

Effect of aloe vera gel compresses on breast engorgement among postpartum mother

Siti Raihanah, Jasmawati Jasmawati, Nursyahid Siregar

East Kalimantan Ministry of Health Health Polytechnic, Samarinda, Indonesia

Abstract

Navigating the challenges of new motherhood, a staggering 50 to 70 percent of women find themselves grappling with clogged milk ducts. Aloe vera gel compresses can be used on breasts to reduce edema. Aloe vera is known for its effective anti-inflammatory properties. This study aimed to investigate the effect of aloe vera gel compresses on breast engorgement in postpartum mothers. The study included postpartum mothers as the target population. The research design employed a pretest-posttest methodology comprising a control group and non-probability sampling using

consecutive sampling. Statistical analyses involved the Paired T-Test and Independent T-Test, with a significance level of $p < 0.05$. The sample consisted of thirty respondents, with 15 in the control group and 15 in the experimental group. Over a period of three days, aloe vera gel compresses were applied to the breasts twice a day. The Bourbonnais pain scale evaluation checklist was used to assess the degree of breast pain. The findings of this study demonstrate that the intervention involving aloe vera gel compresses significantly reduced breast engorgement ($p=0.000$; mean SD 2 ± 1.25) and associated pain ($p=0.000$; mean SD 2.2 ± 1.37). The results of this study suggest that the use of aloe vera gel compresses can effectively alleviate breast pain and swelling in postpartum mothers. Given the substantial benefits observed, healthcare professionals may consider incorporating aloe vera gel compresses as a non-invasive and natural intervention for postpartum mothers experiencing breast engorgement and discomfort.

Correspondence: Siti Raihanah, East Kalimantan Ministry of Health Health Polytechnic, Samarinda, Indonesia.
E-mail: shanaraihana09@gmail.com

Key word: breast; compress; aloe vera gel; engorgement.

Contributions: SR conceptualization, data curation, formal analysis, methodology, validation, visualization, writing – original draft, review and editing, conceptualization, investigation, methodology, validation, and writing – original draft, review and editing; JW conceptualization, methodology, formal analysis, validation, and writing – original draft, review and editing; NS methodology, visualization, writing, review and editing.

Conflict of interest: the authors declare no conflict of interest.

Ethics approval and consent to participate: the research has received ethical approval from the Health Research Ethics Commission, Poltekkes Kemenkes Kalimantan Timur, based on ethical certificate DL.02.03/4.3/10433/2022. During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence and non-maleficence.

Patient consent for publication: written informed consent was obtained for anonymized patient information to be published in this article.

Funding: this research did not receive external funding.

Availability of data and materials: all data generated or analyzed during this study are included in this published article.

Received: 13 September 2023.

Accepted: 9 November 2023.

Early access: 5 December 2023.

This work is licensed under a Creative Commons Attribution 4.0 License (by-nc 4.0).

©Copyright: the Author(s), 2023

Licensee PAGEPress, Italy

Healthcare in Low-resource Settings 2024; 12:11788

doi:10.4081/hls.2023.11788

Publisher's note: all claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article or claim that may be made by its manufacturer is not guaranteed or endorsed by the publisher.

Introduction

A multitude of factors contribute to the low breastfeeding coverage rate.^{1,2} These factors include maternal psychological factors, family support, knowledge of exclusive breastfeeding, a lack of breastfeeding counseling from health professionals, early formula feeding, and breastfeeding issues such as nipple blisters, nipple deformities, and breast engorgement.^{3,4} Breast engorgement, a common issue for breastfeeding mothers during the postpartum period, affects approximately 50-70% of breastfeeding women.⁵ It is often experienced between the third and fourteenth day after birth.⁶ Research conducted by Yanti (2017) at Sidomulyo Health Center in Pekanbaru revealed that 47 out of 67 breastfeeding mothers suffered from breast engorgement.⁷ Similarly, Rutiani's study (2016) reported that out of 26 mothers who underwent cesarean sections at Bandung's Sariningsih Hospital, 19 reported insufficient breast milk.⁸ Setiawan's research (2017) at the Ngrayun Ponorogo Health Center found that 15 out of 40 breastfeeding mothers who visited in January and February 2017 experienced breast engorgement.⁹ A physiological phenomenon known as a breast milk dam occurs when the breast duct (ductus lactiferus) becomes partially or completely clogged with breast milk.¹⁰ Symptoms include breast pain, tension, edema, fever, and decreased milk output.¹¹ Mastitis and breast abscesses can occur in the majority of breastfeeding mothers who experience a 7% breast milk shortage.¹² Furthermore, breast engorgement often influence mothers' decisions to wean their children early and cease exclusive breastfeeding.¹³

