



Oxytocin Massage as a Supportive Technique to Improve Lactation Among Postpartum Women

Hana Nurul Khaeriyah^{1*}, Ossie Happina Sari¹

¹ Midwifery Professional Education, Faculty of Health Sciences, Universitas Bina Bangsa, Serang, Banten, Indonesia

ARTICLE INFO

Article Type:
Research

Article History:
Received: 16 August 2025
Accepted: 29 December 2025
Published: 30 December 2025

***Corresponding author**
Email:
hana.nurul@binabangsa.ac.id

ORIGINAL ARTICLE

ABSTRACT

Breast milk is the optimal source of nutrition for infants, yet low milk production during the early postpartum period often hinders the achievement of exclusive breastfeeding. Oxytocin massage is a simple non-pharmacological technique that may support lactation by enhancing the oxytocin reflex and promoting maternal relaxation. This study aimed to examine the association between oxytocin massage and breast milk production among postpartum mothers in the working area of UPTD Puskesmas Ciawi, Tasikmalaya Regency, in 2024. A quasi-experimental one-group pretest–posttest design was used, involving 20 postpartum mothers selected through total sampling. Breast milk production was assessed using objective expressed milk volume and a validated lactation checklist before and after seven consecutive days of oxytocin massage. Data were analyzed using the paired sample t-test following normality verification. The results showed an increase in the proportion of mothers with adequate milk production from 10% at pretest to 80% at posttest, accompanied by a significant rise in mean production scores ($p < 0.001$; Cohen's $d = 1.32$). While these findings suggest that oxytocin massage may support improvements in breast milk production, the absence of a control group limits causal interpretation. Oxytocin massage may nonetheless be considered a complementary, low-cost intervention in postpartum care, and future studies employing randomized controlled designs are recommended to confirm its effectiveness.

Keywords: Breast Milk Production, Oxytocin Massage, Postpartum Mothers, Exclusive Breastfeeding, Non-Pharmacological Intervention.

ABSTRAK

Air susu ibu (ASI) merupakan sumber nutrisi terbaik bagi bayi, namun rendahnya produksi ASI pada periode postpartum awal sering menjadi hambatan dalam keberhasilan pemberian ASI eksklusif. Pijat oksitosin merupakan teknik nonfarmakologis sederhana yang berpotensi mendukung proses laktasi melalui peningkatan refleksi oksitosin dan pemberian efek relaksasi pada ibu. Penelitian ini bertujuan untuk menganalisis hubungan antara pijat oksitosin dan produksi ASI pada ibu postpartum di wilayah kerja UPTD Puskesmas Ciawi, Kabupaten Tasikmalaya, tahun 2024. Desain penelitian menggunakan quasi-eksperimen dengan pendekatan one-group pretest–posttest yang melibatkan 20 ibu postpartum melalui total sampling. Produksi ASI diukur menggunakan volume ASI perah serta lembar cek laktasi tervalidasi sebelum dan sesudah intervensi pijat oksitosin selama tujuh hari berturut-turut. Data dianalisis menggunakan uji t-berpasangan setelah memenuhi asumsi normalitas. Hasil penelitian menunjukkan peningkatan proporsi ibu dengan produksi ASI adekuat dari 10% pada pretest menjadi 80% pada posttest, disertai peningkatan signifikan pada rerata skor produksi ASI ($p < 0.001$; Cohen's $d = 1.32$). Meskipun hasil ini mengindikasikan bahwa pijat oksitosin dapat mendukung peningkatan produksi ASI, desain tanpa kelompok kontrol membatasi penarikan kesimpulan kausal. Pijat oksitosin tetap dapat dipertimbangkan sebagai intervensi pendamping yang sederhana dan terjangkau dalam asuhan postpartum, dan penelitian lanjutan dengan desain uji coba terkontrol acak diperlukan untuk memastikan efektivitasnya.

Kata Kunci: Produksi ASI, Pijat Oksitosin, Ibu Postpartum, ASI Eksklusif, Intervensi Nonfarmakologis.

