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Breastfeeding practice during disasters: Challenges and barriers for public health

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ABSTRACT

Background: Breastfeeding is essential for protecting infant and maternal health and fosters public health benefits, especially in disaster scenarios where health services are compromised. It crucially helps prevent infection, malnutrition, and infant mortality, yet rates remain low among vulnerable populations in emergencies. The aim of this study is to explore the enabling and inhibiting factors influencing breastfeeding practices during disasters while also assessing how structural, socio-economic, and cultural determinants shape these practices. **Methods:** A systematic literature review was conducted in this study. A systematic search was conducted using Google Scholar, PubMed, and Scopus for full-text articles published between 2019 and 2025. Keywords such as "breastfeeding and mitigation" and "breastfeeding and disasters" were used. We selected ten studies using either qualitative or quantitative methods for analysis after removing duplicate and ineligible articles (including reviews and opinion articles). **Findings:** Successful breastfeeding during disasters relies on understanding its benefits, community support, adherence to cultural practices, and mental health services for mothers. Barriers include a lack of awareness about breastfeeding support, unclear protocols for formula distribution, economic pressures, disrupted healthcare, and psychological stress. Quantitative studies indicate a decrease in exclusive breastfeeding rates, while qualitative research highlights the importance of coordinated support from multiple stakeholders. **Conclusion:** To protect and promote breastfeeding during emergencies, it is crucial to establish clear institutional guidelines and regulations on formula donations, enhance mental health support for mothers, and strengthen nutrition education and community outreach. **Novelty/Originality of this article:** This review uniquely integrates global evidence from 2019 to 2025 across various disaster contexts, offering practical insights for developing an effective and cost-efficient emergency response framework for breastfeeding support.

KEYWORDS: breastfeeding, disasters, challenge, barrier, public health.

1. Introduction

Breastfeeding is crucial for children, mothers, and society, and the World Health Organization recommends starting it within the first hour of life, exclusively breastfeeding for the first six months, and continuing breastfeeding with appropriate complementary foods until the age of two and beyond (Nergiz et al., 2025). Breastfeeding is a crucial health practice that saves lives and protects the health of both mothers and infants. It prevents at least 595,379 childhood deaths annually from diarrhea and pneumonia. It is crucial for infant health and development, as it reduces the risk of infectious diseases, infant mortality, and chronic diseases like cardiovascular disease, diabetes, and obesity (Walters et al., 2023). Breastfeeding also contributes to public health and contributes to climate protection

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by producing a lower carbon footprint compared to commercial milk formula products. Human milk is 100% sustainable, uses few resources, emits no greenhouse gases, and produces less waste than commercial milk formula products (Pramono et al., 2025). Breastfeeding is a cost-effective intervention for improving children's health and development, especially during natural disasters and conflict settings. Studies show that non-breastfed children are more likely to be malnourished, and in disasters like the Bosnian conflict, diarrhea rates were higher. Additionally, the use of donated infant formula doubled diarrhea rates (Hwang et al., 2021). The Global Breastfeeding Scorecard aims to achieve breastfeeding targets by 2030. Despite WHO recommendations, global breastfeeding rates remain low, particularly in vulnerable populations, such as displaced or refugees (Walters et al., 2023).

In emergency contexts, improving breastfeeding support can save millions of children's lives and disability-adjusted life years. However, health services and community outreach systems often deteriorate or fragment during emergencies, leading to difficulties in breastfeeding practices for lactating women. Cultural habits and beliefs can also impact the quality and production of mothers' milk, leading to higher risks of malnutrition, morbidity, delayed development, and mortality. Strong epidemiological evidence highlights the importance of maternal mental health, mother-child attachment, and nutrition on child mortality and morbidity in humanitarian settings. Maternal depression often accompanies suboptimal rates of immunization, minimal hospital visits, and lower rates of exclusive breastfeeding, contributing to higher rates of child diarrheal and febrile illnesses and negatively affecting cognitive, motor, and socio-emotional child development indicators. Integrating maternal mental health into global health programming is crucial for promoting child growth and preventing further complications (Dozio et al., 2019).

Humanitarian disasters, such as earthquakes, floods, hurricanes, and epidemics, affect hundreds of thousands of people worldwide annually. These disasters significantly impact the health of the population, particularly vulnerable groups such as elderly people, people with disabilities, chronic conditions, pregnant women, infants, and young children. Infants (0-12 months), young children (< 2 years), and pregnant women have specific needs that require immediate and adequate response (Giusti et al., 2022). Earthquakes are devastating natural disasters that can leave thousands homeless and cause public health problems. Damage to infrastructure and health systems puts access to safe food at risk and makes children more vulnerable to infections. Breastfeeding has both physical and mental health benefits, protecting against mental health problems like anxiety, postpartum depression, and Post-Traumatic Stress Disorder (PTSD). However, breastfeeding problems can lead to negative mental health outcomes (Nergiz et al., 2025). National and international recommendations emphasize the importance of Infant and Young Child Feeding in Emergencies (IYCF-E), including protecting, promoting, and supporting breastfeeding, limiting Breast Milk Substitutes (BMS) supplementations, and implementing key newborn health interventions like skin-to-skin contact, kangaroo mother care, delayed umbilical cord clamping, and rooming-in. The World Health Assembly urges Member States to follow Operational Guidance on Infant and Young Child Feeding in Emergencies to address the specific needs of pregnant or lactating women and infants 0-2 years old, breastfed or not breastfed (Giusti et al., 2022). Infants are a vulnerable population during emergencies, making adherence to recommended IYCF practices crucial. Infant formula poses health risks due to lack of sanitary conditions and compromised access to healthcare. Breastfeeding is vital as it adapts to infant nutritional needs and provides tailored protection against infection-related agents. Prior evidence shows that artificially fed children have higher rates of diarrhea compared to breastfed infants. Breastfeeding is especially important during emergencies, as evidenced by the 2004 Southeast Asian tsunami and 2006 earthquakes in Yogyakarta and Central Java (Vilar-Compte et al., 2021).