Breast engorgement can develop for various reasons.¹⁴ One contributing factor is the rise in prolactin activity, which occurs biologically 48 hours after delivery. Infants should be fed from breasts swollen with breast milk.¹⁵ Delayed nursing due to the infant being in a sleep phase and taking longer to wake up can lead to less frequent and shorter breastfeeding sessions.¹⁶ Additionally,

primiparous mothers and those who have had cesarean births may face challenges and delays in nursing, putting them at risk for breast engorgement.¹⁷

Currently, treatments for breast engorgement include both pharmaceutical and non-pharmacological approaches.¹⁸ Pharmacological treatments may include the use of serrapeptase medications to reduce breast edema and paracetamol medications to relieve pain.¹⁹ These medications have no adverse effects on the mother or the baby and do not impact milk production.²⁰ However, non-pharmacological treatments such as warm or cold compresses and breast care procedures are also recommended, making medication unnecessary in some cases.²¹

Various methods, including acupuncture, aloe vera, alternating hot and cold compresses, cold compresses, and ultrasound therapy, can be employed to alleviate breast engorgement.²² Aloe vera, a member of the Liliaceae family, has a unique gel that helps prevent skin from drying out and maintains its moisture.^{21,23} Studies suggest that aloe vera's ability to target harmful agents and injured tissue makes it an effective anti-inflammatory.²⁴ Acupuncture, aloe vera, alternating hot and cold compresses, cold compresses, and ultrasound therapy are among the methods to alleviate breast engorgement.²¹ Traditional breast care methods also incorporate hot or cold compresses combined with massage. Aloe vera, which originates from Africa and belongs to the Liliaceae family of plants, is unique for its gel that helps prevent skin from drying out, maintaining its moisture.²⁵ The capacity of aloe vera gel to penetrate the skin and fortify it against excessive fluid loss has contributed to this characteristic.²⁶

According to multiple studies, aloe vera's potential to inhibit, neutralize, reduce, or cluster both harmful agents and damaged tissue renders it an effective anti-inflammatory.²⁵ Indicators of inflammation encompass edema, discomfort, redness, heat, and swelling. Antipyretics are substances or medications that lower body temperature. Aloe vera, functioning as an anti-inflammatory and herbal burn treatment, can reduce swelling and prevent edema by inhibiting the enzyme cyclooxygenase or the production of prostaglandin E2 (PGE2) from arachidonic acid.²⁷ PGE2 substances, produced by macrophages, regulate various inflammatory responses and heighten pain thresholds. Aloe vera extract also impedes neutrophil cell migration and inhibits the growth of *Streptococcus* and *Shigella* bacteria due to its antibacterial properties.²⁵ Aloe vera leaves contain two types of liquids. The first is a clear, jelly-like substance (mucus) that includes antibacterial and antifungal properties, as well as salicylates that can stimulate fibroblasts, which are skin cells that aid in wound healing. Consequently, aloe vera is believed to have the ability to heal wounds, alleviate pain, and possess anti-swelling properties.²⁸ Aloe vera compresses have been proven to reduce pain in swollen body areas. The reduction in the breast swelling pain scale following the application of aloe vera compresses is attributed to the high content of amino acids, minerals, and polysaccharides in aloe vera leaves, which are believed to reduce breast swelling and alleviate inflammation-related pain. Aloe vera compresses are effective in reducing breast discomfort when the breasts are full and swollen.²⁹ This research aimed to demonstrate the effect of aloe vera gel compresses on breast engorgement among postpartum mothers.

