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The effectiveness of oxytocin massage on breast milk production: A literature review

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Abstract

Background: Breast milk, produced by the mother's breast glands, acts as a natural and superior source of high-nutrient, high-energy nourishment for infants since birth. Inadequate milk production can lead to mothers not supplying sufficient nutrition to their babies. Oxytocin massage is a technique that can help boost breast milk production.
Purpose: To determine the effectiveness of oxytocin massage on breast milk production.
Method: This research utilized a literature review approach, employing a descriptive narrative analysis of various studies focused on enhancing breast milk production in lactating mothers. The researcher adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for the selection and assessment of research articles. Articles were sourced from databases such as ScienceDirect, PubMed, and Google Scholar, covering publications from 2019 to 2023.
Results: Oxytocin massage positively impacts breast milk production. According to the findings from the reviewed articles, combining oxytocin massage with lavender aromatherapy, music listening, acupressure therapy, and date milk consumption can further boost breast milk production. These approaches notably enhance milk production and can be considered non-pharmacological options.
Conclusion: Oxytocin massage significantly influences breast milk production.

Keywords: Breast Milk Production; Non-Pharmacological; Oxytocin Massage.

INTRODUCTION

Breast milk stands as a superior natural nutritional source produced by humans, offering unparalleled benefits as an ideal food for infants with lasting advantages. For babies, these benefits encompass weight gain, provision of antibodies, cavity prevention, cognitive enhancement, and allergy prevention. Additionally, breastfeeding benefits mothers by serving as a safeguard against breast and ovarian cancer, functioning as a natural contraceptive, and assisting in post-pregnancy weight reduction (Sehmawati & Setyobudi, 2022).

The significance of exclusively breastfeeding infants from birth to 6 months, followed by continued breastfeeding up to 24 months, is well-established for sustaining the baby's immunity, thanks to its anti-infective attributes. Breast milk is rich in immune-modulating compounds and distinctive nutrients. Moreover, it offers comprehensive nutrition, including carbohydrates in the form of lactose, ample polyunsaturated fats, easily digestible primary proteins like lactalbumin, as well as various vitamins and minerals (Nufus, 2019; Järvinen, Martin, & Oyoshi, 2019).

Exclusive breastfeeding rates worldwide are at 44%, while the global target for exclusive breastfeeding is 70% (World Health Organization,

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2021). The rate of exclusive breastfeeding in Indonesia is 68.74%, surpassing the target of 47% (Ministry of Health of the Republic of Indonesia, 2018; Anggraini & Dilaruri, 2022). WHO recommends exclusive breastfeeding for the first 6 months after birth, supplemented with complementary feeding until the age of 2 years. Similarly, institutions like the American Academy of Pediatrics (AAP), Academy of Breastfeeding Medicine (ABM), and the Indonesian Pediatrician Association recommend exclusive breastfeeding for at least 6 months. Data from UNICEF in 2013 indicated that only 32.6% of 136.7 million babies born worldwide were exclusively breastfed for the first 6 months (Mursalini, Nyorong, & Maryanti, 2022). Babies not given exclusive breastfeeding in industrialized countries have a higher risk of mortality compared to those who are exclusively breastfed, while in developing countries, only 39% of mothers practice exclusive breastfeeding (Putri & Rahmawati, 2021).

The postpartum period is often referred to as the lactation or breastfeeding period. Lactation is the period where changes occur in the breasts, causing them to produce the breast milk. This happens due to a complex interaction between mechanical stimuli, nerves, and various hormones, allowing the breast milk to be released. Breast milk is the most suitable food for babies as it contains the necessary nutrients for the baby's growth and development (Fatrin, Soleha, & Herbiatun, 2022).

The absence of breastfeeding can lead to increased infant mortality due to inadequate nutrition affecting the baby's well-being and survival. Without exclusive breastfeeding, there is a rise in the reliance on formula milk. Factors like insufficient breast milk production post-birth, challenges in baby latching, problematic maternal nipples, maternal employment, and aggressive marketing of formula milk can hinder breastfeeding (Emilda & Juliastuti, 2020). Observations in real-life scenarios indicate that many mothers face challenges with low breast milk production in the initial days after delivery. Various methods are employed to boost milk production, including breast care and oxytocin massages, either individually or in combination (Muslimah, Laili, & Saidah, 2020).

