



The Effectiveness of Rolling Massage and Warm Compress in Increasing Breast Milk Production Among Postpartum Mothers

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ABSTRACT

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Breast milk production plays a vital role in supporting infant growth and development, yet many postpartum mothers face challenges during the early lactation period. In Indonesia, exclusive breastfeeding coverage remains suboptimal at 52.5% (Riskesdas), with insufficient milk production being one of the contributing factors. This study aimed to evaluate the effectiveness of rolling massage and warm compress in enhancing breast milk production. A quasi-experimental design was used with intervention and control groups, each consisting of 10 purposively selected respondents. The intervention was provided once daily for three consecutive days, 15 minutes per session, and breast milk volume was measured using the pumping test method. Results showed a significant difference in mean breast milk production between the intervention group (63.1 ml) and the control group (50.3 ml). The increase in the intervention group was 24.9 ml compared to 12.1 ml in the control group. A paired sample t-test yielded a p-value of 0.000 (<0.05), confirming the effectiveness of rolling massage and warm compress in improving breast milk production. These findings suggest that incorporating simple, non-invasive techniques such as rolling massage and warm compress into maternal health programs may help promote the success of exclusive breastfeeding.

INTRODUCTION

Optimal breast milk production is a crucial factor in supporting infant growth and development, as breast milk contains complete nutrients and antibodies that play a vital role in enhancing the immune system. The rate of exclusive breastfeeding in Indonesia has shown a promising upward trend in recent years. A survey conducted by the World Health Organization (WHO) reported that the proportion of exclusive breastfeeding increased from approximately 52% in 2017 to 55.5% in 2023⁽¹⁾. Furthermore, UNICEF presented an even more optimistic report, stating that the rate had reached 66.4% in 2024⁽²⁾.

Breast milk serves as the primary source of infant nutrition, providing essential nutrients, antibodies, and growth factors that are critical for optimal infant development⁽³⁾. Its production is influenced by the hormonal stimulation of prolactin and oxytocin, as well as mechanical processes such as adequate breast emptying. Insufficient stimulation or barriers to these processes often result in





reduced milk volume⁽⁴⁾. Therefore, various breast stimulation techniques continue to be developed to support successful breastfeeding practices.

One of the stimulation methods is rolling massage, a breast massage technique performed with circular movements from the periphery toward the areola, aimed at facilitating blood and lymphatic flow⁽⁵⁾. This technique helps reduce breast engorgement, enhances the let-down reflex, and improves breast emptying during breastfeeding⁽⁶⁾. A randomized controlled trial by Munsittikul *et al* demonstrated that integrated breast massage significantly reduced plugged ducts and improved milk expression efficiency among lactating mothers, indicating its effectiveness in promoting lactation outcomes⁽⁷⁾.

In addition to massage, the use of warm compresses has also been shown to provide significant benefits in the lactation process. Local heat application promotes vasodilation, improves blood circulation, and decreases the viscosity of fat in breast milk, thereby facilitating milk flow. Recent evidence from Alshakhs *et al* confirmed that warm compresses significantly reduced breast engorgement and discomfort while improving milk flow among breastfeeding women⁽⁸⁾. Consequently, this method is considered safe, affordable, and easy to apply in postpartum care settings.

Moreover, a randomized controlled trial published in Breastfeeding Medicine found that the combination of breast massage and warm compress application significantly increased milk production and decreased maternal anxiety levels among mothers with premature newborns compared to a control group. Rolling massage facilitates milk release through mechanical stimulation, while warm compresses enhance milk flow by improving circulation⁽⁹⁾. This combined intervention has been shown to increase milk volume, enhance breastfeeding quality, and prevent complications such as mastitis. However, further high-quality studies are needed to validate these findings across diverse postpartum populations.

The urgency of this research is reinforced by the importance of early lactation support during the postpartum period. Midwives' support through simple interventions can enhance the success of exclusive breastfeeding and contribute to achieving both national and global health targets. With scientific evidence, rolling massage and warm compresses could be standardized as routine procedures in postpartum wards and community-based care. This aligns with efforts to improve the quality of midwifery services oriented toward maternal and child health.

Based on this rationale, the present study aims to evaluate the effectiveness of rolling massage and warm compresses in increasing breast milk production among postpartum mothers. The findings are expected to provide both scientific and practical contributions to midwifery practice. Furthermore, this study may serve as the foundation for developing non-pharmacological intervention protocols that support successful breastfeeding from the earliest stages of infant life.

METHOD

This study employed an experimental design with a quasi-experimental approach. This design was chosen because it enables the comparison of changes in breast milk production between the intervention group, which received rolling massage combined with warm compress treatment, and the control group, which did not receive any intervention. Accordingly, the effectiveness of the treatment could be evaluated by assessing the mean differences in outcomes before and after the intervention.