Materials and Methods

The study population consisted of postpartum mothers in the Samarinda region who visited the Clinic and Puskesmas. This

study utilized a quasi-experimental research design. It employed a control group and a pretest-posttest methodology. Non-probability sampling with consecutive sampling was used for participant selection. Statistical analyses included the use of the Paired T-test and Independent T-Test. Respondents to this study were postpartum and lactating mothers who experienced breast milk swelling (primipara dan multipara). The sample comprised 30 respondents, with 15 mothers in the experimental group and the remaining 15 in the control group (Table 1). Inclusion criteria: Having signs and symptoms of breast milk damage, willing to be a respondent. Exclusion criteria: Mother was allergic to aloe vera gel, receiving analgesics and lactation suppression, having mastitis, infection, and breast abscesses. The independent variable was aloe vera gel compress and the variables were engorgement and pain. Over a period of three days, mothers' breasts were compressed with 5 gram aloe vera gel that was BPOM (Agency for Drug and Food Control) product twice a day for 10 minutes. The degree of breast pain was assessed using the Bourbonnais pain scale evaluation checklist (Breast pain score 1-10), and breast engorgement was measured using the Hill and Humenick six-point engorgement scale (Breast engorgement score 1-6: 1. Breast flabby, no consistency in the breast; 2. There is a slight breast change; 3. Breast hard, but not painful; 4. Firm breasts, starting to feel pain; 5. Hard and painful breasts; 6. Very firm and very painful.^{30,31} Ethical clearance number DL.02.03/4.3/10433/2022 was obtained from Poltekkes Kemenkes Kalimantan Timur. Respondents were provided with an explanation of how to complete informed consent forms, were informed about the study's risks, and were given the right to withdraw without coercion. During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence, and non-maleficence.

Results

The average age of breastfeeding mothers who experienced breast engorgement in both the intervention (28.33±4.1) and control (29.27±3.9) groups fell within the category of a healthy reproductive age. Specifically, the average age of the mothers in the

Table 1. Frequency distribution of respondents' characteristics based on age, parity, and postpartum days.

Characteristic	Groups		p
	Intervention n (%)	Control n (%)	
Age/Mean ±SD	28.33±4.1	29.27±3.9	0.49*
20-24	3 (20)	0 (0)	
25-28	5 (33.3)	6 (40)	
29-32	5 (33.3)	7 (46.7)	
33-36	2 (13.3)	2 (13.3)	
Parity			
Primipara	9 (60)	11 (73.3)	0.32*
Multipara	6 (40)	4(26.7)	
Days of postpartum	4.87±2.26	4 ±1.19	0.11*
1-3 days	4 (26.7)	6 (40)	
4-6 days	8 (53.3)	8 (53.3)	
7-14 days	3 (20)	1 (6.7)	
Total	30 (100)	30 (100)	

*p>0.05.

intervention group was 28 years, while in the control group, it was 29 years. The Levene test results indicated a $p > 0.05$, signifying that there were no significant age differences between the two groups.

The majority of respondents in both the intervention and control groups experienced breast engorgement on days 3 and 4 following delivery. Additionally, most respondents were primiparous, with 60% in the intervention group and 40% in the control group. The results of the homogeneity test for the two groups concerning characteristics like parity and the timing of breast milk dam occurrence yielded a $p > 0.05$. This suggests that both groups exhibited homogeneous characteristics, indicating that the pre-existing characteristics of the respondents did not significantly affect the study's outcomes.

Table 2 reveals that the variables for breast engorgement scores and pain levels, as well as the results of the normality test, all exhibit a p-value greater than 0.05. Consequently, it can be concluded that the data in both groups adhere to a normal distribution. Furthermore, based on the findings of the homogeneity test for the pretest, posttest, and pre-post difference values between the two groups concerning breast engorgement scores and pain scores, it can be inferred that the data from the two groups are homogeneous, indicating that the data have similar variances.

