BRAIN. Broad Research in Artificial Intelligence and Neuroscience
e-ISSN: 2067-3957 | p-ISSN: 2068-0473
Covered in: Web of Science (ESCI); EBSCO; JERIH PLUS (hkdir.no); IndexCopernicus; Google Scholar; SHERPA/RoMEO; ArticleReach Direct; WorldCat; CrossRef; Peeref; Bridge of Knowledge (mostwiedzy.pl); abcdindex.com; Editage; Ingenta Connect Publication; OALib; scite.ai; Scholar9; Scientific and Technical Information Portal; FID Move; ADVANCED SCIENCES INDEX (European Science Evaluation Center, neredataltics.org); ivySCI; exaly.com; Journal Selector Tool (letpub.com); Citefactor.org; fatcat!; ZDB catalogue; Catalogue SUDOC (abes.fr); OpenAlex; Wikidata; The ISSN Portal; Socolar; KVK-Volltitel (kit.edu)
2025, Volume 16, Special Issue 1 (April 2025), pages: 364-382.
Special Issue 1: *Neuroscience, Artificial Intelligence, and Innovation in Education*
Submitted: January 18th, 2025 | *Accepted for publication:* March 24th, 2025

Online Breastfeeding Education for Adolescent Girls with Depressive Disorder and Postpartum Psychosis

Eva-Maria Elkan
Dunărea de Jos University – Faculty of Medicine and Pharmacy, Galați, Romania.
cojocarumarieva@yahoo.com

Beatrice-Cela Stan
Dunărea de Jos University – Faculty of Medicine and Pharmacy, Galați, Romania.
pohribbeatris@yahoo.com

Letitia Duceac
Dunărea de Jos University – Faculty of Medicine and Pharmacy, Galați, Romania.
letimedr@yahoo.com

Irinel Lungu
Dunărea de Jos University – Faculty of Medicine and Pharmacy, Galați, Romania.
lun_iri@yahoo.com

Ilie Lacramioara
Dunărea de Jos University – Faculty of Medicine and Pharmacy, Galați, Romania.
ilie.lacramiooara@yahoo.com

Ana-Maria Cobzaru
Dunărea de Jos University – Faculty of Medicine and Pharmacy, Galați, Romania.
anna_maria935@yahoo.com

Zainea Pusica
Universitatea de Stat Moldova.
pusipusi67@yahoo.com

Oana – Cristina Alexandru
Emergency Hospital for Chldren Sfântul Ioan Galați, Romania.

Dumitru Marius Dănilă
Emergency Hospital for Chldren Sfântul Ioan Galați, Romania.
marius_danilla@yahoo.com

Anamaria Ciubara
Head of Psychiatry Department from Elisabeta Doamna Hospital, Galați, Romania.
anamburlea@yahoo.com

Abstract: *Motherhood involves profound hormonal, physical, and psychological transformations, along with shifts in social status, daily routines, and sleep patterns, all of which can impact the mother-child relationship and increase maternal vulnerability. These challenges are particularly pronounced in adolescent mothers, who may experience heightened emotional distress, inadequate family support, or social rejection, complicating their breastfeeding journey. Despite targeted health education campaigns, adolescent pregnancies remain prevalent, underscoring the need for innovative interventions to support breastfeeding initiation and continuation among young mothers, for those experiencing postpartum depression and psychosis. This study aims to evaluate the effectiveness of online breastfeeding education as a supportive intervention for adolescent mothers facing perinatal mental health challenges. The research explores how digital resources, virtual counselling, and continuous telehealth support helps breastfeeding adherence, maternal self-efficacy, and emotional well-being. A comparative analysis of existing digital education models and traditional face-to-face breastfeeding support programs is conducted to assess the benefits, limitations, and potential scalability of virtual interventions. Findings indicate that online breastfeeding education significantly improves breastfeeding rates, reduces maternal anxiety, enhances mother-infant bonding, particularly in adolescent mothers with perinatal psychiatric disorders. Challenges such as digital literacy disparities, internet accessibility, and ethical considerations related to telehealth data privacy must be addressed to optimise the effectiveness of digital maternal education. This study bridges the gap between online breastfeeding education, maternal mental health, and digital healthcare accessibility. The findings support the integration of hybrid models that combine virtual breastfeeding education with periodic in-person consultations, offering a scalable and adaptable solution to improve perinatal outcomes for vulnerable maternal populations. Future research should focus on developing personalised digital interventions and assessing long-term breastfeeding success among adolescent mothers receiving online support.*

