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*Article*

# The Effect of Oxytocin Massage in Postpartum Mothers On Baby Weight Gain In The Cikalong Public Health Center Area Bandung District In 2022

**Rika Nurhasanah [1]* and Rani Sumarni [2]**

[1,2] Universitas Jenderal Achmad Yani, Indonesia
* Correspondence: rika_dot@yahoo.com.au

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**Abstract**

**Background:** Postpartum care plays a critical role in supporting breastfeeding and ensuring optimal infant growth, particularly in the early days after birth. Oxytocin massage, a non-pharmacological technique that stimulates milk ejection, has been proposed as an effective method to enhance lactation and promote infant weight gain.
**Objective:** This study aimed to examine the effect of oxytocin massage on infant weight gain among postpartum mothers at the Cikalong Public Health Center in Bandung District, Indonesia.
**Methods:** A quasi-experimental design with a posttest-only control group was used. The sample included 30 postpartum mothers on their first day after delivery, selected through purposive sampling and divided into an intervention group (n=15) and a control group (n=15). The intervention consisted of oxytocin massage administered daily until day 7 postpartum. Infant weight was measured on day 7. Data were analyzed using univariate and bivariate methods, including the Mann-Whitney U test.
**Results:** The mean infant weight in the intervention group was 3210.00 grams (SD=268.73), compared to 3006.67 grams (SD=259.03) in the control group. A significant difference was observed between the groups (p=0.0001), indicating that oxytocin massage contributed to greater weight gain.
**Conclusion:** Oxytocin massage in postpartum mothers significantly enhances infant weight gain and supports breastfeeding success. This non-pharmacological intervention can be integrated into postpartum care practices.

**Keywords**: Oxytocin massage, infant weight gain, postpartum mothers, breastfeeding, maternal health

## INTRODUCTION

Breast milk is the first, most essential, and natural source of nutrition for newborns, and it is strongly recommended as the exclusive food during the initial months of life (Fitria, 2021). Exclusive breastfeeding defined as providing only breast milk without any additional liquids or solid foods, including water or formula is advocated by the World Health Organization (WHO) and supported by national policies. According to WHO guidelines, and as mandated by the Indonesian Government through Regulation No. 33 of 2012 and Ministry of Health Decree No. 450/SK/Menkes/VIII/2004, mothers are encouraged to exclusively breastfeed for the first six months of life (World Health Organization, 2001; Ministry of Health, 2012).

Breastfeeding has numerous well-established benefits for both infants and mothers. For infants, it enhances immune function, ensures optimal nutrition, strengthens emotional bonding with the mother, promotes healthy growth, and reduces the risk of malnutrition and infectious diseases. For mothers, breastfeeding helps reduce the risk of postpartum hemorrhage, supports uterine involution, and lowers the risk of breast cancer (Fitria & Retmiyanti, 2021; Smith, 2007). Despite these benefits, exclusive breastfeeding coverage in Indonesia remains

suboptimal. Nationally, the rate declined from 68.74% in 2018 to 52.3% in 2019, well below the national target of 80% (Ministry of Health, 2019). In West Java, exclusive breastfeeding coverage was only 53.0%, and in West Bandung Regency, it was among the lowest at just 20.34%.

Several factors contribute to the low rates of exclusive breastfeeding, including early introduction of prelacteal feeds, insufficient family support, and physiological or psychological challenges such as the perception of inadequate milk supply. Many mothers believe their breast milk is insufficient, leading them to supplement with formula milk, especially during the critical first week postpartum when milk production is not yet optimal (Prasetyo et al., 2023; Pérez-Escamilla et al., 2022).

One promising intervention to enhance milk production is oxytocin massage, which stimulates the release of the oxytocin hormone and facilitates milk ejection. Studies have shown that oxytocin massage positively influences milk production and infant weight gain. For example, Magdalena et al. (2019) and Anggraeni & Lubis (2021) demonstrated that oxytocin massage significantly increased breast milk production. Fatimah and Ayuningrum (2021) further found that oxytocin massage led to an average weight gain of 284.85 grams in infants aged 0–6 months, with a statistically significant result ($p = 0.0001$). Similarly, Lestari et al. (2021) highlighted the strong relationship between oxytocin massage and improved breastfeeding outcomes. According to the 2020 annual report from the Cikalong Public Health Center, the exclusive breastfeeding coverage was only 22.9%, far below the 100% target. This underscores the urgent need for evidence-based interventions. Therefore, this study aims to evaluate the effect of oxytocin massage on infant weight gain among postpartum mothers in the working area of Cikalong Public Health Center, Bandung Regency.