According to Table 3, it is evident that the breast engorgement score decreased from an average of 4.33 to 2 in the intervention group that received aloe vera gel compresses. Similarly, the control group exhibited the same results, with the mean breast engorgement score dropping from 4.07 to 2.67 due to warm compresses. In the case of pain scores, the intervention group's mean score difference decreased from 5.40 to 2.2. The control group experienced similar results, with the pain score decreasing from 5.73 to 4.07.

The results revealed that the mean difference in breast engorgement scores was 2.33 in the intervention group and 1.40 in the control group. The Independent T-test on breast engorgement scores yielded a p-value of 0.001 ($p < 0.05$), indicating a statistically significant difference in mean breast engorgement scores between the intervention group, which received a combination of aloe vera gel compresses, and the control group, which received warm compresses. The most significant effect was observed in the intervention group when comparing the mean values ($2.33 > 1.40$).

As for the mean difference in pain intensity, it was 3.2 in the intervention group and 1.67 in the control group. The Independent T-test results showed a p-value of 0.000 ($p < 0.05$), signifying a statistically significant difference in mean breast pain scores between the intervention group, treated with aloe vera gel compresses, and the control group, treated with warm compresses. The most pronounced effect was observed in the intervention group, as evidenced by the comparison of mean values ($3.2 > 1.67$; Table 4).

Discussion

The findings from this study revealed that the majority of mothers reported breast milk discharge on days 3 and 4 following delivery. This corresponds to the physiological increase in prolactin hormone production, typically occurring on the third-day post-labor. High prolactin levels stimulate significant breast milk production.³² However, at this stage, most infants are still in the sleep phase and may not be actively nursing due to their initial learning to suckle. Hormonal factors and newborns' suction abilities may influence the prevalence of breast engorgement.³

Breastfeeding was a common practice among the ten respon-

dents, with feeding intervals typically every one to two hours. The majority of research participants were between the ages of 25 and 32, considered a healthy reproductive window with ideal breast physiology and structure. It's worth noting that anxiety levels may rise with age, which can impact pain perception.³³ Importantly, the study showed no significant difference in the ages of respondents between the intervention and control groups, ensuring that age does not impact the study's outcomes.⁴

Based on the survey's findings, the majority of respondents were primiparous, with one child. Some studies, such as Arora's, have found no correlation between parity and the prevalence of breast engorgement. However, other research suggests that primiparas might be more vulnerable to breast engorgement and pain due to their learning curve in establishing successful breastfeeding.^{12,13} The dynamics of breastfeeding and milk removal are closely connected. If the baby does not effectively nurse, the breast might not be emptied properly, potentially worsening milk stagnation. The frequency and duration of nursing sessions can also influence milk production, with fewer than eight nursing sessions per day or less than ten minutes per session leading to decreased milk production.^{15,17}

The findings of the study on the average breast engorgement scores before and after the intervention demonstrate significant

Table 2. Normality test on breast engorgement score and pain intensity.

Dependent of variabel	Shapiro-Wilk		Distribution of data
	Intervention (p)	Control (p)	
Engorgement			
Pre	0.235*	0.278*	Normal
Post	0.293*	0.579*	Normal
Pain intensity			
Pre	0.692*	0.536*	Normal
Post	0.149*	0.186*	Normal

* $p < 0.05$.

Table 3. Difference in mean breast engorgement and pain score before and after intervention.

Variable and groups (N=15)	Pre Mean±SD	Post Mean±SD	p
The score of breast engorgement			
Intervention	4.33±1.11	2±1.25	0.000*
Control	4.07±1.16	2.67±1.45	0.000*
Pain score			
Intervention	5.40±1.35	2.2±1.37	0.000*
Control	5.73±1.43	4.07±1.43	0.000*

* $p < 0.05$.

Table 4. Differences in the effect of aloe vera gel compress on breast engorgement and pain in the Intervention and Control groups.

