



EFFECTIVENESS OF WOOLWICH MASSAGE ON BREAST MILK INTAKE AND INFANT WEIGHT GAIN IN POSTPARTUM MOTHERS

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ABSTRACT	Keywords
Lactation problems during the early postpartum period, such as delayed onset of lactation and breast engorgement, frequently trigger excessive neonatal weight loss and increase the risk of exclusive breastfeeding failure, which predisposes infants to stunting. This study aimed to analyze the effectiveness of the Woolwich Massage intervention on increasing breast milk intake and infant weight gain among postpartum mothers. Method: This quasi-experimental study using a non-equivalent control group design with pre-test and post-test involved 26 postpartum mothers in the Gebangmalang village and Tambakagung village, selected through purposive sampling (13 in the intervention group and 13 in the control group). Breast milk intake was measured using the test weighing method, and infant weight was recorded before and after a 5-day intervention period. The Wilcoxon Signed Rank Test showed that the intervention group experienced a significant increase in mean breast milk intake by 28.9 ml and a significant mean infant weight gain of 190.8 grams, with respective significance values of $p\text{-value} = 0.001$ ($p < 0.05$). Woolwich Massage effectively stimulates the lactiferous sinuses mechanically and hormonally to trigger prolactin release and optimize breast emptying. This complementary therapy is proven effective in optimizing early neonatal nutritional fulfillment and supporting ideal physical growth.	Woolwich Massage, Breast Milk Intake, Infant Weight Gain, Postpartum Mothers

INTRODUCTION

Stunting remains a significant chronic nutritional problem in Indonesia. Based on the Indonesian Nutritional Status Survey (SSGI), the national stunting prevalence in 2023 is projected to reach 21.5% and decline to 19.8% in 2024. However, specific nutritional interventions are still needed, particularly during the First

1,000 Days of Life (HPK), a critical phase of child growth and development (Kementerian Kesehatan RI, 2023). One of the most effective interventions during this period is exclusive breastfeeding for the first six months of life (Victora et al., 2016).

The World Health Organization (WHO) confirms that early initiation of

breastfeeding and exclusive breastfeeding play a crucial role in reducing the risk of infant mortality and preventing chronic malnutrition (World Health Organization, 2023). Breast milk provides all the nutritional needs of infants, supports immune system development, and contributes to optimal physical and neurological growth (Horta & Victora, 2013). However, exclusive breastfeeding coverage in Indonesia has yet to reach the national target, partly due to lactation problems that occur in the early postpartum days (Kementerian Kesehatan RI, 2022).

Postpartum mothers, especially primiparas, often experience delayed onset of lactation (DOL) and milk stagnation in the early postpartum phase (days 0-3). This condition is influenced by various factors, including suboptimal breast emptying, physical fatigue, psychological stress, and a lack of adequate mechanical stimulation of the breasts (Peng et al., 2024). This irregular milk production directly impacts the baby's physiological weight loss (>10%) in the first week of life. If left untreated, mothers tend to provide formula milk as a substitute (prelacteal), which actually increases the risk of gastrointestinal infections and impaired nutrient absorption, which are predisposing factors for stunting (Victora et al., 2016). Therefore, interventions to ensure a smooth flow of breast milk from day one are crucial for maintaining optimal infant growth. The early days after birth are crucial for building bonding, early initiation of breastfeeding (IMD), and ensuring the baby receives colostrum and exclusive breastfeeding for optimal brain and physical development. In midwifery practice, non-pharmacological interventions to support smooth lactation have been widely applied, one of which is oxytocin massage. Oxytocin massage works through parasympathetic nerve stimulation to increase the release of the hormone oxytocin and facilitate the let-

down reflex (Rahmita & Mardiya, 2022; Sukmawati & Sari, 2025; Zelharsandy, 2025). Although effective in providing a relaxing effect, oxytocin massage works systemically hormonally and does not provide direct mechanical stimulation to the blocked area in the breast, especially in the lactiferous sinus (the milk reservoir behind the areola). Often, the hormone oxytocin has worked (the let-down reflex occurs), but the milk is still difficult to come out because of the blockage of the duct in the anterior area of the breast that has not been mechanically broken down (*Oxytocin-a System Activator*, 2013).

To address this gap, the Woolwich Massage technique offers potential complementary therapy. Woolwich Massage is a breast massage technique that focuses on mechanical stimulation of the lactiferous sinus area with the aim of clearing blocked ducts and optimizing milk flow. This technique mimics the movement of a baby's tongue during breastfeeding, thereby supporting a more effective breast emptying process (Irwan Batubara et al., 2024). In addition to its mechanical effect, stimulation of the areola area also has the potential to simultaneously increase the release of the hormones prolactin and oxytocin, which play a crucial role in milk production and release (Christiana et al., 2024). However, research related to Woolwich Massage in Indonesia is still limited. Most existing studies only assess breast milk flow based on subjective indicators or instantaneous expressed milk volume (Irwan Batubara et al., 2024). Scientific evidence linking Woolwich Massage interventions to objective indicators of infant nutritional adequacy, such as breast milk intake, measured quantitatively through test weighing, and infant weight gain in the first week of life, is still very limited. However, breast milk intake and infant weight gain are important

clinical indicators that reflect early nutritional adequacy and serve as a foundation for stunting prevention from the neonatal period (Horta & Victora, 2017).

