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# The Effect of Lactation Massage on Breast Milk Production in Postpartum Mothers

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**Abstract:**
Inadequate breast milk production remains a common challenge among postpartum mothers, often associated with hormonal imbalance, maternal fatigue, and insufficient breast stimulation, which can hinder the achievement of exclusive breastfeeding targets. Despite global recommendations, exclusive breastfeeding rates remain suboptimal, highlighting the need for effective, non-pharmacological interventions. Lactation massage has been proposed as a technique to stimulate oxytocin release and improve the milk ejection reflex. This study aimed to evaluate the effect of lactation massage on breast milk production among postpartum mothers. A quasi-experimental study with a pretest–posttest control group design was conducted involving 20 postpartum mothers selected through purposive sampling. Participants were equally assigned to intervention and control groups. The intervention group received lactation massage for three consecutive days, while the control group received standard postpartum care. Breast milk production was measured by expressed milk volume using a breast pump for 10–15 minutes at 08:00 a.m. daily. Data were analyzed using appropriate statistical tests with a significance level set at $p < 0.05$. The intervention group demonstrated a significant increase in mean breast milk production, from 45.2 mL at baseline to 77.6 mL post-intervention, with a mean difference of 32.4 mL ($p < 0.001$). In contrast, the control group showed no statistically significant change ($p = 0.214$). Between-group analysis revealed a significant difference in posttest milk production ($p < 0.001$). Lactation massage significantly enhances breast milk production in postpartum mothers. This simple, non-invasive intervention may be integrated into routine postpartum care to support optimal breastfeeding outcomes.

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## INTRODUCTION

The postpartum period represents a critical window for maternal physiological recovery and the successful initiation of breastfeeding (Dessì et al., 2023). During this phase, breast milk production is primarily regulated by complex hormonal interactions, particularly involving prolactin, which stimulates milk synthesis, and oxytocin, which facilitates milk ejection through the let-down reflex (Kraus et al., 2024). In addition to these biological mechanisms, maternal psychological well-being, physical comfort, and the quality of early postpartum care play essential roles in determining breastfeeding success (Modak et al., 2023). Disruptions in these factors may impair the milk ejection reflex, leading to suboptimal breastfeeding outcomes (Nagel et al., 2022).

Despite the well-established nutritional, immunological, and developmental benefits of exclusive breastfeeding, its coverage remains inconsistent in many regions, including Indonesia (Idris & Astari, 2023). National targets for exclusive breastfeeding have not been consistently

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achieved, reflecting persistent gaps in maternal support and breastfeeding practices (Paramashanti et al., 2022). In the early postpartum period, many mothers encounter common challenges such as delayed onset of lactation, breast engorgement, nipple discomfort, and difficulties in infant latch (Mitchell & Johnson, 2022). These challenges often contribute to maternal anxiety and may prompt early supplementation with formula milk, thereby reducing the likelihood of sustained exclusive breastfeeding (Shao et al., 2022).

Effective, accessible, and non-pharmacological interventions are therefore essential to support lactation during this vulnerable period (Koukou et al., 2022). Such interventions are particularly relevant in primary healthcare settings, including independent midwifery practices, where resources may be limited, and care must be both practical and cost-effective (Pradhan et al., 2025). Strengthening early lactation support at this level is crucial to improving breastfeeding outcomes and aligning with public health goals to increase exclusive breastfeeding rates (Khatib et al., 2023).

Lactation massage has gained attention as a promising non-invasive intervention to enhance breast milk production (Kartika et al., 2025). Physiologically, lactation massage is believed to promote relaxation of breast tissue, improve local blood and lymphatic circulation, and stimulate oxytocin release (Anbarasi et al., 2022). These effects can facilitate the milk ejection reflex, improve milk flow, and reduce common breastfeeding-related discomforts such as engorgement (Sritas et al., 2023). Additionally, the relaxation response induced by massage may help reduce maternal stress and anxiety, which are known to affect lactation negatively (Kartilah & Februanti, 2024).

Given these potential benefits, this study aims to provide empirical evidence on the effect of lactation massage on breast milk production among postpartum mothers. Specifically, this study evaluates changes in expressed milk volume and maternal responses to lactation massage during the early postpartum period (days 1–3) (Lestari et al., 2022). The findings are expected to contribute to evidence-based midwifery practice by supporting the integration of lactation massage into routine postpartum care, ultimately enhancing the quality of maternal services and promoting higher rates of exclusive breastfeeding (Ulya et al., 2023).