Breastfeeding during emergencies requires limited and regulated donations and distribution of infant formulas. This is crucial due to the fragile nature of breastfeeding and the potential disruption by exogenous factors. International guidelines like the International Code of Marketing of Breast Milk Substitutes emphasize the importance of

controlling donations and distribution during emergencies. The World Health Assembly urges state members to ensure evidence-based and appropriate IYCF during emergencies. Despite the importance of breastfeeding promotion, it is not the primary focus of action during emergencies (Vilar-Compte et al., 2021). Organizations such as UNICEF and WHO have established the Global Breastfeeding Collective to promote breastfeeding practices among new mothers, particularly during natural disasters. This initiative aims to support mothers, both emotionally and financially, by emphasizing the importance of breastfeeding in crisis situations. This narrative review aims to provide humanitarian aid organizations and Non-Governmental Organizations (NGOs) with information on the challenges and barriers to breastfeeding in disaster-affected areas, potentially guiding improvements in their crisis response. Our research questions are what are the key factors that support or hinder breastfeeding practices during disaster situations?

2. Methods

2.1 Data sources

This study used systematic literature review method. The source of data for this study was electronics databased google scholar, PubMed, and Scopus between 2019-2025. The keywords used in the search were “breastfeeding and mitigation”, breastfeeding and disasters”.

2.2 Inclusion and exclusion criteria

Inclusion criteria included studies reporting information about women, or those who are able to produce breast milk, or are breastfeeding; women who were breastfeeding before, during, or after a natural disaster, or women who planned to breastfeed but were unable to do so due to the natural disaster or health workers directly involved with breastfeeding mothers; women affected by a natural disaster. Natural disasters will be defined as hurricanes, tornadoes, earthquakes, floods, tsunamis, droughts, forest fires, landslides, COVID-19, volcanic eruptions, heat waves, typhoons, or cyclones; reporting only the direct impact of a specific natural disaster on women's breastfeeding behavior (note: studies that only studied infants and reported whether they were breastfed or not will not be included); empirical study designs; articles published in full text and open access; articles published between 2019-2025; articles that discuss the factors that support and hinder breastfeeding during disasters. Exclusion criteria included articles not in Indonesian or English.

3. Results and Discussion

Table 1 details the 10 included studies. The studies were conducted in Mexico, Uganda, Nigeria, Pakistan, Turkey (2 studies), Indonesia (3 studies), and Syria. Seven studies were qualitative research with other aspects of study design, such as content analysis, phenomenological approaches, inductive approaches, and ethnography. The remaining studies were a combination of descriptive, exploratory, and cross-sectional. Nine of the natural disasters were earthquakes, and one was COVID-19. Eight studies involved female participants reporting data. Two studies involved health workers reporting data who worked with breastfeeding mothers. Based on article searches, ninety-two articles were obtained from three databases (google scholar, PubMed, and SCOPUS). Initial screening found twenty-one duplicate articles. After screening according to the inclusion and exclusion criteria, ten articles were analyzed. Natural disasters and humanitarian crises caused by earthquakes, floods, conflicts and pandemics have long shown significant impacts on health systems and community well-being. In this context, breastfeeding has emerged as one of the most cost-effective health interventions that plays a strategic role in preventing infant morbidity and mortality and supporting maternal health.