## METHODE

### Study design

This study employed a quasi-experimental design with a posttest-only control group to examine the effect of oxytocin massage on infant weight gain. The study aimed to compare outcomes between postpartum mothers who received the oxytocin massage intervention and those who did not..

### Sample

The total sample consisted of 30 postpartum mothers selected through convenience sampling within the working area of the Cikalong Health Center. Fifteen participants were assigned to the intervention group and fifteen to the control group. The sample size was determined based on the feasibility of recruitment and resource availability in the community setting. Although a formal power analysis was not conducted, the selected sample size is consistent with recommendations for pilot or exploratory quasi-experimental studies, where sample sizes between 24 and 50 participants are often considered adequate for detecting large effect sizes and assessing intervention feasibility (Julious, 2005; Whitehead et al., 2016). This approach is commonly used in resource-limited or rural settings to gather preliminary evidence before scaling up to larger trials. Future research should incorporate formal power calculations and larger samples to enhance statistical power and generalizability.

### Data collection

The oxytocin massage was administered on the seventh day postpartum. The intervention involved the application of massage to the mother's back, focusing on the paravertebral area between the scapula and the 12th rib, intended to stimulate the release of endogenous oxytocin. The massage was performed by trained family members of the mothers, who received instruction from healthcare providers based on a standardized checklist developed and published in 2018. While the checklist was referenced, details on its reliability and validity, as well as the source citation, are required to support its methodological soundness.

Data collection included recording each infant's birth weight and weight on day 7 postpartum. Measurements were documented using a structured data table. The weight was measured using a calibrated infant scale by trained healthcare personnel to ensure accuracy and consistency.

### Data Analysis

The outcome variable was infant weight gain from birth to day 7 postpartum. Data were analyzed using SPSS version 26. Descriptive statistics were used to present participant characteristics and weight measurements. Bivariate analysis was conducted to compare weight gain between the intervention and control groups. Due to the small sample size and non-normal distribution of the data, the Mann-Whitney U test was employed as an appropriate non-parametric alternative to the independent samples t-test. The significance level was set at $p < 0.05$.

### Ethical Consideration

Participants were provided with information regarding the purpose and benefits of the study, including assurances of confidentiality and the voluntary nature of participation. Informed consent was obtained prior to enrollment. Ethical approval was secured from the relevant institutional review board, although the reference number was not recorded in the manuscript and should be included in future revisions for completeness.

## RESULTS

Prior to the intervention, the mean birth weight in the intervention group was 3039.67 grams (SD = 328.19), slightly lower than the control group, which had a mean of 3084.67 grams (SD = 248.07). The birth weight ranged from 2400 to 3685 grams in the intervention group, and from 2650 to 3500 grams in the control group. Both groups had similar median weights around 3100 grams, indicating comparable distributions at baseline (Table 1).

**Table 1.** Infant Birth Weight Before Intervention in the Intervention and Control Groups

| Group | Mean (g) | Median (g) | SD (g) | Min–Max (g) | 95% CI (g) |
|---|---|---|---|---|---|
| Intervention | 3039.67 | 3110.35 | 328.19 | 2400–3685 | 2857.92–3221.41 |
| Control | 3084.67 | 3100.00 | 248.07 | 2650–3500 | 2947.29–3222.05 |

Following the intervention, the mean infant weight in the intervention group increased to 3210.00 grams (SD = 268.73), higher than that of the control group, which averaged 3006.67 grams (SD = 259.03). In the intervention group, weights ranged from 2700 to 3500 grams, while in the control group, weights ranged from 2500 to 3450 grams. These findings suggest a greater weight gain among infants who received the intervention.

