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The Effect of Warm Breast Compresses on Breast Milk Flow in Postpartum Mothers at Lala Medicare Clinic

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ABSTRACT

Introduction: *Breast milk is the optimal source of nutrition for infants; however, many postpartum mothers experience inadequate breast milk flow during the early postpartum period. One non-pharmacological intervention that may support lactation is the application of warm breast compresses, which can stimulate milk ejection and improve blood circulation. This study aimed to examine the effect of warm breast compresses on breast milk flow in postpartum mothers at Lala Medicare Clinic.*
Methods: *This quantitative study employed a quasi-experimental one-group pretest–posttest design. A total of 30 postpartum mothers were selected using total sampling. Breast milk flow was assessed before and after the intervention. Warm breast compresses were applied at a temperature of 40–45°C for 15–20 minutes according to standard procedures. Data were analyzed using the Wilcoxon Signed Rank Test.*
Results: *The proportion of mothers with adequate breast milk flow increased from 26.7% before the intervention to 66.7% after the intervention, while those with inadequate flow decreased from 33.3% to 6.6%. Statistical analysis showed a significant difference in breast milk flow before and after the intervention (p = 0.001).*
Conclusions: *There is an effect of warm compress application on breast milk flow in postpartum mothers.*

Introduction

The World Health Organization (WHO) defines exclusive breastfeeding as feeding infants solely with breast milk, without the addition of any other liquids or solid foods, including water, except for oral rehydration solutions or vitamin, mineral, and medicinal drops or syrups. Exclusive breastfeeding has been widely proven to provide significant health advantages, such as reducing the risk of diarrhea, respiratory infections, atopic dermatitis, obesity, and allergic conditions (Guvenc, 2025). Despite these benefits, exclusive breastfeeding coverage remains suboptimal worldwide. Globally, only about 48% of infants under six months of age receive exclusive breastfeeding, which is still far below the global target of 70% set for 2030 (WHO, 2025). This condition highlights breastfeeding as an ongoing global public health challenge, particularly during the early postpartum period when lactation difficulties are most prevalent.

Recent data indicate that the rate of exclusive breastfeeding in Indonesia reached approximately 68% in 2023. Although this figure reflects an improvement compared to previous years, it remains below the national target of 80%. The gap indicates persistent barriers to successful breastfeeding, especially in urban and peri-urban settings where early postpartum mothers frequently experience breastfeeding problems (Putu et al., 2025). Initiatives to increase exclusive breastfeeding coverage are reinforced by government regulations, including Government Regulation No. 33 concerning Exclusive Breastfeeding, which is further supported by Ministry of Health Regulation No. 15 of 2013 related to the provision of designated facilities

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for breastfeeding and expressing breast milk (Nailuvar et al., 2022). However, regulatory frameworks alone are insufficient without effective clinical interventions that address early lactation problems.

One of the most common barriers to exclusive breastfeeding is inadequate breast milk flow in the early postpartum period. Insufficient milk flow often leads mothers to perceive low milk supply, increasing the likelihood of early formula supplementation and discontinuation of exclusive breastfeeding. This condition may be influenced by multiple factors, including maternal fatigue, psychological stress, inadequate nutrition, lack of breast care, and impaired activation of the milk ejection (let-down) reflex (Rosyida, 2021). Therefore, interventions that support physiological milk flow during the first postpartum week are critical for breastfeeding success.

Breast milk secretion is closely associated with the let-down reflex, which plays a vital role in ensuring smooth milk flow. One effective approach to stimulating this reflex is the application of warm compresses to the breasts. Warm compresses promote vasodilation, thereby increasing blood circulation, opening breast ducts and tissues, and supporting pituitary gland function in the process of milk production (Setyowati et al., 2023).

Various interventions have been developed to improve breast milk flow, including oxytocin massage, breast care techniques, early initiation of breastfeeding, frequent breastfeeding or pumping, relaxation therapy, and lactation counseling. Studies have shown that oxytocin massage and structured breast care can significantly improve milk flow by enhancing oxytocin release and preventing breast engorgement (Nurul Azizah, 2019). Warm breast compresses represent a simple, low-cost, and non-invasive complementary intervention that can be easily performed by postpartum mothers. Physiologically, warm compresses induce vasodilation, improve blood circulation, relax breast tissue, open milk ducts, and stimulate pituitary gland activity, thereby facilitating the let-down reflex and improving milk flow (Turnip et al., 2024). Previous studies have reported that warm compress application significantly increases breast milk volume and secretion, reduces breast engorgement, and alleviates discomfort during breastfeeding.

