Enhancing breast milk production in breastfeeding mothers through oxytocin massage interventions: A systematic review

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Abstract

Background: Low milk production is often a problem faced by breastfeeding mothers. Oxytocin massage is one of the non-pharmacological ways to increase breast milk production. **Objective:** The aim of this systematic review is to analyze the effectiveness of oxytocin massage in increasing breast milk production in breastfeeding mothers. **Methods:** This systematic review used literature search through Pubmed and Google Scholar databases. Inclusion criteria included articles published within the last five years and published in Indonesian or English. Exclusions included articles that could not be accessed in their entirety in the text, editorial or review articles, the subject and purpose of the article did not match this study or articles that did not go through the peer-reviewed process. PICO approach: (P (Population): Breastfeeding mothers, I (Intervention): Oxytocin massage, C (Comparator): not given oxytocin massage, not breastfeeding, O (Outcome): increased milk production). The articles obtained were then selected using the Preferred to as Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. We then evaluated the quality of the selected articles using the Joanna Briggs Institute (JBI) Checklist**. Results:** Based on the six articles analyzed, it can be concluded that oxytocin massage significantly increases milk production, on average by 10-30 ml. The most effective massage location for increasing milk production is at the Acupressure points around the breast with a gentle massage, massage is done in a circular and spiral motion. **Conclusion:** In general, the results of the study support that oxytocin massage can effectively increase milk production in breastfeeding mothers. This technique should be promoted as one of the efforts to support exclusive breastfeeding.

Keywords: oxytocin massage, breastfeeding mothers, breastmilk production

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Abstrak

Latar Belakang: Produksi ASI yang rendah sering menjadi permasalahan yang dihadapi ibu menyusui. Pijat oksitosin merupakan salah satu cara non-farmakologis untuk meningkatkan produksi ASI. **Tujuan**: Tujuan dari *systematic review* ini adalah untuk menganalisis efektivitas pijat oksitosin dalam meningkatkan produksi ASI pada ibu menyusui. **Metode**: *Systematic review* ini menggunakan penelusuran pustaka melalui *database* Pubmed dan Google Scholar. Kriteria inklusi meliputi artikel terbit dalam lima tahun terakhir dan diterbitkan dalam Bahasa Indonesia atau Bahasa Inggris. Eksklusi termasuk artikel yang tidak dapat diakses secara keseluruhan dalam teksnya, artikel editorial atau *review*, subjek dan tujuan artikel tidak sesuai dengan penelitian ini atau artikel yang tidak melalui proses review sejawat (non peer-reviewed). Pendekatan PICO: (P (*Population*): Ibu menyusui, I (*Intervention*): Pijat oksitosin, C (*Comparator*): tidak diberikan pijat oksitosin, tidak menyusui, O (*Outcome*): peningkatan produksi ASI). Artikel yang didapat kemudian diseleksi menggunakan panduan *Preferred to as Reporting Itemss for Systematic Reviews and Meta-Analysis* (PRISMA). Peneliti kemudian mengevaluasi kualitas artikel terpilih menggunakan *Joanna Briggs Institute* (JBI) *Checklist*. **Hasil**: Berdasarkan enam artikel yang dianlisis, dapat disimpulkan bahwa pijat oksitosin secara signifikan meningkatkan produksi ASI, rata-rata sebesar 10-30 ml. Lokasi pemijatan yang paling efektif untuk peningkatan produksi ASI yaitu pada titik Akupresur di sekitar payudara dengan pijatan lembut, pijatan dilakukan dengan gerakan melingkar dan spiral. **Kesimpulan**: Secara umum, hasil kajian mendukung bahwa pijat oksitosin secara efektif dapat meningkatkan produksi ASI pada ibu menyusui. Teknik ini perlu digalakkan sebagai salah satu upaya pendukung ASI eksklusif.

Kata kunci: pijat oksitosin, ibu menyusui, produksi ASI

INTRODUCTION

Breast milk (ASI) is a fat emulsion secreted by the mother's mammary glands and serves as food for the baby. It is a solution of protein, lactose, and inorganic salts. During the period from zero to six months, babies are exclusively breastfed, meaning they are given only breast milk without any additional food or drink (WHO, 2024). Exclusive breastfeeding means the baby receives only breast milk. No other fluids or solid foods are given, not even water, except for oral rehydration solutions, or vitamin drops/syrups, minerals, or medications. During this stage, not even plain water is given. Sufficient breast milk is the best food for babies and can meet their nutritional needs for the first six months. Breast milk is the first and foremost natural food for babies, allowing them to grow well (Limbong et al., 2024).

