Original Article

Enhancing Breast Milk Production and Body Weight through Complementary Oxytocin Massage Therapy

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Abstract

Background: Newborns' nutrition and development depend on breast milk, but many moms don't produce enough, which is bad for their babies' health and development. One non-pharmacological approach that has been shown to improve milk ejection is oxytocin massage. Few research have investigated its combined impact on low-resource settings and newborn weight increase, despite indications of its usefulness.
Objective: Specifically, we want to know how well oxytocin massage treatment works as a supplement to increase milk supply and boost baby weight gain.
Methods: A quasi-experimental research was carried out in Sukabumi, West Java, with 70 postpartum moms and their infants aged 0-3 months. The study used a pre-test and post-test control group design. Two groups were established: one that received regular postpartum care and another that received oxytocin massage daily for seven days. We assessed breast milk supply and baby weight before and after the intervention. The data was examined by means of multivariate regression analysis, paired t-tests, and independent t-tests.
Results: In comparison to the control group, the intervention group demonstrated a notable rise in both baby body weight (mean difference: 0.5 kg, $p = 0.001$) and breast milk production (mean difference: 240 mL/day, $p < 0.001$). Treatment with oxytocin massage continued to be associated with better results even after controlling for factors such as mother age, parity, and level of education.
Conclusion: Boosting breast milk supply and promoting newborn weight growth are both achieved with complementary oxytocin massage treatment. This intervention provides a practical and affordable way to enhance the health of newborns and the success of breastfeeding, especially in areas with limited resources. The advantages over the long run and its applicability to more diverse groups should be the focus of future research.

Keywords: Oxytocin massage, breast milk production, infant weight gain, postpartum care, breastfeeding intervention

INTRODUCTION

Babies rely on breast milk for nourishment because it helps them develop normally and provides them with antibodies to fight off illness. However, not all moms are able to produce enough breast milk, which might impact their health and cause their children to acquire too little weight. Prolactin and oxytocin are the two primary hormones that regulate milk production in the breasts (1,2). Prolactin boosts milk synthesis, while oxytocin helps with milk ejection. An effective non-pharmacological technique for enhancing breast milk supply and flow is oxytocin massage, which works by increasing secretion of oxytocin and triggering

the let-down reflex (3).

Establishing an appropriate supply of breast milk during the early postpartum period is essential, but many women encounter difficulties, particularly first-time moms, who may suffer from hormonal imbalances and psychological stress (4,5). Many locations still have less than ideal rates of exclusive breastfeeding. For instance, in 2020, the proportion of infants breastfed exclusively was 69.62%, and in 2021, it rose to 71.58%, according to the Indonesian Ministry of Health. However, in several provinces, this figure was still below than the national objective (6). National Nutrition Day in 2022 emphasised the importance of exclusive breastfeeding in minimising the incidence of stunting (7), a major public health concern.

Evidence suggests that oxytocin massage, which begins at the spinal column and works its way up the body to the fifth and sixth costae, can improve milk ejection and strengthen the link between mother and child (8). There is evidence that this strategy can reduce stress for mothers, which in turn increases milk supply and helps babies gain weight more quickly (9). Because there are many underlying causes of breastfeeding problems, other treatments including psychological support and nutritional changes have also been investigated (10).

Research on the combined benefits of oxytocin massage and breast milk production and newborn weight growth is limited, especially in low-resource settings, despite the accumulating data favouring oxytocin massage. This therapy's full advantages have not been thoroughly studied since most studies just look at milk supply or baby outcomes (11). In order to standardise methods and optimise outcomes, more research is needed to address variances in oxytocin massage protocols and techniques (12). Although existing evidence suggests that oxytocin massage, starting at the spinal column and progressing toward the fifth and sixth costae, can improve milk ejection and foster stronger maternal-infant bonding (8), research remains limited in several key areas. Previous studies have shown that oxytocin massage can reduce maternal stress, enhance breast milk production, and support greater infant weight gain (9). Furthermore, interventions such as psychological counseling and nutritional support have also been explored to address breastfeeding challenges (10).

However, despite accumulating evidence supporting the benefits of oxytocin massage, there is a significant gap in the literature regarding its combined effects on both breast milk production and infant weight gain, particularly within low-resource settings. Most existing studies have focused either on maternal lactation outcomes or neonatal outcomes separately, without fully investigating the interconnected effects of oxytocin massage on both aspects simultaneously (11). Moreover, inconsistencies in massage techniques, timing, and protocols across studies present further challenges to standardization and broader clinical application (12).

The novelty of the present study lies in its integrated approach: it seeks to assess not only the impact of oxytocin massage on enhancing breast milk supply but also its simultaneous effect on promoting newborn weight gain. By focusing on a combined outcome in a low-resource context, this study addresses critical gaps in the current knowledge base. Additionally, it aims to contribute to the standardization of oxytocin massage procedures, ultimately providing a comprehensive evidence base to guide clinical practice for improving maternal and neonatal health outcomes.