Variable	Groups	Mean	p
Breast engorgement	Intervention	2.33	0.001*
	Control	1.40	
Pain	Intervention	3.20	0.000*
	Control	1.67	

* $p < 0.05$.

changes. This is consistent with Lanka (2018) and Nirala (2020), which supports the idea that aloe vera gel compresses can alleviate breast edema. Aloe vera gel can effectively reduce breast edema.^{34,35} The mechanism behind aloe vera gel compresses may involve reducing intraductal pressure within alveoli, promoting vasoconstriction of swollen lymphatic blood vessels, which softens various breast segments. Aloe vera contains anthraquinone compounds, such as aloin and emodin, which have analgesic properties. Additionally, the presence of pain-relieving enzymes like carboxypeptidase and bradykinase contributes to aloe vera's analgesic action. These properties lead to a reduction in pain-inducing prostaglandins and immune system stimulation, ultimately reducing pain.^{36,37}

The control group's results align with the research findings. The application of warm compresses has a positive effect on breast edema, as confirmed by Lim's research, demonstrating that warm compresses reduce swelling by enhancing lymphatic flow and reducing tissue tension.¹⁹

The study's results regarding pain intensity show that there is a significant difference between the average pain intensity before and after the intervention. Similar results were found in the control group. This is in line with Sari's research (2019), which indicates that aloe vera gel compresses significantly reduce breast swelling pain in breastfeeding mothers. Compresses made from aloe vera have been shown to alleviate discomfort in swollen body parts. The high concentration of amino acids, minerals, and polysaccharides in aloe vera leaves is thought to be responsible for the reduction in breast swelling and pain.^{6,28}

Independent t-test results revealed a statistically significant difference between the control group, which received warm compresses, and the intervention group, which received aloe vera gel compresses, in terms of the mean breast engorgement score. The intervention group exhibited a more substantial effect compared to the control group, as evidenced by the comparison of mean values ($2.33 > 1.40$). Additionally, the mean scores for breast pain showed a significant difference between the two groups. The intervention group experienced a more significant reduction in pain intensity compared to the control group, as indicated by the comparison of mean values ($3.2 > 1.67$). This is attributed to the unique properties of aloe vera gel, which accelerate the reduction of breast engorgement and pain associated with breast milk stagnation.

The study's findings are consistent with Lanka (2018) and Witt (2016), demonstrating the effectiveness of aloe vera gel compresses in reducing breast edema and pain scores in nursing mothers experiencing milk stagnation. Aloe vera contains anthraquinones, including emodin and aloin, which have analgesic properties. The presence of pain-relieving enzymes like carboxypeptidase and bradykinase is linked to aloe vera's analgesic action. This leads to a reduction in pain-inducing prostaglandins and immune system stimulation, contributing to pain relief.^{12,35}

According to various studies on the anti-inflammatory properties of aloe vera, it has the ability to target and alleviate both harmful agents and damaged tissue.³⁸ Indicators of inflammation include edema, discomfort, redness, heat, and swelling.³⁹ Aloe vera, a natural anti-inflammatory and burn remedy, can reduce edema by inhibiting the enzyme cyclooxygenase or the production of prostaglandin E2 (PGE2) from arachidonic acid. PGE2 substances are prostaglandins produced by macrophages that influence various inflammatory responses and increase pain thresholds. Aloe vera extract also inhibits neutrophil cell migration and possesses antibacterial properties, preventing the growth of *Shigella* and *Streptococcus* bacteria.^{40,41}

Conclusions

The results of our investigation unequivocally demonstrate that employing Aloe vera gel compresses yields a significantly positive effect in alleviating breast pain and engorgement. Furthermore, this intervention proves effective in reducing the incidence of breast engorgement. The implications of these findings are of considerable value and relevance, as they can serve as a valuable adjunct to postpartum midwifery services, potentially enhancing the care provided to new mothers.