Oxytocin massage is a technique used to boost breast milk production in postpartum mothers. This massage involves applying pressure along the costal cartilage towards the V and VI regions, triggering the release of prolactin and oxytocin hormones. These hormones facilitate the secretion and flow of breast milk into the milk ducts, resulting in the release of milk droplets from the nipples (Purnamasari & Hindiarti, 2023). When a baby suckles on the areola, the posterior pituitary gland produces oxytocin, prompting the neurohypophysis to intermittently generate and release this hormone. Subsequently, oxytocin stimulates the muscle cells surrounding the alveoli to contract, allowing milk to flow into the ducts (Fatrin et al., 2022).

RESEARCH METHOD

This research used a literature review design with a descriptive narrative analysis of a number of research journal findings discussing efforts to enhance breast milk production in lactating mothers. In the process of evaluating and selecting research publications, the researcher followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards.

The researcher gathered articles retrieved from databases such as Sciencedirect, Pubmed, and Google Scholar with publication dates ranging from 2019 to 2023. The literature search strategy involved keywords related to the topic and research title using the Boolean operators "AND" and "OR". The keywords used include "Oxytocin Massage" AND "Breast Milk Production".

In the initial identification stage, the researcher tallied the articles from all database searches. The subsequent filtering phase involved selecting articles based on their titles and abstracts. The researcher then applied specific inclusion and exclusion criteria to these articles. In the third phase, articles were chosen based on their full text. Moreover, the methodological quality of the publications that passed the full-text review was evaluated. Finally, in the fourth phase, articles pertinent to the research topic and title underwent a systematic review.

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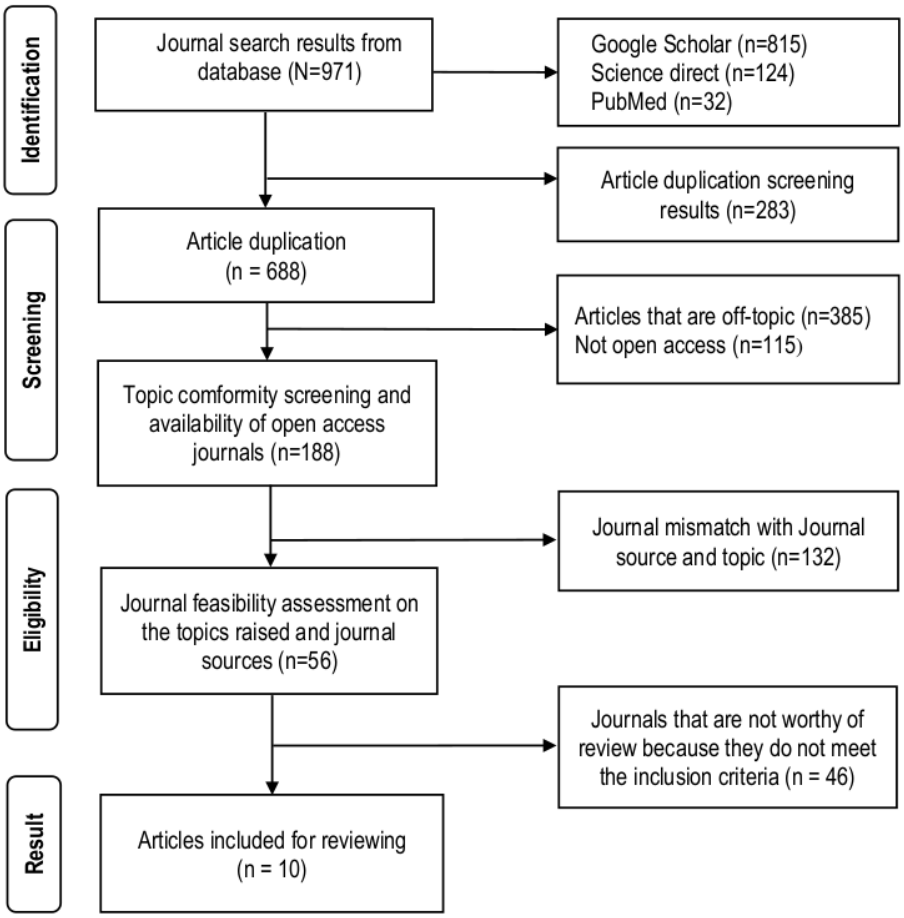
RESEARCH RESULTS



