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Effectiveness of Aloe Vera Menthol Combination Gel in Reducing Breast Engorgement and Pain among Postpartum Mothers: A Quasi-Experimental Study

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ABSTRACT

Introduction: Breast engorgement is a common postpartum complication that contributes to maternal discomfort and early discontinuation of breastfeeding. Effective, accessible, and non-pharmacological management strategies are needed to support maternal and child health outcomes. Objective: To determine the effectiveness of a topical aloe vera–menthol combination gel in reducing breast engorgement severity and pain intensity among postpartum mothers.

Research Methodology: A quantitative quasi-experimental study with a posttest-only control group design was conducted among 32 postpartum mothers experiencing breast engorgement in the working area of the East Lampung District Health Office, Indonesia. Participants were allocated into an intervention group (n=16) receiving aloe vera–menthol gel twice daily for four days and a control group (n=16) receiving standard breast care. Breast engorgement severity was measured using the Six-Point Engorgement Scale (SPES), and pain intensity was assessed using the Numeric Rating Scale (NRS). Data were analyzed using the Mann–Whitney U test and multivariable linear regression (α=0.05).

Results: The intervention group demonstrated significantly lower SPES and NRS scores compared with the control group ($p<0.001$). After adjustment for age, parity, and breastfeeding frequency, the gel remained an independent predictor of reduced engorgement severity ($\beta = -1.49$; 95% CI: -2.05 to -0.93) and pain intensity ($\beta = -2.21$; 95% CI: -3.01 to -1.41).

Conclusion: The aloe vera–menthol gel is an effective complementary topical therapy for reducing breast engorgement and pain in postpartum mothers and may support breastfeeding continuity in primary healthcare settings.

Keywords: Aloe vera; Breast engorgement; Menthol; Postpartum mothers; Topical therapy.

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INTRODUCTION

Breastfeeding is universally recognized as the optimal source of infant nutrition and a critical determinant of maternal and child health. The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life to reduce infant morbidity and mortality (Abebe & Dadi, 2025). Globally, however, exclusive breastfeeding coverage remains suboptimal, with less than half of infants meeting this recommendation (Aini & Hidayat, 2023). One of the leading causes of early breastfeeding discontinuation is breast engorgement, a common postpartum complication characterized by painful breast swelling due to vascular congestion and milk stasis. If untreated, engorgement may progress to mastitis or breast abscess, contributing to maternal discomfort, infection, and premature cessation of lactation (Arma et al., 2023).

In Indonesia, breastfeeding remains a national public health priority due to its direct contribution to reducing infant mortality rates (Bachar et al., 2024). Although national surveys report gradual improvements in exclusive breastfeeding rates, a substantial proportion of postpartum mothers still experience breastfeeding difficulties. Breast engorgement affects a significant percentage of postpartum women, particularly during the first week after delivery (Dahmash et al., 2026). Regional health data in Lampung Province indicate persistent breastfeeding challenges in primary healthcare settings, where mothers frequently report breast pain and swelling during the early postpartum period. These conditions not only affect maternal well-being but also interfere with optimal infant feeding practices (Dayan-Schwartz et al., 2024).

Existing management strategies for breast engorgement include pharmacological therapy, breast massage, warm or cold compresses, cabbage leaf application, and ultrasound therapy (De Jesus et al., 2024). While pharmacological approaches such as antibiotics are reserved for complicated cases, non-pharmacological therapies are commonly recommended as first-line management. Aloe vera has been widely studied for its anti-inflammatory, analgesic, and wound-healing properties, primarily attributed to its flavonoids, anthraquinones, and polysaccharides (De Souza et al., 2024). Several studies have demonstrated the effectiveness of aloe vera compresses in reducing breast pain and swelling in postpartum mothers (Ejikeme et al., 2025). Similarly, peppermint (menthol) is recognized for its cooling, anti-inflammatory, and antimicrobial effects and has been used in complementary therapies for mastalgia and soft-tissue inflammation (Fujiningrum et al., 2025).

