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# Combination of Oketani and Rolling Massage to Increase Breast Milk **Production**

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#### Abstract

Breast milk is the primary source of nutrition essential for infant growth and development. However, However, many mothers experience difficulties in breast milk production after childbirth, including first-time mothers lacking breastfeeding experience and those who have previously given birth. Several factors influence lactation, with breast care being a key determinant, Despite its importance, many postpartum mothers lack knowledge about proper breast care, leading to insufficient milk production that fails to meet their infants' needs. A combination of Oketani and rolling massage has been suggested as an effective intervention for enhancing milk production. The Oketani and rolling massage method is a specialized breast management technique known to improve milk production without causing discomfort. This study aimed to evaluate the effect of Oketani and rolling massage on increasing breast milk production among postpartum mothers at the Bengkulu City health center. The research employed a quasi-experimental design (pre-posttest with a control group), involving a sample of 60 postpartum mothers—30 in the intervention group and 30 in the control group. Breast milk production was measured before and after the intervention over five consecutive days. The findings, analyzed using the Mann-Whitney test, indicated a statistically significant effect of the intervention on breast milk production ( $\rho = 0.000 < \alpha$ 0.05).

Keywords: Breast Milk; Oketani Massage; Rolling Massage; Postpartum

### INTRODUCTION

Breast milk production remains a significant challenge during the postpartum period for both first-time and experienced mothers (Apreliasari & Risnawati, 2020). Insufficient milk production is often attributed to inadequate breastfeeding preparation, including limited knowledge and skills in breast care (Walyani & Purwoastuti, 2020). Nationally, Indonesia's 2022 Health Profile reported that exclusive breastfeeding coverage declined to 67.96%, compared to 69.7% in 2021 (Kementerian Kesehatan RI, 2023). This decrease underscores weaknesses in the promotion and support of exclusive breastfeeding, highlighting persistent challenges in breastfeeding practices at the national level.

Breast care is a crucial component in supporting successful breastfeeding, as it facilitates milk release, maintains nipple hygiene and health, and helps prevent infections such as mastitis (Anggraini et al., 2022; Mulyani & Lestari, 2023). Additionally, proper breast care stimulates the mammary glands, strengthens the nipples, and enables early detection of potential abnormalities (Dewi et al., 2022). The physiological process of breast milk production involves infant suction on the nipple, which activates a neurohormonal reflex through the hypothalamus, leading to the release of prolactin and oxytocin—hormones essential for milk production and secretion (Asmalinda et al., 2020). Despite this natural process, many postpartum mothers encounter challenges such as sore nipples, breast engorgement, and insufficient milk production, which can hinder breastfeeding success (World Health Organization, 2021).

In response to these challenges, various physical interventions, such as Oketani massage and roll massage, have gained widespread use as non-pharmacological methods for enhancing breast milk production. Oketani massage, a technique originating in Japan, is recognized for its gentle approach and effectiveness in increasing areola flexibility and opening milk ducts, thereby improving both the quantity and quality of breast milk (Dewi et al., 2024). Meanwhile, roll massage, applied along the upper spine, is known to stimulate the parasympathetic nervous system and enhance the release of oxytocin, a hormone essential for triggering the let-down reflex during breastfeeding (Tanjung, 2021; Ningdia et al., 2022).

Although both techniques have demonstrated individual effectiveness, research on their combined impact particularly in Indonesia remains limited. This presents a critical research gap, as the potential synergistic effect of Oketani massage and roll massage may optimize breast milk production more effectively. Additionally, existing interventions predominantly address physiological factors, while breastfeeding success is also significantly influenced by psychological aspects, including maternal stress levels and emotional well-being (Ngestiningrum et al., 2022; Wiryadi et al., 2024).

This study introduces a novel approach by evaluating the combined effects of Oketani massage and roll massage as an integrated intervention. The objective is to optimize neurohormonal reflex stimulation while fostering supportive psychological conditions for postpartum mothers. This method is expected to not only enhance breast milk production but also offer a culturally relevant and resource-efficient solution that can be widely implemented in primary healthcare settings. Additionally, this study addresses gaps in local data and provides a scientific foundation for the development of more comprehensive breastfeeding intervention protocols in Indonesia.

## **METHODS**

This study employs a quantitative research approach with a quasi-experimental design (pre-posttest with a control group) (Syahrial, 2024). The research was conducted in the working areas of Lingkar Timur and Suka Merindu Public Health Centers from May to November 2024.

The study population comprised 167 postpartum mothers from these areas. A total of 60 respondents were selected as the study sample, with 30 assigned to the intervention group and 30 to the control group, using an accidental sampling technique..

