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Changes in Breast Milk Production Following Lactation Massage Among Postpartum Mothers: A Quasi-Experimental Study

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ABSTRACT
This study aimed to examine changes in breast milk production following lactation massage among postpartum mothers receiving care at Bajoe Public Health Center, Bone Regency, South Sulawesi, Indonesia. A quantitative quasi-experimental study using a one-group pretest-posttest design was conducted from February to April 2026. Twenty postpartum mothers who met the eligibility criteria and agreed to participate were included in the study. The intervention consisted of standardized lactation massage administered once daily for six consecutive days, from postpartum day 2 to postpartum day 7. Each session lasted 15–20 minutes and was conducted in the morning. Breast milk production was assessed before and after the intervention using a 10-item observation instrument originating from Rohmatika (2021). Each item was scored dichotomously, and the total score was categorized as poor, adequate, or good breast milk production. Descriptive statistics and the Wilcoxon Signed-Rank Test were used for data analysis. The results showed that before the intervention, 17 participants (85%) were classified as having poor breast milk production and three participants (15%) as having adequate production. No participant was classified as having good production. After six consecutive days of lactation massage, all 20 participants (100%) were classified as having good breast milk production. The median score increased from 3 at pretest to 9 at posttest. The Wilcoxon Signed-Rank Test showed a statistically significant difference between pretest and posttest scores ($p < 0.001$). Breast milk production scores improved significantly following lactation massage. However, the one-group pretest-posttest design, absence of a comparison group, small sample, variation in postpartum timing, and potential uncontrolled confounding factors limit causal interpretation. The findings provide preliminary evidence that supports further controlled research on lactation massage as a complementary component of postpartum care.

Keywords: Breast Milk Production, Postpartum, Lactation Massage, Non-Pharmacological Therapy.

I. Introduction

Breastfeeding is widely recognized as one of the most effective public health interventions for improving infant survival, supporting optimal growth and development, and reducing neonatal morbidity and mortality. The World Health Organization recommends exclusive breastfeeding during the first six months of life, followed by continued breastfeeding with appropriate complementary feeding until the age of two years or beyond. Breast milk provides essential nutrients, immunological protection, and bioactive components that support infant development while also providing long-term health benefits for mothers, including a reduced risk of breast and ovarian cancer (Triansyah et al., 2021; World Health Organization, 2021,

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2024). Appropriate breastfeeding support is therefore an important component of maternal and child health services, particularly during the early postpartum period (Widiastuti et al., 2025).

Global breastfeeding practices have improved in recent years; however, exclusive breastfeeding rates remain below international targets. According to UNICEF and the World Health Organization, the global prevalence of exclusive breastfeeding reached only 48% in 2023, indicating that more than half of infants worldwide still do not receive optimal breastfeeding during the first six months of life (UNICEF, 2023). In Indonesia, exclusive breastfeeding coverage increased to 69.26% in 2024, with substantial regional disparities. South Sulawesi reported a coverage rate of 72.26%, while considerable differences persist across provinces, indicating that challenges to successful breastfeeding remain, particularly during the early postpartum period (Kementerian Kesehatan Republik Indonesia, 2025). UNICEF Indonesia has also highlighted the importance of adequate breastfeeding support during the early postnatal period to facilitate breastfeeding initiation and continuation (UNICEF Indonesia, 2024).

One of the challenges frequently experienced during the early postpartum period is perceived or inadequate breast milk production. Mothers may experience delayed lactogenesis, breast engorgement, fatigue, pain, and psychological distress. These conditions may interfere with breastfeeding and reduce maternal confidence. Maternal perception of insufficient milk supply can also contribute to early breastfeeding discontinuation, even when physiological milk production is adequate (Kementerian Kesehatan Republik Indonesia, 2024; Roesli, 2018; Sandhi et al., 2020). Therefore, early postpartum breastfeeding support should address both physiological and psychosocial factors that may influence breastfeeding continuation. Breast milk production is influenced by multiple physiological and psychosocial factors, including maternal nutritional status, breastfeeding frequency, infant attachment, hormonal regulation, maternal emotional well-being, and family support. Maternal stress and anxiety are particularly relevant because psychological distress may interfere with the milk ejection process and breastfeeding effectiveness. Consequently, postpartum interventions should not only provide physical stimulation but also promote maternal comfort and relaxation (Purnamayanthi et al., 2025; Restyo & Maulina, 2026; World Health Organization, 2024).