INTRODUCTION

Breast milk (ASI) is the optimal and most natural source of nutrition for infants, especially during the first six months of life (González, Carosella, & Fernández, 2021; Sánchez et al., 2021; Anggraeni et al., 2022). It contains an ideal composition of macronutrients, antibodies, hormones, and growth factors essential for infant growth and immune protection against infections and chronic diseases later in life. Breastfeeding also provides significant health benefits for mothers, including a reduced risk of breast and ovarian cancers, type 2 diabetes, and hypertension, as well as improved psychological well-being, lower stress levels, and decreased likelihood of postpartum depression. Furthermore, it strengthens maternal sensitivity and emotional bonding with the infant (Gandodi et al., 2025).

Despite these well-established advantages, exclusive breastfeeding coverage in Indonesia remains below the national target of 80%. According to the World Health Organization Indonesia (2023), the national rate of exclusive breastfeeding in 2022 was 67.96%, a decline from 69.7% in 2021, indicating that more intensive support and interventions are needed to improve breastfeeding practices nationwide. This situation highlights that many mothers still face barriers to sustaining exclusive breastfeeding during the early postpartum period.

One of the most frequently reported obstacles is low milk production, particularly within the first week after childbirth. This condition is often multifactorial, involving psychological stress, suboptimal breastfeeding stimulation, hormonal imbalance, and maternal fatigue (Anggeni, 2021). Anxiety resulting from perceived insufficient milk supply can suppress the oxytocin reflex and inhibit milk ejection, thereby decreasing breastfeeding confidence and prompting early formula introduction (Noviyani, 2024).

Oxytocin plays a pivotal role in lactation, as it stimulates the contraction of myoepithelial cells in the mammary alveoli to facilitate milk ejection. The hormone is released in response to nipple stimulation or through sensory input from areas such as the upper back and shoulder blades. Oxytocin massage, a gentle massage along the thoracic vertebrae to the fifth–sixth rib, has been shown to enhance oxytocin release and maternal relaxation (Susanti & Triningsih, 2021). Physiologically, this method stimulates cutaneous mechanoreceptors that send signals to the hypothalamus, prompting oxytocin secretion from the posterior pituitary gland (Anggraeni, 2024).

Previous studies have reported that oxytocin massage effectively increases breast milk production. For instance, Fitria & Retmiyanti (2021) found a significant difference in breast milk volume between intervention and control groups, while (Marlin, 2025) confirmed similar results with a p -value < 0.05 . However, most existing studies have been conducted in hospital settings with small sample sizes, and few have evaluated its implementation within primary health care facilities, particularly in rural areas. Furthermore, limited evidence exists on the sustained effects of oxytocin massage in improving breastfeeding outcomes in Indonesian community contexts (Rosmiarti & Lestari, 2024).

Given these gaps, further research is needed to strengthen evidence regarding the effectiveness of oxytocin massage as a practical, non-pharmacological intervention to improve milk production in postpartum mothers at the primary care level. Therefore, this study aims to analyze the effect of oxytocin massage on increasing breast milk production among postpartum mothers in the working area of Puskesmas Ciawi, Tasikmalaya Regency. By focusing on community-based implementation, this research seeks to provide evidence to support the integration of oxytocin massage into maternal health programs to enhance exclusive breastfeeding rates in Indonesia.

RESEARCH METHODS

This study employed a quasi-experimental design with a one-group pretest–posttest approach to analyze the effect of oxytocin massage on breast milk production among postpartum mothers in the working area of UPTD Puskesmas Ciawi, Tasikmalaya Regency, in 2024. This design was chosen because of the limited access to a comparable control group within the study area, while still allowing changes to be observed before and after the intervention within the same participants. The study population included all postpartum mothers who gave birth and were

breastfeeding in June 2024, totaling 20 individuals. Because the population was less than 100, total sampling was applied. Inclusion criteria were postpartum mothers starting from the first day after delivery, currently breastfeeding, and willing to participate in the study, while exclusion criteria included mothers whose infants had been given formula milk before the study, infants with congenital abnormalities or illness, mothers with baby blues syndrome, or those unwilling to continue participation.

Breast milk production was measured using both objective and subjective indicators to ensure data validity. Objective measurement involved assessing the expressed milk volume (in milliliters) collected through manual pumping for 15 minutes on one breast, following the procedure used by Fitria and Retmiyanti (2021). Subjective assessment was conducted using an observation checklist and maternal self-report form containing indicators such as breast fullness, infant urination frequency, and frequency of breastfeeding within 24 hours. These instruments had been previously validated with a Cronbach’s alpha value of 0.86, indicating good internal consistency.