The research involves two groups, an intervention group and a control group. The design scheme is as follows:

Intervention Group pretest :  $O_1 \rightarrow X_1$  (Oketani + rolling massage)  $\rightarrow O1_a \rightarrow$  Group post-test Control Group pretest :  $O_2 \rightarrow X_2$  (oxytocin massage only)  $\rightarrow O2_a \rightarrow$  Group posttest

Milk production was measured in milliliters (ml) using a standard measuring cup, with measurements taken each morning after breastfeeding. The process was conducted for 15 minutes per day over five consecutive days. The intervention group received treatment  $X_1$ , which involved Oketani massage and rolling massage performed every morning after breastfeeding for 15 minutes per day over the five-day period. Meanwhile, the control group received treatment  $X_2$ , consisting of oxytocin massage, also performed for 15 minutes per day over five days.

The data were analyzed using paired t-tests or Wilcoxon tests to compare breast milk production before and after the intervention, and independent t-tests or Mann-Whitney tests to compare differences between groups. Bivariate analysis was conducted to assess changes in breast milk production within the same group, utilizing the Wilcoxon signed-rank test with a significance level of  $\alpha=0.05$ . Additionally, to evaluate differences in average breast milk production between groups before and after treatment, the Mann-Whitney test was applied with  $\alpha=0.05$ .

Before conducting the bivariate analysis above, the data normality test was first conducted using the Shapiro-Wilk test at  $\alpha$  5%. The results of the Shapiro-Wilk test showed that the data were not normally distributed. Data was processed using the statistical package for the social science (SPSS) version 23 software. This research has received an ethical feasibility test from the health research ethics committee of STIKes Sapta Bakti Bengkulu, number: 079/FEB/KEPKSTIKesSaptaBakti/2024.

#### RESULTS

Table 1. Distribution of Intervention and Control Group Respondent Characteristics by Age and Parity

Variable	Intervention	Control	p-value
Age			
Mean	28,93	27,70	
Median	28,00	27,00	0,388*
Min	17	20	
Max	40	39	
SD	5,771	5,200	
CI 95%	26,78-31,09	25,76-29,64	
Parity			
Primipara	9 (30,0%)	12(40,0%)	0,650**
Multipara	50 (50,0%)	14(46,7%)	
Grande Multipara	6 (20,0%)	4(13,3%)	

<sup>\*</sup>Independent T-test

Table 1 presents the demographic characteristics of respondents in both groups. The intervention group had an average age of 28.93 years (SD = 5.771), with the majority (50%) being multiparous. In the control group, the average age was 27.70 years (SD = 5.200), with nearly half (46.7%) of the respondents also being multiparous. The equality test results indicated that age and parity were comparable between the intervention and control groups (p > 0.05).

Table 2. Distribution of Mean Breast Milk Production of Respondents Before and After Treatment, and Mean Difference in Breast Milk Production of Respondents in Intervention and Control Groups

Variable	Intervention	Control	p-value
Breast milk production Pre			
Mean	13,20	8,57	
Median	10,00	5,00	0,271*
Min	1	2	
Max	34	20	
SD	11,078	6,484	
CI 95%	9,06-17,34	6,15-10,99	
Breast milk production Post			
Mean	119,60	42,93	
Median	100	27,50	
Min	20	5	
Max	300	150	
SD	67,44	34,54	
CI 95%	94,41-144,79	30,03-55,83	
<b>Differences in Milk Production</b>			
Mean	106,40	34,37	
Median	100	20,00	
Min	20	0	
Max	300	140	
SD	67,44	34,54	
CI 95%	94,41-144,79	30,03-55,83	

<sup>\*</sup>Independent T-test

<sup>\*\*</sup> Chi-Square Test

The mean breast milk production of the intervention group respondents before treatment was 13.20 and the standard deviation was 11.078 and it was believed that 95% of the mean breast milk production of the respondents before treatment was in the range of 9.06 to 17.34. The mean breast milk production of the control group respondents before treatment was 8.57 and the standard deviation was 6.484 and it was believed that 95% of the mean breast milk production of the respondents before treatment was in the range of 6.15 to 10.99. The equality test results showed that breast milk production before treatment in the intervention and control groups was equal (p>0.05).

The mean breast milk production of respondents after treatment was 119.60 standard deviation 67.44 and it was believed that 95% of the mean breast milk production of respondents after treatment was in the range of 94.41 to 144.79. The mean breast milk production of the control group respondents after treatment was 42.93, standard deviation 34.54 and it is believed that 95% of the mean breast milk production of respondents before treatment is in the range of 30.03 to 55.83.