Lactation massage has emerged as one of the complementary midwifery interventions designed to improve breast milk production through both physiological and psychological mechanisms. The technique stimulates prolactin and oxytocin secretion, improves blood circulation around the breast tissue, promotes relaxation, and facilitates milk ejection. Because it is simple, safe, inexpensive, and easy to implement in clinical practice, lactation massage has increasingly been incorporated into postpartum care as a non-pharmacological strategy to support breastfeeding success (Marmi, 2017; Rahmawati & Karana, 2023). Previous studies have reported favorable breastfeeding-related outcomes following lactation massage. Rahmawati and Karana (2023) reported an improvement in breast milk production following lactation massage. Similarly, (Retni et al., 2025) reported improvements in breastfeeding-related outcomes among postpartum mothers receiving lactation massage. Recent studies using stronger comparative designs have also reported beneficial findings from massage-based breastfeeding interventions. However, differences in study populations, intervention protocols, postpartum timing, and outcome measurement make direct comparison between studies difficult.

Differences in outcome measurement are particularly important. Some studies assess breast milk production directly through expressed milk volume in milliliters, whereas others use observational indicators or breastfeeding-related scores. These measures do not represent exactly the same outcome. Therefore, findings based on observational scores should not be interpreted as direct evidence of increased breast milk volume. This distinction is relevant to the present study because breast milk production was assessed using a structured observational instrument derived from Rohmatika (2021). Evidence from primary healthcare settings also remains important because postpartum breastfeeding support is frequently provided through community and primary healthcare services. Nevertheless, research examining changes in structured breast milk production scores following a standardized lactation massage procedure in this setting remains limited. In addition, previous studies have varied in the duration and frequency of massage, anatomical areas stimulated, postpartum timing, and use of additional procedures such as warm compresses. These differences indicate the need for further research using clearly described intervention protocols and transparent outcome measurement.

The present study addresses this gap by examining changes in breast milk production scores before and after a standardized lactation massage intervention among postpartum mothers receiving care at Bajoe

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Public Health Center, Bone Regency, South Sulawesi, Indonesia. The intervention was administered once daily for six consecutive days, from postpartum day 2 to postpartum day 7, with each session lasting approximately 15–20 minutes. The intervention was performed by the researcher and a midwife who had previously received lactation massage training from the researcher. This study therefore provides preliminary evidence regarding within-participant changes following lactation massage in a primary healthcare setting. The study used a one-group pretest-posttest design. Consequently, the observed difference between pretest and posttest scores represents a within-participant change and cannot establish that lactation massage alone caused the improvement. Natural changes in lactogenesis during postpartum days 2–7, breastfeeding frequency, maternal adaptation, and other factors may also contribute to changes in breast milk production scores. This limitation is considered in interpreting the findings. Therefore, this study aimed to examine changes in breast milk production scores before and after lactation massage among postpartum mothers at Bajoe Public Health Center, Bone Regency, South Sulawesi, Indonesia.