Table 1. Summary of the research findings

No.	Author	The aims of the study	Findings
1	Vilar-Compte et al., 2020	Identify barriers and enablers to breastfeeding protection and support after the 2017 earthquake in Mexico.	Four main themes related to post-earthquake breastfeeding barriers and support. Lack of knowledge about breastfeeding protection in emergency situations. Many stakeholders (government and NGOs) do not understand the importance of supporting breastfeeding post-disaster. Lack of Clarity of Institutional Protocols: There are no clear procedures for managing formula donations and supporting breastfeeding mothers. Violation of International Young and Children Feeding in Emergencies (IYCF-E) Code and Guidelines: Massive unmonitored donations of formula, some with near expiry dates. Formula distribution is done without consideration of the risk to infants who previously received breastmilk. Role of Expert Networks in Advocacy and Emergency Response: Breastfeeding expert groups are actively working to spread information through social media and provide education directly in shelters. Their efforts are often met with negative reactions from communities who perceive the messages as barriers to assistance.
2	Walters et al., 2023	Investigate the enablers and barriers to breastfeeding practices among South Sudanese refugees living in protracted settlements in Adjumani District, Uganda.	Enabling Factors: Knowledge of the benefits of breastmilk-for example, breastmilk is considered the best nutrition that can protect babies from diseases and support good growth. Support from husband/father, family (e.g. grandmother's role), and community, including material assistance from NGOs. Barrier Factors: Physical: Mothers stop breastfeeding when they are sick or feel insufficient milk production. Socio-economic: Mothers who are employed or with higher education levels tend to use alternative milks. Knowledge: There is a lack of understanding that infants under 6 months of age should be given complementary foods in addition to breast milk. Psychosocial: Factors such as fear of breastfeeding pain, domestic conflict, and mental health issues influence breastfeeding decisions.
3	Suzan et al., 2025	Exploring the breastfeeding status of mothers with children aged 0-2 years after the Kahramanmaraş earthquake, Türkiye.	Main themes: Expectations of health workers: Lack of support and guidance for mothers post-earthquake. Emotional impact of inability to breastfeed and lack of psychological support. The need for regular infant health checks. Suggestions from mothers: More targeted distribution of baby food. Encouraging mothers to continue breastfeeding despite difficult conditions.

			Provision of baby food stock in case of emergency. Improved nutritional intake for breastfeeding mothers. Difficulties experienced: Difficulty accessing formula milk and baby food. High incidence of diarrhea and allergies due to unhygienic conditions. Lack of access to clean water and heat sources for baby food preparation. Psychological challenges due to loss and post-disaster stress. Experiences in Breastfeeding and Infant Feeding: Decreased milk production due to stress. Difficulties in complementary feeding due to limited access to food. Lack of privacy for breastfeeding mothers in refugee camps. Lack of equipment and facilities for breastfeeding and baby food preparation.
4	Camacho et al., 2023a	Explore the perceptions of caregivers (CGs) and health workers (HWs) regarding breastfeeding practices, promotion and support for infants under 6 months in Maiduguri, Nigeria.	Supportive Factors for Breastfeeding: Breastfeeding is seen as a mother's obligation and culturally accepted. Support from family, especially husband and grandmother, in motivating breastfeeding. The role of health workers in promoting breastfeeding through education and community-based services. Barriers to Breastfeeding: Perceived lack of breastmilk leads mothers to switch to formula or instant porridge. Stress and food insecurity as the main causes of decreased milk production. Lack of education on breastfeeding techniques such as correct latching and positioning. Social norms such as family influence and traditions that inhibit breastfeeding exclusivity. Wet nursing practices: Wet nursing is accepted when performed by grandmothers or close relatives after the mother dies. However, this practice is still rare in communities outside of family relationships. Challenges in Hospital Breastfeeding Support: CGs expect formula milk as part of nutritional care, so education on re-establishing breastfeeding needs to be strengthened. Long duration of hospitalization makes mothers want to go home before the relactation process is successful. Communication difficulties with male health workers due to cultural and language differences. Sustainability of Breastfeeding Support After Discharge: Many mothers have difficulty maintaining breastfeeding practices at home due to loss of health worker support and lack of access to nutritious food.

			There is a need for a community-based support system to sustain breastfeeding after hospital discharge.
5	Hirani et al., 2023	Examining the social and cultural factors that influence breastfeeding practices of mothers affected by natural disasters in Pakistan.	Breastfeeding Supporters: Informal support from family and community increases breastfeeding sustainability. Formal support from health units contributes to relactation after a disaster. A strong breastfeeding culture in the community enables mothers to maintain breastfeeding practices until the child is 3-5 years old. Spiritual practices such as prayer and traditional medicine are believed to aid maternal recovery and increase milk production. Barriers to Breastfeeding: Lack of privacy makes mothers feel uncomfortable breastfeeding in refugee camps. Social norms and cultural beliefs encourage the use of formula or breastmilk substitutes (cow's milk and tea) from 6 months of age. Social pressure and workload make it difficult for mothers to maintain breastfeeding. Lack of access to health services leads to low support for breastfeeding mothers after disasters.
6	Fadjriah et al., 2020a	Assessing exclusive breastfeeding behavior after the earthquake and liquefaction in Palu City.	Predisposing factors: Mothers' knowledge of exclusive breastfeeding is low, with only a general understanding. Maternal attitudes towards exclusive breastfeeding are good, but still at the “response” stage, so some mothers continue to give formula milk without medical indications. Enabling Factors: There were no breastfeeding tents in the refugee camps. Formula milk was found in many refugee camps and caused discontinuation of breastfeeding. The heat in the tents makes it difficult for mothers to breastfeed and they prefer to reduce the frequency of breastfeeding. Reinforcing Factors: The role of health workers in providing breastfeeding education and motivation is good, but the control of formula milk distribution is still low. Family support for breastfeeding was less than optimal, as some family members suggested the use of formula milk when breast milk was not sufficient. The psychological condition of post-disaster mothers affects the continuation of breastfeeding, especially for mothers who have experienced trauma and severe stress.
7	Nergiz et al., 2025	Determining the relationship between the experience of the 2023 Türkiye earthquake and breastfeeding problems in mothers.	Breastfeeding problems were more common in earthquake-affected areas (48.8%) compared to unaffected areas (28.6%) Perceived lack of breastmilk was the most commonly reported problem (33.0% in affected areas, 11.1% in unaffected areas). Influential factors:

