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Effectiveness of oxytocin massage on breast milk production in postpartum mothers

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Abstract

Background: The postpartum period is a crucial period in a mother's life after childbirth, as it involves significant physical and emotional recovery. One of the main causes of postpartum morbidity is breastfeeding problems due to low milk production. Based on the 2023 Indonesian Health Profile from the Ministry of Health, only around 65.5% of mothers successfully breastfeed exclusively for the first six months. Breastfeeding is considered the best method to provide necessary nutrition, which has benefits not only for the mother's health but also for the optimal growth and development of the child. Oxytocin massage therapy is a massage that aims to stimulate the hormone oxytocin. This technique is effective in increasing milk production and release, providing relaxation, reducing stress, and increasing the bond between mother and baby.

Purpose: To identify breast milk production in postpartum mothers using oxytocin massage.

Method: This experimental study used a post-test control group design. The population was 36 postpartum mothers within 3 hours of delivery. Through purposive sampling, 24 postpartum mothers were selected as respondents, divided into 12 in the intervention group and 12 in the control group. The measurement instrument used was an observation questionnaire on breast milk production, which measured the newborn's urine volume over a 24-hour period (normally 6-8 times a day). A urine volume of 30-50 mg was categorized as good and a urine volume of less than 29 mg was $\geq$ inadequate. The intervention consisted of oxytocin massage given to postpartum mothers 3 hours postpartum, every morning and evening, for 3 days. Data were analyzed using the Wilcoxon test to determine the effect of oxytocin massage on breast milk production.

Results: The average age of respondents was 27.63 years with a standard deviation of ± 4.29 years with the majority of respondents being in the 26-30 years age range of 45.8%. Most of the respondents' education level was junior high school, namely 41.7%, and the majority of respondents had a job status as a housewife, namely 62.5%. Based on the Wilcoxon test, $p\text{Value}=0.02$ was obtained, where for the intervention group, those classified as less were 16.7% and those in the good category were 83.3%. While for the control group, those classified as less were 66.7% and those in the good category were 33.3%.

Conclusion: Oxytocin massage intervention has an effect on increasing breast milk production in postpartum mothers. Oxytocin massage has been proven effective in increasing breast milk production and shows a significant difference in breast milk volume after oxytocin massage, where breast milk production increases to a greater or smoother flow, thereby ensuring adequate breast milk supply for the baby.

Suggestion: It is recommended that health facilities or community cadres educate the public regarding the understanding and benefits of oxytocin massage. This increased public knowledge will contribute to the implementation of early nutritional adequacy programs for toddlers as an effort to prevent stunting.

Keywords: Breast milk production; Exclusive breastfeeding; Infant phase; Oxytocin massage; Postpartum mothers

INTRODUCTION

The postpartum period represents a critical phase in a mother's life, encompassing substantial physical and emotional recovery. According to the World Health Organization, approximately 60% of maternal deaths occur during this period, particularly within the first six weeks after delivery. One of the leading causes of postpartum morbidity is breastfeeding difficulties, often linked to insufficient breast milk production. The WHO recommends oxytocin massage as an effective non-pharmacological intervention to stimulate the let-down reflex and enhance milk production (World Health Organization, 2025).

In Indonesia, lactation problems remain prevalent. The *Indonesia Health Profile 2023* reported that only 65.5% of mothers successfully practiced exclusive breastfeeding during the first six months. Barriers such as breast pain, engorgement, and delayed let-down reflex are major contributors to early cessation of breastfeeding. These challenges highlight the limited knowledge and skills among mothers in performing oxytocin massage independently to facilitate milk flow (Ministry of Health of the Republic of Indonesia, 2024).

In West Kalimantan, particularly Pontianak, exclusive breastfeeding coverage is lower than the national average, at 57.8% in 2023 (West Kalimantan Provincial Health Office, 2023). This underscores the need for sustained and intensive educational efforts using effective media to ensure that postpartum mothers can correctly and routinely practice oxytocin massage.

The relationship between infant development and breastfeeding is a crucial concept in nutrition and health, supporting both optimal physical growth and cognitive development. Breast milk provides complete nutrition and antibodies that protect against disease, thereby accelerating developmental milestones, especially when given exclusively for six months. Infants who are breastfed demonstrate higher cognitive development compared to those fed with formula. Breastfeeding is widely regarded as the best method of providing essential nutrition, offering benefits not only for maternal health but also for the child's growth and development.