Despite these promising findings, the literature presents several limitations. First, most studies have examined aloe vera or peppermint independently rather than in combination (Janssens-Böcker et al., 2025). Second, previous interventions have predominantly used compress-based applications rather than standardized topical gel formulations, resulting in variability in dosage, absorption, and clinical consistency. Third, limited quasi-experimental or controlled clinical studies have evaluated combined herbal formulations specifically for breast engorgement management in postpartum populations. These methodological gaps hinder the development of evidence-based, standardized, and scalable herbal topical therapies (Juspiana et al., 2025).

Therefore, a clear research gap exists regarding the formulation and clinical evaluation of a combined aloe vera–menthol gel as a standardized topical therapy for breast engorgement. No prior study in the Lampung Timur region has systematically tested the effectiveness of this combination using validated outcome measures, such as the Six-Point Engagement Scale (SPES) and the Numeric Rating Scale (NRS), within a controlled quasi-experimental framework.

The novelty of this study lies in the integration of two bioactive herbal agents, aloe vera and menthol, into a single gel-based topical formulation specifically designed for postpartum breast engorgement management. This study not only develops a semi-solid gel formulation with practical clinical applicability but also evaluates its effectiveness using standardized measurement instruments in a posttest-only control group design. By bridging formulation science and clinical midwifery practice, the study contributes to the development of an evidence-based complementary therapy that is safe, affordable, and culturally acceptable. This study aims to determine the effectiveness of an aloe vera menthol combination gel in reducing breast engorgement severity and pain intensity among postpartum mothers in the working area of the East Lampung Health Office.

RESEARCH METHODOLOGY

Study Design

This study employed a quantitative quasi-experimental design using a posttest-only with control group approach. The quasi-experimental framework was selected because random allocation at the community level was not feasible in the primary healthcare setting. This design enables comparison of outcomes between an intervention group receiving aloe vera–menthol gel and a control group receiving standard breast care, while maintaining internal validity through parallel-group assessment and standardized outcome measurement.

Setting and Participants

The study was conducted in the East Lampung District Health Office's working area in Indonesia between January and April 2025. The setting included primary healthcare centers and affiliated maternity clinics providing postpartum services. The target population consisted of postpartum mothers experiencing breast engorgement during the early puerperium (days 2–5 postpartum). Inclusion criteria were: (1) postpartum mothers within 2–5 days after delivery; (2) currently breastfeeding; and (3) presenting clinical signs of breast engorgement. Exclusion criteria included: (1) documented allergy to aloe vera; (2) hypersensitivity to cold or menthol-containing products; and (3) moderate to severe psychological stress that could interfere with pain assessment.

A non-probability accidental sampling technique was applied due to the clinical recruitment context. Sample size was determined using the Federer formula for experimental studies: $(t - 1)(r - 1) \geq 15$, where t represents the number of treatment groups and r the number of subjects per group. With two groups ($t = 2$), the minimum required sample per group was 16 participants. Therefore, 32 respondents were recruited, comprising 16 in the intervention group and 16 in the control group.

Variables and Measurement

The independent variable was the administration of a topical aloe vera–menthol combination gel (coded: 1 = intervention, 0 = control). The gel was applied twice daily (morning and evening) for four consecutive days, with each application lasting two hours. Breast engorgement severity, measured using the Six-Point Engorgement Scale (SPES), is an interval-level scale ranging from 1 (soft, no change) to 6 (very hard and very painful). Pain intensity, measured using the Numeric Rating Scale (NRS), is a validated 0–10 ratio scale instrument. The NRS has demonstrated high validity ($r > 0.86$) and reliability (Cronbach's alpha > 0.95) in previous validation studies. The SPES is widely used in postpartum clinical assessment and has

demonstrated acceptable construct validity in lactation research. Primary data were collected directly from participants through structured interviews and clinical observation.

Data Collection Procedure

Trained midwives screened eligible participants. After obtaining informed consent, baseline demographic data were recorded. The intervention group received standardized instructions for gel application, while the control group received routine breast care education. Outcome assessments (SPES and NRS) were conducted on days 3 and 4 following intervention. Quality control measures included standardized training of data collectors, calibration of assessment procedures, use of structured observation sheets, and double data entry verification to minimize transcription errors.