Keywords: *breastfeeding; postpartum; depression; psychosis; teenager; online; education.*

How to cite: Elkan, E.-M., Stan, B.-C., Duceac, L., Lungu, I., Lacramioara, I., Cobzaru, A.-M., Pusica, Z., Alexandru, O.-C., Dănilă, D. M., & Ciubara, A. (2025). Online breastfeeding education for adolescent girls with depressive disorder and postpartum psychosis. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience, 16*(Sup 1), 364–382. https://doi.org/10.70594/brain/16.S1/29

©2025 Published by EduSoft Publishing. This is an open-access article under the CC BY-NC-ND license

1. Introduction

Perinatal depression affects 10-20% of mothers, the mothers most exposed to this risk being those with emergency caesarean section, those with poor social support or those who have significant weight gain during pregnancy. There are also some milder manifestations called postpartum blues (transient reversible phenomena) determined by hormonal fluctuations after childbirth. They mainly appear 3-4 days after birth, and in the case of some women, the symptoms can last from a few days to a few weeks after birth. (Shen et al., 2022). There is a growing signs of evidence of mothers with pre-existing psychiatric pathologies before birth. The rate of births in women with a psychotic disorder is reported to be increasing. These cases are beginning to be managed in such a way that the mother can adequately care for her child, including from the perspective of breastfeeding (Cès et al., 2018). Online education is a useful tool to help restore mental health in families where the mother has postpartum depression or postpartum psychosis. (Tabi et al., 2022). Mothers may show hypomanic symptoms after childbirth, which are part of the bipolar disorder type II registries and which are more difficult to recognise. They may present with mild disorientation, distractibility and irritability as well as a reduced need for sleep. (Sharma, Burt, & Ritchie, 2009)

Postpartum psychosis remains a major public health problem because it affects 1-2 patients/1000 parturients, these figures increase in mothers with pre-existing psychiatric disorders. From all mothers with postpartum psychosis ,12% may develop schizophrenia caused by imbalances suffered during labor. Phenomena that herald psychosis are confusion, memory disorders, affective disorders, irritability, restlessness, bizarre delusions. There are mothers who try to hide their psychotic symptoms (Spinelli, 2009). Prolactine is the lactotrope hormone in the hypophysis being involved in fertility, mental illness and breastfeeding. Dopamine cand influence the secretion of Prolactine thus the intim relationship between lactation and maternal perinatal depression. Prenatal mental illness can influence breastfeeding. Studies were done in the USA that showed that at birth breastfeeding is initiated in approximately 75% of children, only that, until the age of 6 months, only 25% maintain it. Other reasons for interrupting breastfeeding are returning to work too soon, but also the lack of solid educational support regarding breastfeeding before birth. (Allen et al., 2022). On the other hand, mothers are more receptive to individual breastfeeding counselling programs (Blitman et al., 2022). The problem also lies in adapting to the daily routine in the hospital where breastfeeding takes place under supervision, in forming a routine at the patient's home, in incorporating an individualised daily program for the mother and her child (Spatz et al., 2015).

Consolidation of the daily routine of nursing mothers occurs only 10-12 weeks after birth. That's why combined methods are the most successful, combining family support, home visits, visits to the family physician's office and online education (Froehlich et al., 2015). Mothers can interrupt the administration of breast milk because of pain due to the possible appearance of goiter or even mastitis, for social reasons related to work. In many cases mother are under the social pressure not to deform their body and no longer fit the social standards of beauty. Breastfeeding difficulties could be a risk factor for the onset of postpartum depression. These difficulties may weaken or alter her perception of her relationship with her own child. Feelings such as shame, guilt, fear, anxiety may develop. Neuroscience clarify the role of the hypophysis which through neuropeptides determine the development of microdomains in the brain and subtle interactions of the molecular level of the neurons (Hou et al., 2016) Interruption for pain reasons psychologically affects mothers more pronounced than reducing the duration of breastfeeding. The inability of the child to feed or an incorrect attachment to the breast put the mother in difficulty. The meals will be longer in duration and the mother will become more exhausted. (Brown, Rance, & Bennett, 2016). Online education can be a method to be permanently near the breastfeeding adolescent mothers and their abilities to cope with the child needs must be trained each day and them to feel secured. So the mothers are motivated to consolidate the good habits.