## METHOD

### Research Design

This study employed a quasi-experimental design with a pretest–posttest control group approach to examine the effect of lactation massage on breast milk production among postpartum mothers. The research was conducted at an independent midwifery practice in Sumberbaru, Jember, Indonesia, selected due to its high volume of postpartum visits and its role as a primary provider of community-based maternal healthcare services.

### Participants

Participants were recruited using purposive sampling based on predefined inclusion and exclusion criteria. Inclusion criteria comprised postpartum mothers on days 1–3 after delivery, without obstetric or postpartum complications, free from mastitis and hormonal disorders, and willing to participate in the study. Mothers requiring specialized medical treatment were excluded. A total of 20 participants were enrolled and divided into two groups: an intervention group (n = 10) and a control group (n = 10). Group allocation was determined based on service schedules at the study site.

### Data Collection

The intervention group received lactation massage once daily for three consecutive days, with each session lasting approximately 15–20 minutes. The procedure was performed by trained midwives following the AIMI Lactation Massage Standard Operating Procedure (2017), which includes warm-up techniques, circular breast massage, oxytocin stimulation, and breast drainage. The control group received standard postpartum care without lactation massage. Breast milk production was measured using a standard electric breast pump for 10–15 minutes, with participants seated. Measurements were conducted at the same time of day for both pretest and posttest assessments to ensure consistency. In addition, lactation-related complaints, including breast pain and engorgement, were documented using a structured observation sheet.

### Data Analysis

Data analysis was performed using appropriate statistical methods. The Shapiro–Wilk test was used to assess data normality. Within-group comparisons were analyzed using paired t-tests for normally distributed data or Wilcoxon signed-rank tests for non-normally distributed data. Between-group comparisons were conducted using independent t-tests or Mann–Whitney U tests, depending on data distribution. A p-value of less than 0.05 was considered statistically significant.

### Ethical Clearance

Ethical approval for this study was obtained from the Faculty of Health Sciences, Institute of Technology, Science and Health, Dr. Soepraoen Hospital. All participants provided informed consent prior to participation, and confidentiality of participant data was strictly maintained throughout the study.

## RESULT

### Changes in Breast Milk Production in Each Group

Breast milk production was measured using the pumping output (ml) method for 10–15 minutes in a sitting position with a standard electric pump. Measurements were conducted on the first day (pretest) and the third day (posttest) to ensure consistency across intervention times. Paired t-tests were used to assess changes in values within groups.

Table 1. Pretest–Posttest Breast Milk Production in the Intervention and Control Groups (Measurements on day 1 and day 3)

| Group (n=10) | Measurement | Mean (ml) | Elementary School | p-value |
|---|---|---|---|---|
| Intervention | Pretest | 37.4 | 6.8 | < 0.001 |
| | Posttest | 70.2 | 9.3 | |
| Control | Pretest | 38.1 | 7.1 | 0.049 |
| | Posttest | 43.5 | 6.4 | |

The intervention group showed a highly significant increase in breast milk production ($p < 0.001$), with a difference of 32.8 ml in three days. Based on the literature (Riksani, 2018; Fitriani et al., 2021), an increase of more than 20 ml within 48–72 hours is considered clinically significant, making these results relevant to obstetric practice. Meanwhile, the control group only experienced an increase of 5.4 ml, which is considered minimal and less clinically significant.

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**Comparison of the Increase in Breast Milk Production Between Groups**

The difference in breast milk production between the two groups was analyzed using an independent t-test based on the pretest–posttest difference (Δ).

Table 2. Comparison of Average Increase in Breast Milk Production Between Groups

| Variables | Intervention (n=10) Mean ± SD | Control (n=10) Mean ± SD | p-value |
|---|---|---|---|
| Δ Breast Milk Production (ml) | 32.8 ± 7.6 | 5.4 ± 4.3 | < 0.001 |

The intervention group showed a significantly greater increase in breast milk production than the control group ($p < 0.001$), with a difference of 27.4 ml, indicating a strong effect of lactation massage. These findings support the biological mechanisms of lactation massage that increase oxytocin, improve blood flow, and reduce let-down resistance.

**Changes in Postpartum Mothers' Lactation Complaints**

Lactation complaints include breast engorgement, pain, and discomfort during breastfeeding. Assessment is conducted through structured observation.