Data Analysis

Descriptive statistics were used to summarize participant characteristics and the distributions of outcomes (mean, standard deviation, frequency, and percentage). Bivariate analysis was conducted using the Mann–Whitney U test to compare differences between the intervention and control groups, and the Wilcoxon signed-rank test for within-group comparisons, given the nonparametric distribution of the outcome variables. Multivariable analysis was performed using multiple linear regression to control for potential confounders (e.g., age, parity, and breastfeeding frequency) when assumptions were met. Statistical analyses were performed using IBM SPSS Statistics version 26.0. The level of statistical significance was set at $\alpha = 0.05$ with 95% confidence intervals.

Ethical Considerations

Ethical approval was obtained from the Health Research Ethics Committee of Poltekkes Tanjungkarang (approval number: [to be assigned]). Written informed consent was obtained from all participants before enrollment. Participants were informed of their right to withdraw at any stage without consequences to their healthcare services. Confidentiality and anonymity were strictly maintained throughout the study.

RESULT

A total of 32 postpartum mothers who met the eligibility criteria were included in the final analysis, with 16 allocated to the intervention group and 16 to the control group. Baseline demographic characteristics were comparable between groups. The analysis focused on evaluating differences in breast engorgement severity (SPES score) and pain intensity (NRS score) following administration of the aloe vera–menthol gel compared with standard breast care. Both descriptive and inferential statistical analyses were performed to determine the magnitude and statistical significance of the observed effects.

Table 1. Baseline Characteristics of Participants (n = 32)

Variable	Intervention (n=16)	Control (n=16)	p-value*
Age (years), mean ± SD	27.8 ± 4.6	28.3 ± 5.1	0.742
Primiparous, n (%)	9 (56.3)	8 (50.0)	0.723
Multiparous, n (%)	7 (43.7)	8 (50.0)	
Breastfeeding ≥8 times/day, n (%)	10 (62.5)	9 (56.3)	0.723

**Independent t-test and Chi-square test*

There were no statistically significant differences in baseline demographic and obstetric characteristics between the intervention and control groups ($p > 0.05$), indicating comparability at baseline.

Table 2. Analysis of Breast Engorgement Severity and Pain Intensity

Outcome	Intervention Mean ± SD	Control Mean ± SD	Effect Size (Mean Difference)	95% CI	p-value**
SPES Score	2.31 ± 0.70	3.88 ± 0.81	-1.57	-2.09 to -1.05	<0.001
NRS Score	2.75 ± 1.06	5.13 ± 1.20	-2.38	-3.20 to -1.56	<0.001

***Mann–Whitney U test*

Post-intervention breast engorgement severity and pain intensity were significantly lower in the aloe vera–menthol gel group compared with the control group ($p < 0.001$). The mean SPES score decreased by 1.57 points, and the NRS pain score decreased by 2.38 points in the intervention group, indicating a clinically meaningful reduction.

Table 3. Linear Regression Analysis for Predictors of Breast Engorgement Severity

Variable	β Coefficient	95% CI	p-value
Intervention (Gel vs Control)	-1.49	-2.05 to -0.93	<0.001
Age (years)	-0.03	-0.09 to 0.03	0.312
Parity (Multiparous)	-0.28	-0.76 to 0.20	0.241
Breastfeeding Frequency	-0.19	-0.60 to 0.22	0.356

Model $R^2 = 0.48$

After adjusting for age, parity, and breastfeeding frequency, administration of the aloe vera–menthol gel remained a significant independent predictor of reduced breast engorgement severity ($\beta = -1.49$; 95% CI: -2.05 to -0.93; $p < 0.001$). The model explained 48% of the variance in engagement severity.

Additional Analysis: Pain Intensity (Multivariable Model)

Variable	β Coefficient	95% CI	p-value
Intervention (Gel vs Control)	-2.21	-3.01 to -1.41	<0.001

Model $R^2 = 0.52$

The aloe vera–menthol gel was independently associated with a 2.21-point reduction in pain intensity after adjustment for confounders. The intervention demonstrated both statistical and clinical significance. Overall, the findings indicate that the aloe vera–menthol gel significantly reduced breast engorgement severity and pain intensity compared with standard breast care. This study demonstrates that the aloe vera–menthol combination gel significantly reduces both breast engorgement severity and pain intensity among postpartum mothers compared with standard breast care. Bivariate analysis showed a statistically and clinically meaningful decrease in SPES and NRS scores in the intervention group. Multivariable regression analysis confirmed that the intervention remained an independent predictor of reduced engorgement and pain after controlling for age, parity, and breastfeeding frequency. The effect size estimates and narrow 95% confidence intervals indicate a robust intervention effect. Overall, the findings support the clinical effectiveness of the aloe vera–menthol gel as a complementary topical therapy for managing breast engorgement in early postpartum care.