The oxytocin massage intervention was conducted once daily in the afternoon for seven consecutive days following the Standard Operating Procedure (SOP) of the Indonesian Ministry of Health. The massage was performed along the spine from the thoracic vertebrae to the fifth–sixth rib for approximately 15 minutes. To minimize observer bias, the intervention and data collection were carried out by different trained health workers who had received standardized instructions on the procedure. Primary data were obtained through direct observation, questionnaires, and checklists, while secondary data were gathered from midwives’ registers within the Puskesmas Ciawi working area. Prior to analysis, data were processed through editing, coding, entry, and cleaning stages to ensure accuracy and completeness.

Normality of data distribution was tested using the Shapiro–Wilk test, which yielded a p-value greater than 0.05, indicating normally distributed data. Therefore, the paired sample t-test was applied to compare mean breast milk production before and after the intervention. A p-value ≤ 0.05 was considered statistically significant, signifying that oxytocin massage had an effect on breast milk production among postpartum mothers.

RESULTS

A total of 20 postpartum mothers participated in this study. The characteristics of respondents included age, parity, education level, and employment status. Most participants were aged 20–35 years (80%), multiparous (65%), had secondary education (70%), and were unemployed/housewives (75%). These characteristics provide a clearer context regarding the population studied and possible factors influencing breastfeeding outcomes.

Breast milk production was assessed using an objective scoring scale, where a higher score indicates better milk production (based on expressed volume in millilitres and validated checklist indicators). Table 1 presents the comparison of breast milk production before and after the oxytocin massage intervention.

Table 1. Breast Milk Production Before and After Oxytocin Massage (n = 20).

Category	Before (n)	%	After (n)	%
Low	18	90%	4	20
Adequate	2	10%	16	80
Mean \pm SD	1.20 \pm 0.41	–	1.90 \pm 0.31	–

Note: Scoring direction: 0 = low production, 1 = moderate, 2 = adequate. Higher scores represent better production.

Table 1 shows that before receiving oxytocin massage, most respondents (90%) were categorized as having low milk production. After the seven-day intervention, the proportion of mothers with adequate production increased significantly to 80%. This descriptive pattern suggests a marked improvement in lactation following the intervention. The improvement in mean breast milk production scores is visually illustrated in Figure 1, which shows a clear upward shift after the intervention.

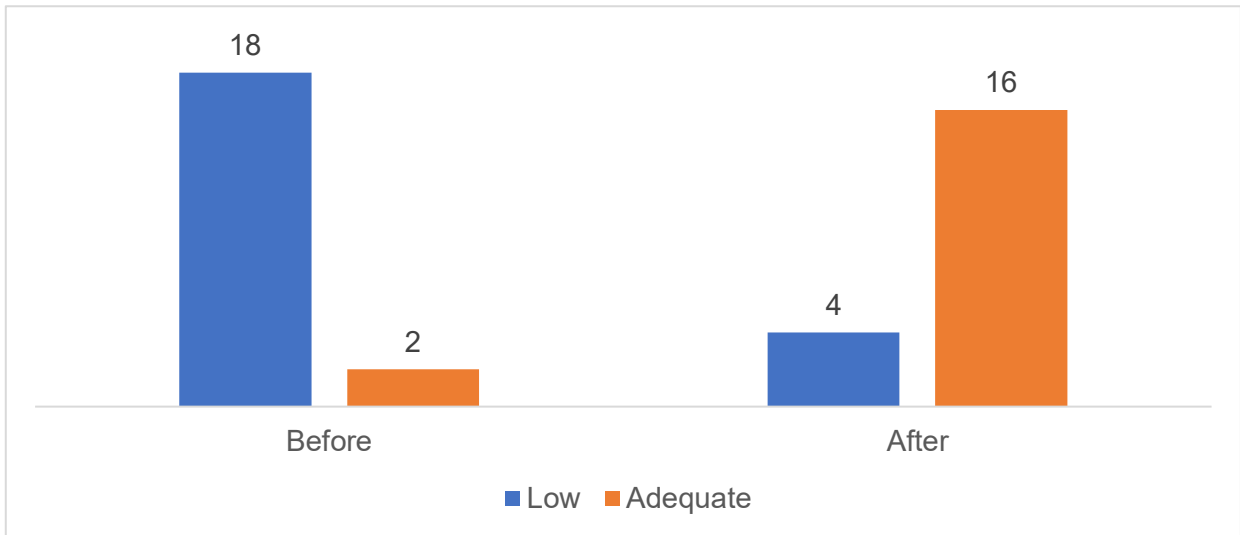


Figure 1. Comparison of Breast Milk Production Before and After the Intervention.