II. Literature Review and Hypothesis Development

2.1. Lactation and Breast Milk Production

Breast milk production is a complex physiological process regulated by hormonal mechanisms, mammary stimulation, maternal factors, and infant feeding patterns. Prolactin plays a central role in milk synthesis, whereas oxytocin mediates milk ejection through contraction of the myoepithelial cells. Effective and frequent milk removal through breastfeeding stimulates neuroendocrine responses that contribute to the maintenance of lactation (Hannan et al., 2022; Neville, 2023; Neville et al., 2023). During the first postpartum week, lactation undergoes dynamic physiological changes associated with secretory activation and increasing milk volume. Secretory activation generally occurs within the first few days after birth, although its timing varies among mothers. Therefore, assessment of milk production during the early postpartum period should account for postpartum timing, as lactation status and milk output may differ substantially between earlier and later postpartum days (Neville, 2023; Parker et al., 2024). This issue is relevant to the present study because participants received lactation massage between postpartum days 2 and 7. Therefore, changes in the outcome may reflect both the intervention and normal postpartum lactation progression.

2.2. Lactation Massage

Lactation massage is a complementary breastfeeding-support intervention involving stimulation of selected areas of the body, including the neck, shoulders, back, and breasts. The SOP used in the present study includes preparatory procedures, massage techniques, breast stimulation, areolar stimulation, Marmet expression, and alternating warm and cold water application. The procedure is intended to provide physical stimulation and maternal relaxation while supporting the milk ejection process. However, the intervention should be regarded as a complementary component of breastfeeding support rather than a replacement for breastfeeding counseling, assessment of infant attachment, evaluation of maternal or infant problems, or clinical management of lactation disorders.

2.3. Empirical Evidence on Massage-Based Lactation Interventions

Previous studies generally report favorable outcomes, but the strength of evidence varies according to research design and outcome measurement. A randomized controlled study among mothers with preterm births found higher milk production among mothers receiving back and breast massage during postpartum days 3–7 compared with controls (Ercīyas & Kavlak, 2024). Another randomized controlled study involving 120 mothers of premature infants found higher cumulative milk production in groups receiving breast massage, warm compression, or their combination compared with controls. Milk production was directly measured in milliliters (Mollaahmetoglu & Guvenc, 2025). A further randomized controlled study found that pectoralis major myofascial release massage improved newborn breast milk intake and reduced maternal breast pain and engorgement (Choi et al., 2023). These findings suggest that massage-based interventions may influence several breastfeeding-related outcomes, not only maternal perception of milk production.

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Recent Indonesian evidence also supports further investigation. A quasi-experimental study published in 2026 reported significant improvement after three consecutive days of lactation massage and found differences between intervention and control groups. However, the study involved only 20 participants and used direct expression and volume measurement (Siregar et al., 2026). Another Indonesian study reported increased breast milk volume following lactation massage in a two-group pretest-posttest design. The intervention group had a greater mean increase than the control group. These findings are relevant but cannot be directly equated with the present study because the present study uses an observational score rather than direct milk-volume measurement (Herawati et al., 2023). Thus, existing evidence generally points toward beneficial associations between massage-based interventions and breastfeeding outcomes. Nevertheless, differences in study populations, postpartum timing, intervention components, comparison groups, and outcome measurements remain substantial.

2.4. Research Gap

The literature indicates that massage-based interventions may support lactation outcomes, but three gaps remain relevant. First, previous studies use different outcome measures. Several randomized trials measure milk volume directly, while other studies use observational indicators. Second, intervention protocols vary in duration, frequency, anatomical areas, and additional procedures. Third, evidence from routine primary healthcare settings remains less extensive than evidence from specialized maternity or hospital settings. The present study responds to these gaps by evaluating changes in a structured breast milk production score among postpartum mothers receiving care in a primary healthcare setting. The intervention followed a standardized SOP and was administered once daily for six consecutive days. The theoretical rationale suggests that tactile stimulation and maternal relaxation may support the physiological processes involved in milk ejection. Nevertheless, because the present study did not measure oxytocin or prolactin concentrations and did not include a control group, the theoretical mechanism is not directly tested.

H1: There is a difference in breast milk production scores among postpartum mothers before and after receiving lactation massage.