Based on this gap, interventional research is needed that can provide strong scientific evidence regarding the effectiveness of Woolwich Massage on breast milk intake and infant weight gain in primiparous postpartum mothers. This research is expected to contribute to the development of evidence-based midwifery care and support the national priority program for stunting prevention through optimizing breastfeeding from the earliest stages of life.

This research is urgently needed to provide strong scientific evidence regarding the effectiveness of Woolwich Massage as a midwifery intervention solution that is applicable, easy, low-cost, and can be implemented independently by mothers.

METHOD

This study used a quasi-experimental design with a non-equivalent control group pretest-posttest design. The study was conducted in Gebang Village, Malang, and Tambak Agung Village, Mojokerto Regency. The study population was all postpartum mothers with term infants who met the inclusion criteria. A sample of 26 respondents was selected using purposive sampling and divided into an intervention group (n=13) and a control group (n=13).

The intervention group received Woolwich Massage for 15–20 minutes twice daily for five consecutive days according to standard operating procedures (SOP), while the control group received routine postpartum care without Woolwich Massage. The independent variable in this study was Woolwich Massage, while the dependent variables included infant breast milk intake and weight gain.

Breast milk intake was measured using the test weighing method, which involves weighing the infants before and after breastfeeding using a digital scale. Infant weight gain was calculated based on the difference in weight between the initial and final measurements. Respondent characteristics data were collected using a structured observation sheet. Data were analyzed using an *Wilcoxon Signed Rank* Test with a significance level of $p < 0.05$.

RESULTS

Table 1. Respondent characteristics based on age, education, parity, and occupation in Gebangmalang Village, and Tambakagung Village.

Respondent characteristics in Table 4.1 show that in the intervention group, most mothers were aged <21 years (62%) and the majority were primiparous (62%). Meanwhile, in the control group, most were aged 21-35 years (85%) and multiparous (77%).

No	Variable	Control group		Intervention group	
		f	(%)	f	(%)
1	Maternal age				
	< 21	0	0	8	62
	21 - 35	11	85	4	31
	> 35	2	15	1	8
2	Parity				
	Primipara	3	23	8	62
	Multipara	10	77	5	38
3	Education				
	SD-SMP	1	8	1	8
	SMA/SMK				
	K	11	85	12	92
	S1	1	8	0	0
4	Occupation				
	Working	3	23	4	31
	Unemployed	10	77	9	69
	TOTAL	13	100	13	100

Table 2. Differences in breast milk intake in the control group before and after.

Intake ASI	Mean	N	Difference	ρ
Before	4,00	13	15,1	0,001
After	19,1	13		

The results of the statistical test using the *Wilcoxon Signed Rank Test*, showed a p -value = 0.001 (p -value <0.05) which means there was a significant difference in the amount of breast milk intake before and after.

Table 3. Differences in breast milk intake in the intervention group before and after being given *Woolwich Massage*

Intake ASI	Mean	N	Difference	ρ
Before	3,1	13	28,9	0,001
After	32	13		

The results of the statistical test using the *Wilcoxon Signed Rank Test*, showed a p -value = 0.001 (p -value <0.05) which means there was a significant difference in the amount of breast milk intake before and after being given *Woolwich Massage*.

Table 4. Difference in infant weight in the control group before and after

Body weight	Mean	N	Difference	ρ
Before	3066,2	13	100,8	0,001
After	3166,9	13		

The results of the statistical test using the *Paired t-test*, showed that the p -value = 0.001 (p -value <0.05) which means that there was a significant difference in the baby's weight before and after in the control group.

Table 5. Difference in infant weight in the intervention group before and after being given *Woolwich Massage*

Body weight	Mean	N	Difference	ρ
Before	3068,5	13	190,8	0,001
After	3259,2	13		

The results of statistical tests using the *Wilcoxon Signed Rank Test* showed that the p -value = 0.001 (p -value <0.05), which means there was a significant difference in baby weight gain before and after being given *Woolwich Massage*.

DISCUSSION

Breast milk intake before and after *Woolwich Massage*

Breast milk intake in the intervention group after receiving *Woolwich Massage* therapy increased by 28.9 ml, with a significance value of 0.001. Based on the analysis of the results, the research hypothesis was accepted, namely that there was a difference in breast milk intake in the intervention group before and after *Woolwich Massage*.

In this study, breast milk intake on the first day averaged 4 ml. Breast milk intake after receiving *Woolwich Massage* twice daily for five days increased to an average of 15.1 ml.

