


Original Research Paper


Using fire cupping therapy to enhance early lactation to prevent stunting in coastal regions

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Abstract

Globally, stunting continues to be a serious public health problem. Efforts to prevent stunting include exclusive breastfeeding and complementary feeding. The success of early breastfeeding after childbirth determines the success of exclusive breastfeeding, which contributes to reducing the stunting prevalence. Breast pain and insufficient milk production are causes of early breastfeeding failure. Fire cupping therapy can be an alternative to overcome these problems. Unfortunately, research on the effect of this therapy on early breastfeeding initiation is limited. This study aims to determine the effect of fire cupping therapy on early lactation in postpartum women in the coastal area of Konawe Regency. A quasi-experimental design with a pre-test and post-test nonequivalent control group was used in this study. Purposive sampling was used to select samples, and 30 respondents were obtained (divided into intervention and control groups of 15 respondents each). The intervention group received fire cupping therapy 2 times for 30 minutes. Univariate analysis using descriptive analysis and bivariate analysis using paired t-test. In the intervention group there was a significant increase in the mean LATCH score of 1.26 (p-value <0.05). In the control group, the mean LATCH score of 0.67 was not significant (p-value > 0.05). Fire cupping therapy effectively improves early lactation outcomes in postpartum mothers. Incorporating complementary therapies into maternal health care procedures may improve breastfeeding outcomes and general maternal and newborn health, especially for stunting prevention. Future studies should investigate the long-term impact of fire cupping therapy on breastfeeding outcomes and involve larger and more varied populations.

Keywords: initiation of breastfeeding; early lactation; fire cupping therapy; LATCH score; Postpartum

1. Introduction

Globally, stunting continues to be a serious public health issue. The SDGs target is to end malnutrition, including reducing stunting prevalence in children under 5 years of age (Huck, 2022). However, three-quarters of the world's children live in countries that are unable to achieve these targets. The prevalence of stunting globally in 2022 is 148.1 million (22.3%). Asia and Africa are the continents with the highest prevalence of stunting at 52% and 43%, respectively (WHO, 2023). The target for reducing stunting in Indonesia in 2024 is 14%, while the latest data on stunting prevalence in 2022 is still quite high at 21.6% (Kementerian Kesehatan RI, 2023). The prevalence of stunting in Southeast Sulawesi and Konawe Regency in 2022 exceeds the national prevalence with 27.7% and 28.3% respectively (Kementerian Kesehatan Republik Indonesia, 2022; Kementerian Kesehatan RI, 2021).

Inadequate breastfeeding and nutrition, poor nutrition in pregnant and lactating mothers, recurrent infections, socioeconomic and political factors are some of the determinants of stunting (Kasajja et al., 2022; Raiten & Bremer, 2020; Vonaesch et al., 2018). The risk of stunting in coastal areas is higher due

to the lack of exclusive breastfeeding and unhealthy environmental factors that contribute to recurrent infections (Haron et al., 2023; Swanida et al., 2020). Stunting can increase morbidity and mortality due to infectious diseases that cause a vicious cycle because it worsens nutritional status and decreases immunity (de Onis & Branca, 2016). Decreased academic performance, learning ability, and work productivity are the long-term impacts of stunting (Ekholuenetale et al., 2020; Ponum et al., 2020).

Some efforts that can be made to prevent stunting are exclusive breastfeeding, complementary feeding, handling toddler nutrition problems, immunization, and education (Kementerian Kesehatan Republik Indonesia, 2022). WHO recommends education and improving nutrition for pregnant women, maternal and newborn health, and sufficient breast milk production for early breastfeeding (WHO, 2018). Postpartum care is given to mothers and babies immediately after birth until the first six weeks of life; even the first two weeks after birth are recommended as an important time for the recovery of maternal and infant health (World Health Organization Special Programme of Research, 2022; Zabidi et al., 2023). WHO and UNICEF recommend that babies should be exclusively breastfed for the first 6 months of life (UNICEF, 2018). The success of early breastfeeding is a determinant in providing exclusive breastfeeding, which contributes to reducing stunting prevalence (Gayatri & Dasvarma, 2020; Talbert et al., 2020).