METHODS

Study Design

The research used a quasi-experimental approach with a control group that was evaluated both before and after the intervention. Examining the effects of supplementary oxytocin massage treatment on breastfeeding rates and baby weight was the goal of the intervention.

Sample

Mothers who were nursing their kids exclusively for at least three months after giving birth were included in the research. Postpartum moms between the ages of 20 and 40 who were healthy enough to undergo oxytocin massage (i.e., not suffering from an illness or a serious skin disease) and who were also ready to participate and give their informed permission were considered for inclusion. Babies born with feeding problems, mothers who used formula or supplemental feedings throughout the trial, and postpartum moms with systemic disorders (such as diabetes or hypertension) were all deemed ineligible.

Using the G*Power 3.1 program, the necessary sample size was determined. The minimum necessary sample size was 64, supposing a power (1-β) of 0.80, a significance level (α) of 0.05, and an effect size of 0.5. A total of 70 people were enlisted to cover any possible attrition. The participants were chosen using a purposive sample method from a variety of sources in Sukabumi, West Java, including hospitals and community health centres.

Instrument

A manual breast pump equipped with standardised collecting units was used to measure the amount of breast milk. The units of measurement used were millilitres (mL). The digital newborn scale was used to measure body weight, and it had an accuracy of ±10 grammes. Handayani et al. [1] gave the recommendations that the intervention protocol followed. Trained midwives massaged participants with oxytocin, and they were monitored for method adherence using a checklist.

Procedure

The study's protocol was given the go light by the hospital's IRB. We found people who could take part in the study and checked them against our inclusion and exclusion lists. Every single participant gave their written informed permission. Babies' weight and the amount of breast milk were measured to establish a baseline. Over the course of seven days, those who participated in the intervention group were given oxytocin massage treatment for fifteen minutes each day. Postpartum care as usual was provided to the control group, who did not participate in massage treatment. On day 7, we took the same measurements of breast milk output and baby body weight again. After the research was over, participants were asked to fill out a feedback form that reflected on their experiences with the intervention.

Data Analysis

To summarise demographic and baseline variables, descriptive statistics were utilised. For the purpose of comparing group results before and after the intervention, researchers utilised paired t-tests, whereas for the purpose of comparing group differences, they utilised independent t-tests. A significance level of $p < 0.05$ was used. The latest version of SPSS, 26.0, was used for all analyses.

RESULTS

There were a total of 70 participants in the trial; 35 were assigned to the intervention group and 35 were assigned to the control group. Age, education, employment, parity, and newborn age are some of the demographic variables summarised in Table 1. The demographic features of the intervention and control groups were similar at baseline, as no statistically significant differences were found.

Table 1. Demographic Characteristics of Participants (N = 70)

Characteristics	Intervention Group (n = 35)	Control Group (n = 35)	*p*-value
Age (mean ± SD, years)	29.4 ± 4.5	28.8 ± 5.1	0.612
Education Level (%)			
- Primary	8 (22.9%)	10 (28.6%)	0.625
- Secondary	18 (51.4%)	17 (48.6%)	
- Tertiary	9 (25.7%)	8 (22.9%)	
Occupation (%)			
- Housewife	24 (68.6%)	26 (74.3%)	0.586
- Employed	11 (31.4%)	9 (25.7%)	
Parity (%)			
- Primipara	15 (42.9%)	17 (48.6%)	0.631
- Multipara	20 (57.1%)	18 (51.4%)	
Infant Age (months)	3.2 ± 0.9	3.3 ± 1.1	0.783

Breast milk production and baby weight were measured in both the intervention and control groups before and after the intervention using a univariate analysis. Breast milk supply and infant body weight both increased significantly after the intervention in the intervention group compared to values before the intervention. Table 2 shows that whereas the control group's breast milk output increased significantly, their newborn body weight did not.

Table 2. Breast Milk Production and Infant Body Weight (Univariate Analysis)

Variable	Group	Pre-intervention (mean ± SD)	Post-intervention (mean ± SD)	*p*-value
Breast Milk Production (mL/day)	Intervention Group	510 ± 120	750 ± 140	<0.001
	Control Group	520 ± 110	600 ± 130	<0.001
Infant Body Weight (kg)	Intervention Group	4.5 ± 0.8	5.0 ± 0.9	0.004
	Control Group	4.6 ± 0.7	4.8 ± 0.8	0.118

***Explanation*:**

The effects of oxytocin massage treatment on breastfeeding success and baby weight were tested in a bivariate study. There was a statistically significant difference between the two groups when it came to the effects of oxytocin massage treatment on enhancing breast milk production and newborn body weight.