Breast milk is a complex and dynamic biological fluid, uniquely available to meet the nutritional needs of infants (Khotimah, Satillah, Fitriani, Miranti, Maulida, Hasmalena, & Zulaiha, 2024; Rodríguez, Sánchez, Guardado, Jiménez, SanJuan, Aguilera, & Suárez, 2022). Breastfeeding beyond six months, and up to two years, continues to confer long-term health benefits. These include both short- and long-term advantages, such as protection against infections, reduced risk of sudden infant death syndrome, and strengthened mother–infant bonding (Victoria, Nurhidayah, Aghadiati, Lailiyah, & Surmita, 2025; Dinleyici, 2025; Picó, Palou, Pomar, & Palou, 2021).

Milk production in postpartum mothers typically becomes established within 48–96 hours after delivery, averaging 800 mL/day by the second week. Colostrum is produced during pregnancy, while mature milk increases significantly after days 10–14. Breast milk production is influenced by breast care, maternal psychological and nutritional status, and the frequency of infant suckling. Factors such as maternal knowledge, spousal support, early initiation of breastfeeding, and breast care practices are essential in facilitating milk production and are simple yet highly beneficial for both mother and infant (Apriana, 2023). Medication use is another factor that may affect lactation, as certain drugs can either enhance or suppress milk production. Although medication use among breastfeeding mothers is common, risk–benefit considerations are necessary since some drugs may pass into breast milk and pose risks to newborns (Vasconcellos, Colvero, & Fiori, 2023).

Oxytocin massage involves stimulation along the vertebrae up to the scapular region (5th–6th costae) to promote oxytocin release. This technique effectively enhances milk production and ejection, provides relaxation, reduces stress, and strengthens mother–infant bonding. Regular oxytocin massage is one of the best natural ways to maintain smooth breast milk production. A back massage—particularly along the spine and down to the shoulder blades—stimulates the nervous system, sending messages to the hypothalamus in the brain, which then releases the hormone oxytocin.

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This hormone causes the myoepithelial cells in the breasts to contract, resulting in a smoother and more abundant milk flow. As a non-pharmacological intervention, back massage offers a safe, inexpensive, and accessible alternative to support lactating mothers in improving milk supply (Noviyana, Lina, Diana, Dwi, Eni, Fransisca, & Welmi, 2022; Sinaga & Astuti, 2025).

Field observations, particularly at Saigon Community Health Center, revealed persistent challenges, with many postpartum mothers lacking adequate knowledge of the benefits and techniques of oxytocin massage. The practice is not yet performed routinely or optimally, either by mothers themselves or with family support. Therefore, this study was conducted to examine the relationship between oxytocin massage therapy and breast milk production among postpartum mothers, providing a practical reflection of community conditions. The findings are expected to contribute to improving maternal and infant quality of life through safe, effective, and correct oxytocin massage practices.

RESEARCH METHOD

This study employed an experimental design using a post-test control group approach. The study population consisted of 36 postpartum mothers at three hours after delivery. Through purposive sampling, 24 participants were selected and assigned into two groups: 12 mothers in the intervention group and 12 mothers in the control group. Inclusion criteria were: mothers with infants aged 0–6 months, not currently using medication, and willing to participate in the study. Exclusion criteria included mothers who were not exclusively breastfeeding and those with normal breast anatomy. The measurement instrument was an observation questionnaire assessing breast milk production, determined by the volume of neonatal urine collected over 24 hours. Normal urine frequency was defined as 6–8 times per day. Urine volume was categorized as adequate (30–50 mL) or inadequate (<29 mL).

The intervention consisted of oxytocin massage administered to postpartum mothers beginning three hours after delivery, performed twice daily (morning and evening) for three consecutive days. The independent variable was oxytocin massage, while the dependent variable was breast milk production in postpartum mothers. Data were analyzed using the Wilcoxon Signed Rank Test to evaluate the effect of oxytocin massage on breast milk production outcomes.

RESEARCH RESULTS

Table 1. Characteristics of the Respondents (N=24)

Variable	Results
Age (n%)(Mean±SD)(Range)(Year)	(27.63±4.29)(20-40)
20-25	8/33.3
26-30	11/45.8
31-35	4/16.7
36-40	1/4.2
Education (n%)	
Elementary	5/20.8
Junior High	10/41.7
Senior High	9/37.5
Occupation (n%)	
Farmer	6/25.0
Merchant	2/8.3
Housewife	15/62.5
Government Officer	1/4.2

Table 1 shows that the respondents had a mean age of 27.63 years (SD ± 4.29), with the largest proportion (45.8%) in the 26–30 year age group. In terms of educational attainment, most respondents had completed junior high school (41.7%). Furthermore, the majority of respondents were housewives (62.5%).

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Table 2. The effect of oxytocin massage therapy on breast milk production (N=24)

Variable	Results		
	Intervention(n=12)	Control(n=12)	p-Value
Breastmilk Production(n/%)			
Inadequate	2/16.7	8/66.7	0.02
Adequate	10/83.3	4/33.3	

Table 2. presents the analysis of the effect of oxytocin massage on breast milk production. The Wilcoxon test yielded a p-value of 0.02, indicating a statistically significant difference between groups. In the intervention group, 16.7% of mothers were classified in the inadequate category, while 83.3% were in the adequate category. In contrast, within the control group, 66.7% of mothers were categorized as inadequate and only 33.3% as adequate.