Early lactation is breastfeeding immediately after giving birth (Gayatri & Dasvarma, 2020). Some previous studies reported various obstacles in early breastfeeding, including breast pain and swelling, breast milk stagnation, insufficient milk production, difficulty attaching the baby to the nipple, cracked nipples, and fatigue (Cooklin et al., 2018; Gianni et al., 2019; Liu et al., 2022; Meyling et al., 2023; Mogensen et al., 2020; Witt et al., 2016). If the condition is not treated immediately, it can potentially lead to early weaning (Coban et al., 2021; Liu et al., 2022; Mogensen et al., 2020; Stuebe et al., 2014; Witt et al., 2016). Research by Tosun & Pinar (2021), explains that dry cupping combined with oxytocin massage can facilitate breast milk, relieve breast pain, and increase early lactation. Fire cupping therapy can be used in postpartum and early lactation care. Fire cupping is a cupping therapy method that uses a glass cup by burning a cotton ball soaked in alcohol to apply negative pressure into the cup and placing it on the skin surface (An et al., 2021). Research on fire cupping therapy for postpartum care and early lactation is still limited. This study aims to determine the effect of fire cupping therapy on early lactation in postpartum women in the coastal areas of Konawe Regency.

2. Research Methods

This quantitative study used a quasi-experimental design with a pre-test and post-test nonequivalent control group. It was conducted in the coastal areas of Konawe Regency From April to August 2024. The study was approved by the Health Research Ethics Commission of the Indonesian Public Health Experts Association (IAKMI) of Southeast Sulawesi province with the number 104/KEPK-IAKMI/IV/2024.

Respondents of this study were 30 postpartum women in the coastal area Konawe Regency. The purposive sampling technique used by the following inclusion criteria: postpartum women with normal delivery, low breast milk production, and willingness to take part in the study. Whereas the exclusion criteria are pathological postpartum mothers and low birth weight babies who are being treated in hospitals. Thirty respondents were divided into two groups, who were divided into 2 groups, namely 15 intervention groups and 15 control groups. Respondents in the intervention group received fire cupping therapy, which was given 2 times for 30 minutes. While the control group did not receive any treatment. The cupping points used were BL14, BL17, BL20, BL23, BL30, BL32, BL36, GV1, GV2, GV3, LU1, CV17, GB21, LIV14, CV6, REN2, ST18, ST25, ST29, ST36, and SP6.

Early lactation improvement was assessed using the LATCH score by Jensen et al. (1994). This score consist of five indicators: L (“latch-on”), A (“audible swallowing”), T (“the type of mother’s

nipple”), C (“comfort level”), and H (“hold positioning”). Each LATCH score indicator is assigned points of 0, 1, or 2. Ten is the highest possible score. In this study, assessment with LATCH score was done twice, before and after the intervention. The results of the LATCH score reliability assessment showed a Cronbach alpha value of 0.86, which means that the tool is reliable for measuring breastfeeding success (Aksu & Palas Karaca, 2021). The research data were univariate analysis using descriptive analysis to describe the characteristics of respondents (age, education, occupation, newborn weight, first breastfeeding, and frequency of breastfeeding) and research variables. Bivariate analysis using paired t-tests to determine the influence of variables and interventions given during the study (the effect of fire cupping therapy on LATCH scores).

3. Results and Discussion

3.1. Results

The majority of respondents in this study were aged 26-30 years (36.67%); had a high school education level (43.33%); were housewives (93.33%); and had a baby weight >2700 g (90%). The first time breastfeeding was given in more than 1 hour after birth (63.33%), and a frequency of breastfeeding less than 8 times per day (56.67%). The distribution of respondent characteristics was presented in Table 1.