III. Research Method

3.1. Research Design

This study used a quantitative quasi-experimental one-group pretest-posttest design. The design was selected to examine changes in breast milk production scores within the same participants before and after a standardized lactation massage intervention. The design is appropriate for detecting within-participant change, but it cannot isolate the intervention effect from maturation, history, natural progression of lactation, or other time-related factors. The manuscript therefore interprets the statistical result as an observed pretest-posttest difference rather than definitive causal evidence.

3.2. Research Setting and Study Period

The study was conducted at Bajoe Public Health Center, Tanete Riattang Timur District, Bone Regency, South Sulawesi, Indonesia. Data collection took place from February to April 2026. Participants were recruited from postpartum mothers receiving care during the study period.

3.3. Participants and Recruitment

The target population consisted of postpartum mothers receiving routine postnatal care at the study setting. Consecutive sampling was used to recruit all postpartum mothers who met the predefined eligibility criteria and were available during the February-April 2026 study period. The inclusion criteria were: (1) Postpartum mothers with normal vaginal delivery.; (2) mothers in the early postpartum period; (3) willingness

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to participate and provide informed consent; (4) absence of postpartum complications; and (5) a healthy live-born infant receiving direct breastfeeding. Mothers with severe maternal complications, infants requiring intensive care, or conditions contraindicating breastfeeding were excluded. During the recruitment period, 26 mothers met the eligibility criteria. Six eligible mothers declined participation, while 20 mothers agreed to participate and were enrolled in the study. All 20 participants completed the intervention and posttest assessment, and no participant was lost to follow-up. No formal a priori sample-size calculation was conducted because recruitment was limited to eligible mothers available during the February-April 2026 study period and the research was conducted within a limited fieldwork period. This recruitment approach may limit the statistical generalizability of the findings and is acknowledged as a study limitation.

3.4. Twenty postpartum mothers participated in the study.

a. Variables

The independent variable was the standardized lactation massage intervention. The dependent variable was the breast milk production score measured using the 10-item observational checklist. Demographic variables included age, parity, occupation, and education.

b. Intervention Protocol

The intervention was delivered once daily for six consecutive days, from postpartum day 2 through postpartum day 7. Each session lasted approximately 15–20 minutes and was conducted in the morning. Thus, each participant received six lactation massage sessions during the intervention period. The intervention was administered by the researcher and a midwife who had previously been trained in the lactation massage procedure by the researcher. Each participant therefore received a total of six sessions. The intervention followed the study SOP. Preparation included explaining the procedure, obtaining consent, protecting privacy, preparing equipment, positioning the mother comfortably, and performing hand hygiene. The massage sequence included the neck, shoulders, scapular area, and back, followed by breast massage and stimulation. The breast procedure included large and small butterfly movements, wing-shaped movements, circular finger movements, pressure-point stimulation, C-shaped support, areolar stimulation, and the Marmet technique. The procedure ended with alternating warm and cold water for approximately five minutes, drying the breasts, restoring maternal comfort, evaluating the mother's response, handwashing, and documentation. The researcher was responsible for participant assessment, intervention delivery, supervision of the trained midwife, and documentation. The trained midwife assisted with intervention delivery according to the same SOP. To improve intervention consistency, both providers followed the same written sequence, duration, frequency, and session timing. No additional massage intervention was intentionally administered during the six-day intervention period.

c. Research Instruments and Materials

Four instruments were used: a respondent characteristic questionnaire, the lactation massage SOP, an implementation observation checklist, and the breast milk production checklist. The intervention SOP was based on Buku Panduan Pijat Laktasi Bagi Bidan (Helina et al., 2020). The breast milk production checklist was derived from Rohmatika (2021). The breast milk production checklist contains 10 indicators: breast fullness before feeding; visible milk leakage from the nipple; breastfeeding frequency of at least 10–12 times per day; infant sleep or calmness for 2–3 hours after feeding; infant urination of approximately 6–8 times per day; infant defecation of approximately 3–4 times per day; yellowish stool; maternal tingling associated with milk flow; audible swallowing during feeding; and breast softness after feeding. Each item is scored Yes = 1 and No = 0. Scores of 8–10 indicate good production, 4–7 adequate production, and 1–3 poor production. The checklist does not directly measure milk volume in milliliters.