The World Health Organization (WHO) (2022) reported that only 42% of countries provide exclusive breastfeeding and has set a target to increase this to 75% by 2022. According to the Central Statistics Agency, the percentage of infants under six months who receive exclusive breastfeeding in Indonesia has increased over the past three years: 66.99% in 2019, 69.2% in 2020, and 71.58% in 2022.

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Nationally, the number of infants receiving exclusive breastfeeding in 2020 was 66.06%, surpassing the 2020 Renstra target of 40% (Indonesia Health Profile, 2020). Meanwhile, the achievement of exclusive breastfeeding in Central Java province in 2020 was 86.30%, and the rate of exclusive breastfeeding for infants aged 0-6 months in the city of Surakarta in 2021 was 82.96% (Central Java Health Profile, 2021).

Breast milk (ASI) is vital for the growth and development of a child. However, low breast milk production is a common issue with breastfeeding. One cause of this condition is the lack of baby's sucking stimulation, which plays a role in activating the hormone oxytocin. Other causes related to low breast milk production include premature birth, cesarean delivery, and maternal health issues. Optimal breast milk production can be achieved through a combination of interventions involving psychological support, proper nutrition, correct breastfeeding techniques, the use of milk production stimulating supplements (galactagogues), breast care, as well as adequate rest and relaxation (Buckland et al., 2020; McBride et al., 2023; Smith et al., 2023). These interventions need to be supported by maternal health literacy for optimal breast milk production management (Putri et al., 2023).

Among the interventions to increase breast milk production, oxytocin massage is an alternative technique for oxytocin activation by specifically addressing one of the influencing factors (Putri & Rahmawati, 2021). Oxytocin massage on the fifth and sixth ribs through spinal massage, starting from the fifth and sixth ribs up to the shoulder blades, stimulates the parasympathetic nerves to activate the posterior pituitary gland, resulting in the release of oxytocin (Ermiati et al., 2024). This massage technique, which involves touch, also aims to stimulate the production of oxytocin, leading to the contraction of myoepithelial cells to stimulate the mother’s milk glands to relax thanks to the release of endorphins. Support from the intervention provider and those around the mother also helps to increase comfort, thereby enhancing breast milk production.

Oxytocin massage, although known to have potential benefits in increasing breast milk production, is rarely the subject of in-depth research. Exploring the effectiveness of oxytocin massage in breastfeeding mothers across various conditions requires a systematic and thorough investigation to establish a strong foundation in clinical practice. This study aims to strengthen scientific evidence regarding effective oxytocin massage techniques for enhancing breast milk production, thereby promoting its application in postpartum care.

METHOD

This study is a systematic review aimed at analyzing the effectiveness of oxytocin massage in increasing breast milk production among breastfeeding mothers. Article search was conducted using the PICO framework with the following components: P (Population): breastfeeding mothers, I (Intervention): oxytocin massage, C (Comparator): no oxytocin massage, not breastfeeding, O (Outcome): increase in breast milk production. Online databases including Google Scholar and PubMed were utilized to search for articles meeting the following

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inclusion criteria: articles published in Indonesian or English within the last five years (2019-2024), written in Indonesian or English language, and matching the PICO criteria as mentioned earlier. Articles that were not fully accessible in text, editorials or reviews, articles with subjects and objectives not aligned with this study, or articles that did not undergo peer review were excluded. Keywords used for searching articles in these databases were "pijat oksitosin" ("oxytocin massage") AND "produksi ASI" ("breastmilk production") AND "Ibu menyusui" ("breastfeeding mother") AND "peningkatan ASI" ("increase in breastmilk production").

The articles retrieved from these databases underwent screening based on the inclusion and exclusion criteria. Articles selected for review were assessed for quality using the Joanna Briggs Institute (JBI) Checklist. The reporting of the article search process followed guidelines from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Figure 1). In the final stage, researchers compiled summaries of the selected articles for review and conducted synthesis of the findings.