References

- Pratiwi DN, Ernawaty. Implementation of an exclusive breastfeeding policy in wonogiri regency. *Indones J Public Heal* 2023;18:21-33.
- Sebayang SK, Dibley MJ, Astutik E, et al. Determinants of age-appropriate breastfeeding, dietary diversity, and consumption of animal source foods among Indonesian children. *Matern Child Nutr* 2020;16:e12889.
- Alekseev NP, Vladimir II, Nadezhda TE. Pathological Postpartum Breast Engorgement: Prediction, Prevention, and Resolution. *Breastfeed Med* 2015;10:203-8.
- Seran MA, Arief YS, Kurnia ID. The analysis of family support factors in exclusive breastfeeding based on precede proceed theory. *Int J Pharm Res* 2020;12:1728-34.
- Radwan H. Patterns and determinants of breastfeeding and complementary feeding practices of Emirati Mothers in the United Arab Emirates. *BMC Public Health* 2013;25:171.
- Cho J, Ahn S. Development and evaluation of breastfeeding promotion program for mothers with breast engorgement following cesarean birth. *J Korean Acad Nurs* 2014;44:170-8.
- Yanti PD. Hubungan Pengetahuan, Sikap Ibu Dengan Bendungan ASI di Puskesmas Sidomulyo Pekanbaru Tahun 2016. *J Endur* 2017;2:81.
- Rutiani CEA, Fitriana LA. Gambaran Bendungan Asi Pada Ibu Nifas Dengan Seksio Sesarea Berdasarkan Karakteristik Di Rumah Sakit Sariningsih Bandung. *J Pendidik Keperawatan*. 2016;2(2).
- Setiawan SA, Rafikasari H. Hubungan Pengetahuan Ibu Nifas tentang Perawatan Payudara Dengan Kejadian Bendungan ASI di Puskesmas Ngrayun Kecamatan Ngrayun Kabupaten Ponorogo. *J Delima Harapan* 2017;4(2).
- Sriraman NK. The Nuts and Bolts of Breastfeeding: Anatomy and Physiology of Lactation. *Curr Probl Pediatr Adolesc Heal Care* 2017;47:305-10.
- Berens PD. Breast Pain: Engorgement, Nipple Pain, and Mastitis. *Clin Obs Gynecol* 2015;58:902-14.
- Witt AM, Bolman M, Kredit S, Vanic A. Therapeutic Breast Massage in Lactation for the Management of Engorgement, Plugged Ducts, and Mastitis. *J Hum Lact* 2016;32:123-31.
- Nisa F, Devi SR. The influence of health education about the true position of breastfeeding for post partum mothers in the Pepe Village, Indonesia. *J Public Heal Africa* 2019;10:142-4.
- Gavhale PR, Moon SH. To Evaluate the Effectiveness of Lactational Counseling on Prevention of Breast Engorgement among Postnatal Mothers. *J Evol Med Dent Sci* 2021;10:663-6.
- Rollins NC, Bhandari N, Hajeerbhoy N, Set al. Why invest, and what it will take to improve breastfeeding practices? 2016. 504 p.
- Coban A, Bayraktar S, Yildiz N, et al. A Case Study of Early Postpartum Excessive Breast Engorgement: Is it Related to