Table 2. Results of Normality Test and Paired Sample t-Test.

Variable	Mean ± SD	Normality (p)	t-value	p-value	95% CI	Effect Size (Cohen's d)
Before Intervention	1.20 ± 0.41	0.351	–	–	–	–
After Intervention	1.90 ± 0.31	0.495	–4.87	0.000	–0.98 to –0.42	1.32 (large)

Table 2 shows that the paired sample t-test revealed a statistically significant increase in breast milk production after the oxytocin massage intervention ($p = 0.000, <0.05$). The mean difference was 0.70 points, with a confidence interval ranging from -0.98 to -0.42 , indicating a substantial and consistent improvement. The effect size (Cohen's $d = 1.32$) falls into the large category, demonstrating a strong practical impact of the intervention. These findings confirm that oxytocin massage significantly enhances breast milk production among postpartum mothers in this study.

DISCUSSION

The findings of this study indicate that breast milk production improved significantly following the application of oxytocin massage among postpartum mothers. While this result aligns with existing evidence, a deeper interpretation is required to understand the underlying mechanisms and alternative explanations. Early postpartum is a period characterized by physiological adjustments involving fluctuating levels of prolactin and oxytocin, which naturally increase as lactation becomes established (Fu et al., 2015). Thus, part of the observed improvement may reflect the normal course of lactogenesis II rather than the intervention alone. Previous studies highlight that milk production typically increases within 48–72 hours after birth, even without external stimulation, as long as breastfeeding is initiated early and performed frequently (Neville & Morton, 2001). Therefore, natural hormonal progression must be considered as a potential confounding factor in interpreting the results.

In addition to hormonal influences, maternal psychological adaptation may also contribute to improved lactation over time. Anxiety and stress commonly occur in early postpartum but tend to decrease as mothers become more confident in breastfeeding (Nurhasanah et al., 2023). Several authors have emphasized that reductions in maternal stress can enhance oxytocin release, thereby improving milk ejection (Chairil et al., 2024). This suggests that part of the increase in milk production may stem from psychological stabilization rather than the massage itself. However, oxytocin massage may accelerate this process because of its relaxing effect, which enhances parasympathetic activity and supports the oxytocin reflex more efficiently than natural adaptation alone (Moberg, 2024).

When compared with larger or more rigorous studies, the findings of this research are generally consistent. (Fitria & Retmiyanti, 2021) reported that mothers receiving oxytocin massage showed significantly higher expressed milk volumes compared with controls. Randomized trials conducted in hospital settings also demonstrated increased plasma oxytocin levels following back massage, supporting the physiological rationale for this procedure. However, most existing studies involve larger samples or controlled designs, making their conclusions more robust than those from a one-group design. Therefore, the current study contributes additional contextual evidence but should be interpreted with caution due to its limited methodological strength.

Diet, hydration, maternal nutritional status, parity, and breastfeeding experience are additional factors that may influence milk production and were not fully controlled in this study. Multiparous mothers, for instance, often demonstrate more established lactation patterns compared with primiparous women. Maternal diet rich in protein, essential fatty acids, and adequate fluids may also enhance lactation, but these variables were not measured. These uncontrolled factors limit the ability to attribute improvements exclusively to oxytocin massage. Nevertheless, the large effect size observed indicates that the intervention likely contributed meaningfully to the increase, even if other factors were also involved.

The theoretical implications of this study reinforce the central role of oxytocin in lactation physiology. Mechanistically, oxytocin massage stimulates cutaneous mechanoreceptors along the thoracic spine, transmitting signals to the hypothalamus and posterior pituitary to enhance oxytocin secretion. This promotes the contraction of myoepithelial cells surrounding the alveoli, strengthening the milk ejection reflex. Beyond its physiological function, oxytocin is closely linked to emotional bonding, relaxation, and maternal confidence. Therefore, the intervention may offer dual benefits physiological stimulation of milk flow and psychological reinforcement of maternal comfort during breastfeeding (Ross & Young, 2009).