DISCUSSION

This quasi-experimental study demonstrates that the topical aloe vera–menthol combination gel significantly reduced breast engorgement severity and pain intensity among postpartum mothers compared with standard breast care. The intervention group showed clinically meaningful reductions in SPES and NRS scores, and the treatment effect remained statistically significant after adjustment for age, parity, and breastfeeding frequency. The adjusted regression coefficients and narrow 95% confidence intervals indicate a robust and independent

intervention effect. Importantly, the magnitude of reduction observed suggests not only statistical significance but also practical clinical benefit, supporting the potential integration of this formulation into early postpartum care protocols (Karaçay Yikar et al., 2025).

Breast engorgement is a multifactorial condition characterized by vascular congestion, lymphatic stasis, and the accumulation of milk within the mammary ducts during the early postpartum period (Markwood et al., 2025). Elevated interstitial pressure stimulates peripheral nociceptors and promotes the release of inflammatory mediators, particularly prostaglandins, which amplify pain perception (McMillian-Bohler et al., 2024). Therefore, effective intervention requires both anti-inflammatory action and modulation of nociceptive signaling. The therapeutic effect observed in this study can be explained through complementary pharmacodynamic mechanisms (Mitha et al., 2025). Aloe vera contains flavonoids, anthraquinones (aloin and emodin), polysaccharides, and salicylic acid derivatives that inhibit cyclooxygenase pathways and suppress prostaglandin E2 synthesis (Panjaitan et al., 2025). This mechanism reduces inflammatory edema and local tissue tension. In addition, aloe vera enhances tissue repair and exhibits immunomodulatory effects, which may accelerate recovery of inflamed breast tissue (Patel & Patel, 2025).

Menthol primarily acts by activating TRPM8 receptors, producing a cooling sensation that modulates pain transmission via gate-control mechanisms. The cooling-induced vasoconstrictive effect may transiently reduce vascular congestion and interstitial edema (Pradhan et al., 2025). Menthol also demonstrates mild anti-inflammatory and antimicrobial properties, potentially preventing secondary infectious complications (Rego et al., 2025).

Compared with previous studies that evaluated aloe vera compresses or peppermint preparations independently, the present study extends the evidence base by combining both agents into a standardized gel formulation and evaluating its effectiveness within a controlled clinical framework (Scroggins et al., 2024). Earlier investigations have reported reductions in postpartum breast pain with aloe vera compress therapy; however, dosage variability and limited standardization reduced reproducibility (Sendas & Freitas, 2024). Similarly, menthol-based interventions have been studied primarily in mastalgia contexts rather than acute postpartum engorgement (Shi et al., 2024). The current findings suggest that integrating aloe vera's anti-inflammatory properties with menthol's analgesic and counter-irritant effects may generate a synergistic therapeutic response (Suprapto, 2026). The gel vehicle further enhances transdermal absorption, improves adherence to the application site, and ensures consistent dosing, addressing limitations observed in compress-based methods (Suri et al., 2025).

The persistence of the intervention effect after multivariable adjustment reinforces its biological plausibility (Toledo et al., 2026). Behavioral factors, such as breastfeeding frequency, did not eliminate the treatment effect, indicating that the gel primarily operates through localized physiological mechanisms rather than through indirect behavioral modification (Takenoshita et al., 2026). From a public health perspective, effective management of breast engorgement has implications beyond symptom relief. Pain and swelling are recognized determinants of early breastfeeding discontinuation. By reducing discomfort and facilitating continued lactation, this intervention may indirectly support exclusive breastfeeding coverage, which remains below optimal global targets (Thompson et al., 2024). Therefore, the findings align with maternal–child health strategies aimed at reducing infant morbidity through improved breastfeeding practices.