PRISMA Flow Diagram

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Results Analysis of The Selected Articles

Author	Title	Method	Result
(Putri, & Rahmawati, 2021).	The Effectiveness of Oxytocin Massage and Lavender Aromatherapy on the Successful Relactation in Postpartum Mothers..	Pre-experimental design research. The research design used is a one-group pre and posttest design. The sampling technique in this study is non-probability sampling using accidental sampling technique. The main intervention provided is Oxytocin massage compared with Oxytocin massage combined with lavender aromatherapy.	There is an influence of providing oxytocin massage with lavender aromatherapy on the successful relactation in postpartum mothers. During the breastfeeding period, breast milk production is largely determined by the principle of supply and demand, meaning the more often the breasts are emptied and suckled by the baby, the more breast milk production will increase. However, this does not apply to the first 1-3 days after the baby's birth. During that time, breast milk production is more determined by the hormone prolactin's action, so stimulation is needed either in the form of baby suckling or breast care to obtain colostrum maximally.
(Anggraini, & Dilaruri, 2022).	The Effectiveness of Oketani Massage and Oxytocin Massage in Increasing Breast Milk Production	The research has a quasi-experimental quantitative design with a one-group pretest-posttest design. This study uses a Non-probability Sampling method, namely purposive sampling type, with sample selection based on specific characteristics related to the known population. The main intervention provided is oxytocin massage compared to Oketani massage.	The Wilcoxon test on the Oketani massage group before and after the intervention shows a p-value of 0.000 < α (0.05), indicating that the volume of breast milk production has increased significantly. The Wilcoxon test for the oxytocin massage group has a p-value of 0.000 < α (0.05), showing a difference before and after the intervention. The results of the Independent Sample T-test between the Oketani massage group and the oxytocin massage group indicate a difference in the volume of breast milk production before and after the intervention with a p-value of 0.046 < α (0.05). The alternative hypothesis (Ha) is accepted, suggesting that there is a difference between Oketani massage and oxytocin massage in increasing breast milk production.

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(Nufus, 2019).	The Effectiveness of Oxytocin Massage on Breast Milk Production	The research has a quasi-experimental design with a non-randomized posttest without control group. Sampling was done using purposive sampling. The sample consists of 50 individuals divided into 2 groups: 25 respondents receiving oxytocin massage and 25 respondents without oxytocin massage.	Based on the analysis using the chi-square statistical test, it was found that the calculated t-value is 9.22 > t-table 3.84. Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. This indicates that the majority of breast milk production in normal postpartum mothers is sufficient, and there is a difference in breast milk production in postpartum mothers after receiving oxytocin massage.
(Rahmawati, & Sugiarto, 2022).	Effectiveness of Oxytocin and Marmet Massage on Breast Milk Expenditure In Post Section Saecaria Mothers	This research is a pre post test design. The sampling technique used is simple random sampling. The number of samples is 30 pregnant women post Sectio Caesarea. The primary intervention was guinea pig massage compared with oxytocin massage.	There is an effect of oxytocin and marmet massage on the speed of breast milk expenditure (p<0,05). Oxytocin and marmet massage are effective to increase the speed of milk breast milk expenditure. This intervention can be given to post section saecaria pregnant women.
(Aryani, Hasan, & Atikasari, 2019).	The Difference Between Woolwich Massage and Oxytocin Massage on Breast Milk Flow in Postpartum Mothers on Days 1-3 at Independent Practice of Midwife Dince Safrina in Pekanbaru City	Quasi-experimental research. Data collection uses inclusion and exclusion criteria. The population for this study is all normal postpartum mothers at PMB Dince Safrina in Pekanbaru City from March to June 2019. The sample used consists of 15 individuals in the Woolwich massage group and 15 individuals in the oxytocin massage group. The data analysis technique used is the Mann Whitney test.	The average for Woolwich massage is 9.00 and the average for oxytocin massage is 9.93. The Mann Whitney U statistical test with a significance level of 95% indicates a difference in breast milk flow between mothers who received Woolwich massage and those who received oxytocin massage with a p-value of 0.001. It is recommended for midwives to consider implementing oxytocin massage intervention for postpartum mothers as an alternative to enhance breast milk production.
(Meilirianta, Sutijan, & Rustandi, 2020).	Comparison of Breast Care and Oxytocin Massage on Breast Milk Production in Normal Postpartum Mothers	Quasi-experimental research with a pre and post-test without control approach, involving 40 respondents selected through consecutive sampling. The study uses the McNemar test and the Fisher test. The main	After conducting research on the comparison between breast care and oxytocin massage on breast milk production in normal postpartum mothers, it can be concluded that there is a difference in breast milk production before and after