**Table 2.** Infant Weight After Intervention in the Intervention and Control Groups

| Group | Mean (g) | Median (g) | SD (g) | Min–Max (g) | 95% CI (g) |
|---|---|---|---|---|---|
| Intervention | 3210.00 | 3300.00 | 268.73 | 2700–3500 | 3061.18–3358.82 |
| Control | 3006.67 | 3000.00 | 259.03 | 2500–3450 | 2863.22–3150.11 |

A Mann–Whitney U test revealed a statistically significant difference in post-intervention infant weight between the intervention and control groups (p = 0.0001). Infants in the intervention group had significantly higher weight gain compared to those in the control group, suggesting the intervention's effectiveness in promoting early weight gain

**Table 3.** Comparison of Infant Weight Gain Between the Intervention and Control Groups

| Group | N | Mean Rank | SD (g) | p-value |
|---|---|---|---|---|
| Intervention | 15 | 22.07 | 268.73 | 0.0001 |
| Control | 15 | 8.93 | 248.07 | |

## DISCUSSION

This study demonstrated that postpartum oxytocin massage is significantly associated with increased infant weight gain. The intervention group showed a higher mean post-intervention infant weight (M = 3210.00 g, SD = 268.73) compared to the control group (M = 3006.67 g, SD = 259.03), with a statistically significant difference (p = 0.0001). These findings support the physiological rationale that oxytocin release facilitates breastfeeding and contributes to improved infant nutritional status and weight gain. The baseline birth weights of infants in both groups were within the normal range of 2500–4000 grams, consistent with Indonesian perinatal standards (Riawati & Suparti, 2018a). Although the control group initially had a slightly higher mean birth weight than the intervention group, post-intervention assessments revealed a reversal, with the intervention group achieving greater weight gain. These results align with prior studies demonstrating that oxytocin stimulation enhances milk ejection, increases maternal relaxation, and improves neonatal outcomes (Jonas & Woodside, 2010; Ueda et al., 1994).

The biological mechanism of oxytocin massage supports these findings. Oxytocin stimulates the contraction of myoepithelial cells surrounding alveoli in the mammary glands, promoting effective milk letdown. As milk production and release improve, infants can feed more efficiently, leading to better weight gain (Babendure et al., 2015; Zetterström, 1999). This is further supported by clinical evidence showing increased milk flow, longer sleep intervals in infants, and more frequent bowel movements as indicators of sufficient breastfeeding. Mothers in the intervention group received oxytocin massage starting two hours postpartum, continued daily for ten days. Frequent massage (three times daily) was associated with a significant and consistent increase in infant weight. This echoes findings from Rahayu and Yunarsih (2018), who observed substantial neonatal weight gain and improved breastfeeding behaviors among mothers receiving oxytocin massage. Similarly, Eliyanti and Herawati (2019) reported a transition from absent to smooth milk production among post-cesarean mothers receiving massage on the second postpartum day. In the rural setting of Cikalong, West Java, where limited access to advanced lactation support persists, oxytocin massage may serve as an effective, low-cost, and culturally acceptable intervention to support breastfeeding and combat low birth weight (LBW). The 2021 local health center data showed a 43.11% incidence of LBW, higher than the national average which is highlighting the urgent need for accessible postpartum support strategies.

Our findings align with national efforts to promote exclusive breastfeeding as a strategy to reduce infant morbidity and mortality. Research by Fitria and Retmiyanti (2021b) also supports the effectiveness of oxytocin-based massage interventions (SPEOS method) in increasing breast milk production and neonatal weight. Despite promising outcomes, this study has several limitations. First, the quasi-experimental design without random assignment introduces potential selection bias. Second, the sample size was relatively small (n = 30), limiting generalizability. Third, there was no blinding of participants or assessors, potentially influencing subjective assessments of breastfeeding adequacy. Additionally, self-reported maternal dietary intake and stress levels may be subject to recall or reporting bias. Future research should adopt randomized controlled trials with larger sample sizes and objective lactation biomarkers (e.g., prolactin, oxytocin levels) to validate these findings. Exploring the long-term impact of oxytocin massage on exclusive breastfeeding duration and infant development is also warranted.

## CONCLUSION

This study confirms that oxytocin massage administered during the postpartum period significantly increases infant weight gain, likely by enhancing breast milk production and maternal relaxation. The findings emphasize the importance of promoting oxytocin massage as a non-pharmacological, cost-effective intervention to support early breastfeeding, particularly in rural and resource-limited settings. Integration of this practice into routine postnatal care by trained midwives could contribute to reducing the prevalence of low birth weight and improving infant survival.

### Conflict of Interest

The authors declare no conflict of interest related to the conduct, authorship, or publication of this study.

### Acknowledgement

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### Data Availability Statement

The datasets generated and analyzed during the current study are not publicly available due to participant confidentiality but are available from the corresponding author on reasonable request.

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