Mothers deserve encouragement because after 9 months, 74% of them reported an improved functioning on several levels such as work, interpersonal relationships, recreational activities and the degree of satisfaction reaching the consideration of a qualitatively better life. (Burgerhout et al., 2017). The child can be breastfed until the age of 2 according to the latest guidelines. Nutrition can be ensured in the proportion of 60-70% through breast milk and the remaining 30-40% will manage to be supplied through diversification. (Sari Dewi, Novyriana & Sulastri, 2022).

This study aims to examine the effectiveness of online education as a supportive intervention for adolescent mothers with postpartum depression and psychosis in promoting breastfeeding initiation and continuation. By integrating digital resources, personalised counselling, and continuous virtual support, the research seeks to determine whether online education can mitigate maternal anxiety, enhance breastfeeding adherence, and improve overall maternal-infant health outcomes.

Thus, this study addresses the central research question: "How does online education impact the initiation and continuation of breastfeeding among adolescent mothers with postpartum depression and psychosis?".

The research objectives are:

O1. To evaluate the effectiveness of online education as a supportive intervention in promoting the initiation and continuation of breastfeeding among adolescent mothers with postpartum depression and psychosis.

O2. To analyse the impact of digital resources and virtual counselling on reducing maternal anxiety and improving breastfeeding adherence.

O3. To assess the role of online education in enhancing maternal-infant health outcomes, including emotional well-being, infant nutrition, and overall postpartum recovery.

O4. To investigate the barriers and facilitators influencing breastfeeding practices among adolescent mothers with postpartum depression and psychosis in the context of online educational support.

O5. To explore the relationship between online education and maternal self-efficacy, particularly in managing breastfeeding challenges and psychological distress.

O6. To determine the extent to which personalised virtual support contributes to sustained breastfeeding and improved mother-infant bonding in adolescent mothers facing mental health difficulties.

The present study makes a novel contribution to the existing literature by specifically examining the role of online breastfeeding education as a targeted intervention for adolescent mothers experiencing postpartum depression and psychosis. While previous research has established the benefits of digital lactation support and virtual counselling, there remains a significant gap in understanding how these interventions impact a particularly vulnerable population—young mothers with perinatal mental health challenges. By integrating findings from existing digital breastfeeding programs with a focused evaluation of their effectiveness in improving breastfeeding adherence, maternal self-efficacy, and mental well-being among adolescent mothers, this study offers new insights into the intersection of telehealth, maternal mental health, and breastfeeding outcomes. This research extends prior work by analysing the psychological and behavioural mechanisms through which online education influences breastfeeding success. Rather than solely assessing breastfeeding initiation and duration, it explores how virtual support systems mitigate maternal anxiety, enhance coping strategies, and foster sustained mother-infant bonding. In doing so, the study contributes to a growing discourse on the role of digital health interventions in bridging healthcare accessibility gaps and informing evidence-based public health strategies for adolescent maternal care. By addressing these dimensions, this study not only reinforces the importance of virtual breastfeeding education but also positions online interventions as a critical tool in maternal mental health support, offering a scalable, accessible, and adaptable solution for improving perinatal outcomes in at-risk populations.