DISCUSSION

The postpartum period is a critical stage for mothers, particularly in recovery and the success of breastfeeding. One intervention that can facilitate breast milk production is oxytocin massage, a back massage technique that stimulates oxytocin release and promotes milk ejection. Oxytocin massage also influences psychological factors by enhancing relaxation and maternal comfort, thereby triggering oxytocin secretion and improving lactation. The physiological effects include stimulation of mammary gland cells to secrete milk, ensuring infants receive adequate nutrition as reflected in weight gain, urine output of 30-50 mL per 24 hours (6-8 times), bowel movements 2-5 times daily, and sleep duration of 2-3 hours (Hanum, Purwanti, & Khumairoh, 2015; Lubis & Anggraeni, 2021).

However, field observations, particularly at Saigon Community Health Center, revealed persistent challenges. Many postpartum mothers remain unaware of the benefits and correct techniques of oxytocin massage. The practice is not routinely or optimally performed, either by mothers themselves or with family support. Health education provided by professionals is often limited to verbal explanations and lacks variety, making it difficult for mothers to understand and retain the information.

Maternal age plays a role in breast milk production, though its influence is not highly significant. Age is more closely associated with psychological readiness from pregnancy through postpartum.

The ideal reproductive age is 20–35 years; however, mothers in late adolescence or early adulthood may lack psychological maturity, leading to anxiety, fear, nervousness, or confusion when caring for infants. Emotional instability can inhibit prolactin and oxytocin secretion, thereby reducing milk production (Khusniyati & Purwati, 2024; Delvina, Kasoema, Fitri, & Angraini, 2022).

Knowledge also contributes to behavioral change. Mothers with higher education levels are more likely to understand and apply information, while those with lower education levels may struggle to manage breastfeeding challenges. Higher education equips individuals with analytical, critical, and logical thinking skills. Higher levels of literacy enable individuals to sift facts from opinions and better understand complex information (Saraung, Rompas, & Bataha, 2017; Lestari, 2023; Ulfah & Sukmawati, 2025).

Employment factors further influence breastfeeding practices. Work-related stress, long hours, and limited time for breastfeeding often lead mothers to substitute formula milk. Specific barriers such as shift work, maternal age, and inadequate workplace lactation facilities hinder success. Employment-related variables—including workload, workplace distance, managerial support, and stress affect exclusive breastfeeding outcomes (Wijayanti, Margawati, & Rahfiludin, 2023).

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Oxytocin massage has been shown to be more effective in enhancing milk production compared to other methods, such as date palm extract, particularly within the first 1-3 days postpartum. While both interventions can improve lactation, oxytocin massage demonstrates superior efficacy (Darmayanti, Darmi, & Pangestu, 2024; Azis, 2023). Mechanistically, spinal stimulation activates neurotransmitters that signal the medulla oblongata, which in turn stimulates the hypothalamus and posterior pituitary to release oxytocin, facilitating milk ejection. Massage also induces relaxation and reduces stress, further supporting oxytocin release (Apreliasari & Risnawati, 2020).

The findings of this study, supported by Wilcoxon test results ($p = 0.02$), confirm a significant association between oxytocin massage and breast milk production. These results are consistent with previous studies reporting similar statistical significance ($p = 0.049$, $p < 0.05$), reinforcing the effectiveness of oxytocin massage in improving lactation. Mothers reported feeling calmer, more relaxed, and more confident in breastfeeding after receiving oxytocin massage, with visible milk flow observed during the intervention (Litasari, Mahwati, & Rasyad, 2018; Dwita & Mutmainnah, 2023).

Overall, oxytocin massage is proven to be an effective non-pharmacological intervention for increasing breast milk production and ejection. This study highlights its potential as a safe, accessible, and practical technique that can be performed independently by mothers, spouses, or family members at home to address breastfeeding difficulties in the postpartum period.

CONCLUSION

Oxytocin massage intervention demonstrated a significant effect in enhancing breast milk production among postpartum mothers. The therapy was proven effective, with a marked increase in breast milk volume following the intervention, resulting in smoother and more abundant lactation. These findings suggest that oxytocin massage can be recommended as a safe, non-pharmacological intervention to support exclusive breastfeeding and ensure adequate nutrition for infants.

SUGGESTION

It is recommended that health facilities and community health workers provide education to the public regarding the understanding and benefits of oxytocin massage. Enhancing community knowledge in this area will contribute to the implementation of early childhood nutrition adequacy programs as a preventive effort against stunting.

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