The practical and policy implications of this study extend beyond the local setting. Oxytocin massage is simple, low cost, and feasible for implementation in primary healthcare facilities, including rural areas where lactation support is often limited. Integrating this technique into routine postnatal care or as part of standardized breastfeeding support programs can enhance early lactation outcomes (Dwita et al., 2023). Training midwives and community health workers to perform oxytocin massage may strengthen breastfeeding promotion strategies and help address suboptimal exclusive breastfeeding rates nationally. However, broader implementation requires evidence from controlled trials and larger populations to support policy adoption (Semrau et al., 2025).

This study has several limitations that must be acknowledged explicitly. The absence of a control group limits the causal inference of the intervention, as improvements could be influenced by natural lactation progression or other confounding factors not measured in this study. The small sample size restricts generalizability and statistical power. Potential bias may also be present despite attempts to minimize it, particularly if participants altered breastfeeding behavior simply due to awareness of being observed (Hawthorne effect). Future studies should therefore include larger samples, randomized controlled designs, and standardized measurement tools that incorporate both objective and biochemical indicators of lactation.

Overall, this study contributes to growing evidence that oxytocin massage can serve as an effective complementary intervention to enhance breast milk production. Although the results must be interpreted with caution due to methodological constraints, the findings underline the potential for integrating oxytocin massage into midwifery practice as part of holistic breastfeeding support.

CONCLUSION

This study suggests that oxytocin massage is associated with improvements in breast milk production among postpartum mothers, as indicated by the shift from predominantly insufficient to more adequate production following the intervention. Although these findings are consistent with the physiological role of oxytocin in facilitating milk ejection and maternal relaxation, the one-group pretest–posttest design limits the ability to determine causality, and natural lactation progression or other maternal factors may also have influenced the outcomes. Therefore, while

oxytocin massage may be considered a supportive and low-cost complementary practice in postpartum care, further research using randomized controlled trials with larger samples and longer follow-up periods is needed to confirm its effectiveness and more clearly delineate its impact on lactation.