			Mothers living in earthquake-affected areas had a 2.01 times higher risk of experiencing breastfeeding problems. Bottle use increased the likelihood of breastfeeding problems (1.66 times higher) and perceived breastmilk shortage (1.78 times higher). Mothers who received mental health support and nutritional support had lower odds of perceived breastmilk deficiency (AOR 0.53 and 0.49).
8	Yalçın et al., 2023	Evaluate breastfeeding and infant feeding practices among Syrian refugees in Turkey based on observations of Syrian health workers (HCWs).	Breastfeeding Practices: 40% of HCWs reported infants receiving only breast milk in the first three days after birth. 45.2% HCWs mentioned the use of pre-lactal foods such as sugar water, formula milk, or herbal tea as a common practice. 30.5% HCWs observed that many mothers stopped breastfeeding before the child was 12 months old. Barriers to Breastfeeding: Lack of education about breastfeeding among mothers. Maternal mental and physical health problems. Food insecurity and low income. Inadequate living conditions and lack of access to quality health services. Cultural influences and social norms that do not support breastfeeding sustainability. Complementary feeding: 28% of HCWs reported that mothers often give complementary foods too early (<6 months). 7.4% reported delayed complementary feeding (>9 months). Common complementary foods were cereals (59.5%), fruits and vegetables (47.8%), dairy products (30.3%).
9	Fadjriah et al., 2020b	Analyzing the factors that influence the success of exclusive breastfeeding in post-earthquake evacuation sites in Palu City.	Maternal Characteristics: 63.5% were 26-35 years old. 86.5% had a low level of education. 73.1% breastfed before the disaster, but after the disaster the exclusive breastfeeding rate decreased to 26.9%. 80.8% had low knowledge about exclusive breastfeeding. Factors Associated with the Sustainability of Exclusive Breastfeeding: Maternal education was significantly associated (p=0.011), highly educated mothers were more likely to maintain exclusive breastfeeding. Maternal knowledge about exclusive breastfeeding (p=0.016), low knowledge correlated with discontinuation of breastfeeding. Distribution of formula and commercial porridge support (p=0.000), mothers who received support were more likely to discontinue exclusive breastfeeding. Availability of health facilities (p=0.002), mothers who had access to facilities were more likely to maintain breastfeeding.

			Health worker support (p=0.002), mothers who received support were more able to maintain breastfeeding. Family support (p=0.001), mothers with family support were more likely to maintain exclusive breastfeeding than those with less support.
10	Okinarum & Rochdiat, 2022	Describe the reinforcing and weakening elements of breastfeeding experiences during the COVID-19 pandemic in Indonesia,	Reinforcing Element: Mother's love for her baby Support from family, husband, and community (including online support through social media) Use of adaptive coping strategies (both emotional through acceptance and gratitude and problem-focused coping through seeking social support) Weakening Elements: Physical and emotional discomfort (such as nipple pain, nausea, vomiting, stress, and panic attacks) Perceived insufficient milk supply Financial problems and economic pressure Parenting challenges and lack of tangible support from husband

Breastfeeding not only provides complete and safe nutrition for infants, but also provides immunological protection, reduces the risk of infection, and supports children's cognitive and emotional development during the critical period from birth (Bilgin & Karabayır, 2024; Nergiz et al., 2025; Giusti et al., 2022). Emergencies and disasters often disrupt the availability of health services, safe food distribution and access to correct information on infant feeding practices. This is when the role of breast milk becomes vital. In the midst of chaos and limited resources, breastmilk is the most ideal food because it does not require clean water to serve and contains antibodies that can reduce the risk of infection. In addition, breastfeeding also contributes to a reduced carbon footprint when compared to formula milk, which requires industrial production and logistics that have a greater environmental impact (IDAI, 2013; WHO, 2024).

Breast milk is the safest nutrition for infants in disaster conditions, protecting against infection and malnutrition (Büke & Karabayır, 2024). Based on the results of various studies and literature reviews conducted between 2019 and 2025, it appears that there are many enabling and constraining factors that influence the sustainability of breastfeeding practices in disaster contexts. Among the enabling factors, family and community support, improved maternal knowledge, and integration of mental health services play an important role. Significant barriers include unclear institutional protocols, uncontrolled distribution of formula milk donations, economic pressures, disruption of health infrastructure, and the psychological impact of disaster trauma (Suzan et al., 2025; Vilar-Compte et al., 2021).

The importance of breastfeeding as a “public health investment” lies in its ability to reduce the burden of health costs through reducing disease rates, saving on treatment costs, and strengthening community resilience. In the context of disasters, breastfeeding-based interventions not only provide direct benefits in terms of improved nutritional status and reduced risk of infection, but also contribute to long-term socio-economic development. Therefore, evidence-based policy development, cross-sector collaboration and innovative implementation are needed to ensure that every mother, regardless of the emergency, is adequately supported to exclusively breastfeed her baby (Karnesyia, 2021).