Table 3. Bivariate Analysis of Oxytocin Massage Therapy and Outcomes

Variable	Group	Mean Difference (95% CI)	*p*-value
Breast Milk Production (mL/day)	Intervention Group	240 (190, 290)	<0.001
	Control Group	80 (40, 120)	<0.001
Infant Body Weight (kg)	Intervention Group	0.5 (0.3, 0.7)	0.001
	Control Group	0.2 (-0.1, 0.5)	0.114

The effects of oxytocin massage treatment on breast milk supply and infant body weight were examined in a multivariate analysis that took into account confounding factors such as mother age, parity, and education level. Increased breast milk production and newborn body weight were independently predicted by oxytocin massage treatment, even after controlling for mother factors. Infant body weight was likewise significantly (albeit modestly) affected by maternal education level (table 4).

Table 4. Multivariate Analysis of Oxytocin Massage Therapy and Outcomes

Outcome	Variable	β (SE)	95% CI	*p*-value
Breast Milk Production (mL/day)	Oxytocin Massage	180 (22.4)	135.8, 224.2	<0.001
	Maternal Age	-5.2 (3.8)	-12.8, 2.4	0.175
Infant Body Weight (kg)	Oxytocin Massage	0.4 (0.1)	0.2, 0.6	0.002
	Education Level	0.1 (0.05)	0.01, 0.2	0.032

DISCUSSION

Oxytocin massage treatment significantly improves infant body weight and increases breast milk supply, according to this study's results. This finding is in line with other studies that have shown that oxytocin massage can enhance the frequency of breastfeeding and the amount of milk that is ejected from the breast [13,14]. Research has shown that babies whose mothers produce enough breast milk have better neonatal development outcomes, which is in line with the therapy's effect on weight gain [15].

Previous research has shown that oxytocin massage is beneficial for postpartum moms, and these findings support that hypothesis. For instance, according to research cited by Uvnas-Moberg et al., oxytocin release during nursing promotes milk ejection and maternal calm, which in turn aids child weight growth [16]. In addition, alleviating mother stress—which can restrict oxytocin release—improved lactation outcomes with breast massage therapies, according to Telles et al. [17]. This study offers a full picture of the influence of massage on newborn health because it integrates the therapeutic benefits of massage with constant monitoring of baby weight.

Our findings highlight the significance of combining frequent massage with breastfeeding education for the best possible outcomes [18], in contrast to Gupta et al.'s findings that massage alone had no effect on breast milk supply. Possible explanations for this disparity include differences in intervention frequency, research design, or sample size.

In particular, initiatives aimed at improving the health of mothers and infants stand to benefit greatly from the study's conclusions. Increased rates of successful breastfeeding and better development in newborns may result from including oxytocin massage therapy into standard postpartum care. By include this method in prenatal seminars, healthcare workers may equip women with practical strategies to handle breastfeeding difficulties. Additionally, this treatment might be incorporated into postnatal appointments to treat common problems like inadequate milk production or delayed breastfeeding, which would reduce the likelihood of newborn malnutrition.

There are a number of caveats to this study that mitigate its otherwise encouraging results. To start with, the results can't be applied to larger populations because of the limited sample size. Second, it's possible that the study's controlled environment didn't accurately reflect real-world conditions. Third, there was a lack of a thorough evaluation of dietary determinants, stress levels, and sleep patterns among mothers, all of which have the potential to affect breast milk supply. If we want a whole picture of how effective oxytocin massage treatment is, future studies should look at these factors.

Implications

The findings of this study reinforce the potential of oxytocin massage therapy as a non-invasive, low-cost intervention to improve maternal lactation and promote infant weight gain. Implementing oxytocin massage as part of postpartum care programs could enhance breastfeeding outcomes, strengthen maternal-infant bonding, and contribute to reducing neonatal morbidity associated with poor weight gain. Health practitioners in low-resource settings could particularly benefit from adopting this technique, providing an accessible strategy to support maternal and newborn health without reliance on advanced technology or expensive interventions.

Limitations

This study has several limitations. First, the sample size was relatively small and limited to a specific geographic location, which may restrict the generalizability of the findings to broader populations. Second, the study's duration did not allow for long-term follow-up to assess sustained effects on breastfeeding and infant growth beyond the immediate postpartum period. Third, potential confounding factors such as maternal nutrition, psychological status, and socioeconomic conditions were not controlled in detail, which could have influenced outcomes. Future research should aim to include larger, more diverse populations, standardized oxytocin massage protocols, and extended follow-up periods to validate and expand upon these findings.

CONCLUSION

This study provides evidence that oxytocin massage therapy effectively enhances breast milk production and supports infant weight gain. These results contribute to the growing body of knowledge supporting non-invasive interventions to improve maternal and newborn health outcomes. While promising, further large-scale, longitudinal studies are necessary to confirm these benefits, refine techniques, and develop clinical guidelines for broader implementation. Integrating oxytocin massage into postpartum care practices could represent an important advance in supporting breastfeeding success, particularly in resource-limited settings.

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Author Contribution

AW : Conceptualization and Study Design, Methodology, Data Curation, Writing – Original Draft, Writing – Review & Editing

NAA and BP : Conceptualization and Study Design, Methodology, Formal Analysis,

Conflict of Interest
The authors declare no potential conflicts of interest.

Data Availability Statement
The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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