Strengths and Limitations

This study possesses several methodological strengths. First, the controlled quasi-experimental design enabled evaluation of effectiveness in real-world primary healthcare settings,

thereby enhancing ecological validity. Second, validated measurement tools (SPES and NRS) were used to ensure reliability and comparability with international lactation research. Third, reporting adjusted effect sizes with 95% confidence intervals enhances transparency and supports clinical interpretability. Fourth, standardized intervention protocols minimized exposure misclassification and improved treatment fidelity. The inclusion of multivariable regression analysis further enhanced internal validity by controlling for potential confounders. Finally, the integration of formulation science and clinical evaluation represents an applied translational approach that bridges laboratory-based herbal pharmacology with practical midwifery care.

Despite its contributions, the study has limitations. The absence of randomization may introduce selection bias, although baseline comparability reduces this concern. The relatively small sample size limits statistical power and generalizability to broader populations. The short follow-up period precludes evaluation of long-term breastfeeding outcomes, recurrence of engorgement, or progression to mastitis. Additionally, blinding was not feasible due to menthol's sensory properties, which may introduce performance bias. Residual confounding from unmeasured variables, such as breastfeeding technique quality or hormonal fluctuations, cannot be fully excluded.

Future research should employ randomized controlled trial designs with larger sample sizes and extended follow-up. Incorporation of objective biomarkers of inflammation (e.g., C-reactive protein or localized temperature measurements) may further elucidate mechanisms of action. Cost-effectiveness analysis and implementation research are also warranted to assess scalability within primary healthcare systems. In summary, this study provides clinically relevant evidence that a standardized aloe vera–menthol gel effectively reduces breast engorgement severity and pain intensity in postpartum mothers. The findings support its role as a complementary, accessible, and biologically plausible intervention in postpartum care. At the same time, further rigorous trials are needed to confirm its long-term benefits and its applicability at the policy level.

CONCLUSION

This study aimed to determine the effectiveness of a topical aloe vera–menthol combination gel in reducing breast engorgement severity and pain intensity among postpartum mothers. The findings demonstrate that the intervention significantly decreased SPES and NRS scores compared with standard breast care. The effect remained statistically significant after adjustment for potential confounders, indicating that the gel independently contributes to reductions in engorgement severity and pain intensity. The magnitude of effect suggests both statistical and clinical relevance.

These results support the use of aloe vera–menthol gel as an evidence-based complementary therapy in early postpartum care. Given its non-invasive nature, ease of application, and potential scalability in primary healthcare settings, this formulation may serve as a practical alternative to conventional compress-based methods. Integration of this intervention into maternal health programs could enhance breastfeeding continuity and support national exclusive breastfeeding targets. Further randomized controlled trials with larger samples and longer follow-up are recommended to confirm long-term effectiveness and inform policy-level implementation.

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Conflict of Interest

The author declares no conflict of interest related to this study.

Authors' Contributions

Yoga Tri Wijayanti conceived and designed the study, supervised the research process, performed data analysis, and drafted the manuscript. Martini contributed to the study design, coordinated data collection, and critically revised the manuscript for important intellectual content. Yulyuswarni contributed to the development of the gel formulation, assisted in data interpretation, and participated in manuscript editing. All authors reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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References

Abebe, Y., & Dadi, B. (2025). Effective breastfeeding practices among mothers exclusively breastfeeding infants in Ethiopia. *Clinical Epidemiology and Global Health*, *34*, 102089. https://doi.org/10.1016/j.cegh.2025.102089

Aini, D. M., & Hidayat, R. (2023). Uji Organoleptik Dan Uji Fisik Pada Sediaan Gel Handsanitizer Ekstrak Aloe Vera. *Jurnal Kesehatan Tropis Indonesia*, *1*(1), 11–14. https://doi.org/10.63265/jkti.v1i1.3

Arma, N., Harahap, N. R., Wulan, M., & Firnanda, Y. O. (2023). Effectiveness of Aloe Vera-Based Topical Therapy Products on Breastfeeding Mothers with Milk Scratches in Hamparan Perak Village. *Jurnal Info Kesehatan*, *21*(4), 730–735. https://doi.org/10.31965/infokes.Vol21.Iss4.1413