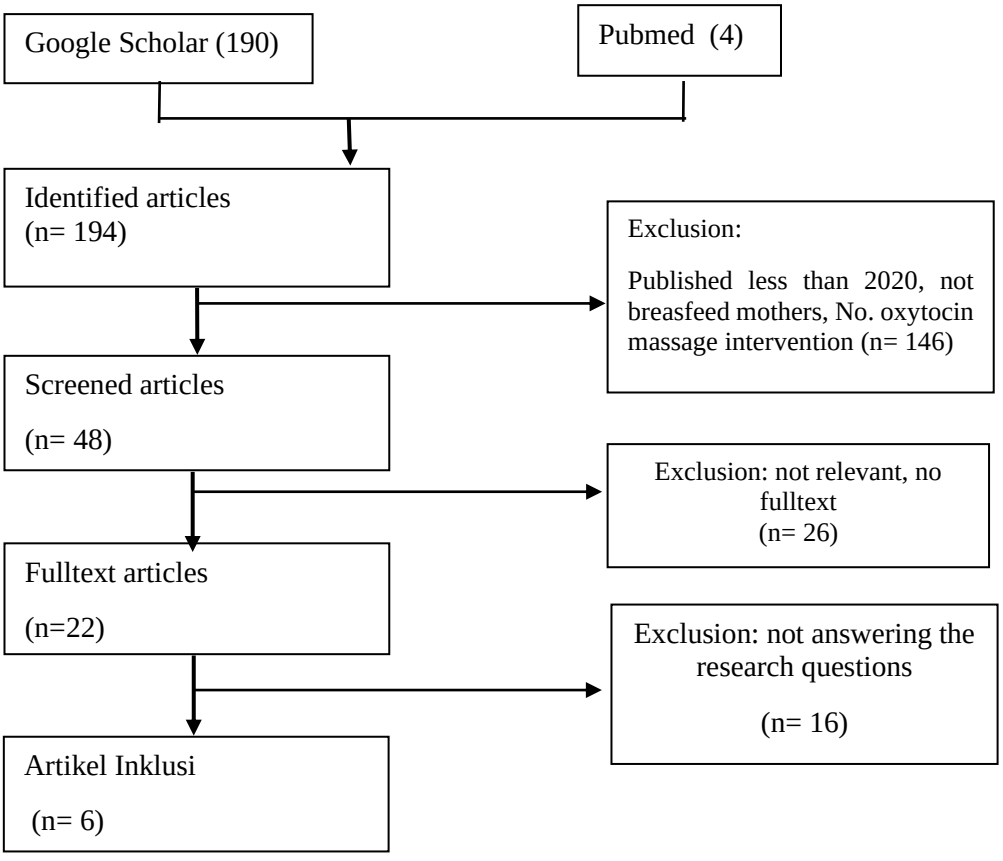

Figure 1
Prisma flow of the systematic review

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RESULT AND DISCUSSION

Breast milk production serves as the indicator of the effectiveness of oxytocin massage interventions, with most studies employing quantitative methods such as quasi-experimental pre-post test designs. Oxytocin massage involves massaging acupressure points around the breasts and the upper to lower spine area. Research findings indicate that oxytocin massage is effective in increasing the volume or quantity of breast milk.

In their case study approach, Damayanti et al. (2024) recommend performing oxytocin massage 2-3 times daily for 15 minutes each session. The goal is to stimulate the release of oxytocin and prolactin hormones, thereby increasing breast milk production. Overall, the articles reviewed generally conclude that oxytocin massage is effective in enhancing breast milk production in breastfeeding or postpartum mothers, which can aid in improving breast milk supply and breastfeeding success (Damayanti et al., 2024).Lebih lanjut, artikel lain membahas pijat oksitosin dengan menekan titik akupresur di sekitar payudara seperti Nei Guan, Zu San Li, dan San Yin Jiao dengan gerakan melingkar dan spiral selama 15-20 menit, dua kali sehari (Anggraini et al., 2022). Penelitian ini menunjukkan peningkatan volume ASI dari 86,27 mililiter menjadi 126,35 mililiter. Sementara itu, penelitian lain melaporkan peningkatan ASI dari 35-37,5 mililiter (Damayanti et al., 2024). Penelitian tambahan menunjukkan bahwa produksi ASI tetap lancar pada 1-2 hari setelah dilakukan pijat (Juwayriyah et al., 2024). Table 1 presents a summary analysis of the articles used in the synthesis process on the effectiveness of oxytocin massage in increasing breast milk production.