The study population consisted of postpartum mothers experiencing problems with breast milk production in the working area of Palimanan Public Health Center, Palimanan District, Cirebon Regency, in 2025. The sample was selected using a purposive sampling technique based on inclusion criteria, namely mothers with normal postpartum conditions, aged 20-40 years, and willing to participate as respondents. The sample size was determined using the Slovin formula with a 5% margin of error, resulting in a total of 20 respondents, divided into two groups: 10 respondents in the intervention group and 10 respondents in the control group.



The intervention consisted of a combination of warm compresses and rolling massage performed in accordance with standardized midwifery procedures. Each treatment was carried out once daily for three consecutive days, with each session lasting 15 minutes. During the intervention, mothers were placed in a semi-Fowler position with adequate back and arm support to ensure comfort. Warm compresses were applied to both breasts using sterile hydrogel packs wrapped in a clean towel, maintained at a temperature of approximately $40 \pm 2^{\circ}\text{C}$ and applied for 3 minutes to facilitate vasodilation and softening of the breast tissue.

Rolling massage was conducted in two stages. First, a relaxation massage was applied to the upper back area using gentle rhythmic rolling movements along the paraspinal and scapular regions for approximately 4 minutes. Second, a focused rolling massage was performed directly on the breasts, using gentle circular strokes from the periphery toward the areola for about 8 minutes (approximately 4 minutes per breast). The pressure applied was maintained at a gentle to moderate level, adjusted to each participant's comfort, and was not intended to cause pain. All procedures were performed by licensed midwives who had previously attended a structured training session to standardize the intervention technique and ensure consistency.

Breast milk production was measured using the pumping test method. An electric breast pump was applied under uniform suction settings for 10 minutes of double pumping, and the total volume expressed was collected in calibrated containers and recorded in milliliters. Measurement was conducted at baseline (before intervention) and after each intervention session.

Data analysis was performed using the paired sample t-test to determine differences in breast milk production before and after the intervention within each group, and the independent sample t-test to compare differences between the intervention and control groups. All statistical analyses were conducted at a 95% confidence level, with the significance value set at $p < 0.05$. This study protocol was reviewed and approved by the Health Research Ethics Committee of the Institute for Research and Community Service (LPPM), STIKes Karya Husada Kediri, under approval number 096/EC/LPPM/STIKES/KH/VIII/2025. All respondents provided written informed consent prior to participation.

RESULT AND DISCUSSION

Based on the conducted study, a recapitulation of breast milk production data was obtained for both the experimental and control groups. The experimental group received the intervention consisting of rolling massage and warm compresses, whereas the control group received only light stroking and basic postpartum care. The recapitulated data on breast milk production following the intervention in both the experimental and control groups are presented in Table 1.

Table 1.
Recapitulation of breast milk production after intervention

Description	Experimental Group (ml)	Control Group (ml)
Mean	63.1	50.3
Highest	67	61
Lowest	59	42
Respondents	10	10

Based on Table 1, it can be seen that the mean breast milk production in the experimental group was higher, at 63.1 ml, compared to 50.3 ml in the control group. The highest milk production in the experimental group reached 67 ml, while in the control group it was only 61 ml. Similarly, the lowest value in the experimental group was 59 ml, which was higher than that of the control group at 42 ml.





These findings indicate that the intervention of rolling massage and warm compresses in the experimental group had a positive impact on increasing breast milk production compared with the standard care provided in the control group. The average comparison of breast milk production between the experimental and control groups after the intervention is presented in Figure 1.

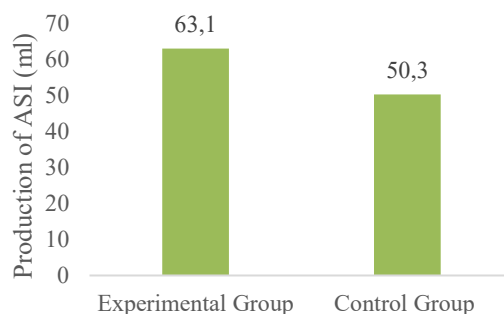


Figure 1. Comparison of mean breast milk production after intervention

The effectiveness of the rolling massage and warm compress intervention in increasing breast milk production is presented in the recapitulation table of breast milk production improvement shown in Table 2.

Table 2.
Increase in breast milk production and the effectiveness of rolling massage

Description	Experimental Group (ml)	Control Group (ml)	Efektivitas (P Value)
Mean	24.9	12.1	0.000
Highest	27	22	
Lowest	24	6	
Respondents	10	10	

Based on the results of the paired sample t-test presented in Table 2, the mean increase in breast milk production in the experimental group was 24.9 ml, which was higher than that of the control group at 12.1 ml. The highest increase in the experimental group reached 27 ml, whereas in the control group it was only 22 ml. Statistical testing showed a significance value (p-value) of 0.000 (<0.05), indicating a significant difference between the experimental and control groups.