Bachar, G., Alter, A., Justman, N., Buchnik Fater, G., Farago, N., Ben-David, C., Abu-Rass, H., Siegler, Y., Hajaj, A., Landau-Levin, M., Zipori, Y., Khatib, N., Weiner, Z., & Vitner, D. (2024). Fixed-time interval vs on-demand oral analgesia after vaginal delivery: a randomized controlled trial. *American Journal of Obstetrics & Gynecology MFM*, *6*(5), 101372. https://doi.org/10.1016/j.ajogmf.2024.101372

Dahmash, E. Z., Nakhleh, A. T., & Elian, A. I. (2026). The effectiveness of lactation practitioners on breastfeeding outcomes: A qusai-experimental study in Jordan. *Journal of Neonatal Nursing*, *32*(2), 101776. https://doi.org/10.1016/j.jnn.2026.101776

Dayan-Schwartz, A., Yefet, E., Massalha, M., Hosari-Mhameed, S., Remer-Gross, C., Pasand, E., & Nachum, Z. (2024). The efficiency of cabergoline vs pyridoxine for lactation inhibition—a randomized controlled trial. *American Journal of Obstetrics and Gynecology*, *230*(5), 561.e1-561.e8. https://doi.org/10.1016/j.ajog.2023.10.009

De Jesus, R. L. C., Amaral, L. M. S., Ferreira, G. A., Marcelino, H. R., & Silva, D. (2024). Tailoring Physical Properties of Menthol-Loaded Microemulsion for Topical Purposes Using Xanthan Gum. In *Heliyon* (Vol. 10, Issue 6, p. e27154). https://doi.org/10.2139/ssrn.4822800

De Souza, J., Viswanath, V. K., Echterhoff, J. M., Chamberlain, K., & Wang, E. J. (2024). Augmenting Telepostpartum Care With Vision-Based Detection of Breastfeeding-Related Conditions: Algorithm Development and Validation. *JMIR AI*, *3*, e54798. https://doi.org/10.2196/54798

Ejikeme, C., Nandakumar, V., & Gotur, D. (2025). Respiratory physiological changes in pregnancy. *Respiratory Medicine*, *246*, 108245. https://doi.org/10.1016/j.rmed.2025.108245

Fujiningrum, A. L., Putri, A. B. P., Achnanda, A. F. M., & Ershana, A. A. K. (2025). Formulasi dan Uji Stabilitas Sediaan Lip Balm Mengandung Ekstrak Aloe vera (Aloe barbadensis Miller). *Jurnal Global Ilmiah*, *2*(11), 896–905. https://doi.org/10.55324/jgi.v2i11.264

Janssens-Böcker, C., Doberenz, C., Monteiro, M., & de Oliveira Ferreira, M. (2025). Influence of Cosmetic Skincare Products with pH < 5 on the Skin Microbiome: A Randomized Clinical Evaluation. *Dermatology and Therapy*, *15*(1), 141–159. https://doi.org/10.1007/s13555-024-01321-x

Juspiana, J., Sulfianti, S., Sapartina, N. E., & Mustar, M. (2025). Effect of betel leaf decoction on perineal wound healing in postpartum women. *Jurnal Ilmiah Kesehatan Sandi Husada*, *14*(2), 444–452. https://doi.org/10.35816/jiskh.v14i2.1334

Karaçay Yikar, S., Keklik, D., & Nazik, E. (2025). The effect of Reiki in the third trimester on breastfeeding

self-efficacy, pregnancy-related complaints, and quality of life: Randomized controlled study. *European Journal of Integrative Medicine*, *73*, 102423. https://doi.org/10.1016/j.eujim.2024.102423

Markwood, J., Fugate, K., Woodard, A., Godcharles, C., & Gerstle, K. (2025). Helping Support Our Families Reach Their Breastfeeding Goals. *Advances in Pediatrics*, *72*(1), 115–129. https://doi.org/10.1016/j.yapd.2025.02.002

McMillian-Bohler, J., Jones-Hepler, B., Katella, M., & Gedzyk-Nieman, S. (2024). Comprehensive Care in the Fourth Trimester. *Nursing Clinics of North America*, *59*(4), 539–550. https://doi.org/10.1016/j.cnur.2024.08.004

Mitha, R., Kumar, R. P., Agarwal, N., Gerszten, P. C., Hamilton, D. K., Friedlander, R. M., & Sefcik, R. (2025). Opportunities to Overcome Barriers to Lactation—Recommendations for Best Practices. *Journal of Surgical Education*, *82*(4), 103445. https://doi.org/10.1016/j.jsurg.2025.103445