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	at the Inpatient Health Center (UPT Puskesmas Rawat Inap) in Jatinangor, Sumedang District	intervention is oxytocin massage compared to breast care..	intervention in intervention group 1 (breast care) and intervention group 2 (oxytocin massage). Breast care has a more significant impact on breast milk production compared to oxytocin massage with a p-value of 0.001 (p<0.05).
(Anggiani, & Farlikhatun, 2023).	Comparison of Date Milk and Oxytocin Massage on Increasing Breast Milk Production in Breastfeeding Mothers in the Jiput Health Center Working Area, Pandeglang Regency	Quasi-experimental method with a two group pretest and posttest design approach. This research design has two groups, namely the experimental group and the control group. The effectiveness of the treatment was assessed by comparing the posttest and pretest scores. Data analysis used the Wilcoxon and Mann Whitney tests. The main intervention was the administration of date milk compared with oxytocin massage.	After being given date milk to 18 respondents, the majority of respondents (66.7%) had smooth breast milk production, while after being given oxytocin massage the majority of respondents (88.9%) had smooth breast milk production. The Wilcoxon test shows that there is an effect of giving dates on increasing breast milk production (p-value 0.001) and the effect of oxytocin massage on increasing breast milk production (p-value 0.000). There is no difference in the effectiveness of giving dates and oxytocin massage on breast milk production because both date milk and oxytocin massage have good benefits for increasing breast milk production.
(Khasanah, Rahayu, & Saadah, 2023).	Comparison of Breast Milk Production Between BOM Methods (Breast Care, Oxytocin Massage, Mermaid Technique) With Breast Care in Postpartum Mothers in Takeran District, Indonesia	Quasi experiment with post-test only control group design. The population is all pregnant women in the work area of the Takeran Health Center whose expected delivery day is in March-April 2022 as many 32 pregnant women. All affordable populations were sampled. The independent variable is BOM and Breast Care and the dependent variable is breast milk production. Data analysis used the Mann Whitney statistical test.	There is a difference in the amount of breast milk production between the BOM method and breast care. The BOM method can be used as an alternative non-pharmacological therapy to increase breast milk production in postpartum mothers, thereby increasing the success of exclusive breastfeeding.

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(Dağli, & Çelik, 2022).	The effect of oxytocin massage and music on breast milk production and anxiety level of the mothers of premature infants who are in the neonatal intensive care unit: A self-controlled trial	This study was designed in the self-controlled trial type. A self-controlled study design is a type of research in which both the experimental and the control groups consist of the same participants. The main interventions were oxytocin massage and music compared with the quantities of breast milk.	Maternal anxiety scores decreased in oxytocin massage, and music intervention, and the amount of breast milk secretion increased.
(Susilowati, & Tridiyawati, 2023).	The Effectiveness Of The Combination Of Acupressure Therapy With Oxytocin Massage Against The Length Of Time Of Milk Production In Puerperal Mothers	Quasi-experiment with posttest only control group design. The sample in this study was all postpartum mothers at BPM. carried out in August-October 2022 as many as 30 people, the sampling technique was total sampling. The analytical method used is univariate and bivariate analysis with Independent Sample Test. The main intervention carried out was acupressure therapy with oxytocin massage compared to oxytocin massage.	The average length of time for expressing breast milk in the intervention group was 2.16 hours and in the control group 2.79 hours. There is an effectiveness of the combination of acupressure therapy with oxytocin massage on the length of time for breast milk production in postpartum mothers with a p-value of 0.000.