REFERENCES

- Anggeni, U. (2021). Pengaruh Pijat Oksitosin Terhadap Produksi Asi Pada Ibu Post Partum (Studi Literatur) Tahun 2021. *Jurnal Kesehatan dan Pembangunan*, 11(22), 61-71. <https://doi.org/10.52047/jkp.v11i22.114>
- Anggraeni, A. K. (2024). Peningkatan Produksi ASI Pada Ibu Post Partum Melalui Tindakan Pijat Oksitosin. *Madu: Jurnal Kesehatan*, 13(2), 139-145. <https://doi.org/10.31314/mjk.13.2.139-145.2024>
- Anggraeni, R., Aljaberi, M. A. A., Nambiar, N. N., Sansuwito, T. B., & Wati, N. L. (2022). The relationship of supplementary feeding, breast milk (MP-ASI) to infants with the event of diarrhea. *International Journal of Nursing Information*, 1(1), 1-9. <https://doi.org/10.58418/ijni.v1i1.9>
- Chairil, C., Isnaniar, I., Norlita, W., & Ayu, A. S. (2024). Tingkat Kecemasan Ibu Post Partum Primipara dalam Proses Menyusui Bayi di Wilayah Kerja Puskesmas Siak Hulu II. *As-Shiha: Jurnal Kesehatan*, 4(2), 128-150. Retrieved from: <https://ejurnal.umri.ac.id/index.php/JKU/article/view/8541>
- Dwita, P., & Mutmainnah, M. (2023). The Application of Oxytocin Massage in Postpartum Mother Care to Overcome Breastfeeding Problems is not Effective in the Work Area of Putri Ayu Community Health Center Jambi City. *Jurnal Pinang Masak*, 2(2), 85-97.
- Fitria, R., & Retmiyanti, N. (2021). Pijat Oksitosin terhadap Produksi Asi pada Ibu Post Partum. *Jurnal Ilmiah Universitas Batanghari Jambi*, 21(1), 275-276. <https://doi.org/10.33087/jjubj.v21i1.1325>
- Fu, M., Zhang, L., Ahmed, A., Plaut, K., Haas, D. M., Szucs, K., & Casey, T. M. (2015). Does Circadian Disruption Play a Role in the Metabolic-Hormonal Link to Delayed Lactogenesis II?. *Frontiers in nutrition*, 2, 4. <https://doi.org/10.3389/fnut.2015.00004>
- Gandodi, V. S., Krishna, A. V., Padarathi, P., & Sandeep, D. (2025). Breastfeeding Benefits : A Comprehensive Review of Maternal and Infant Health Outcomes. *Indian Journal of Pharmacy Practice*, 18(1), 16–23. <https://doi.org/10.5530/ijopp.20250126>
- González, H. F., Carosella, M., & Fernández, A. (2021). Nutritional risks among not exclusively breastfed infants in the first 6 months of life. *Arch Argent Pediatr*, 119(6), 582-588.
- Marlin, R. (2025). Pengaruh Pijat Oksitosin Terhadap Produksi Asi pada Ibu Postpartum: Literature Review. *Jurnal Inspirasi Kesehatan*, 3(1), 89-98. <https://doi.org/10.52523/jika.v3i1.154>
- Moberg, K. U. (2024). Comprehensive Psychoneuroendocrinology Oxytocin in growth , reproduction , restoration and health. *Comprehensive Psychoneuroendocrinology Journal*, 20(December 2023). <https://doi.org/10.1016/j.cpneec.2024.100268>
- Neville, M. C., & Morton, J. (2001). Symposium : Human Lactogenesis II : Mechanisms , Determinants and Consequences Physiology and Endocrine Changes Underlying Human Lactogenesis II 1 , 2. *Journal of Nutrition*, 131(11), 3005S-3008S. <https://doi.org/10.1093/jn/131.11.3005S>
- Noviyani, F. (2024). Indonesian Journal of Community Empowerment (IJCE) Pijat Oksitosin pada Ibu Postpartum sebagai Upaya Meningkatkan Produksi Asi. *Indonesian Journal of Community Empowerment (IJCE)*, 6(1), 30–34.
- Nurhasanah, N., Nugrahini , E. Y., Kasiati, K., & Islamiah , A. (2023). Hubungan Tingkat Kecemasan Dengan Produksi ASI Pada Ibu Nifas Di TPMB Yuni Hermanto Bangkalan: The Relationship Between Anxiety Level and Breast Milk Production in Postpartum Mothers at TPMB Yuni Hermanto Bangkalan. *Journal of Midwifery Science and Women's Health*, 4(1), 1–7. <https://doi.org/10.36082/jmswh.v4i1.1104>
- Rosmiarti, R., & Lestari, S. . (2024). Penerapan Pijat Oksitosin untuk Meningkatkan Produksi Asi Ibu Menyusui pada Masa Nifas. *Ners Akademika*, 3(1), 1–6. <https://doi.org/10.35912/nersakademika.v3i1.3901>

- Ross, H. E., & Young, L. J. (2009). Frontiers in Neuroendocrinology Oxytocin and the neural mechanisms regulating social cognition and affiliative behavior. *Frontiers in Neuroendocrinology*, 30(4), 534–547. <https://doi.org/10.1016/j.yfrne.2009.05.004>
- Sánchez, C., Franco, L., Regal, P., Lamas, A., Cepeda, A., & Fente, C. (2021). Breast milk: A source of functional compounds with potential application in nutrition and therapy. *Nutrients*, 13(3), 1026. <https://doi.org/10.3390/nu13031026>
- Semrau, K., Litman, E., Molina, R. L., Marx Delaney, M., Choi, L., Robertson, L., Noel-Storr, A. H., & Guise, J. M. (2025). Implementation strategies for WHO guidelines to prevent, detect, and treat postpartum hemorrhage. *The Cochrane database of systematic reviews*, 2(2), CD016223. <https://doi.org/10.1002/14651858.CD016223>
- Susanti, E. T., & Triningsih, L. (2021). Pijat Oksitosin Oleh Suami. *Jurnal Keperawatan*, 7(1), 39–52.
- Susanti, E. T., Triningsih, L. (2021). Literature Review: Pijat oksitosin oleh suami terhadap produksi asi pada ibu nifas. *Jurnal Keperawatan*, 7(1), 39–52.
- World Health Organization Indonesia. (2023). *World Breastfeeding Week*. World Health Organization Indonesia. Retrieved from: <https://www.who.int/indonesia/news/events/world-breastfeeding-week/2023>