- Feedback Inhibition of Lactation? *J Hum Lact* 2020;37:414-8.
17. Garcia LP. The Lancet: série sobre amamentação. *Epidemiol e Serviços Saúde*. 2016;25(1).
 18. Mogensen N, Portman A, Mitchell K. Nonpharmacologic Approaches to Pain, Engorgement, and Plugging in Lactation: Applying Physical Therapy Techniques From Breast Cancer Care to Breastfeeding Patients. *Clin Lact* 2020;11(1).
 19. Zakarija-Grkovic I, Stewart F. Treatments for breast engorgement during lactation. *Cochrane Database Syst Rev*. 2020;9:CD006946.
 20. Siregar E, Hardjanti TS. Non Pharmacological Treatments For Breast Engorgement: A Systematic Review. *Int Conf Appl Sci Heal* 2019;4:492-502.
 21. Anggraini YD, Rahmawati RSN, Indriani R, Sendra E. The Effectiveness Of Herbal Ingredients To Relieve Breast Engorgement : Literature Review. *J Inov Ris Ilmu Kesehatan* 2022;1(4).
 22. Gresh A, Robinson K, Thornton CP, Plesko C. Caring for Women Experiencing Breast Engorgement: A Case Report. *J Midwifery Womens Heal* 2019;64:763-8.
 23. Umborowati MA, Anggraeni S, Prakoeswa CRS. The beneficial effect of Aloe vera in skin barrier function improvement: A double-blind randomized trial of Madurese batik craftswomen. *J Pakistan Assoc Dermatologists* 2022;32:142-7.
 24. Huda MH, Chipojola R, Lin YM, et al. The Influence of Breastfeeding Educational Interventions on Breast Engorgement and Exclusive Breastfeeding: A Systematic Review and Meta-Analysis. *J Hum Lact* 2022;38:156-70.
 25. Wizia, Lady, Susanti E. Aloe Vera Gel Compression as Breast Engorgement Pain Relief. *Women, Midwives Midwifery* 2021;1(3).
 26. Maleki A, Youseflu S. The Effectiveness of Aloe Vera on Relief of Irritation and Nipple Pain in Lactating Women: Systematic Review and Meta-Analysis. *Obstet Gynecol Int* 2022;2022:7430581.
 27. Niazi A, Rahimi VB, Askari N, et al. Topical treatment for the prevention and relief of nipple fissure and pain in breastfeeding women: A systematic review. *Adv Integr Med* 2021;8:312-21.
 28. Bhattacharya M, Malik S, Singh A. Aloe Vera *Barbedensis*: A review on its Ethanopharmacological value. *J Pharm Res* 2011;4:4507-10.
 29. Rajeswari R, Umadevi M, Rahale CS, Pushpa R, Selvavenkadesh S, Kumar KPS, et al. Aloe Vera: The Miracle Plant Its Medicinal and Traditional Uses in India. *J Pharmacogn Phytochem* 2012;1(4).
 30. Bourbonnais F. Pain assessment: development of a tool for the nurse and the patient. *J Adv Nurs* 1981;6:277-82.
 31. Hill PD, Humenick SS. The Occurrence of Breast Engorgement. *J Hum Lact* 1994;10:79-86.
 32. Boskabadi H, Ramazanadeh M, Zakerihamidi M, Omran FR. Risk factors of breast problems in mothers and its effects on newborns. *Iran Red Crescent Med J* 2014;16:e8582.
 33. Utami R, Arief YS. The effectiveness of breastfeeding self-efficacy intervention on implementation of breastfeeding in low-birth-weight infants: A systematic review. *J Pak Med Assoc* 2023;73:S153-7.
 34. Nirala RK, Raj P, Anjana K, et al. A review on Aloe vera and its traditional uses in India. *J Pharmacogn Phytochem* 2020;9:2571-3.
 35. Lanka S. A Review On Aloe Vera-The Wonder Medicinal Plant. *J Drug Deliv Ther* 2018;8(5).
 36. Verma SK. Aloe vera their chemicals composition and applications: A review. *Int J Biol Med Res* 2011;2:466-71.
 37. Abdurrohman MMS, Putranto R, Suhartono B, Fa'adiyah DA. the Effect of Giving Aloe Vera Gel on Rats With Bacteria-Induced Periodontitis. *ODONTO Dent J* 2021;8:140.
 38. Retnowati D, Sari R, Hendradi E, Septiani S. The stability and irritability study of the chitosan-Aloe vera spray gel as wound healing. *J Basic Clin Physiol Pharmacol* 2021;32:651-6.
 39. Solikhah TI, Solikhah GP, Susilo RJK. Aloe vera and virgin coconut oil (Vco) accelerate healing process in domestic cat (*felis domesticus*) suffering from scabies. *Iraqi J Vet Sci* 2021;35:699-704.
 40. Aini AN. Pemberian Kompres Lidah Buaya Untuk Mengurangi Nyeri Akibat Pembengkakan Payudara Pada Asuhan Keperawatan Ibu Post. Universitas Muhammadiyah Surakarta; 2019.
 41. Mwale M, Masika PJ. Analgesic and anti-inflammatory activities of Aloe *ferox* Mill. aqueous extract. *African J Pharm Pharmacol* 2010;4:291-7.