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DISCUSSION

Oxytocin hormone influences breast milk production, while prolactin hormone affects breast milk secretion. Releasing oxytocin hormone requires stimulation at the nipple or through massage on the spine. Through this massage, mothers feel calm, reduce pain, and relax, which can quickly release oxytocin hormone (Nuampa, & Payakkaraung, 2021).

This research suggests that breast milk production can be boosted using non-pharmacological methods like oxytocin massage, Oketani massage, breast care, and drinking date milk. Oxytocin massage involves massaging the spinal area, which activates the parasympathetic nerves and promotes oxytocin release for milk production (Sandriani, Fitriani, & Rahayu, 2023). Moreover, this massage can be enhanced with aromatherapy, music, and acupressure. Oketani massage, on the other hand, strengthens the pectoralis muscles to improve milk output and soften the breast, facilitating easier breastfeeding for infants (Resmana, & Hadianti, 2019).

Studies have shown that combining oxytocin massage with lavender aromatherapy, music, or acupressure can positively influence breast milk production in postpartum mothers (Kasad, Harahap, Nurdahliana, & Noviyanti, 2022). Breast milk production typically follows the principle of supply and demand during breastfeeding, where frequent emptying and suckling of the breast by the baby lead to increased production (Widiastuti, & Widiani, 2020). However, this principle doesn't apply during the initial 1-3 days post-birth. During this period, prolactin hormone plays a more crucial role in milk production, necessitating proper stimulation, either through baby feeding or breast care, to maximize colostrum production.

In this research, participants received oxytocin massages combined with lavender aromatherapy twice daily. Located in the upper spine, between the shoulders, are nerves that connect to the breasts. Massaging this area can alleviate back tension and boost breast milk production (Triansyah, Indarty, Tahir, Sabir, Nur, Basir-Cyio, & Rusydi, 2021). The regularity of these massages can impact milk production. For optimal results, it is recommended to perform the massage twice daily, in the morning and evening. This massage stimulates neurotransmitters in the spine, which activate the medulla oblongata. This sends signals to the hypothalamus in the posterior pituitary to release oxytocin, which then travels through spinal nerve fibers. These fibers regulate blood pressure, heart rate, and the autonomic nervous system. Oxytocin also influences the myoepithelial cells around breast alveoli, prompting them to contract and expel milk produced by the mammary glands (Putri, & Rahmawati, 2021).

The findings from interventions using oxytocin massage, as well as Oketani or Marmet massages, indicate a significant boost in breast milk volume. Oketani massage proves more effective than both Marmet and oxytocin massages in enhancing milk production. Comparative analysis reveals that Oketani massage yields the highest milk volume. This technique enhances pectoralis muscle strength, leading to increased milk production and softer, more elastic breasts, making breastfeeding easier for infants. Additionally, Oketani massage offers holistic relief and comfort to mothers, enhancing milk quality, averting nipple soreness and mastitis, and addressing or mitigating lactation issues stemming from flat or inverted nipples (Susilowati, & Tridiyawati, 2023).

Comparing the effects of Woolwich massage to oxytocin massage, the study found distinct differences in breast milk production between postpartum mothers using each method. Oxytocin massage resulted in a greater milk flow compared to Woolwich massage. Nonetheless, Woolwich massage also impacts the vegetative nerves and underlying skin tissues, promoting relaxation and enhancing blood circulation in the ductal system, thereby facilitating a consistent milk flow (Aryani et al., 2019).

In addition to massage methods, breast milk production can also benefit from consuming date milk. This research suggests that both date milk and oxytocin massage have similar effects in boosting breast milk production. Mothers can opt for either approach to enhance milk production either through nutritional support or hormonal activation. Dates contain hormones akin to oxytocin, specifically a hormone called patuchin, which is thought to constrict blood vessels around the breast. These hormones in dates aid in stimulating the constriction of blood vessels surrounding the mother's breast, facilitating milk production (Anggiani, & Farlikhatun, 2023).

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CONCLUSION

Oxytocin massage notably enhances the efficiency of breast milk production. Alongside this massage, combining it with lavender aromatherapy, music listening, acupressure, and drinking date milk can further boost breast milk production. These approaches offer effective non-pharmacological options to improve breast milk flow.

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