The mean difference in breast milk production of the intervention group respondents was 106.40 standard deviation of 67.44, and it is believed that 95% of the mean difference in breast milk production of the respondents is in the range of 94.41 to 144.79. The mean difference in breast milk production of the respondents in the control group was 34.37 standard deviation of 34.54, and it is assumed that 95% of the mean difference in breast milk production of the respondents is in the range of 30.03 to 55.83. This result shows that the mean difference in breast milk production of the intervention group (Oketani massage and rolling massage) is higher than that of the control group (oxytocin massage) and has a positive pattern.

# **Bivariate Analysis**

Bivariate analysis was conducted to determine the difference in breast milk production of respondents before and after treatment in the same group, namely the *Wilcoxon signed ranks* test with  $\alpha$  5%. Meanwhile, to determine the difference in the average breast milk production of respondents before and after treatment in different groups using the Mann-Whitney test with  $\alpha$  5%.

Before conducting the bivariate analysis above, the data normality test was first conducted using the Shapiro-Wilk test at  $\alpha$  5%. The results of the Shapiro-Wilk test showed that the data were not normally distributed.

Table 3. Differences in Breast Milk Production Before and After Oketani and Rolling Massage in the Intervention Group and Oxytocin Massage in the Control Group

Variable	N	Median (min-max)	Z	p-value
<b>Intervention Group Breast Milk Production</b>				
Intervention Pre	30	10,00 (1-34)	-4,783	0.000***
Intervention Post	30	100,00 (20 -		
		300)		
<b>Control Group Breast Milk Production</b>				
Intervention Pre	30	5,00 (2-20)	-4,542	0.000***
Intervention Post	30	27,50 (5 - 150)		

<sup>\*\*\*</sup> Wilcoxon Test

The results of the analysis with the *Wilcoxon signed rank test* statistical test showed a p-value =  $0.000 \le 0.05$ . So it can be concluded that there is a difference in the mother's milk production before and after Oketani and rolling massage treatment in the intervention group. The results of the analysis with the *Wilcoxon signed rank test* statistical test showed a p-value =  $0.000 \le \alpha \ 0.05$ . So it can be concluded that there is a difference in maternal milk production before and after oxytocin massage treatment in the control group.

Table 4. The Effect of Oketani and Rolling Massage on Increasing Breast Milk Production in Postpartum Mothers

Variable	Mean Difference	Median (Min-Max)	U	p-value
Breastmilk production				
Intervention	72,03	87,00(19,00-275,00)	100,000	0,000****
Control		20,00(0,00-140,00)		

<sup>\*\*\*\*</sup>Mann Whitney Test

The results of the analysis showed a mean difference in breast milk production of postpartum mothers in the intervention group and control group of 72.03 and a positive pattern, which means that the breast milk production of postpartum mothers in the intervention group was higher than the control group. The results of the analysis using the Mann-Whitney test showed a p value =  $0.000 < \alpha \ 0.05$ . So it can be concluded that there is an effect of Oketani and Rolling Massage on increasing breast milk production in postpartum mothers.

# **DISCUSSION**

# Age & Parity

The results showed that the average age of respondents in the intervention group was 28.93 years and the average age of the control group was 27.70 years. Previous studies have shown that age and parity have a significant relationship with breast milk production (Ariani.

P, 2022). Age (p = 0.022), parity (p = 0.053), and frequency of breastfeeding (p = 0.041) were significantly related to breast milk production (Leiwakabessy et al., 2020; Alfiatun et al., 2021)

In terms of parity, most respondents in both the intervention and control groups were multiparous. Parity refers to the number of live births a woman has had. A multiparous woman has given birth two to four times (Manuaba, 2020). According to the previous study, there is a significant relationship between parity and smooth breast milk production (p = 0.001), suggesting that mothers with more childbirth experiences tend to produce more milk due to their increased knowledge and experience in breastfeeding (Rahmawati & Saidah, 2020).

## **Breastmilk Volume Results**

The study results demonstrated an increase in breast milk production among both the intervention and control groups. In the intervention group, the average breast milk volume before treatment was 13.20 ml with a standard deviation (SD) of 11.08, and a 95% confidence interval (CI) ranging from 9.06 to 17.34 ml. After the administration of Oketani and rolling massage for five consecutive days, the average volume increased significantly to 119.60 ml (SD = 67.44), with a 95% CI of 94.41 to 144.79 ml. In the control group, which received only oxytocin massage, the average breast milk volume before treatment was 8.57 ml (SD = 6.48), with a 95% CI of 6.15 to 10.99 ml. Following the intervention, the average increased to 42.93 ml (SD = 34.54), with a 95% CI of 30.03 to 55.83 ml.