Table 1. Distribution of Respondent Characteristics

Variables	n	%
* Age		
17 – 20	6	20.00
21 – 25	2	6.67
26 – 30	11	36.67
31 – 35	8	26.67
36 – 40	1	3.33
41 – 45	2	6.67
* Education		
Elementary school	7	23.33
Junior High School	8	26.67
Senior High School	13	43.33
Bachelor	2	6.67
* Work		
Housewife	28	93.33
Teacher	2	6.67
* Baby Weight		
> 2700 gram	27	90.00
< 2700 gram	3	10.00
* First breastfeeding		
< 1 hour after birth	11	36.67
> 1 hour after birth	19	63.33
* Frequency of Breastfeeding		
> 8 times	13	43.33
< 8 times	17	56.67

Source: Primary Data, 2024

In the intervention group, the mean pre-test and post intervention LATCH scores were 6.87 (SD 1.06) and 8.13 (SD 1.40), respectively. Whereas in the control group, the mean pre-test and post-intervention LATCH scores were 6.93 (SD 1.43) and 7.60 (SD 1.59), respectively (see Table 2).

Table 2. Distribution of LATCH Scores Before and After Fire Cupping Therapy in Postpartum Women

LATCH Score Variable	Mean	Min-Max	SD
Intervensi Group			
LATCH Score (pre test)	6.87	5 – 9	1.06
LATCH Score (post test)	8.13	6 – 10	1.40
Control Group			
LATCH Score (pre test)	6.93	5 – 9	1.43
LATCH Score (post test)	7.60	5 – 10	1.59

Source: Primary Data, 2024

The statistical test result presented in Table 3 s indicates a significant difference in the LATCH scores for postpartum women experiencing fire cupping therapy compared to the control group. The mean LATCH score in the intervention group improved to 1.26 (SD 1.03; t-value $-4.750 < t\text{-table} -2.145$; and p-value of $0.00 < 0.05$). Meanwhile, the mean LATCH score in the control group was 0.67 (SD 1.49; t-count of $-1.726 > -2.145$; and p-value of 0.10). The result proved that fire cupping therapy effectively enhances early lactation outcomes in postpartum women.

Table 3. Statistical Test Results of the Effect of Fire Cupping Therapy on LATCH Scores in Postpartum Women

LATCH score variable	Mean	SD	t-value	t-table	p-value
Intervention Group					
Pre - Post-test	1.26	1.03	-4.750	-2.145	0.00
Control Group					
Pre - Post-test	0.67	1.49	-1.726	-2.145	0.10

Source: Primary Data, 2024

3.2. Discussion

Efforts to prevent stunting begin in the first 1000 days of life, which include 9 months of pregnancy and 2 years after birth. Therefore, comprehensive health care is needed starting from pregnancy, childbirth and postpartum to improve the quality of life of mothers and children (Nurfatimah et al., 2021). Postpartum care is provided immediately to mothers and babies up to 6 weeks after delivery or the postpartum period. The postpartum period requires special attention because it can cause postpartum complications that threaten the lives of mothers and babies (Yimer et al., 2024). Complaints of breast pain, nipples, and concerns about breast milk supply cause discomfort and mood disorders resulting in postpartum depression and anxiety. Several studies have shown that complaints of postpartum pain and depression can inhibit early lactation and early cessation of breastfeeding (Cooklin et al., 2018; Pope & Mazmanian, 2016).

The majority of respondents in this study breastfed for the first time in more than 1 hour after birth (63.33%). Delayed initiation of breastfeeding impacts infant mortality and morbidity. The previous study showed that infants who initiated breastfeeding 2-23 hours and 24-96 hours after birth had a 1.41 and 1.79 higher risk of neonatal mortality, respectively, compared to infants who breastfed within the first hour after birth (NEOVITA Study Group, 2016). In addition, Smith et al. (2017) reported an increased risk of coughing and breathing difficulties of 11% and 48%, respectively, at six months after birth associated with delayed initiation of breastfeeding. Delaying the start of breastfeeding also reduces the chance of introducing colostrum, the first milk, which deprives the infant of its antibodies and immunoglobulins and raises the risk of complications like infection and sepsis in the future (Patil et al., 2015; Raihana et al., 2019). The frequency of breastfeeding in this study was low, with most

respondents had a frequency of breastfeeding less than 8 times per day (56.67%). Regular breastfeeding, particularly during the first weeks postpartum, becomes the most important factor in achieving a high supply of milk that is adequate in nutrients for healthy growth and development. Therefore, [ACOG \(2021\)](#) advised the mother to breastfeed at least eight to twelve times daily.