A preliminary assessment conducted at Lala Medicare Clinic revealed that all assessed postpartum mothers experienced inadequate breast milk flow during the first week after delivery. In addition, most mothers lacked knowledge regarding breast care and were unfamiliar with the application of warm breast compresses. Furthermore, warm compress therapy had not yet been integrated into routine postpartum care services at the clinic. These findings indicate that early lactation problems observed globally and nationally are also evident at the local level, underscoring the urgency of implementing effective, practical interventions.

These preliminary findings are in line with the study conducted by (Guvenc, 2025), which reported a significant effect of warm compress application on increasing both the volume and secretion of breast milk in mothers with premature infants. Statistical analysis demonstrated a p-value < 0.05, confirming a meaningful improvement in milk production following the intervention. The use of warm compresses on the breasts during breastfeeding has been shown to enhance milk flow from the mammary glands. Additionally, warm compresses can stimulate the let-down reflex, reduce the risk of breast engorgement, improve local blood circulation, and alleviate muscle discomfort associated with ischemia (Laksonowati & Mulyantoro, 2021). In addition, research by (Agustia et al., 2025) indicated that mothers who received a combination of oxytocin massage and breast care experienced smoother breast milk flow compared to those who did not receive breast care. This evidence further emphasizes the importance of breast care in supporting effective lactation.

Although previous studies have explored various methods to improve lactation, evidence focusing on warm breast compresses as a standalone intervention during the critical early postpartum period remains limited, particularly in Indonesian primary healthcare settings.

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Moreover, comparative evidence between warm compresses and other lactation-support interventions is still scarce. This gap highlights the need for further research to strengthen the evidence base for simple, feasible, and scalable interventions to improve breast milk flow.

Therefore, this study aims to examine the effect of warm breast compress application on breast milk flow among postpartum mothers at Lala Medicare Clinic in 2025. The findings are expected to contribute to evidence-based postpartum care practices and support efforts to improve exclusive breastfeeding coverage.

Methods

This type of research is quantitative, using an quasi experimental design. The pre-experimental design used is a one-group pretest-posttest without control design. The independent variable in this study was the warm breast compress. The dependent variable in this study was breast milk flow in postpartum mothers. The steps to be taken in data collection are as follows: The researcher will coordinate with Lala Medicare Clinic, Depok, and local midwives to identify and recruit postpartum mothers who meet the criteria as research respondents. The researcher will then explain the purpose, objectives, and procedures of the study to all respondents and obtain their informed consent to participate in the research. The researcher will conduct an initial assessment (pre-test) to determine the condition of breast milk flow prior to the intervention. The pre-test will be administered using questionnaires and observation sheets, with an approximate completion time of 5 minutes. After the pre-test, the researcher will provide the intervention in the form of warm breast compresses to the respondents. The researcher will first explain the procedure and benefits of warm breast compresses, followed by a demonstration of the correct technique. The warm compress intervention will be carried out in accordance with the standard operating procedure (SOP), using warm water at a temperature of approximately 40–45°C for 15–20 minutes on the breasts.

Warm compresses were administered directly to the respondents at Lala Medicare Clinic or monitored by local midwives according to the schedule determined by the researcher. During the intervention, the researcher ensured that respondents performed the warm compress procedures correctly and safely in accordance with the standard operating procedure. After the completion of the intervention, a follow-up assessment (post-test) was conducted to evaluate breast milk flow in postpartum mothers. Breast milk flow was measured using a structured breast milk flow assessment questionnaire and an observation checklist, which had been developed based on standardized lactation assessment indicators. The questionnaire assessed maternal perceptions of milk flow, including breast fullness, ease of milk release, and infant satisfaction during breastfeeding, while the observation checklist evaluated objective signs such as milk dripping or spraying, breast softness after feeding, and infant swallowing patterns. The post-test assessment was administered using the same instruments as the pre-test, with an estimated completion time of approximately five minutes. All pre-test and post-test data were collected, coded, and processed by the researcher. Data analysis was performed using appropriate statistical tests to determine the effect of warm breast compress intervention on breast milk flow in postpartum mothers.

The population of this study consisted of all postpartum mothers within one to seven days after delivery at Lala Medicare Clinic from August to September 2025. Based on clinic records, the total population during the study period was 30 postpartum mothers. The sampling technique used was total sampling, resulting in a total sample of 30 respondents. The inclusion criteria for this study were postpartum mothers aged 1–7 days after delivery, mothers who were breastfeeding, mothers who experienced signs of suboptimal breast milk flow, mothers who were

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physically and mentally stable, and mothers who were willing to participate in the study as indicated by informed consent. Mothers with breast infections such as mastitis, those with contraindications to warm compress therapy, or those who declined participation were excluded from the study. Breast milk flow in postpartum mothers assessment aspects are: Adequate: score ≥ 76%, Moderately adequate: score 56–75%, Inadequate: score ≤ 55%. The sampling technique used was total sampling. The test used in this study is Wilcoxon because the data is not normally distributed.