Statistically, the paired sample t-test results in this study revealed a significant difference, with a p-value of 0.000. This finding is consistent with Shanti's research, which demonstrated the effectiveness of warm steam therapy in increasing breast milk production among postpartum mothers, with a significance of $p < 0.05^{(12)}$. Such comparisons indicate that various forms of heat therapy produce similar outcomes in supporting lactation. Therefore, both warm compresses and steam therapy may serve as safe alternatives for enhancing breast milk production. Nevertheless, the choice of intervention should be adjusted according to maternal comfort and the availability of resources.

This study demonstrated that the intervention of rolling massage and warm compresses significantly increased breast milk production in postpartum mothers. These findings are consistent with the study of (10), which reported that breast warming prior to pumping resulted in a significant increase in milk volume. The physiological effect is thought to result from vasodilation and improved circulation in breast tissue, thereby facilitating milk ejection⁽¹¹⁾. Thus, the present study strengthens the evidence



that physical stimulation in the form of warming has a positive impact on lactation. This suggests that the body's natural mechanisms can be optimized through simple approaches.

Thus, the intervention of rolling massage and warm compresses was proven effective in increasing breast milk production among postpartum mothers compared to standard care. The comparison of breast milk production improvement between the experimental and control groups after the intervention is illustrated in Figure 2.

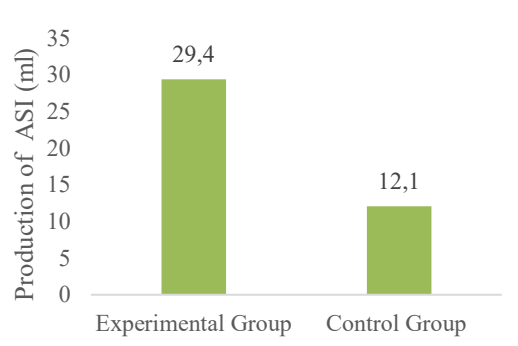


Figure 2. Increase in breast milk production after intervention

Figure 2 clearly shows that postpartum mothers who received rolling massage and warm compresses experienced greater increases in breast milk production than those in the control group, thereby reinforcing the statistical findings presented earlier. This intervention also has additional benefits in addressing engorgement complaints. Aprila et al demonstrated that warm compresses can reduce breast pain and facilitate milk flow⁽¹⁴⁾. These findings support the results of the present study, in which the intervention not only increased breast milk volume but also potentially alleviated maternal discomfort. This is important because breast engorgement is one of the main barriers to successful breastfeeding⁽¹⁵⁾. Thus, this simple intervention has a dual impact that mutually reinforces each other.

In addition to warm compresses, rolling massage has been shown to accelerate the let-down reflex and improve breastfeeding efficiency. Shanti reported that breast massage could increase milk production, particularly in mothers who delivered premature infants⁽¹²⁾. The results of this study align with those findings, as rolling massage performed on postpartum mothers led to higher average milk production compared with the control group. The combination of massage and warm compresses plays a dual role in reducing mechanical obstruction in the milk ducts while enhancing hormonal stimulation of oxytocin⁽¹³⁾. This strategy introduces a new dimension to non-pharmacological interventions in support of exclusive breastfeeding programs.

Although the results of this study showed significant effectiveness, several limitations should be acknowledged. The number of respondents was relatively small ($n = 20$), limiting the generalizability of the findings to a broader population. In addition, the study only assessed breast milk volume in the short term without evaluating the sustainability of the intervention's effects. Other factors such as nutritional status, rest patterns, and family support were also not explored in depth, even though they may influence breast milk production. Therefore, further research with a larger sample size and a longitudinal design is highly recommended.

CONCLUSION

This study demonstrated that rolling massage and warm compresses were proven effective in increasing breast milk production among postpartum mothers, as evidenced by the significant difference in the average volume of breast milk between the experimental and control groups. This finding confirms that simple stimulation through rolling massage and warm compresses can serve as a non-





pharmacological method that may be integrated into midwifery practice. The implication of these findings is that rolling massage can be recommended as an effective intervention to support the success of exclusive breastfeeding.