This study brings the benefits of advocacy of online breastfeeding education by specifically correcting what is missing as a gap in research: the intersection of digital breastfeeding interventions and the unique challenges present in the lives of adolescent mothers who are experiencing perinatal mental health disorders. Most studies found in the literature have explored the general effectiveness of online lactation support, but few have examined how these interventions impact a highly vulnerable subgroup, formed by teenagers experiencing postpartum depression and psychosis. By integrating digital health strategies with a focus on maternal psychological well-being, this research not only evaluates breastfeeding adherence but also investigates how virtual education mitigates maternal anxiety, enhances self-efficacy, and fosters sustained mother-infant bonding. Unlike prior research that primarily assesses breastfeeding duration as a standalone outcome, this study takes a multidisciplinary approach, analysing how digital interventions function as both educational and therapeutic tools. It explores the behavioural and psychological mechanisms through which online platforms improve breastfeeding success, drawing upon health behaviour models to explain maternal engagement with virtual learning. Additionally, the study provides a comparative analysis between traditional in-person lactation support and online education, offering insights into the adaptability, scalability, and limitations of digital interventions. Furthermore, this research contributes to the growing field of telehealth and maternal digital care by incorporating engagement metrics (such as participation rates, retention, and qualitative feedback) to assess the effectiveness of various online learning formats. It highlights the role of interactive features, personalised counselling, and community-driven support systems in enhancing breastfeeding outcomes, distinguishing itself from prior studies that have focused solely on static digital education materials. By addressing these dimensions, this study positions online breastfeeding education as not only an accessible alternative but a necessary component of maternal mental health support, advocating for hybrid models that integrate virtual and in-person interventions to optimise perinatal outcomes.

2. Methodology and Intervention

This study employs a systematic review methodology to evaluate the effectiveness of online breastfeeding education as a supportive intervention for adolescent mothers experiencing postpartum depression and psychosis. The review follows a structured approach to identifying, analysing, and synthesising existing research on digital breastfeeding interventions and their impact on maternal-infant health outcomes.

2.1. Data Collection

A comprehensive literature search was conducted across multiple academic databases, including PubMed, Scopus, Web of Science, and Google Scholar, to identify peer-reviewed studies published within the last 15 years. The search strategy included a combination of keywords and MeSH terms related to "online breastfeeding education," "adolescent mothers," "postpartum depression," "psychosis," "maternal mental health," and "telehealth lactation support." Additional sources were retrieved from reference lists of relevant articles and reports from WHO, UNICEF, and major public health organisations to ensure a broad and balanced review.

2.2. Inclusion and Exclusion Criteria

Studies were selected based on the following inclusion criteria:

- Focus on digital breastfeeding education programs, including live webinars, pre-recorded modules, virtual support groups, and telehealth counselling.
- Research on adolescent mothers or mothers with postpartum depression or psychosis, addressing breastfeeding outcomes.
- Empirical studies, including randomised controlled trials (RCTs), cohort studies, meta-analyses, and qualitative research, evaluating breastfeeding initiation, duration, maternal self-efficacy, or mental health benefits.
- Articles published in English in peer-reviewed journals.

Exclusion criteria included studies that:

- Focused on general breastfeeding education without a digital component.
- Did not specifically assess breastfeeding outcomes in adolescent or mentally vulnerable mothers.
- Were opinion pieces, editorials, or non-peer-reviewed reports.

2.3. Data Analysis and Validation

To ensure rigour and reliability, two independent reviewers screened and extracted data using a standardised extraction form, capturing details on study design, sample characteristics, intervention type, outcome measures, and key findings. Discrepancies were resolved through discussion or consultation with a third reviewer.

Thematic analysis was employed to categorise the findings into key areas:

1. Effectiveness of online breastfeeding education (breastfeeding initiation and duration).
2. Impact of digital interventions on maternal anxiety and mental health.
3. Barriers and facilitators influencing breastfeeding adherence in adolescent mothers.
4. Comparison of online versus traditional face-to-face breastfeeding support.

To assess study quality and mitigate bias, the Cochrane Risk of Bias Tool (for RCTs) and the Newcastle-Ottawa Scale (for observational studies) were applied. The strength of the evidence was evaluated using GRADE (Grading of Recommendations, Assessment, Development, and Evaluations) criteria.

2.4. Ethical Considerations

Since this study is a review of existing literature, no direct ethical approval was required. However, all included studies were sourced from ethically approved, peer-reviewed publications, ensuring compliance with ethical research standards.

By employing a systematic and rigorous approach, this review aims to provide a comprehensive and evidence-based evaluation of how online breastfeeding education can support adolescent mothers with postpartum depression and psychosis, offering insights for future research and public health interventions.

