of breast milk at mother postpartum in Rejang Lebong Regency. Paper presented at:1st International Conference on Inter-Professional Health Collaboration (ICIHC 2018); 2018 Oct 30-Nov 1; Poltekkes Kemenkes Bengkulu, Indonesia.
31. Jogdeo BA, Bhore DNR. The effect of back massage on let down reflex among mothers who had undergone cesarean section. Int J Sci Res. 2016; 5(3):250-2.
32. Patel U, Gedam D. Effect of back massage on lactation among postnatal mothers. Int J Med Res Rev. 2013; 1(01):5-11. doi: https://doi.org/10.17511/ijmrr.2013.i01.02.
33. Khanal BT, Angeline AM, Kathreena MU, Cutinho SP, Effect of back massage on lactation among postnatal mothers in postnatal ward of selected hospital, Mangaluru. Indian J Appl Res. 2016; 6(11):157-60. doi : 10.36106/ijar.
34. Patimah S, Mashoedi ID, Hadisaputro S. The effect of lactapuncture massage on breast milk production through prolactin hormone levels changes in Dr. M. Ashari Hospital, Pemalang, Central Java. Indones J Med. 2019; 4(1):15-20. doi: 10.26911/theijmed.2019.04.01.03.
35. Anggorowati A, Susilowati D, Zubaidah Z. Effects of engineered stimulation of oxytocin on hormonal status of postpartum women. Hiroshima J Med Sci. 2018; 67 (Special Issue):91-96.
36. Nurlaila, Indrasa N. The effect of stimulation methods on breast treatment for breast milk smoothness in postpartum mother. J Med Sci Clin Res. 2019; 7(4):244-49. doi: https://dx.doi.org/10.18535/jmscr/v7i4.43.
37. Sulaeman ES, Yunita FA, Yuneta AEN, Ada YR, Wijayanti R, Setyawan H, et al. The effect of oxytocin massage on the postpartum mother on breastmilk production in Surakarta Indonesia. Paper presented at: International Conference on Health and Well-Being (ICHWB); 2016 May 27-28; Surakarta, Indonesia.
38. Nurvitasari S, Pujiastuti R, Arfiana A. Effectiveness of woolwich massage to meet adequacy of breast milk in newborns. Midwifery Nurs Res. 2019; 1(1):57-62. doi: 10.31983/manr.v1i1.4067.