Physiologically, in the first days after delivery, breast milk production is still inhibited by the activity of the hormones progesterone and estrogen, which are antagonistic to prolactin. The decrease in these hormones after the placenta is delivered triggers the second phase of lactogenesis, which is characterized by a significant increase in breast milk secretion. One way to increase breast milk production in postpartum mothers is by providing a relaxing sensation to stimulate the hormones prolactin and oxytocin through *Woolwich Massage* (Retnawati et al., 2024). Prolactin influences the amount of breast milk

production, while oxytocin influences the milk production process.

The advantage of the *Woolwich Massage* intervention lies in the precise circular massage of the lactiferous sinus area (1-1.5 cm outside the areola). This local stimulation sends impulses to the hypothalamus, stimulating the anterior pituitary to increase prolactin secretion, while simultaneously suppressing factors inhibiting lactation (Sari et al., 2023). Woolwich massage has several benefits, including increasing the prolactin and oxytocin reflex (let-down reflex), preventing blockages, increasing milk production, and preventing inflammation or breast engorgement (Retnawati et al., 2024).

The results of this study are also supported by a case study reported by Meirita et al. (2024), which concluded that Woolwich Massage was proven effective in significantly increasing breast milk production from 132 cc to 420 cc within 7 days. Woolwich Massage is considered more effective than back massage techniques because its intervention provides a more specific approach to lactation physiology by directly stimulating the mammary glands, rather than simply providing general body relaxation (Meirita et al., 2024).

Therefore, the combination of hormonal stimulation and the mechanical effects of this massage aligns with the theory of Sari et al. (2023), which states that *Woolwich Massage* can empty the lactiferous sinuses and relieve milk duct blockages. Optimal milk availability in the anterior breast area ensures that the baby receives maximum fluid intake when breastfeeding.

Baby Weight Gain Before and After Woolwich Massage

The weight of infants in the intervention group after receiving *Woolwich Massage*

therapy increased by 190.8 grams, with a significance value of 0.001. Based on the analysis of the study results, the research hypothesis was accepted, namely that there was a difference in infant weight in the intervention group before and after *Woolwich Massage*.

The average infant weight before treatment was 3068.5 grams, increasing to an average of 3259.2 grams. Weight is one of the main anthropometric indicators used to assess and monitor growth status in infants. Several factors influence infant weight gain, one of which is good nutrition. Adequate and balanced nutrition can increase infant weight, while inadequate nutrition can decrease it. Therefore, for newborns, the best nutritional support should be oriented towards exclusive breastfeeding for the first 6 months of life. However, in practice, smooth milk production is greatly influenced by several external and internal factors, including breastfeeding frequency, maternal psychological well-being, and breast care (Khusniyati & Purwati, 2024).

Woolwich Massage is an effective non-pharmacological method for optimizing breast care. It can stimulate myoepithelial cells to produce breast milk, increase milk volume, and prevent breast engorgement (Retnawati et al., 2024). This massage stimulates breast nerve cells, which are then transmitted to the hypothalamus and responded to by the anterior pituitary gland, releasing the hormone prolactin (Umi, 2024). Prolactin plays a crucial role in smooth breast milk production.

The results of this study align with Umi's (2024) study, which demonstrated that Woolwich Massage interventions for breastfeeding mothers significantly influenced weight gain in infants aged 0-6 months ($p\text{-value} = 0.022$ ($p < 0.05$)). In the study, the intervention group, which received twice-daily Woolwich massage stimulation, achieved a significantly higher

average weight gain of 268 grams in 7 days, compared to the control group (lactation technique education only), which only experienced an average gain of 98.66 grams. This confirms that the dual stimulation of sucking and Woolwich massage mechanically empties the lactiferous sinuses, thus significantly improving the infant's fluid intake.

With smooth breast milk production and release, the infant's macro and micronutrient needs are optimally met, including the transfer of calorie-rich fat (hindmilk). Signs that the baby is receiving sufficient breast milk include weight gain according to the growth curve on the Health Card (KMS), urination frequency of 6-8 times daily, and bowel movements of 3-4 times daily. According to the KIA (Mother's and Child's Health) handbook, infants aged 1-3 months typically gain around 800-900 grams per month. When monitored weekly, infants' weight at this age will increase by between 100 and 200 grams (Kementerian Kesehatan RI, 2020; Umi, 2024). Therefore, the average weight gain of 190.8 grams in this study demonstrates that Woolwich Massage is an effective intervention for maintaining optimal infant growth.

CONCLUSIONS

Based on the results of data analysis, it can be concluded that the Woolwich Massage intervention was proven to be significantly effective in increasing infant breast milk intake by 28.9 ml (from an average of 3.1 ml to 32 ml) and triggering a significant increase in infant weight by 190.8 grams (from an average of 3,068.5 grams to 3,259.2 grams) during five days of treatment with a significance value of $p\text{-value} = 0.001$ ($p < 0.05$). Therefore, it is recommended for midwives and clinical practitioners to integrate the Woolwich Massage technique as one of the standards of

postpartum complementary care to prevent delayed onset of lactation (DOL).

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