Results

1. Respondent Characteristics

Table 1. Characteristics of Research Samples

Respondent Characteristics	Number (n)	Percentase (%)
Years		
17-25 years	6	20
26-35 year	20	66,7
> 35 years	4	13,3
Total	30	100
Level of Education		
High School	18	60
Diploma	6	20
Bachelor's Degree	6	20
Total	30	100
Work		
Housewife	20	66,7
Enterpreneur	5	16,7
Employee	5	16,7
Total	**30**	**100**

Based on Table 1, most respondents were aged 26–35 years (66.7%), followed by those aged 17–25 years (20%) and over 35 years (13.3%). This indicates that the majority of respondents were within the optimal reproductive age. In terms of education, the majority of respondents had a high school education (60%), while those with diploma and bachelor's degrees each accounted for 20%. Educational level may influence mothers' understanding of postpartum care and breastfeeding practices.

Regarding occupation, most respondents were housewives (66.7%), while entrepreneurs and employees each represented 16.7% of the sample. Occupational status may affect mothers' availability and involvement in postpartum and breastfeeding care.

2. Respondents' Breast Milk Flow Assessment Before and After Intervention

Table 2. Respondents' breast Milk Flow Assessment Before Intervention (n = 30)

Breast Milk Flow Category	Number (n)	Percentage (%)
Adequate (≥ 76%)	8	26.7
Moderately adequate (56–75%)	12	40.0
Inadequate (≤ 55%)	10	33.3
Total	**30**	**100**

Based on Table 2, before the intervention, most postpartum mothers had moderately adequate breast milk flow (40.0%), while 33.3% experienced inadequate breast milk flow. Only 26.7% of respondents showed adequate breast milk flow prior to the intervention, indicating that lactation problems were still common in the early postpartum period.

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Table 3. Respondents' breast Milk Flow Assessment After Intervention (n = 30)

Breast Milk Flow Category	Number (n)	Percentage (%)
Adequate (≥ 76%)	20	66.7
Moderately adequate (56–75%)	8	26.7
Inadequate (≤ 55%)	2	6.6
Total	**30**	**100**

After the intervention (Table 3), a marked improvement in breast milk flow was observed. The proportion of mothers with adequate breast milk flow increased to 66.7%, while those with inadequate breast milk flow decreased substantially to 6.6%. This finding suggests that the intervention was effective in improving breast milk flow among postpartum mothers.

3. The Effect of Warm Breast Compresses on Breast Milk Flow in Postpartum Mothers

Table 4. The Effect of Warm Breast Compresses on Breast Milk Flow In Postpartum Mothers

Variable	n	z	p-value
Breast milk flow before–after intervention	30	-3,464	0,001

Based on Table 4, the Wilcoxon Signed Rank Test showed a Z value of −3.464 with a p-value of 0.001 ($p < 0.05$). This result indicates that there is a statistically significant difference in breast milk flow among postpartum mothers before and after the intervention. Therefore, it can be concluded that the intervention had a significant effect on improving breast milk flow in postpartum mothers.

Discussion

1. Respondent Characteristics

The respondent characteristics in this study indicate that most postpartum mothers were aged 26–35 years (66.7%), followed by those aged 17–25 years (20%) and over 35 years (13.3%). This age distribution reflects a predominance of mothers within the optimal reproductive age, which has been consistently associated with better breastfeeding outcomes. Recent studies have demonstrated that mothers aged 25–35 years tend to have higher breastfeeding initiation and continuation rates due to favorable physiological conditions, emotional maturity, and greater adaptability to postpartum changes. A systematic review by (Balogun et al., 2015) confirmed that maternal age is a significant predictor of successful breastfeeding practices, particularly during the early postpartum period.

With regard to educational level, the majority of respondents had completed high school education (60%), while diploma and bachelor's degree holders each accounted for 20%. Maternal education remains a critical determinant of breastfeeding behavior, as it influences health literacy, access to information, and compliance with breastfeeding recommendations. Recent evidence suggests that while higher education is generally associated with improved breastfeeding knowledge, targeted education and counseling can effectively enhance breastfeeding practices among mothers with secondary education. A 2021 cross-sectional study by (SaThierbach et al., 2015) reported that breastfeeding self-efficacy and knowledge

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were significantly influenced by structured postpartum education regardless of formal education level.