The provision of fire cupping therapy in postpartum care in this study can improve early lactation. The results showed a significant effect of fire cupping therapy on improving the LATCH score of the intervention group compared to the control group. In the intervention group, there was a significant increase in the mean LATCH score by 1.26 (p -value < 0.05). Meanwhile, in the control group, the increase in mean LATCH score of 0.67 was not significant (p -value > 0.05). A systematic review and meta-analysis of the impact of traditional Chinese medicine on postpartum lactation showed that cupping therapy is one of the therapies used to increase breast milk volume for patients with breast milk deficiency, thereby supporting the lactation process during the postpartum period ([Fang et al., 2024](#)).

Breastfeeding triggers the release of oxytocin, which also causes physiological alterations to encourage production of milk and psychological changes to make motherhood easier. These effects can be influenced by stress and medical interventions after delivery, which might negatively impact the breastfeeding initiation ([Uvnäs-Moberg et al., 2020](#)). Fire cupping therapy increases milk secretion and sustains breastfeeding by stimulating acupuncture sites associated with the breast and nipples, which accelerates the pituitary gland's release of prolactin and oxytocin. Cupping therapy can improve lactation outcomes by improving blood circulation, relaxing tight muscles, and reducing discomfort associated with breastfeeding ([Liu et al., 2022](#)). The cupping points used in this study were BL14, BL17, BL20, BL23, BL30, BL32, BL36, GV1, GV2, GV3, LU1, CV17, GB21, LIV14, CV6, REN2, ST18, ST25, ST29, ST36, and SP6. Several studies have shown that acupuncture points associated with improved breastmilk production include ST18, CV17, and GB21 ([Fang et al., 2024](#); [Kurniawan & Agustijaya, 2019](#); [Machmudah et al., 2020](#)). According to [Machmudah et al. \(2020\)](#) increasing the letdown reflex can be done by stimulating the jianjing point (GB21) to cause a relaxing effect during breastfeeding.

Dry cupping therapy can improve human health and quality of life, positively affecting physical and psychological health. In general, this therapy can balance emotions, feelings of relaxation, peace of mind, vitality, sleep quality, and daily activities ([Majeed et al., 2019](#)). Specifically, cupping therapy increases the flexibility of connective tissue by mobilizing the skin, muscles, tendons, and fascia which affect neurophysiological activity such as nociceptors, spinal cord and various nervous systems which ultimately causes a relaxation effect ([Mohamed et al., 2023](#)). This condition can reduce muscle tension and provide comfort for mothers and babies when breastfeeding during the postpartum period.

4. Conclusion

We found a significant difference in the LATCH scores for postpartum women experiencing fire cupping therapy compared to the control group. In the intervention group, there was a significant increase in the mean LATCH score by 1.26 (p -value < 0.05). Meanwhile, although there was an increase in the mean LATCH score of 0.67 in the control group, the increase was not significant (p -value > 0.05). The result proved that fire cupping therapy effectively enhances early lactation outcomes in postpartum women. According to these results, incorporating complementary therapies into maternal healthcare procedures can improve breastfeeding outcomes and the general health of both the mother and the newborn, especially for stunting prevention. Subsequent studies ought to investigate the long-term impacts of fire cupping therapy on breastfeeding results and involve bigger, more varied populations.