The present study did not conduct a new psychometric validity or reliability assessment of the checklist. Therefore, the manuscript does not report a new validity coefficient or reliability coefficient. This limitation is stated explicitly to avoid implying that the study performed a validation study. The implementation checklist was used to document adherence to the SOP rather than to generate the primary outcome. Equipment used during the massage included a chair or treatment table, pillow, virgin coconut oil, washcloth, basin, and towel. The materials were selected according to the study SOP.

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d. Data Collection Procedure

After eligibility screening and informed consent, the researcher administered the pretest using the 10-item checklist. The participant then received the first lactation massage session in the morning. The same schedule was repeated once daily for six consecutive days, from postpartum day 2 through postpartum day 7. The posttest was conducted after completion of the intervention using the same checklist. The same participant served as the unit of comparison for pretest and posttest measurements.

e. Data Analysis

Categorical demographic data were summarized using frequencies and percentages. Breast milk production scores were summarized using mean, standard deviation, median, minimum, and maximum values. Normality was assessed using the Shapiro-Wilk test. Because the paired scores were not normally distributed, the Wilcoxon Signed-Rank Test was used to compare pretest and posttest scores. Statistical significance was set at $p < 0.05$. The paired nature of the observations was preserved because each posttest score was matched to the same participant's pretest score.

f. Ethical Considerations

No formal ethical clearance was obtained from a research ethics committee for this study. This information is reported transparently because no ethics approval number or committee approval document is available. Before participation, eligible mothers received information about the study procedures and voluntary participation. Written informed consent was obtained. Participants could decline participation or withdraw without affecting their routine health services. Participant identities were replaced by codes during analysis and reporting. No adverse events related to the lactation massage intervention were reported during the six-day intervention period

IV. Result and Discussion

4.1. Research Result

a. Respondent Characteristics

A total of 20 postpartum mothers participated in this study. Table 1 presents the demographic characteristics of the respondents.

Table 1. Demographic Characteristics of Respondents (n = 20)

Variable	Quantity		
	Category	**n**	**%**
Age (years)	< 20	5	25
	20-35	12	60
	> 35	3	15
Parity	Primipara	8	40
	Multipara	12	60
	Grandemultipara	0	0
Occupation	Unemployed	8	40
	Employed	12	60
Education	Primary School	1	5
	Junior High School	2	10
	Senior High School	15	75
	Higher Education	2	10

Most respondents were between 20 and 35 years of age (60%). Multiparous mothers accounted for 60% of the participants, while 40% were primiparous. Most respondents were employed (60%) and had completed senior high school education (75%). Overall, the study population represented postpartum mothers of productive reproductive age with predominantly secondary educational attainment.

b. Breast Milk Production Before and After the Intervention

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Changes in breast milk production before and after lactation massage are presented in Table 2.

Table 2. Breast Milk Production Before and After Lactation Massage (n = 20)

Assessment	Quantity		
	Category	n	%
Pretest	Good	0	0
	Adequate	3	15
	Poor	17	85
	Total	20	100
Posttest	Good	20	100
	Adequate	0	0
	Poor	0	0
	Total	20	100

Before the intervention, most respondents demonstrated poor breast milk production (85%), while 15% were classified as having adequate production. None of the respondents achieved the good category at baseline. After receiving lactation massage, all respondents (100%) achieved the good category.

c. Descriptive Statistics

Table 3. Descriptive Statistics of Breast Milk Production Scores

Statistic	Pretest	Posttest
n	20	20
Mean	2.95	9.10
SD	1.00	0.72
Median	3	9
Minimum	2	8
Maximum	5	10
Mean change	6.15	—

The paired data show that every participant had a higher posttest score than the corresponding pretest score. The mean score increased by 6.15 points, from 2.95 to 9.10. The median increased from 3 to 9. The minimum score increased from 2 to 8, and the maximum increased from 5 to 10.

d. Normality Test

Prior to hypothesis testing, data normality was evaluated using the Shapiro–Wilk test. The results are presented in Table 4.