39. Nurdiana D, Onny S, Sumarni S, Supriyana S, Maharani Y, editors. Oxytocin massage as an alternative in increasing prolactin hormone level and lactation process on post-sectio caesarrea women (case study in Semarang city hospital). Paper presented at: ASEAN/Asian Academic Society International Conference Proceeding Series; 2016 May 12-13; Songkhla, Thailand.
40. Kabir N, Tasnim S. Oketani lactation management: a new method to augment breast milk. J Bangladesh Coll Phys Surg. 2009; 27(3):155-9. doi: 10.3329/jbcps.v27i3.4293.
41. Ahn E, Kang HJKjoa. Introduction to systematic review and meta-analysis. Korean J Anesthesiol. 2018; 71(2):103-12. doi: 10.4097/kjae.2018.71.2.103.
42. Suyati S, Roudhotul J S, Fitriani Y. The effect of date palm for the smoothness of breast milk on postpartum maternal. Semantic Scholar [Internet]. 2016 [cited 2020 Feb 2]; Available from: http://eprints.ners.unair.ac.id/385/3/THE%20EFFECT%20OF%20DATE%20PALM%20FOR%20THE%20SMOOTHNESS%20OF%20BREAST%20MILK.pdf
43. Walker M. Breastfeeding management for the clinician using the evidence. 3rd ed. Burlington: Jones & Bartlett Learning; 2014.
44. Scott JA, Binns CW, Oddy WH. Predictors of delayed onset of lactation. Matern Child Nutr. 2007; 3(3):186-93. doi: 10.1111/j.1740-8709.2007.00096.x.
45. Rocha BO, Machado MP, Bastos LL, Barbosa Silva L, Santos AP, Santos LC, et al. Risk factors for delayed onset of lactogenesis II among primiparous mothers from a Brazilian baby-friendly hospital. J Hum Lact. 2020; 36(1):146-56. doi:10.1177/0890334419835174.
46. Kitano N, Nomura K, Kido M, Murakami K, Ohkubo T, Ueno M, et al. Combined effects of maternal age and parity on successful initiation of exclusive breastfeeding. Prev Med Rep. 2015; 3:121-6. doi:10.1016/j.pmedr.2015.12.010.
47. Nuampa S, Tilokskulchai F, Sinsuksai N, Patil CL, Phahuwatanakorn W. Breastfeeding experiences among Thai adolescent mothers: a descriptive qualitative study. PRIJNR [Internet]. 2018Sep.28 [cited 2020Jul.14]; 22(4):288-03. Available from: https://he02.tci-thaijo.org/index.php/PRIJNR/article/view/102314
48. Nuampa S, Tilokskulchai F, Patil CL, Sinsuksai N, Phahuwatanakorn W. Factors related to exclusive breastfeeding in Thai adolescent mothers: Concept mapping approach. Matern Child Nutr. 2019; 15(2):e12714. doi: 10.1111/mcn.12714.
49. Lauwers J, Swisher A. Counseling the nursing mother: A lactation consultant's guide. 6th ed. Burlington: Jones & Bartlett Learning; 2011.
50. Sakha K, Behbahan A. The onset time of lactation after delivery. Med J Islam Repub Iran (Online). 2005; 19(2): 135-9.
51. World Health Organization. Breastfeeding counselling a training course: Director's guide. WHO/UNICEF; 1993.
52. Dion LJ, Cutshall SM, Rodgers NJ, Hauschulz JL, Dreyer NE, Thomley BS, et al. Development of a hospital-based massage therapy course at an academic medical center. Int J Ther Massage Bodywork. 2015; 8(1):25-30. doi: 10.3822/ijtmb.v8i1.249.
53. Reed D, Titler MG, Dochterman JM, Shever LL, Kanak M, Picone DM. Measuring the dose of nursing intervention. Int J Nurs Terminol Classif. 2007; 18(4):121-30. doi: 10.1111/j.1744-618X.2007.00067.x.
54. Nommsen-Rivers LA, Chantry CJ, Peerson JM, Cohen RJ, Dewey KG. Delayed onset of lactogenesis among first-time mothers is related to maternal obesity and factors associated with ineffective breastfeeding. Am J Clin Nutr. 2010; 92(3): 574-84. doi: 10.3945/ajcn.2010.29192.
55. Genna CW. Supporting sucking skills in breastfeeding infants. 3rd ed. Burlington: Jones & Bartlett Learning; 2017.
56. Hurst NM. Recognizing and treating delayed or failed lactogenesis II. J Midwifery Womens Health. 2007; 52(6):588-94. doi: 10.1016/j.jmwh.2007.05.005.
57. Scanlon KS, Alexander MP, Serdula MK, Davis MK, Bowman BA. Assessment of infant feeding: the validity of measuring milk intake. Nutr Rev. 2002; 60(8):235-51. doi: 10.1301/002966402320289368.
58. Perez-Escamilla R, Martinez JL, Segura-Perez S. Impact of the baby-friendly hospital initiative on breastfeeding and child health outcomes: a systematic review. Matern Child Nutr. 2016; 12(3):402-17. doi: 10.1111/mcn.12294.
59. Labbok MH. Global baby-friendly hospital initiative monitoring data: update and discussion. Breastfeed Med. 2012; 7(4):210-22. doi: 10.1089/bfm.2012.0066.

ประสิทธิผลของเทคนิคการนวดที่แตกต่างกันต่อการเพิ่มปริมาณน้ำนมในมารดาที่เลี้ยงลูกด้วยนมแม่: การทบทวนวรรณกรรมอย่างเป็นระบบ