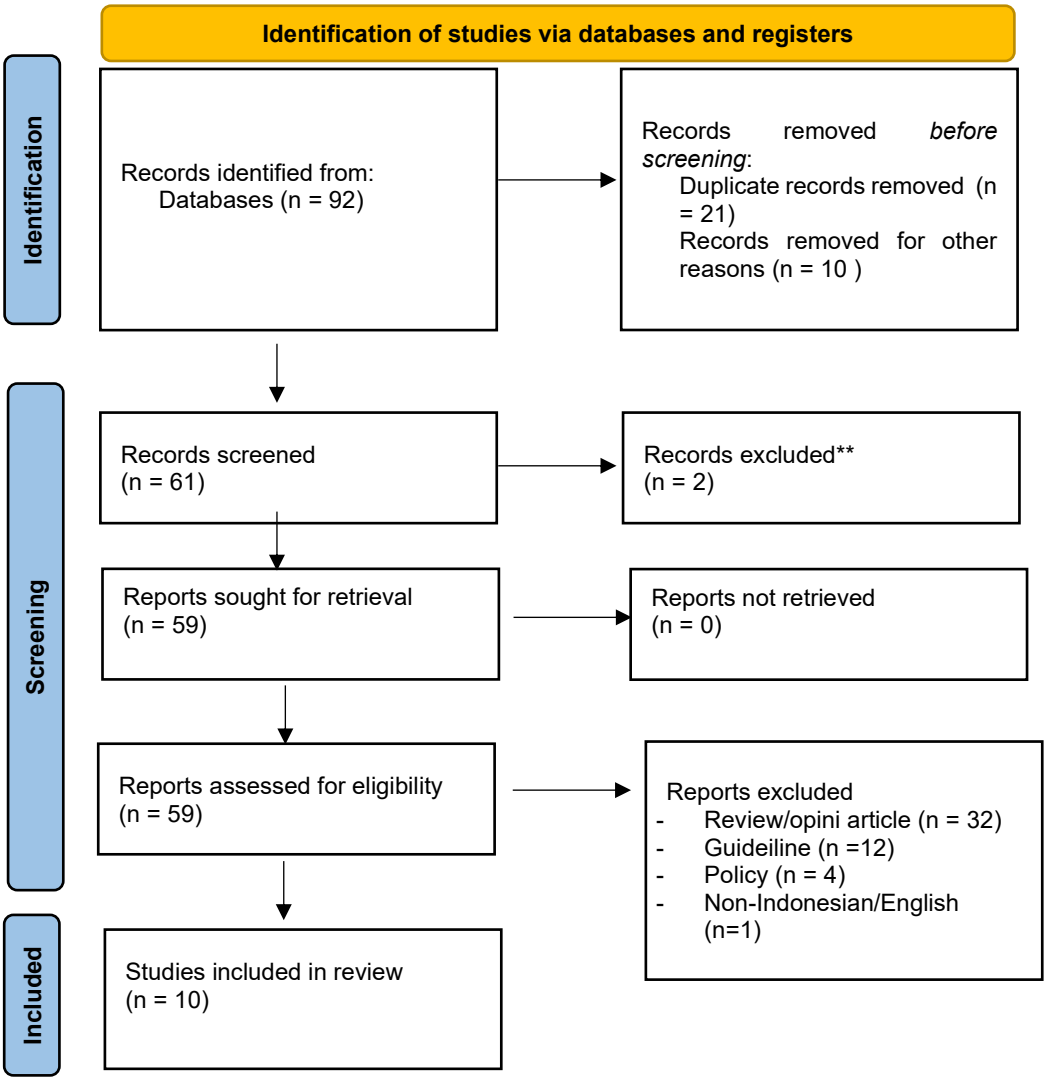

Fig. 1. PRISMA flow diagram

3.1 Factors supporting breastfeeding in disaster situations

3.1.1 Family and community support

An important finding of many studies is that social support, both from family and community, significantly contributes to the continuation of breastfeeding practices in the midst of disasters. In many disaster-affected areas, the role of husbands, family members and neighbors as providers of emotional support and physical assistance has been shown to increase mothers' confidence in breastfeeding (Walters et al., 2023). For example, the provision of special rooms or breastfeeding tents in refugee camps is one of the concrete efforts to overcome the limitations of privacy and facilities, allowing mothers to breastfeed comfortably (IDAI, 2013). In some refugee camps where community support is already in place, breastfeeding support groups often hold regular meetings to share experiences, effective breastfeeding techniques and stress management tips. This not only increases practical knowledge, but also creates a sense of solidarity among mothers facing similar situations. This kind of collaborative approach, involving community leaders and local health cadres, greatly increases the likelihood of exclusive breastfeeding success as mothers feel supported in every aspect of their daily lives (Camacho et al., 2023b; Çaylan et al., 2022).

In addition, family support in the form of moral encouragement and practical assistance such as looking after older children, helping with logistical arrangements at the evacuation centers, and providing food and basic necessities, helped to ease the burden on

mothers. In conditions where access to information and health facilities is very limited, the active role of the family is crucial to the continuation of breastfeeding, despite the many challenges that must be faced. This is in line with reports from Indonesian Pediatric Society (IDAI) that emphasize the importance of family support in disaster situations to maintain breastfeeding (Giusti et al., 2022; IDAI, 2013; Karnesyia, 2021). For mothers who are not breastfeeding due to health problems, breast milk bank and wet nursing programs can be a solution (Aros-Vera et al., 2021; Bilgin & Karabayır, 2024; Gawrońska et al., 2024). Previous studies have found that wet nursing lasts for 4.25 months. This is certainly very helpful for babies to get breast milk. Wet nursing can be an effective solution in food crises and humanitarian emergencies despite social and logistical challenges (Azad et al., 2019).