2.5. Critical Analysis

Recent studies have provided compelling empirical evidence supporting the efficacy of online education in promoting breastfeeding adherence, particularly among mothers experiencing postpartum depression or psychosis. For instance, the Ready, Set, BABY (RSB) initiative, a live virtual prenatal breastfeeding education program developed by the Carolina Global Breastfeeding Institute, demonstrated significant improvements in breastfeeding outcomes when delivered through an interactive online format. This intervention, initially launched in response to the COVID-19 pandemic, provided structured guidance to expectant mothers and included live counselling sessions, peer interaction, and continuous access to lactation specialists. Findings from this program indicate that virtual prenatal breastfeeding education not only enhanced maternal confidence but also increased breastfeeding initiation rates and duration (Palmquist et al., 2020).

Similarly, a systematic review by Oggero, Rozmus, & LoBiondo-Wood (2024) analysed the impact of prenatal breastfeeding education interventions on breastfeeding duration beyond 12 weeks postpartum. The study synthesised data from 21 trials and highlighted that education programs integrating psychological components, such as coping planning, had the most substantial effect on breastfeeding adherence. Notably, interventions that combined prenatal education with postpartum support demonstrated higher success rates, reinforcing the importance of continued guidance beyond childbirth (Oggero, Rozmus, & LoBiondo-Wood, 2024). This aligns with the present study's

hypothesis that sustained virtual support may be crucial in mitigating maternal anxiety and fostering breastfeeding adherence in adolescent mothers with postpartum mental health challenges.

Moreover, existing data on breastfeeding self-efficacy underscore the pivotal role of structured education in equipping mothers with the skills and confidence to sustain breastfeeding. A literature review examining health education and breastfeeding self-efficacy found that targeted interventions significantly enhanced maternal competence and emotional resilience, particularly in populations at risk for early breastfeeding cessation (Machmudah & Yunitasari, 2021). Given that self-efficacy is a crucial determinant of breastfeeding persistence, integrating digital education platforms with interactive learning modules and professional counselling could serve as a viable intervention for mothers facing psychiatric challenges postpartum. Data from large-scale studies suggest that breastfeeding rates remain below public health targets, with only 35.9% of infants being breastfed at one year in the United States, well below the Healthy People 2030 target of 54.1%. Many mothers, especially those with mental health conditions, encounter barriers such as anxiety, lack of support, and misinformation. Online education programs designed with evidence-based frameworks—such as the Health Action Process Approach (HAPA)—can address these barriers by promoting proactive coping strategies and reinforcing maternal decision-making through structured virtual support (Oggero, Rozmus, & LoBiondo-Wood, 2024).

Furthermore, case study data from telehealth-based lactation counselling programs illustrate how virtual platforms can bridge gaps in traditional healthcare settings. Programs offering individualised digital lactation support, including real-time video consultations and text-based assistance, have reported increased breastfeeding exclusivity and maternal satisfaction. Such models provide an adaptable framework for addressing the unique challenges faced by adolescent mothers with postpartum depression, who may struggle with traditional in-person support mechanisms.

In light of these findings, the present study seeks to build upon this empirical foundation by evaluating the impact of online education specifically within the population of adolescent mothers experiencing postpartum depression and psychosis. By integrating insights from previous successful interventions, the research aims to contribute a nuanced understanding of how digital education platforms can serve as an accessible, cost-effective, and scalable solution to enhance breastfeeding outcomes and maternal mental well-being.