Table 1. Summary of the references included in this study

No	Tittle, authors	Method	Study's result
1	Pengaruh Pijat Oksitosin Terhadap Produksi ASI Ibu Menyusui di Wilayah Kerja Puskesmas Sidomulyo Rawat Jalan Pekanbaru (Magdalena et al., 2020)	The research design is quantitative, using a pre-experimental design with a single group (pre-post test). The sampling technique is purposive sampling with a sample size of 16 breastfeeding mothers. Statistical analysis was conducted using a paired t-test. The intervention involved oxytocin massage on the mother's back, particularly in the Th12-L2 or lower back area. The massage duration was 3-5 minutes, conducted over three consecutive days.	The oxytocin massage has an influence on breastfeeding mothers' milk production in the Sidomulyo Primary Health Care (Puskesmas) outpatient area in Pekanbaru. This is evident from the increase in the frequency of infant breastfeeding (p-value=0.00) by 2.19 and the increase in the frequency of infant urination (p-value=0.00) by 2.25.
2	Efektifitas pijat oketani dan pijat oksitosin dalam meningkatkan produksi air susu ibu (ASI) (Anggraini et al., 2022)	The research design is a quantitative quasi-experimental study. The sampling technique used is purposive sampling with a sample size of 34 postpartum mothers whose infants are aged 0-40 days. The massage intervention was administered to recently delivered mothers, focusing on	The Wilcoxon test was conducted on the oxytocin massage group. The results showed an average volume of 86.27 milliliters before the intervention, with a standard deviation of 34.95, and an average volume of 126.35 milliliters after the

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		massaging along the spine up to the 6th vertebra using regular circular motions with both thumbs for 3 minutes daily over 3 consecutive days.	intervention, indicating an increase of 40.07 milliliters. From these findings, it can be concluded that there is a significant increase in breast milk production volume.
3	Komparasi Efektivitas Kompres Hangat dan Pijit Oksitosin untuk Mempercepat Produksi Asi pada Ibu Nifas di Puskesmas Gunung Sari (Supiana et al., 2024)	The research design is descriptive with a comparative type. Oxytocin massage involves massaging the spine of two postpartum mothers within 0-42 days postpartum. The massage focuses on the fifth to sixth vertebrae and is conducted for 15 to 20 minutes daily over six consecutive days.	The research results indicate that both oxytocin massage and warm compress were effective in facilitating breast milk production for both respondents. Breast milk production was successfully established for both respondents. The first respondent achieved smooth breastfeeding 1 day after the intervention, while the second respondent achieved it 2 days after the intervention.
4	Studi Kasus Terapi Kombinasi Hypnobreastfeeding dan Pijat Oksitosin untuk Meningkatkan Produksi ASI pada Ibu Menyusui di RW 03 Desa Banteran (Siti Juwayriyah, Ridlwan Kamaluddin, Arif Imam Hidayat, 2024)	The research design is quantitative, employing a case study approach, focusing on evidence-based practices in community nursing and maternal nursing. Hands are pressed around the gaps between the vertebrae of the spine. Hand pounding motions are applied slowly and gently. Oxytocin massage is performed daily for 15 to 30 minutes on breastfeeding mothers with infants aged 0-6 months.	The combination of hypnobreastfeeding and oxytocin massage has been shown to increase breast milk production among breastfeeding mothers by an average of 100ml. This intervention has proven effective in enhancing breast milk production.
5	Pengaruh pijat Oksitosin dan musik terhadap produksi ASI dan tingkat kecemasan ibu dari bayi prematur yang berada di unit perawatan intensif neonatal: Uji coba terkontrol mandiri (Dağli & Çelik, 2022)	This study was conducted using a self-controlled trial design with 73 mothers of premature infants. Mothers removed all upper clothing and sat in a chair leaning forward. With fists clenched and thumbs facing outward, researchers performed friction movements that continued for three minutes.	The results of this study examined the increase in breast milk volume following oxytocin massage and music, which were 35.0 ± 14.6 ml and 37.5 ± 15.3 ml, respectively, compared to the control group at 34.0 ± 13.7 ml.
6	Efektivitas Pijat Oksitosin Dan Braest Care Terhadap Produksi Asi Pada Ibu Post Partum Di PMB Bidan Depi Alqorni Tahun 2024 (Damayanti et al., 2024)	The research design is a quantitative direct experimental study involving two postpartum mothers. Oxytocin massage is recommended twice daily for seven days, with each session lasting approximately fifteen minutes. The oxytocin massage involves pressing on acupressure points around the breasts using gentle circular and spiral motions.	The results showed that mothers who received oxytocin massage experienced a larger volume of breast milk compared to those who received breast care. The breast milk volume in the oxytocin massage group reached 130 ml, whereas in the breast care group, it was 100 ml.