ศศิธารา น่วมภา สุดาภรณ์ พยัคฆเรือง*

บทคัดย่อ: ปริมาณน้ำนมไม่เพียงพอเป็นเหตุผลสำคัญในการหยุดเลี้ยงลูกด้วยนมแม่ การนวดเป็นวิธีทางเลือกที่มีประสิทธิภาพและมีความเสี่ยงต่ำสำหรับการส่งเสริมการสร้างและหลั่งน้ำนม อย่างไรก็ตาม จากการทบทวนวรรณกรรมอย่างเป็นระบบที่ผ่านมายังไม่พบเรื่องที่เกี่ยวข้องกับวิธีการนวดต่อการสร้างน้ำนมในมารดาหลังคลอด การทบทวนวรรณกรรมอย่างเป็นระบบนี้เพื่อระบุและสังเคราะห์เทคนิคการนวดเพื่อเพิ่มปริมาณน้ำนมในมารดาในทวีปเอเชีย โดยใช้แนวทางการทบทวนวรรณกรรมอย่างเป็นระบบของ The Preferred Reporting Items for Systematic Reviews and Meta-Analysis ซึ่งสืบค้นงานวิจัยภาษาอังกฤษที่ตีพิมพ์ระหว่างปีคริสตศักราช 2009-2020 จากฐานข้อมูล PubMed, CINAHL, Science Direct, Scopus, SAGE Journal, BMJ Journals และแหล่งข้อมูลของหน่วยงานด้านการเลี้ยงลูกด้วยนมแม่ การศึกษาเชิงทดลองถูกคัดเลือกตามเกณฑ์การคัดเข้าและเกณฑ์การคัดออก รวมทั้งมีการคัดเลือกและสกัดข้อมูลอย่างเป็นระบบ สำหรับคุณภาพของระเบียบวิธีการวิจัยประเมินโดยใช้เครื่องมือมาตรฐานของการประเมินงานวิจัยเชิงปริมาณของ Joanna Briggs Institute

งานวิจัยจำนวน 22 เรื่องจากทวีปเอเชียได้รับการคัดเลือก ผลการทบทวนวรรณกรรมพบว่าการนวดแบ่งออกเป็น 2 กลุ่มประกอบด้วย การนวดบางส่วนของร่างกาย และการนวดเต้านม ซึ่งการใช้เทคนิคการนวดแบบผสมผสานส่งผลต่อการเพิ่มปริมาณน้ำนม อย่างไรก็ตาม งานวิจัยส่วนมากมีคุณภาพงานวิจัยระดับต่ำและปานกลางเนื่องจากความไม่ชัดเจนของอคติในงานวิจัยและมีความไม่เป็นเอกพันธ์ของงานวิจัย รวมทั้งมีข้อจำกัดของรายละเอียดในกลุ่มควบคุม ความหลากหลายของคุณสมบัติของกลุ่มตัวอย่าง และขนาดกลุ่มตัวอย่างน้อย จึงไม่สามารถวิเคราะห์อภิมานได้ การศึกษาต่อไปจำเป็นต้องพัฒนาคุณภาพของระเบียบวิธีวิจัยและเครื่องมือการวัดปริมาณน้ำนมแม่ที่เป็นมาตรฐานเพื่อการวิเคราะห์ผลร่วมกันของการทดลอง เทคนิคการนวดเป็นทางเลือกหนึ่งสำหรับการส่งเสริมการเลี้ยงลูกด้วยนมแม่อย่างต่อเนื่อง อย่างไรก็ตาม ทักษะการนวดจำเป็นต้องถูกทำให้เป็นมาตรฐานสำหรับพยาบาลและรวมเข้าไปในหลักสูตรการศึกษาพยาบาล

Pacific Rim Int J Nurs Res 2021; 25(1) 114-130

คำสำคัญ: การเลี้ยงลูกด้วยนมแม่ น้ำนมแม่ การนวด การพยาบาล หลังคลอด การทบทวนวรรณกรรมอย่างเป็นระบบ

ติดต่อที่ : ศศิธารา น่วมภา,* *RN, PhD (Nursing) อาจารย์ ภาควิชาการพยาบาลสูติศาสตร์-นรีเวชวิทยา คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล*
E-mail: sasitara.nua@mahidol.edu
สุดาภรณ์ พยัคฆเรือง, *RN, PhD (Nursing) รองศาสตราจารย์ ภาควิชาการพยาบาลกุมารเวชศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล*
E-mail: sudaporn.pay@mahidol.ac.th