Table 4. Shapiro–Wilk Normality Test

Breast Milk Production	Shapiro-Wilk	
	Statistics	P value
Pretest	.800	.001
Posttest	.812	.001

The Shapiro–Wilk test indicated that both pretest and posttest data were not normally distributed ($p < 0.05$). Therefore, a non-parametric statistical approach was considered appropriate for testing the study hypothesis.

e. Pretest-Posttest Changes in Breast Milk Production Scores

The Wilcoxon Signed Ranks Test was performed to examine differences in breast milk production before and after the intervention.

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Table 5. Wilcoxon Signed Ranks Test

	Quantity		
	N	**W**	**P value**
Breast Milk Production Pretest vs. Posttest	20	0	.000

The Wilcoxon Signed-Rank Test demonstrated a statistically significant within-participant difference between pretest and posttest scores ($W = 0$, $p < 0.001$). The result supports the hypothesis that the paired breast milk production scores differed after the intervention. Because there was no control group, the result is interpreted as an observed change associated with the intervention rather than definitive evidence of causation.

4.2. Discussion

The principal finding of this study was a consistent improvement in breast milk production scores after six consecutive days of lactation massage. The mean score increased from 2.95 to 9.10, the median increased from 3 to 9, and every participant had a higher posttest score. The categorical distribution changed from 85.0% poor and 15.0% adequate at baseline to 100.0% good after the intervention. The Wilcoxon result was statistically significant. These findings indicate a substantial within-participant change in the observed breastfeeding-related score. The magnitude and uniform direction of the change are notable, but they should not be interpreted as proof that massage alone caused the improvement. The intervention occurred during postpartum days 2–7, a period in which lactation naturally changes. Breastfeeding frequency, infant suckling, maternal experience, parity, nutritional status, sleep, stress, and other factors may also change during this period. A control group would be required to estimate how much of the change exceeds the expected natural postpartum trajectory.

The present findings are consistent with recent evidence from primary healthcare settings. A quasi-experimental study with a comparison group found that lactation massage was associated with improved milk production. Milk output was measured directly in cubic centimeters (cc), and a significant between-group difference was reported (Siregar et al., 2026). Compared with that study, the current research uses a one-group design and an observational score. The similarity in direction is consistent with the plausibility of a beneficial association, but the different outcome measures and study designs prevent direct comparison of effect magnitude. Beneficial findings have also been reported among postpartum mothers after cesarean section using a two-group pretest-posttest design. This population represents a specific clinical context in which postoperative pain and recovery may influence breastfeeding (Purnamayanthi et al., 2025). The current study involved mothers with normal postpartum conditions and therefore addresses a different clinical population. The comparison suggests that massage-based support may be relevant across settings, but it does not establish that the same effect size occurs in all postpartum groups.

Rolling massage combined with warm compresses has also been examined using a pumping test to measure milk volume. The intervention was administered once daily for three consecutive days, which resembles the frequency and duration structure used in the present study (Kumalasari & Ediyono, 2025). However, their intervention included a different massage technique and an additional warm-compress component, while the current study followed the lactation massage SOP. This difference illustrates why massage protocols should be reported in detail rather than grouped under a single generic category. Other Indonesian studies also support a beneficial direction. Improvement following oxytocin massage was reported in a one-group pretest-posttest study, while another study reported improvement after combining Oketani and oxytocin massage (Indrayani et al., 2022; Sulistyawati & Mildiana, 2022). Different outcomes have also been reported when breast massage was compared with combination massage (Egam & Veronica, 2023). These findings collectively suggest that tactile interventions may support breastfeeding, but the evidence also shows that the intervention label alone does not identify a single standardized treatment.