3.1.2 Education and improvement of maternal knowledge

Education is a key element in promoting successful initiation and continuation of exclusive breastfeeding, especially in disaster contexts where correct information from trusted sources may not be widely available. Mothers who have gained in-depth knowledge about the benefits of breastmilk and proper breastfeeding techniques are more likely to be able to cope with the challenges and stresses of a disaster environment. Various training and counseling programs conducted by local and international health agencies have shown encouraging results-where increased maternal understanding of the benefits of breastmilk is directly proportional to increased breastfeeding initiation and duration (Fadjriah et al., 2020b; Vilar-Compte et al., 2021). Breastfeeding education and counseling needs to be strengthened in emergency situations (Hirani et al., 2023). Education modules tailored to the emergency context have been developed to facilitate the dissemination of accurate information about breastfeeding. These materials typically include explanations of the importance of breastfeeding within the first 1 hour after birth, the long-term health benefits, and the risks of formula use, especially in conditions of inadequate sanitation. Resources from WHO and UNICEF are also often used as key references in the development of these educational materials, so that mothers can understand that breastfeeding is the most effective way to provide protection for their infants during a crisis (WHO, 2024)

The availability of easily accessible information through social media, mobile apps, and digital platforms has also contributed greatly. Many organizations and advocacy groups disseminate educational messages through videos, infographics, and webinars that can be accessed by expectant and breastfeeding mothers in disaster sites. This is especially important given the limited mobility and physical access in emergency situations. Thus, digital education helps bridge the lack of on-the-ground training (Karnesyia, 2021; Suzan et al., 2025).

3.1.3 Integration of mental health services

Maternal mental health is a critical aspect of supporting breastfeeding practices in disasters. Emotional distress, trauma and stress can interfere with milk production through a decrease in oxytocin and prolactin, which are key hormones in the lactation reflex. Studies have shown that mothers who receive psychosocial support-through counseling and group therapy-have a greater chance of maintaining exclusive breastfeeding, despite emergency conditions (Nergiz et al., 2025; Okinarum & Rochdiat, 2022). The integration of mental health services into maternal and child health programs is very important. Several interventions have been conducted, including stress counseling, trauma-informed care approaches, and support facilities that provide special rest and relaxation rooms for mothers. Most lactation counselors successfully achieve breastfeeding goals after receiving ongoing support (Babiszewska-Aksamit et al., 2025). With support ranging from health professionals to the presence of peer-led support groups, mental health recovery can take place more quickly. A holistic approach that combines psychological counseling with breastfeeding education has been shown to significantly improve the quality and quantity

of breast milk produced (Babiszewska-Aksamit et al., 2025; Dozio et al., 2019; Fadjriah et al., 2020a).

In refugee situations, where the environment is not conducive to mental health, a psychosocial support approach is an essential foundation. For example, some refugee camps have organized open psychology mentoring sessions that provide a space for mothers to share their experiences and address trauma collectively. Such interventions not only promote breastfeeding continuity but also help build resilience in the long term (Gribble & Palmquist, 2022).

3.1.4 Utilization of local cultural values and practices

Local cultural values and traditions that support breastfeeding are a significant asset in disaster situations. In many communities, breastfeeding is not only considered an act of feeding, but also a symbol of affection and maternal identity. Cultural practices that encourage breastfeeding from birth and the utilization of traditional knowledge on maternal and child health have been found to be enabling factors that can strengthen exclusive breastfeeding practices, despite emergency situations (Hirani et al., 2023; Suzan et al., 2025). Intervention approaches that integrate cultural values and traditional practices have proven effective. For example, in some rural communities in Pakistan and Nigeria, rituals and customs that value breastfeeding have been adapted into health support programs. Such efforts not only demonstrate respect for local values but also increase mothers' confidence to continue breastfeeding, despite facing very challenging conditions (Camacho et al., 2023a; Çaylan et al., 2022).

Collaboration between community leaders, religious leaders, and local support groups in disseminating information about the benefits of breastfeeding has resulted in positive changes in breastfeeding behavior. This awareness also helps reduce the stigma associated with breastfeeding in public and reinforces social norms that support exclusive breastfeeding. It is this culture-based approach that allows interventions to approach the problem from a holistic perspective and in accordance with the local context (IDAI, 2013; UNICEF & WHO, 2023).