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References

- ACOG. (2021). Breastfeeding Challenges. *Obstetrics & Gynecology*, 137(2). <https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2021/02/breastfeeding-challenges>
- Aksu, S., & Palas Karaca, P. (2021). The Effect of Reflexology on Lactation in Women Who Had Cesarean Section: A Randomized Controlled Pilot Study. *Complementary Medicine Research*, 28(4), 336–343. <https://doi.org/10.1159/000513924>
- An, S. K., Kim, K. W., Lee, H. L., Lee, T. W., Kim, E. S., Lee, B. R., & Yang, G. Y. (2021). An Experimental Study on the Pressure Range of Fire Cupping Method. *Journal of Acupuncture Research*, 38(3), 200–204. <https://doi.org/10.13045/jar.2021.00080>
- Coban, A., Bayraktar, S., Yıldız, N., Tunçel, D., Gökçay, G., & Ince, Z. (2021). A Case Study of Early Postpartum Excessive Breast Engorgement: Is it Related to Feedback Inhibition of Lactation? *Journal of Human Lactation*, 37(2), 414–418. <https://doi.org/10.1177/0890334420962073>
- Cooklin, A. R., Amir, L. H., Nguyen, C. D., Buck, M. L., Cullinane, M., Fisher, J. R. W., & Donath, S. M. (2018). Physical health, breastfeeding problems and maternal mood in the early postpartum: A prospective cohort study. *Archives of Women's Mental Health*, 21(3), 365–374. <https://doi.org/10.1007/s00737-017-0805-y>
- de Onis, M., & Branca, F. (2016). Childhood stunting: A global perspective. *Maternal and Child Nutrition*, 12, 12–26. <https://doi.org/10.1111/mcn.12231>
- Ekhoulenetale, M., Barrow, A., Ekhoulenetale, C. E., & Tudeme, G. (2020). Impact of stunting on early childhood cognitive development in Benin: Evidence from Demographic and Health Survey. *Egyptian Pediatric Association Gazette*, 68(1). <https://doi.org/10.1186/s43054-020-00043-x>
- Fang, Y. W., Chen, S. F., Wang, M. L., & Wang, M. H. (2024). Effects of traditional Chinese medicine-assisted intervention on improving postpartum lactation: A systematic review and meta-analysis. *Heliyon*, 10(6), e27154. <https://doi.org/10.1016/j.heliyon.2024.e27154>
- Gayatri, M., & Dasvarma, G. L. (2020). Predictors of early initiation of breastfeeding in Indonesia: A population-based crosssectional survey. *PLoS ONE*, 15(9 September), 1–15. <https://doi.org/10.1371/journal.pone.0239446>
- Gianni, M. L., Bettinelli, M. E., Manfra, P., Sorrentino, G., Bezze, E., Plevani, L., Cavallaro, G., Raffaelli, G., Crippa, B. L., Colombo, L., Morniroli, D., Liotto, N., Roggero, P., Villamor, E., Marchisio, P., & Mosca, F. (2019). Breastfeeding Difficulties and Risk for Early Breastfeeding Cessation. *Nutrients*, 11(10), 2266. <https://doi.org/10.3390/nu11102266>
- Haron, M. Z., Jalil, R. A., Hamid, N. A. A., Omar, M. A., & Abdullah, N. H. (2023). Stunting and Its Associated Factors among Children Below 5 Years Old on the East Coast of Peninsular Malaysia: Evidence from the National Health and Morbidity Survey. *Malaysian Journal of Medical Sciences*, 30(5), 155–168. <https://doi.org/10.21315/mjms2023.30.5.13>
- Huck, W. (2022). Goal 2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture End hunger, achieve food security. *Sustainable Development Goals*, 125–152. <https://doi.org/10.5771/9783748902065-125>