Occupational status also played an important role in shaping respondent characteristics, with 66.7% of mothers identified as housewives, while entrepreneurs and employees each represented 16.7% of the sample. Employment status has been widely discussed in recent literature as a key factor influencing breastfeeding continuation. A longitudinal study by (Mirkovic et al., 2016) found that non-employed mothers were more likely to maintain exclusive breastfeeding compared to working mothers, largely due to greater time flexibility and reduced work-related stress. Conversely, employed mothers often face structural barriers such as short maternity leave and limited workplace lactation support, which negatively affect breastfeeding duration.

Overall, the respondent characteristics observed in this study are consistent with recent findings indicating that maternal age, education, and occupation interact to influence breastfeeding readiness and practices. These socio-demographic factors do not act independently but rather shape maternal capacity to engage with breastfeeding interventions and postpartum care. Recent global recommendations emphasize the importance of tailoring breastfeeding support based on maternal characteristics to improve outcomes. World Health Organization highlights that understanding maternal demographic profiles is essential for designing effective, equitable, and sustainable breastfeeding support strategies (WHO, 2025).

2. Respondents' Breast Milk Flow Assessment Before and After Intervention

The findings of this study indicate that prior to the intervention, the majority of postpartum mothers experienced suboptimal breast milk flow, with 40.0% categorized as having moderately adequate flow and 33.3% experiencing inadequate flow. Only 26.7% of respondents demonstrated adequate breast milk flow during the early postpartum period. These results suggest that lactation challenges remain prevalent shortly after childbirth. Physiologically, the initiation of effective lactation depends on complex hormonal mechanisms involving prolactin and oxytocin, which may be disrupted by stress, fatigue, delayed breastfeeding initiation, or inadequate breast stimulation (Neville et al., 2012). Consequently, insufficient breast milk flow in the early postpartum phase is a common phenomenon, particularly among first-time mothers or those lacking adequate breastfeeding support.

After the intervention, a substantial improvement in breast milk flow was observed. The proportion of mothers with adequate breast milk flow increased markedly to 66.7%, while the percentage of those experiencing inadequate flow declined sharply to 6.6%. This shift indicates that the intervention was effective in enhancing breast milk flow among postpartum mothers. Previous studies have demonstrated that breastfeeding-related interventions—such as education, breast stimulation, counseling, and emotional support—can significantly improve lactation outcomes by enhancing maternal confidence and optimizing hormonal responses (Skouteris et al., 2014). These mechanisms are critical in facilitating the milk ejection reflex and sustaining adequate milk production.

The reduction in the proportion of mothers with inadequate breast milk flow following the intervention underscores the importance of targeted lactation support during the postpartum period. Psychological factors, including anxiety, stress, and lack of self-efficacy, are known to negatively affect oxytocin release and subsequently inhibit breast milk flow (Dennis & McQueen, 2009). Interventions that provide reassurance, hands-on guidance, and consistent support may alleviate maternal stress and promote more effective breastfeeding behaviors. This is supported by evidence showing that mothers who receive structured postpartum breastfeeding support are more likely to experience successful lactation and prolonged breastfeeding duration (Mcfadden et al., 2017).

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A quasi-experimental study found that warm herbal compresses applied daily for three days significantly increased postpartum mothers' oxytocin levels and milk production compared to a control group. The intervention group showed a statistically significant rise in milk volume, suggesting that warmth may stimulate the physiological processes involved in lactation (e.g., increased oxytocin) which facilitates milk let-down and flow (Laksonowati & Mulyantoro, 2021).

Similarly, research on warm breast compresses before pumping indicates that warming breast tissue improves efficiency of milk removal. Mothers using a warmed breastshield experienced shorter time to remove 80% of total milk and greater milk yield in the early minutes of expression compared to a standard (ambient-temperature) shield. This suggests a potential practical benefit in clinical or home pumping routines (Kent et al., 2011).

Overall, this study supports existing evidence that early postpartum interventions can effectively improve breast milk flow and reduce lactation problems. The observed improvements highlight the importance of continuous breastfeeding support as part of comprehensive postpartum care. Future research is recommended to explore the long-term effects of such interventions on exclusive breastfeeding duration and infant growth outcomes, as well as to examine the effectiveness of different types of lactation interventions across diverse populations.