Statistical analysis using the Wilcoxon signed-rank test revealed a significant increase in breast milk production both in the intervention group (p = 0.000; p  $\leq$  0.05) and the control group (p = 0.000; p  $\leq$  0.05). Furthermore, the mean difference in milk production between the two groups was 72.03 ml, indicating a more pronounced increase in the intervention group. This difference was tested using the Mann-Whitney U test, which also yielded a significant result (p = 0.000; p < 0.05), confirming that the combination of Oketani and rolling massage was more effective than oxytocin massage alone in increasing breast milk production in postpartum mothers.

# **Intervention Mechanism**

Oketani massage is known to help alleviate pain after childbirth by promoting physical relaxation in the mother. As the body begins to recover post-delivery, this massage technique supports that process by specifically targeting the breast area. Unlike conventional breast massages, Oketani massage gently softens and increases the elasticity of the areola, nipples, and surrounding breast tissue. This improved flexibility facilitates easier latch-on for the baby during breastfeeding. Additionally, by applying pressure to the alveoli, the massage helps regulate and improve the flow of breast milk, ensuring it is released more smoothly and evenly

(Dary & Sulistyaningsih, 2023). Likewise, rolling back massage can influence the endorphin hormone and stimulate the oxytocin reflex which can also relax the mother and smooth the flow of nerves and milk ducts in both breasts (Juwita & Annisa, 2023; Kasmawati et al., 2024)).

# The Comparison with the Previous Study

The results of this study are in line with the previous study which reported an increase in breast milk from an average of 82.40 cc to 105.20 cc after Oketani massage (p = 0.000). In this current study, the intervention group saw an average increase of 106.40 ml (SD = 67.44), while the control group had a 34.37 ml increase (SD = 34.54) (Sari & Syahda, 2020).

The difference in breast milk production in the control group also showed an increase, but it was lower compared to the intervention group that received Oketani and rolling massage. Oxytocin massage performed in the control group was able to enhance breast milk production, but the increase was less significant than that observed with the combination of Oketani and rolling massage. These findings are consistent with the previous study which examined the effect of Oketani massage on breast milk production in postpartum mothers at the Bangkinang Community Health Center. The study reported that after receiving Oketani massage, the average breast milk production reached 105.20 cc, with a p-value of 0.000 ( $\leq 0.005$ ) (Sari & Syahda, 2020).

Oketani massage, consisting of eight techniques including retro-mammae separation and milking motions, stimulates the mammary glands, improves breast tissue flexibility, and increases milk quality in terms of fat content and energy (Yasni et al., 2020). When combined with rolling massage, the results are more pronounced compared to oxytocin massage alone, as rolling massage also reduces breast engorgement and enhances oxytocin release (Juwita & Annisa, 2023; Hairunisyah, 2025).

Despite the positive results, several factors must be considered. The study did not explore long-term breastfeeding outcomes or variations in maternal nutrition, psychological state, or infant demand, all of which could influence milk production. Additionally, the sample size and geographic scope may limit generalizability. In practice, the combination of Oketani and rolling massage offers a promising, non-pharmacological intervention to support postpartum lactation. It is recommended that healthcare providers incorporate these techniques into routine postpartum care and educate mothers on their application. Further research should explore the long-term benefits, potential interactions with other lactation interventions, and applicability across diverse populations.

## **CONCLUSIONS**

The study revealed that the integration of Oketani massage with rolling massage was significantly more potent in increasing the volume of breast milk production in postpartum mothers than oxytocin massage alone. The intervention group that received the combination of these two methods recorded an average increase in breast milk volume of 106.40 ml, while the control group that only received oxytocin massage only experienced an average increase of 34.37 ml. Wilcoxon and Mann-Whitney U statistical analysis confirmed that this increase was statistically significant (p = 0.000).

The effectiveness of the Oketani technique is believed to stem from its ability to improve breast tissue elasticity as well as stimulate milk flow through pressure on the alveoli, while the rolling massage also contributes to calming and stimulating the release of oxytocin hormone. This combination supports smooth lactation both physiologically and psychologically.

These results are in line with previous studies and strengthen the evidence that nonpharmacological techniques such as Oketani massage and bolster massage can be effective and practical interventions in postpartum care. However, this study has limitations in terms of geographical reach, and sample size, and has not evaluated the long-term impact or other external factors that may affect milk production. The combination of Oketani massage with rolling massage should be considered as part of a series of postpartum care protocols by health workers. Further research is recommended to explore the long-term benefits and applicability to a wider population.

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