- Jensen, D., Wallace, S., & Kelsay, P. (1994). LATCH: A breastfeeding charting system and documentation tool. *Journal of Obstetric, Gynecologic, and Neonatal Nursing: JOGNN*, 23(1), 27–32. <https://doi.org/10.1111/j.1552-6909.1994.tb01847.x>
- Kasajja, M., Nabiwemba, E., Wamani, H., & Kamukama, S. (2022). Prevalence and factors associated with stunting among children aged 6–59 months in Kabale district, Uganda. *BMC Nutrition*, 8(1), 79. <https://doi.org/10.1186/s40795-022-00578-9>
- Kementerian Kesehatan Republik Indonesia. (2022). *Buku Saku: Hasil Survei Status Gizi Indonesia (SSGI) 2022*.
- Kementerian Kesehatan RI. (2021). *Buku Saku Hasil Studi Status Gizi Indonesia (SSGI)*. <https://doi.org/10.36805/bi.v2i1.301>
- Kementerian Kesehatan RI. (2023). *Dua Fokus Intervensi Penurunan Stunting untuk Capai Target 14% di Tahun 2024*.
- Kurniawan, L. C., & Agustijaya, O. (2019). *Pengaruh Titik Akupunktur ST 18, GB 21, CV 17 terhadap Peningkatan Volume ASI Ibu Menyusui di BPS E Malang*. 7(1).
- Liu, J., Chen, H., Wang, W., & Zhao, D. (2022). Application of Traditional Chinese Medical Science Characteristic Nursing Mode Based on Evidence-Based Medicine to Puerperal Breast Tenderness and Pain. *Evidence-Based Complementary and Alternative Medicine*, 2022. <https://doi.org/10.1155/2022/7527890>
- Machmudah, M., Khayati, N., Widodo, S., Hapsari, E. D., & Haryanti, F. (2020). Improvement of Prolactin Hormone Levels on Postpartum Mothers Taken by The Oketani Massage and Pressure in GB-21 Point. *IJNP (Indonesian Journal of Nursing Practices)*, 4(1). <https://doi.org/10.18196/ijnp.41101>
- Majeed, S., Majeed, M., & Ajike, M. A. (2019). Dry cupping therapy and the wellness management of health travelers Modernization of Traditional Medicine. *Traditional Medicine Research*, 4(1), 12–24. <https://doi.org/10.12032/TMR201915095>
- Meyling, M. M. G., Frieling, M. E., Vervoort, J. P. M., Jong, E. I. F., & Danielle, E. (2023). *Health problems experienced by women during the first year postpartum: A systematic review*. 1–20.
- Mogensen, N., Portman, A., & Mitchell, K. (2020). Nonpharmacologic Approaches to Pain, Engorgement, and Plugging in Lactation: Applying Physical Therapy Techniques From Breast Cancer Care to Breastfeeding Patients. *Clinical Lactation*, 11(1), p35.
- Mohamed, A. A., Zhang, X., & Jan, Y. K. (2023). Evidence-based and adverse-effects analyses of cupping therapy in musculoskeletal and sports rehabilitation: A systematic and evidence-based review. *Journal of Back and Musculoskeletal Rehabilitation*, 36(1), 3–19. <https://doi.org/10.3233/BMR-210242>
- NEOVITA Study Group. (2016). Timing of initiation, patterns of breastfeeding, and infant survival: Prospective analysis of pooled data from three randomised trials. *The Lancet. Global Health*, 4(4), e266-275. [https://doi.org/10.1016/S2214-109X\(16\)00040-1](https://doi.org/10.1016/S2214-109X(16)00040-1)
- Nurfatihah, N., Ramadhan, K., Entoh, C., Longgupa, L. W., & Hafid, F. (2021). Continuity of Midwifery Care Implementation to Reduce Stunting. *Open Access Macedonian Journal of Medical Sciences*, 9(E), 1512–1516. <https://doi.org/10.3889/oamjms.2021.7062>
- Patil, C. L., Turab, A., Ambikapathi, R., Nesamvuni, C., Chandyo, R. K., Bose, A., Islam, M. M., Ahmed, A. S., Olortegui, M. P., De Moraes, M. L., Caulfield, L. E., & on behalf of the MAL-ED network. (2015). Early interruption of exclusive breastfeeding: Results from the eight-country MAL-ED study. *Journal of Health, Population and Nutrition*, 34(1), 10. <https://doi.org/10.1186/s41043-015-0004-2>
- Ponum, M., Khan, S., Hasan, O., Mahmood, M. T., Abbas, A., Iftikhar, M., & Arshad, R. (2020). Stunting diagnostic and awareness: Impact assessment study of sociodemographic factors of