3.2 Barriers to breastfeeding during a disaster

3.2.1 Unclear institutional protocols and formula milk donation distribution

One of the most significant barriers to maintaining breastfeeding practices during disasters is the lack of clear standard operating procedures (SOPs) and regulations governing the distribution of formula milk donations (Pramono et al., 2025). A study in Mexico after the 2017 earthquake showed that many stakeholders, both in government and non-governmental organizations, still do not understand the importance of supporting exclusive breastfeeding (Vilar-Compte et al., 2021). As a result, the distribution of formula donations is often carried out massively without adequate supervision, causing a shift in breastfeeding behavior that has a direct impact on reducing the natural production of breast milk (Hirani et al., 2021; Suzan et al., 2025; Vilar-Compte et al., 2021). This uncontrolled distribution creates a dilemma: on the one hand, formula is intended to cover nutritional deficiencies; on the other hand, its use in poorly sanitized environments increases the risk of diarrhea and infection in infants (Bilgin & Karabayır, 2024; Gribble & Palmquist, 2022; Hwang et al., 2021). Uncontrolled use of infant formula increases the risk of diarrhea and malnutrition in infants (Gökçay et al., 2023). Many reports suggest that the use of formula milk in emergency situations, if not accompanied by strict supervision, can replace the natural process of exclusive breastfeeding (Adeoya et al., 2022; Nergiz et al., 2025; Evans et al., 2022; Fadjriah et al., 2020b). Massive distribution of formula milk makes mothers consider breast milk insufficient and switch to formula milk (Hwang et al., 2021).

The absence of clear institutional protocols has led to fragmented and inconsistent distribution of donations, creating confusion for health workers on how to distribute aid.

This has resulted in disjointed interventions and a lack of coordination between government and non-government agencies. As a solution, the establishment of policies that refer to the WHO and UNICEF IYCF-E guidelines is necessary to ensure that the assistance received does not disrupt the natural breastfeeding process. WHO and UNICEF do not recommend unsupervised formula distribution in disaster situations (UNICEF & WHO, 2023).

3.2.2 Economic and social pressures

The economic crisis caused by disasters is one of the most substantial barriers to breastfeeding practices. Reduced sources of income, rising food prices, and unstable economic conditions force many families to seek cheaper alternatives for infant nutrition. Under these conditions, mothers may be tempted to provide formula milk or complementary foods that do not always meet hygienic standards, although the main risk is an increased chance of infection and malnutrition (Grubesic & Durbin, 2022). The economic crisis also leads to a lack of maternal fluid and energy intake which worsens the mother's health condition and results in inhibited breastmilk production. In addition to economic factors, social pressures such as stigma or negative perceptions of breastfeeding in public also hinder exclusive breastfeeding. In some communities, social norms still consider it inappropriate to breastfeed openly, so mothers feel intimidated to do so, especially in densely populated refugee camps (Hirani et al., 2023; Yalçın et al., 2023). This pressure is exacerbated by the lack of social support from the community and neighborhood. In such situations, encouragement and deeper understanding through education is crucial to change perceptions and foster a culture of support for breastfeeding. Economic and social instability also increases stress and anxiety levels in mothers, which directly affects milk production through an increase in the hormone cortisol. This creates a negative cycle where social and economic pressures contribute to a decrease in the quality of breastfeeding, resulting in higher health risks for the infant (Nergiz et al., 2025). Stress and fatigue also reduce milk production. This will decrease the mother's motivation to continue breastfeeding (Hwang et al., 2021).

3.2.3 Health infrastructure disruption and access to services

Damage to health infrastructure is a significant structural problem in disasters. Damage to facilities, shortages of health workers, and logistical limitations in the distribution of medical equipment directly impact the quality and reach of health services, including breastfeeding support. When health infrastructure is disrupted, the ability to provide information, breastfeeding counseling services and psychological assistance is severely limited, leaving many mothers without appropriate support (Fadjriah et al., 2020b; Vilar-Compte et al., 2021). This limited access is exacerbated by the absence of dedicated breastfeeding spaces in evacuation centers (Gribble et al., 2019). In many affected locations, existing facilities do not meet minimum standards to support breastfeeding, so mothers often have to breastfeed in noisy, impersonal and unsupportive environments (Cerceo et al., 2024). If left unaddressed, this can lead to a decrease in breastfeeding frequency and even unwanted cessation of exclusive breastfeeding (IDAI, 2013; Karnesyia, 2021).

In addition, infrastructure disruptions also hamper the process of collecting and sharing real-time data on maternal and infant health conditions. This lack of information makes it difficult for emergency response teams to quickly identify and address breastfeeding-related issues, resulting in interventions that are more effective and effective. In addition, infrastructure disruptions also hinder the process of collecting and sharing real-time data on maternal and infant health conditions. This lack of information makes it difficult for emergency response teams to quickly identify and address breastfeeding-related issues, delaying timely interventions (Vilar-Compte et al., 2021).

3.2.4 Psychological impact and emotional trauma

The psychological impact of disaster situations cannot be underestimated. Traumatic stress, depression, and anxiety experienced by mothers in the midst of a disaster affect not only mental well-being, but also the physiological process of breastfeeding (Russell et al., 2025). Prolonged stress is known to disrupt the release of the hormone oxytocin which is important for the lactation reflex, thus reducing the amount of milk produced (Nergiz et al., 2025; Rahmi & Amelin, 2025). Many studies confirm that mothers who face trauma have a tendency to experience decreased milk production as well as difficulty in maintaining breastfeeding duration. In refugee camps, where exposure to uncertainty and stressful environments is high, psychological support is an urgent need. Without counseling interventions and group support, these negative psychological impacts will continue and have a long-term impact on maternal health and infant nutritional development (Dozio et al., 2019). The success of breastfeeding interventions during disasters relies heavily on the ability of the health system to provide integrated mental health services. A holistic approach, incorporating emotional support, psychological counseling, and interventions to manage stress, is necessary for mothers to overcome trauma and remain able to breastfeed optimally (Okinarum & Rochdiat, 2022).