An important qualification is provided by a systematic review that identified 22 studies of massage techniques among Asian breastfeeding mothers and found promising results, particularly for combined techniques (Nuampa & Payakkaraung, 2021). However, methodological quality was often low or moderate and studies differed in participants, massage methods, control conditions, and outcome measures. The present outcome instrument is also different from the direct milk-volume measurements used in several

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previous studies. The checklist captures ten observable indicators, including maternal breast changes, breastfeeding frequency, infant output, infant stool characteristics, maternal milk-flow sensation, audible swallowing, and breast softness. The score therefore reflects a broader breastfeeding-related construct. It should not be interpreted as a direct estimate of milk volume. This measurement distinction is particularly important for the interpretation of the 100% good category after intervention. The result means that all participants met the checklist threshold for the good category. It does not mean that all participants produced the same quantity of milk or that their milk volume reached a clinically defined target. The checklist is useful for field assessment because it is simple and does not require pumping equipment, but it has less precision than direct quantitative measurement.

The inclusion of infant indicators in the checklist is clinically reasonable because breastfeeding adequacy is reflected partly through infant behavior and elimination patterns. However, these indicators can be influenced by factors beyond maternal milk production. Urination and defecation, for example, may vary with age, feeding pattern, and individual physiology. Infant calmness after feeding can also reflect sleep, temperament, or other conditions. Thus, the composite score should be understood as a practical observational indicator rather than a biochemical or volumetric outcome. The neuroendocrine explanation remains biologically plausible. Breastfeeding stimulates oxytocin release, which is associated with milk ejection, milk production, and physiological and psychological adaptations that support breastfeeding and motherhood (Uvnäs-Moberg et al., 2020). Massage may provide tactile stimulation and promote relaxation, which could support the conditions needed for effective milk ejection. Nevertheless, the present study did not measure hormone concentrations. It therefore cannot establish that prolactin or oxytocin increased because of the intervention.

Maternal relaxation is another plausible pathway. The postpartum period can include fatigue, pain, anxiety, and uncertainty about milk supply. Psychological factors can influence breastfeeding confidence and perceptions of milk adequacy. Perceived insufficient milk supply has multiple determinants, while perceived infant dissatisfaction is a common reason mothers perceive their milk supply as inadequate (Huang et al., 2021; Kent et al., 2021). A massage intervention that improves comfort may therefore have value even if its direct physiological effect on milk synthesis is modest. However, the current study did not measure maternal stress, anxiety, pain, breastfeeding self-efficacy, or maternal satisfaction. The study therefore cannot determine whether relaxation mediated the observed score change. Future studies should incorporate validated psychological measures and, where feasible, hormonal or objective milk-production outcomes to test the proposed pathway more rigorously.

The participant characteristics also require cautious interpretation. Most mothers were 20–35 years old and multiparous. Multiparous mothers may have previous breastfeeding experience, which could influence confidence and feeding technique. However, the study did not measure previous breastfeeding duration or previous breastfeeding difficulties. Therefore, parity cannot be treated as a demonstrated moderator of the intervention effect. Education and occupation may also shape breastfeeding information access and time availability, but the current sample was too small to assess their independent relationships with outcome change. The descriptive characteristics are therefore useful for understanding the study population but should not be presented as explanations for the observed intervention response.