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REFERENCES

1. World Health Organization. Ibu membutuhkan lebih banyak dukungan menyusui selama masa kritis bayi baru lahir [Mothers need more breastfeeding support during the critical period of newborn care] [Internet]. Jakarta: WHO Indonesia; 2024. Available from: <https://www.who.int/indonesia/id/news/detail/01-08-2024-mothers-need-more-breastfeeding-support-during-critical-newborn-period>
2. United Nations Children's Fund (UNICEF). Ibu membutuhkan lebih banyak dukungan menyusui selama masa kritis bayi baru lahir [Mothers need more breastfeeding support during the critical period of newborn care] [Internet]. Jakarta: UNICEF Indonesia; 2024. Available from: <https://www.unicef.org/indonesia/id/press-releases/ibu-membutuhkan-lebih-banyak-duktungan-menyusui-selama-masa-kritis-bayi-baru-lahir>
3. Nisaalfiyanti N, Dwi RW, Eka ML. Implementasi terapi rolling massage pada ibu post partum terhadap produksi asi di ruang nuri RSAU Dr Esnawan Antariksa [Implementation of rolling massage therapy for postpartum mothers on breast milk production in the nursing room of Dr. Esnawan Antariksa General Hospital]. *J Manaj Kesehat Keperawatan*. 2024;1(3):114–8.
4. Kartini M, Kusumadewi BN. Efektivitas massage untuk meningkatkan produksi air susu ibu (ASI) pada ibu postpartum [The effectiveness of massage to increase breast milk production in postpartum mothers]. *J Kesehat*. 2023;12(1):163–77.
5. Badrus AR. Perbedaan massage woolwich dan massage rolling (punggung) terhadap peningkatan produksi asi pada ibu postpartum [The difference between Woolwich massage and rolling massage (back) in increasing breast milk production in postpartum mothers]. *J Heal Educ Sci Technol (J-HESTech)*. 2018;1(1):43-7.
6. Sari PP, Veronica, Isnayati. Intervensi massage rolling punggung terhadap kelancaran asi pada ibu postpartum [The effect of back rolling massage on breast milk flow in postpartum mothers]. *J Keperawatan Degener Pelni*. 2024;1(1):51–8.
7. Munsittikul N, Tantaobharse S, Siripattanapipong P, Wutthigate P. Integrated breast massage versus traditional breast massage for treatment of plugged milk duct in lactating women : a randomized controlled trial. *Int Breastfeed J*. 2022;1–9. <https://doi.org/10.1186/s13006-022-00485-6>
8. Alshakhs FH, Katooa NE, Badr HA, Thabet HA. The effect of alternating application of cold and hot compresses on reduction of breast engorgement among lactating mothers. *Int J Nurs Educ*. 2024;16(1):1–27.
9. Mollaahmetoglu ŞE, Guvenc G. The effect of breast massage and warm compress application on milk production and anxiety in mothers with premature newborn: a randomized controlled trial. *Breastfeed Med*. 2024;20(6).
10. Sandriani S, Fitriani R, Rahayu GZ. Effect of oxytocin massage on breast milk production in postpartum mothers: a case study. *Genius Midwifery J*. 2023;2(1):30–8.



11. Meirita T, Sari A, Ciptiasrini U. Perbandingan pemberian woolwich massage dan back massage terhadap peningkatan produksi ASI di TPMB Ny. T Kabupaten Garut tahun 2024 [Comparison of Woolwich massage and back massage on increasing breast milk production in TPMB Ny. T, Garut Regency in 2024]. *Sinergi J Ris Ilm.* 2024;1(10):930–9.
12. Shanti EFA. Efektivitas produksi asi pada ibu post partum dengan massage rolling (punggung) Effectiveness of breast milk production in postpartum mothers with rolling massage (back)]. *Midwifery J J Kebidanan Univ Muhammadiyah Mataram* [Internet]. 2020;3(1):76–80. Available from: <http://journal.ummat.ac.id/index.php/MJ/article/view/152/125>
13. Nurfija J, Murni NNA. Perbedaan antara kombinasi massage woolwich dan massage rolling dengan teknik marmet terhadap produksi asi pada ibu nifas di wilayah kerja Puskesmas Karang Pule [The difference between the combination of Woolwich massage and rolling massage with the Marmet technique on breast milk production in postpartum mothers in the Karang Pule Community Health Center work area.]. *J Midwifery Updat.* 2020;2(2):129–33.
14. Aprila PZ, Hardisman H, Yulizawati Y. Narrative review of the effectiveness of rolling massage and endorphin massage on asi production in breastfeeding mothers. *J Midwifery.* 2024;8(2):15.
15. Suari NKAG, Simanjuntak M. Penerapan woolwich massage terhadap produksi asi dan pencegahan bendungan asi pada postpartum sectio caesarea [Application of Woolwich massage to breast milk production and prevention of breast milk stasis in postpartum caesarean section]. *Bul Kesehat Publ Ilm Bid Kesehat.* 2024;8(2):208–30.