3. The Effect of Warm Breast Compresses on Breast Milk Flow in Postpartum Mothers

Statistically, the variation in breast milk flow pre, and post, intervention has been found to be statistically significant with a p value < 0.05. This indicates that the increase in breast milk flow seen in this study cannot be attributed to mere luck or chance but rather is the result of the direct effect of thermal stimulation via warm breast compresses. Consequently, the working hypothesis that warm compresses affect breast milk flow is confirmed by scientific evidence.

This study shows the warm breast compresses are significantly effective in helping postpartum mothers to have a smooth flow of breast milk. The study outcome reveals that after the intervention, more mothers are able to produce sufficient milk and at the same time, the number of mothers with insufficient milk has dropped noticeably. These findings are consistent with warm compresses being an effective non, drug method of supporting the lactation process in the early postpartum period.

Such outcomes are consistent with the one published a few years ago at an independent midwifery practice that stated warm compresses placement evidently improved smooth milk secretion in postpartum mothers by Wilcoxon Signed Rank test ($p < 0.05$). After the intervention, 80% of the respondents showed improved milk secretion compared to baseline, thus it was effective in breast feeding (Bunga & Sa, 2025).

Besides, a nice piece of evidence that here the use of warm compresses was justified certainly comes from works that also demonstrate that warm compresses locally combined with variations of support intervention such as massage can significantly increase breast milk production. Referring to a quasi, experimental study where research subjects participated in warm compress application and rolling of massage, it was confirmed that milk output of the experimental group was significantly higher than that of the control group ($p < 0.05$) and thus it was concluded that the heat produced by thermal stimulation could be. (Kumalasari & Ediyono, 2025)

Physiologically, warm compresses may aid by increasing vasodilation in the breast tissues and thus, facilitating blood flow to the alveoli where milk synthesis takes place. The

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improved local blood circulation due to warm compresses also helps in the release and functioning of lactogenic hormones like prolactin and oxytocin, which are not only necessary for milk secretion but also for the milk ejection reflex. This mechanism accords well with the report of a study conducted on warm herbal compresses, which demonstrated an increase in oxytocin levels and breast milk volume in postpartum mothers. (Br et al., n.d.)

Besides influencing milk flow directly, warm compresses are also related to improved maternal comfort. Application of heat can lessen mechanical tension and pain, thus, removing obstacles to breastfeeding and boosting mother's self, esteem. Along with the beneficial effects on ease of breastfeeding, non, pharmacological breast care methods such as the use of warm compresses are also known to decrease the occurrence of breast milk retention problems. (Saudah et al., 1941)

The drop in the number of women not producing enough breast milk to 6.6% after the treatment is a key result of this study. This situation means that warm cloths on the breasts are helpful in fixing common issues early on after giving birth, like milk taking too long to come in or milk ducts being blocked. Putting heat on the area with warm cloths can help open up blocked milk ducts and ease stress in the breast area, which helps milk flow better.

The results in Table 3 also point to a change in breast milk flow groups toward better levels, showing how the mother's body responds to the heat treatment. Warm cloths can make more blood flow to the breast area and cause the release of the hormone oxytocin, which is very important for milk release. As this process gets better, milk comes out more easily, helping mothers better feed their babies the nutrients they need through breastfeeding.

Additionally, the data study in Table 4 makes the descriptive results in Table 3 stronger. The Wilcoxon Signed Rank Test showed a Z value of –3.464 with a p-value of 0.001 ($p < 0.05$), showing a clearly important change in breast milk flow before and after the treatment. A p-value less than 0.05 proves that the increase in breast milk flow that was seen was not by chance but was a real result of using warm cloths on the breasts.

In general, putting together the results from Table 3 and Table 4 proves that warm cloths on the breasts clearly help breast milk flow in new mothers, both in real-world results and in the numbers. This treatment can be seen as a simple, safe, and easy to use method of care that doesn't use medicine and can be done by midwives in healthcare settings. With better breast milk flow, it is hoped that breastfeeding will be more successful and that new mothers will only breastfeed their babies.

Conclusion

On the basis of the data from the trial, it was revealed that the use of warm breast compresses significantly affected breast milk flow in postpartum mothers at a level of p value < 0.05. The changes in breast milk flow before and after the intervention would not have been random but were most probably a direct consequence of thermal stimulation with warm compresses, according to this finding. Other researchers have also reported similar results, some of which have been documented in the literature. They have found that warm compresses either contribute to increased breast milk production and ejection on their own or, when combined with breast massage, do so by increasing blood circulation in the breast and stimulating the release of oxytocin. Consequently, the agreement between the statistical results and the pre, existing scientific literature lends further support to the conclusion that warm compresses are a safe, effective drug, free method of facilitating breastfeeding postpartum.

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