The primary healthcare setting is an important practical aspect of the study. The intervention used basic equipment, a written SOP, and a standardized sequence that was delivered by the researcher and a trained midwife. The broader implementation of maternal and child health services also requires adequate access to health services, appropriate facilities, and available health personnel (Akhirta et al., 2025). Such considerations are relevant when integrating breastfeeding support into primary healthcare services. The standardized procedure used in this study suggests that lactation massage may be considered as an adjunctive component of postpartum breastfeeding support when trained personnel and appropriate supervision are available. However, implementation should not focus only on massage administration. Breastfeeding support in primary healthcare should continue to include assessment of breastfeeding technique, infant attachment, feeding frequency, maternal breast conditions, infant output, and signs of inadequate intake or other conditions requiring referral. Lactation massage should therefore be positioned as a complementary intervention rather than a substitute for comprehensive breastfeeding assessment and counseling.

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The six eligible mothers who declined participation are relevant to interpretation. Their refusal may reflect preferences, time constraints, discomfort with massage, or other reasons that were not systematically recorded. Because the characteristics of nonparticipants were not compared with participants, selection bias cannot be excluded. The final sample therefore represents mothers who both met the criteria and accepted participation, not all eligible mothers. The lack of formal ethical clearance is another limitation. The study used informed consent and voluntary participation, but the absence of committee review means that the study did not receive an independent ethics assessment. This is reported transparently. Future research should obtain formal ethical approval before recruitment, particularly when involving postpartum mothers and clinical interventions.

The strongest conclusion supported by the current evidence is therefore that breast milk production scores improved significantly within participants after the six-day lactation massage intervention. This result is compatible with previous massage-based research but does not establish a causal effect or quantify an increase in milk volume. The study contributes context-specific evidence from a primary healthcare setting and clarifies the practical protocol and outcome measurement used. For future research, randomized controlled trials should compare standardized lactation massage with usual postpartum care or another active intervention. Recruitment should use an a priori sample-size calculation. Intervention timing should be standardized by postpartum day. Outcome measurement should include direct milk volume, infant milk intake where feasible, and validated breastfeeding-related measures. Follow-up should extend beyond the immediate intervention period to determine whether changes are sustained and whether they translate into longer exclusive breastfeeding duration.

Another practical issue is intervention fidelity. Massage-based studies often differ in anatomical areas, pressure, sequence, session length, and frequency. Without fidelity assessment, a positive result may be difficult to reproduce because the term lactation massage can represent different procedures across settings. The present study addresses this problem by using a written SOP and an implementation checklist. Even so, the study did not calculate a formal inter-rater reliability coefficient for practitioner adherence. Future studies should report fidelity scores, practitioner competency assessment, and any deviations from the protocol. These details would allow readers to distinguish the effect of the intended intervention from variation in its delivery. A stronger study could also compare different massage protocols to determine whether whole-body massage, breast massage, warm compresses, or combined techniques produce different outcomes. Such comparisons would help distinguish the effect of tactile stimulation from the effect of relaxation and from other components of postpartum breastfeeding support. Standardized intervention fidelity assessment should also be included to ensure that different practitioners deliver the procedure consistently. The findings also support a cautious service-level interpretation. Primary healthcare facilities may consider lactation massage as an adjunct to routine breastfeeding assessment when trained personnel and a standardized protocol are available. Implementation should remain integrated with clinical screening, breastfeeding technique assessment, infant monitoring, and referral when complications or persistent feeding problems are identified. The approach should be evaluated locally before routine scale-up.

V. Conclusion

Lactation massage was associated with a statistically significant improvement in breast milk production scores among 20 postpartum mothers at Bajoe Public Health Center. The mean score increased from 2.95 to 9.10 and the median increased from 3 to 9. All participants showed higher posttest scores, and the Wilcoxon Signed-Rank Test indicated a significant within-participant difference ($W = 0$, $p < 0.001$). The findings support the potential use of standardized lactation massage as a complementary component of postpartum breastfeeding support in primary healthcare. However, the one-group pretest-posttest design, small consecutive sample, lack of formal ethical clearance, and use of an observational composite score rather than direct milk-volume measurement limit causal and generalizable conclusions. Future controlled studies should use larger samples, objective milk-production measurements, standardized postpartum timing, longer follow-up, and relevant maternal and infant confounders.

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