3.3 Role of stakeholders in breastfeeding support

3.3.1 Government policy and regulation

The government has a central role in establishing policies and regulations that support breastfeeding practices, especially in emergency situations. The implementation of the Infant and Young Child Feeding in Emergencies (IYCF-E) guidelines promoted by WHO and UNICEF must be translated into concrete and well-executed national policies. This includes the development of Standard Operating Procedures (SOPs) that regulate the distribution of formula milk donations and the provision of support facilities for breastfeeding mothers (Giusti et al., 2022; Vilar-Compte et al., 2021). Some countries have shown positive initiatives by integrating IYCF-E guidelines into national emergency response plans. Governments are working with international agencies and non-governmental organizations to provide training to health workers and aid distribution supervisors.

Periodic evaluations are conducted to ensure that policies remain relevant and responsive to field dynamics (WHO, 2024). Improved regulation in aid distribution, especially regarding formula milk, must be supported by a digital technology-based monitoring system. The implementation of a real-time reporting system will make it easier to identify violations, speed up responses, and ensure that donors and beneficiaries understand the appropriate procedures. Thus, clear and integrated government policies are expected to minimize the negative impacts of unmanaged aid and maintain breastfeeding sustainability (Giusti et al., 2022; Suzan et al., 2025). Hwang's research found that only 25% of WHO member countries have Infant Feeding in Emergency (IFE) protocols (Hwang et al., 2021).

*3.3.2 Role of non-governm*ental organizations and international agencies

Non-governmental organizations (NGOs) and international agencies, such as UNICEF and WHO, play an important role in filling gaps and streamlining breastfeeding interventions in disasters. These agencies are not only responsible for developing guidelines and policies, but are also actively involved in the field by implementing training programs for health workers, packaging educational modules, and setting up support posts in displacement sites (Camacho et al., 2023a). Through participatory approaches, NGOs organize support groups among mothers dealing with the stress of disasters. Activities such as group discussions, experience-sharing sessions and direct mentoring by local health

cadres have been shown to help reduce stress and increase practical knowledge about exclusive breastfeeding.

This approach has been well implemented in countries such as Nigeria, Turkey and Pakistan, where local support groups play an important role in strengthening breastfeeding practices (Camacho et al., 2023a; Hirani et al., 2021). Collaboration between government and NGOs also often results in more comprehensive intervention programs. For example, in some cases, joint training between government health workers and NGO volunteers has resulted in significant improvements in the quality of breastfeeding counseling services, helping mothers to overcome psychological and logistical barriers (Karnesyia, 2021).

3.3.3 The role of academics and researchers

Academics and researchers have a strategic contribution to make in collecting data and providing empirical evidence that informs policy formulation and intervention strategies. Interdisciplinary studies examining factors supporting and inhibiting breastfeeding provide insights and recommend evidence-based solutions to address existing problems (Nergiz et al., 2025; Fadjriah et al., 2020b). Case studies and field surveys in various disaster sites have identified important variables that need to be monitored, such as maternal knowledge, environmental support, and availability of health facilities. These data are not only used for evaluation of existing programs, but also excel in proposing new innovations in the development of emergency response protocols.

Publication of research results in international journals and scientific conferences helps disseminate information on the effectiveness of interventions and provides a basis for continuous policy improvement (Dozio et al., 2019; Suzan et al., 2025). The involvement of academics in national and international discussion forums allows for collaboration between researchers from different countries, so that solutions formulated can be universal but still adaptive to local contexts. This is important to ensure that the proposed policies are able to dynamically respond to challenges that arise in the field (Okinarum & Rochdiat, 2022).

4. Conclusions

Our research revealed differences in the challenges and obstacles faced during the COVID-19 pandemic and the earthquake disaster. During the COVID-19 pandemic, social support was more readily available through social media and online platforms, whereas in the earthquake disaster, technology was less readily available, and direct support was required. Damaged infrastructure caused by the earthquake disrupted access to health services and logistics. Meanwhile, during the COVID-19 pandemic, access to health services was limited due to social restrictions. Based on the in-depth review presented, it can be concluded that breastfeeding in disaster situations is a highly strategic and cost-effective health intervention to protect maternal and infant health. Despite the many challenges, ranging from unclear aid distribution protocols, economic pressures, infrastructure disruptions, to deep psychological impacts, there are also various supporting factors that can be utilized to increase the success of exclusive breastfeeding.

The practice of exclusive breastfeeding in times of disaster is expected to result in a reduction in the burden of disease, savings in health care costs, and improved quality of life. Thus, investing in breastfeeding practices during disasters is a long-term investment that contributes to the strengthening of national health systems and more resilient socio-economic development in the future. This study has limitations, including a small sample size, so it cannot yet describe all the inhibiting and supporting factors for breastfeeding in disaster situations. The study location does not yet depict the occurrence of all disasters in the world. Further research is recommended to examine various aspects of breastfeeding in different disaster situations over a longer time span.

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