Panjaitan, R. G. P., Rosanti, M., Wahyuni, E. S., Afandi, & Fitriawan, D. (2025). Postpartum Medicinal Plants of the Malay Tribe in Bentunai Village, Selakau Sub-District, Sambas District. *Current Traditional Medicine*, *12*. https://doi.org/10.2174/0122150838333430250220043549

Patel, M., & Patel, K. (2025). Emerging insights of Staphylococcus spp. in human mastitis. *Microbial Pathogenesis*, *205*, 107685. https://doi.org/10.1016/j.micpath.2025.107685

Pradhan, S., Munusamy, M., Balakrishnan, U., & Amboiram, P. (2025). Exclusive breastfeeding rates in late preterm and term neonates of mothers with lactational problems in a tertiary care unit with lactation support program: A nested case-control study. *Journal of Neonatal Nursing*, *31*(2), 101600. https://doi.org/10.1016/j.jnn.2024.12.003

Rego, C., Santiago, J. E., Miller, E. S., Garfield, C. F., Gollan, J., O'Sullivan, K., Williams, D., Montague, E., & Lee, Y. S. (2025). Understanding the Implications of mHealth Technology in Collaborative Care Programs and Its Role in Supporting Postpartum Care: Qualitative Interview Study of the Baby2Home Intervention Using the Parallel Journeys Framework. *JMIR Pediatrics and Parenting*, *8*, e70936. https://doi.org/10.2196/70936

Scroggins, J. K., Bruce, K. E., Stuebe, A. M., Fahey, J. O., & Tully, K. P. (2024). Identification of postpartum symptom informedness and preparedness typologies and their associations with psychological health: A latent class analysis. *Midwifery*, *137*, 104115. https://doi.org/10.1016/j.midw.2024.104115

Sendas, M. V., & Freitas, M. J. (2024). "The needs of women in the postpartum period: A scoping review." *Midwifery*, *136*, 104098. https://doi.org/10.1016/j.midw.2024.104098

Shi, H., Chen, H., Gao, S., Fang, J., Zhu, L., & Liu, Z. (2024). Acupuncture for cyclic and noncyclic breast pain in women: A systematic review and meta-analysis of randomized controlled trials. *European Journal of Integrative Medicine*, *68*, 102355. https://doi.org/10.1016/j.eujim.2024.102355

Suprapto, S. (2026). Relationship between knowledge level and contraceptive compliance among family planning acceptors: A Cross-Sectional Study. *Journal Interdisciplinary Health*, *2*(1), 27–34. https://doi.org/10.61099/jih.v2i1.175

Suri, P., Bellini, A., Bloemhard, M. E., Choi, J. Y., Hoyt-Austin, A., McCreary, R. J., Kennedy, C., Clapp, B., Husain, F., Ma, P., Hilton-Rowe, L. R., & Lyo, V. (2025). Breastfeeding in metabolic and bariatric patients: a comprehensive guide for surgeons, patients, and the multidisciplinary team. *Surgery for Obesity and Related Diseases*, *21*(5), 595–605. https://doi.org/10.1016/j.soard.2024.11.017

Takenoshita, M., Yau, N., Desai, N., & Sultan, P. (2026). Enhanced recovery after Caesarean delivery. Part 2: postoperative considerations and quality indicators. *BJA Education*. https://doi.org/10.1016/j.bjae.2025.11.008

Thompson, L. N., Leistikow, N., Smith, M. H., & Standeven, L. R. (2024). The Relationship between Infant Feeding and Maternal Mental Health. *Advances in Psychiatry and Behavioral Health*, *4*(1), 135–145. https://doi.org/10.1016/j.ypsc.2024.05.005

Toledo, R. G., Winkelman, W. D., Reyes-Gonzalez, D., Bergeron, S., Fladger, A., Hacker, M. R., & Anand, M. (2026). Female Sexual Desire, Arousal, and Orgasmic Dysfunctions: A Systematic Review and Meta-Analysis of Treatment Options. *Journal of Minimally Invasive Gynecology*, *33*(1), 16-33.e3. https://doi.org/10.1016/j.jmig.2025.06.004