- stunting among school-going children of Pakistan. *BMC Pediatrics*, 20(1), 1–9. <https://doi.org/10.1186/s12887-020-02139-0>
- Pope, C. J., & Mazmanian, D. (2016). Breastfeeding and postpartum depression: An overview and methodological recommendations for future research. *Depression Research and Treatment*, 2016. <https://doi.org/10.1155/2016/4765310>
- Raihana, S., Dibley, M. J., Rahman, M. M., Tahsina, T., Siddique, M. A. B., Rahman, Q. S., Islam, S., Alam, A., Kelly, P. J., Arifeen, S. E., & Huda, T. M. (2019). Early initiation of breastfeeding and severe illness in the early newborn period: An observational study in rural Bangladesh. *PLoS Medicine*, 16(8), e1002904. <https://doi.org/10.1371/journal.pmed.1002904>
- Raiten, D. J., & Bremer, A. A. (2020). Exploring the nutritional ecology of stunting: New approaches to an old problem. *Nutrients*, 12(2). <https://doi.org/10.3390/nu12020371>
- Smith, E. R., Locks, L. M., Manji, K. P., McDonald, C. M., Kupka, R., Kisenge, R., Aboud, S., Fawzi, W. W., & Duggan, C. P. (2017). Delayed Breastfeeding Initiation is Associated with Infant Morbidity. *The Journal of Pediatrics*, 191, 57-62.e2. <https://doi.org/10.1016/j.jpeds.2017.08.069>
- Stuebe, A. M., Horton, B. J., Chetwynd, E., Watkins, S., Grewen, K., & Meltzer-Brody, S. (2014). Prevalence and risk factors for early, undesired weaning attributed to lactation dysfunction. *Journal of Women's Health*, 23(5), 404–412. <https://doi.org/10.1089/jwh.2013.4506>
- Swanida, N., Malonda, H., Arthur, P., & Kawatu, T. (2020). History of Exclusive Breastfeeding and Complementary Feeding as a Risk Factor of Stunting in Children Age 36-59 Months in Coastal Areas. *Journal of Health, Medicine and Nursing*, 70, 52–57. <https://doi.org/10.7176/jhmn/70-07>
- Talbert, A., Jones, C., Mataza, C., Berkley, J. A., & Mwangome, M. (2020). Exclusive breastfeeding in first-time mothers in rural Kenya: A longitudinal observational study of feeding patterns in the first six months of life. *International Breastfeeding Journal*, 15(1), 1–9. <https://doi.org/10.1186/s13006-020-00260-5>
- Tosun, H., & Pinar, G. (2021). Effectiveness of Dry Cupping Therapy Combined with Breast and Oxytocin Massage on Early Lactation: A Case Report. *EC Nursing Healthcare*, 3(3), 18–23.
- UNICEF. (2018). Breastfeeding: A mother's gift, for every child—UNICEF DATA. *Unicef*, 1–13.
- Vonaesch, P., Rendremanana, R., Gody, J. C., Collard, J. M., Giles-Vernick, T., Doria, M., Vigan-Womas, I., Rubbo, P. A., Etienne, A., Andriatahirintsoa, E. J., Kapel, N., Brown, E., Huus, K. E., Duffy, D., Finlay, B. B., Hasan, M., Hunald, F. A., Robinson, A., Manirakiza, A., ... Gouandjika-Vassilache, I. (2018). Identifying the etiology and pathophysiology underlying stunting and environmental enteropathy: Study protocol of the AFRIBIOTA project. *BMC Pediatrics*, 18(1), 1–18. <https://doi.org/10.1186/s12887-018-1189-5>
- WHO. (2018). *Reducing Stunting In Children*.
- WHO. (2023). *Levels and Trends in Child Malnutrition Child Malnutrition: Key Findings of the 2023 Edition* (1st ed). World Health Organization.
- Witt, A. M., Bolman, M., Kredit, S., & Vanic, A. (2016). Therapeutic Breast Massage in Lactation for the Management of Engorgement, Plugged Ducts, and Mastitis. *Journal of Human Lactation*, 32(1), 123–131. <https://doi.org/10.1177/0890334415619439>
- World Health Organization Special Programme of Research, D. (2022). WHO recommendations on maternal and newborn care for a positive postnatal experience. In *World Health Organization*.
- Yimer, T. S., Sisay, F. A., Belay, H. G., Mihretie, G. N., Dagnaw, E. H., & Ferede, W. Y. (2024). Early Post-natal Care Services Utilization and its associated factors among mothers Systemic Review and Meta-Analysis. *Heliyon*, 10(1), e23760. <https://doi.org/10.1016/j.heliyon.2023.e23760>
- Zabidi, N. A., Nazri, F., Syafinaz, I., Amin, M., Salahuddin, M., Basri, M., Basha, R. K., & Othman, S. H. (2023). Early Post-natal Care Services Utilization and its associated factors among mothers

Systemic Review and Meta-Analysis. *International Journal of Biological Macromolecules*, 2(2), 33–47. <https://doi.org/10.1016/j.heliyon.2023.e23760>