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Overall, the articles analyzed conclude that oxytocin massage is an effective intervention for increasing breast milk production in breastfeeding mothers. It helps maintain the smooth flow of breast milk production and supports breastfeeding success. Moving forward, researchers will provide a more detailed overview of the increase in breast milk production as an outcome of the effectiveness of oxytocin massage intervention in breastfeeding mothers.

The amount of breast milk before and after oxytocin massage is measured in most studies (Anggraini et al., 2022; Dağli & Çelik, 2022; Damayanti et al., 2024; Magdalena et al., 2020). The results show significant improvement. Research by Magdalena et al. (2020) indicates that massaging at the correct location, around the upper spine (Th12-L2), increased infant breastfeeding frequency significantly with a p-value of 0.00 by 2.19 times.

In another study by Anggraini et al. (2022) involving 17 participants, oxytocin massage was found to increase breastfeeding frequency, focusing on massaging along the spine up to the 6th vertebra. The research results indicated an average breast milk volume of 86.27 milliliters before the intervention and 126.35 milliliters after the intervention, showing an increase of 40.07 milliliters (Anggraini et al., 2022). This demonstrates a significant improvement in breast milk production volume.

The study by Juwayriyah et al. (2024) compared oxytocin massage with warm compress. The results showed that both methods helped accelerate breast milk production, but oxytocin massage required approximately one to two days longer compared to warm compress. On the other hand, the study by Damayanti et al. (2024) compared oxytocin massage with conventional breast care. The results indicated that the breast milk volume in mothers receiving oxytocin massage reached 130 ml, which was more than the usual breast care treatment that yielded only 100 ml.

In addition, providing nutrition or supplements can only enhance the quality of breast milk, whereas oxytocin massage can stimulate the natural release of oxytocin hormone. Oxytocin massage targets the spine where oxytocin reflexes are located, unlike breast massage, which focuses solely on the breast area. By stimulating the mechanism of breast milk production more comprehensively, oxytocin massage has been proven effective in increasing breast milk production.

The effectiveness of oxytocin massage on breast milk production is evidenced by a greater increase in breast milk volume among mothers receiving oxytocin massage compared to those receiving regular breast care (Damayanti et al., 2024). The breast milk volume in the oxytocin massage group reached 130 ml, indicating the superiority of this intervention in enhancing breast milk production.

From the narrative, oxytocin massage has proven to be an effective intervention in increasing breast milk production among breastfeeding mothers. Various studies demonstrate that oxytocin massage not only enhances breast milk volume but also increases the frequency of breastfeeding sessions. Despite variations in massage methods and durations, consistent findings show a significant increase in breast milk production following oxytocin massage compared to other methods like warm compress or conventional breast care. Therefore, oxytocin massage can be considered a beneficial and practical strategy to support

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breastfeeding success and improve the health of both mother and baby. Further research with larger sample sizes and more rigorous study designs is needed to strengthen these findings and explore the biological mechanisms underlying the effects of oxytocin massage on breast milk production.

CONCLUSION

This systematic review concludes that oxytocin massage is effective in increasing breast milk production in breastfeeding mothers. Among the various massage locations reviewed, one of the most effective locations for enhancing breast milk production is through massage on the back, especially at acupressure points around the breasts, using gentle strokes. This intervention is administered twice daily for 15 minutes each session, consecutively for one week. The results showed an increase in breast milk production by 130 ml.

SUGGESTIONS

Based on the findings of this systematic review, it is recommended that healthcare practitioners, especially nurses, integrate oxytocin massage as part of interventions to enhance breast milk production. Given its effectiveness, the implementation of oxytocin massage can help achieve the WHO targets and Indonesia's government programs aimed at increasing rates of exclusive breastfeeding. This implementation can be achieved through training programs and education directed towards healthcare professionals and breastfeeding mothers, ensuring that this technique is applied correctly and consistently in efforts to support maternal and infant health.

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