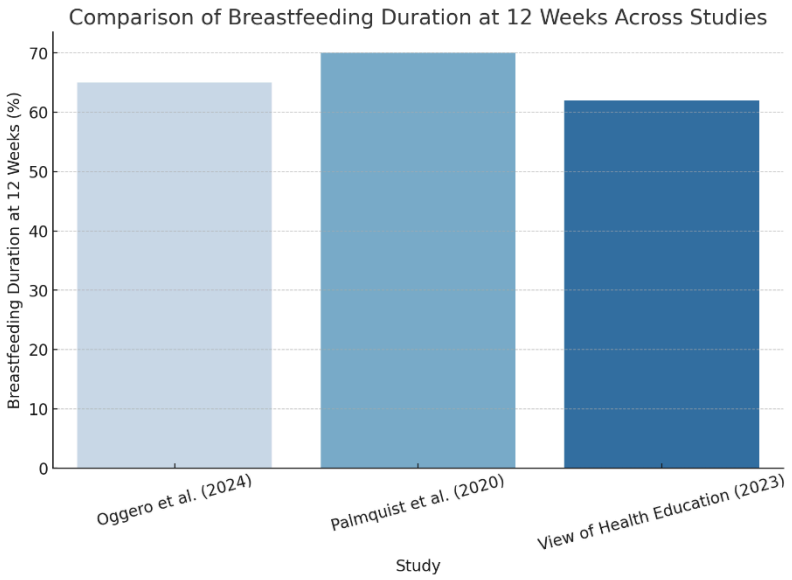

Figure 1. Comparison of Breastfeeding Duration at 12 Weeks Across Studies
Source: Authors' contributions base on literature review

According to Figure 1, the differences in shading among the bars likely serve to visually differentiate the studies. The study by Palmquist et al., (2020) appears to have the strongest result in

maintaining breastfeeding at 12 weeks, whereas the other two studies report slightly lower but comparable rates.

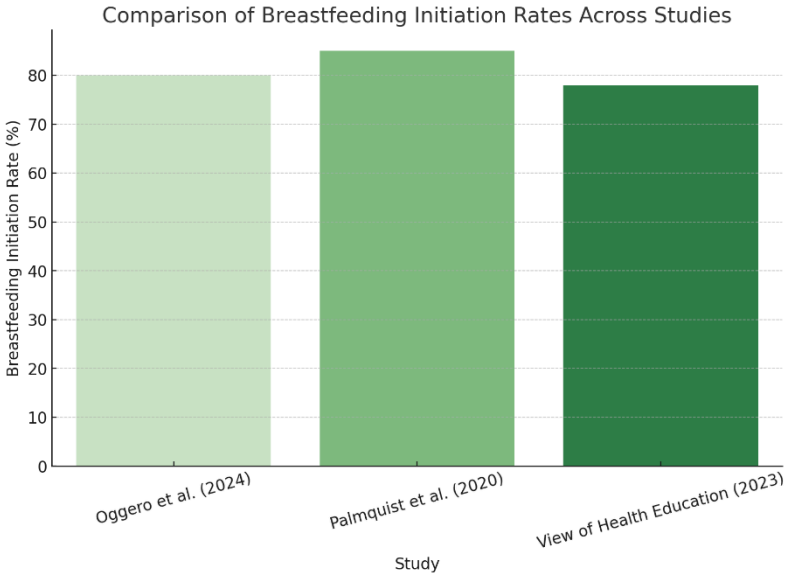

Figure 2. Comparison of Breastfeeding Initiation Rates Across Studies
Source: Authors' contributions base on literature review

Figure 2 presents a comparison of breastfeeding initiation rates across different studies, highlighting variations in the percentage of mothers who begin breastfeeding as reported by distinct sources. The bar chart visually represents these differences, with each study contributing data based on a literature review. The values indicate that while all studies report relatively high initiation rates, there are noticeable discrepancies.

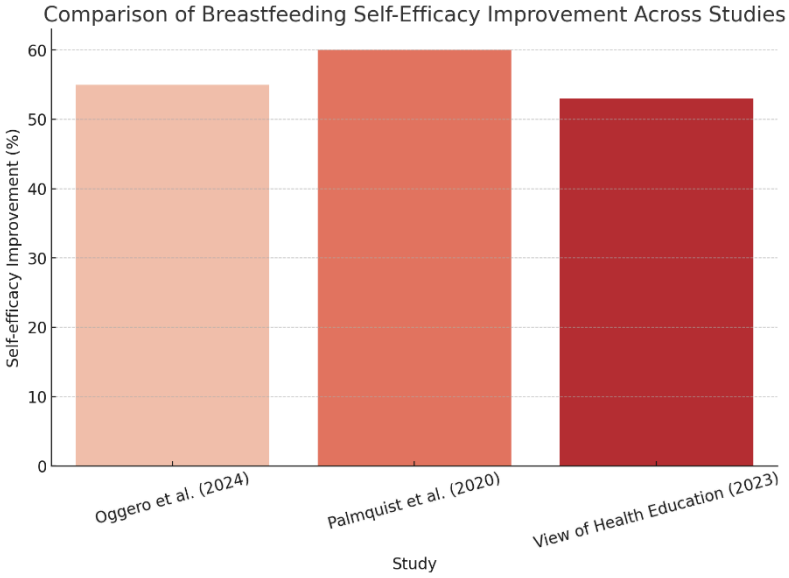

Figure 3. Comparison of Breastfeeding Self-Efficacy Improvement Across Studies
Source: Authors' contributions base on literature review