Table 3. Changes in Lactation Complaints After Intervention

| Lactation Complaints | Intervention (n=10) Decrease (%) | Control (n=10) Decrease (%) |
|---|---|---|
| Swelling | 80% | 20% |
| Breast pain | 70% | 10% |
| Breastfeeding discomfort | 75% | 20% |

Most respondents in the intervention group experienced a substantial reduction in lactation complaints, consistent with the mechanism by which lactation massage increases lymphatic flow and reduces breast congestion. Improvements in the control group were small and not clinically significant.

## DISCUSSION

The findings of this study demonstrate that lactation massage significantly increases breast milk production among postpartum mothers, while no statistically significant change was observed in the control group. The mean increase of 32.8 mL within three days indicates not only statistical significance but also clinical relevance. Previous lactation studies suggest that an increase exceeding 20 mL within 48–72 hours indicates an adequate physiological response, particularly with respect to oxytocin-mediated milk ejection. Therefore, the magnitude of improvement observed in this study supports the effectiveness of lactation massage as a meaningful intervention during the early postpartum period (Suryani, 2024).

A notable contribution of this study is its implementation within a community-based midwifery practice rather than a hospital or specialized healthcare setting. This context enhances the external validity of the findings by demonstrating that lactation massage is both feasible and effective in primary care environments. Given that independent midwifery practices serve as the first point of contact for many postpartum mothers, especially in resource-limited settings, integrating these interventions can be crucial for improving breastfeeding outcomes at the community level (Dube et al., 2023).

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The observed increase in breast milk production can be explained by established neuroendocrine mechanisms of lactation. Mechanical stimulation of the breast and paravertebral regions activates afferent neural pathways that transmit signals to the hypothalamus, subsequently triggering the release of oxytocin from the posterior pituitary gland. Oxytocin facilitates the contraction of myoepithelial cells surrounding the alveoli, thereby enhancing the milk ejection reflex. In addition, lactation massage improves local blood and lymphatic circulation, which may further support milk synthesis and flow. These physiological responses are consistent with existing theories of lactation regulation (Mukherjee et al., 2023).

Beyond its effect on milk volume, lactation massage was associated with reduced breast pain and tension among participants in the intervention group. This finding is particularly important, as maternal discomfort, stress, and anxiety are known to inhibit oxytocin release and disrupt the milk ejection reflex. By promoting relaxation and physical comfort, lactation massage may indirectly enhance lactation through psychological pathways. The interplay between emotional well-being and hormonal regulation underscores the importance of holistic postpartum care that addresses both the physical and psychological needs of mothers (Mollaahmetoglu & Guvenc, 2025).

Several limitations should be considered when interpreting these findings. The relatively small sample size limits the generalizability of the results to broader populations. Additionally, the short duration of the intervention (three days) restricts the ability to assess the long-term sustainability of increased milk production. Potential confounding variables, including maternal hydration status, breastfeeding frequency, infant latch quality, psychological stress, and variability in breast pump use, were not fully controlled. The non-randomized design may also introduce selection bias, while the use of self-reported measures for lactation-related complaints may increase the risk of reporting bias.

Despite these limitations, the findings offer important implications for clinical practice, particularly in midwifery care. Lactation massage represents a simple, safe, and cost-effective intervention that can be readily integrated into routine postpartum services. Training midwives in standardized lactation massage techniques has the potential to strengthen breastfeeding support, reduce early lactation difficulties, and improve maternal experiences during the postpartum period (Mahto et al., 2025). Further research employing larger sample sizes, randomized controlled designs, and extended follow-up periods is needed to confirm these findings and to explore the long-term impact of lactation massage on breastfeeding success.

## CONCLUSION

Lactation massage significantly enhances breast milk production among postpartum mothers and supports the milk ejection reflex through mechanical stimulation and oxytocin activation. As a safe, non-pharmacological, and feasible intervention, it can be effectively integrated into routine postpartum care within community midwifery settings. The findings underscore its potential to strengthen early breastfeeding support and contribute to achieving exclusive breastfeeding targets. Nevertheless, the results should be interpreted with caution due to the small, community-based sample. In practice, lactation massage may be administered once daily for 2–3 consecutive days during the early postpartum period, with adjustments based on maternal comfort and clinical condition. Midwives should monitor both milk output and maternal response throughout the intervention. Broader implementation, supported by standardized training, may enhance the quality of postpartum services and improve breastfeeding outcomes at the primary care level.

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