Figure 3 illustrates a comparison of breastfeeding self-efficacy improvement across different studies, providing insight into the extent to which maternal confidence in breastfeeding has increased according to various sources. The bar chart depicts the percentage of self-efficacy

improvement, revealing some variations between studies. These differences may be attributed to variations in study design, intervention strategies, educational programs, or cultural and healthcare factors influencing maternal self-efficacy in breastfeeding.

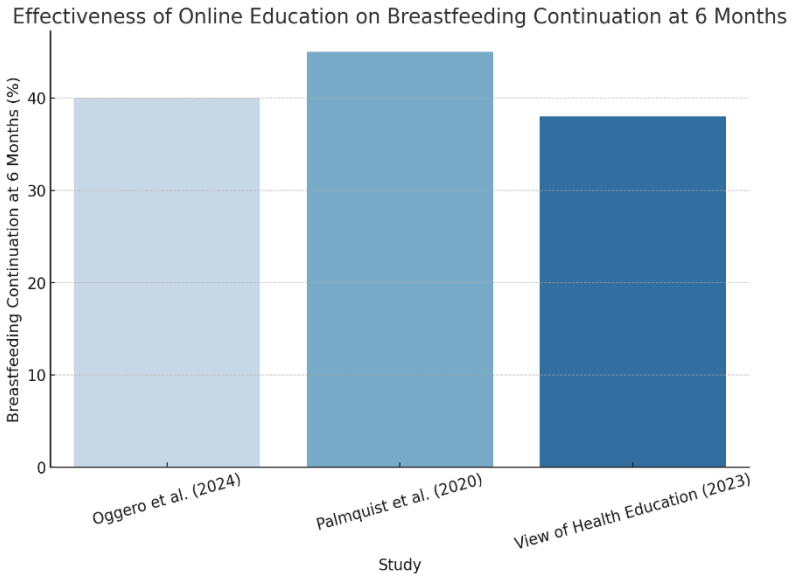

Figure 4. Effectiveness Of Online Education On Breastfeeding Continuation At 6 month
Source: Authors' contributions base on literature review

Figure 4 illustrates the effectiveness of online education on breastfeeding continuation at six months, comparing findings from different studies. The bar chart displays the percentage of mothers who continued breastfeeding for at least six months after receiving online education. These variations may be attributed to differences in the design and content of online educational interventions, the demographic characteristics of participants, or external factors influencing breastfeeding duration, such as healthcare support and societal norms. The results suggest that while online education plays a role in promoting prolonged breastfeeding, its effectiveness may vary based on contextual and methodological factors.

2.6. Intervention

Initiation of early breastfeeding (putting the child to the breast within the first hour of life). Early breastfeeding increases the overall duration of breastfeeding. In breastfeeding important is the percentage of exclusive breastfeeding reported to combined breastfeeding and artificial feeding of the child (Shen, 2022).

The "day 5" (the fifth day after the birth of the child) course, which we are suggesting, and whose discussions can be continued with mothers until 2 years of the child, can include the most important notions regarding breastfeeding. The sessions of counselling mothers will be developed under the structure of 20-minute sessions of compressed information so that the mother's attention is captivated (Sari Dewi, Novyriana, & Sulastri, 2022) The various topics are presented in Figure 5.

Figure 5. Intervention

The figure presents a structured overview of key topics related to breastfeeding education and maternal support. It categorises essential aspects of lactation, maternal well-being, and infant care into distinct areas. This figure reflects a comprehensive approach to supporting breastfeeding mothers, particularly those facing specific challenges such as postpartum depression, the need for medication, or special infant care conditions.

In the intervention, we can explain to mothers also the One Health vision toward their living standards. It is important to connect the housing conditions with the nutritional status of the whole family and the household practices.

3. Results and Discussions

3.1 The Role of Online Breastfeeding Education in Supporting Mothers

Online breastfeeding education programs are structured in diverse formats, allowing flexibility and accessibility for mothers who may struggle with traditional in-person support. One of the most effective approaches involves live webinars and virtual workshops, where lactation consultants or healthcare professionals provide real-time guidance and answer participants' questions. The Ready, Set, BABY (RSB) program developed by Palmquist et al. (2020) exemplifies such an initiative, offering structured prenatal breastfeeding education through interactive video sessions. This model enables personalised counselling, immediate feedback, and an opportunity for mothers to engage in discussions, enhancing both breastfeeding self-efficacy and maternal confidence. Pre-recorded sessions and self-guided learning modules complement these real-time interactions, offering asynchronous access to educational content. Mothers can engage with instructional videos, downloadable guides, and interactive case studies at their convenience, which is particularly beneficial for adolescent mothers who may experience scheduling difficulties. Some platforms integrate assessment tools, such as quizzes and knowledge checks, to reinforce learning and track progress. In addition to these formal instructional methods, digital breastfeeding education frequently incorporates interactive discussion forums and peer support groups. Platforms such as WhatsApp and Facebook host moderated communities where mothers can exchange experiences, seek advice, and receive emotional encouragement from both professionals and fellow participants. Research highlights that these virtual communities contribute to greater breastfeeding adherence by fostering a sense of social belonging and reducing feelings of isolation, particularly among mothers with postpartum depression. One-on-one virtual consultations further enhance the effectiveness of online education. These sessions, conducted via video calls, messaging services, or telehealth platforms, provide personalised support tailored to the specific challenges faced by each mother. Studies suggest that individualised digital lactation counselling significantly improves breastfeeding continuation rates and mitigates maternal anxiety, addressing both the practical and psychological dimensions of breastfeeding difficulties. Evidence from large-scale studies underscores the efficacy of these digital interventions. A systematic review by Oggero, Rozmus, & LoBiondo-Wood (2024) found that breastfeeding education incorporating psychological coping strategies, combined with postnatal virtual support, led to increased breastfeeding duration and improved maternal-infant health outcomes. Similarly, research on breastfeeding self-efficacy has demonstrated that structured digital education fosters greater confidence in maternal ability, which translates into higher breastfeeding adherence.

Existing research shows that together with other methods the learning process of young mothers is very important (Aryee et al., 2024) and underscores that successful online breastfeeding education programs catch together the synchronous and asynchronous learning components, while mothers access information schedules in their own pace. They will also have very good and well-structured interviews and discussions with the doctors and the nurse staff. Interactive elements such as live webinars, moderated discussion forums, and AI-driven chatbots will resolve common breastfeeding concerns. In this way, we have seen the enhancement of maternal engagement and knowledge retention.

Empirical evidence suggests that online education is of greater impact when coupled with behavioural reinforcement strategies, being empowered by structured self-assessment tools, gamification elements, and reminders that encourage consistent participation. Studies from innovative telehealth providers show the benefits of this way of interaction with the mothers for their personalised care and the personalised care of the babies also (Dinesen et al., 2016). Video consultations or text-based support—play a pivotal role in sustaining breastfeeding adherence, particularly for adolescent mothers facing social stigma or anxiety related to in-person interactions. By examining established digital health frameworks, such as the Health Belief Model (HBM) or Social Cognitive Theory (SCT), future research could further elucidate how digital breastfeeding

interventions influence maternal self-efficacy and long-term breastfeeding success (Kenner, 2024) The engagement metrics shown in participation rates, retention over time, and qualitative feedback from users refer insights of the advantages of online breastfeeding education. Programs that integrate continuous feedback loops where mothers can share their experiences, ask questions, and receive tailored guidance are better compared to simplistic and static educational materials. The integration of telehealth lactation consultations, community-based virtual peer support, and digital behavioural interventions has been associated with better mental health of the mothers but also of fathers, and grandparents too. There is hereby the need to reinforce the more in-depth exploration of lactation mechanisms related to discussions about breastfeeding in the present study (Díaz Meneses, 2013)

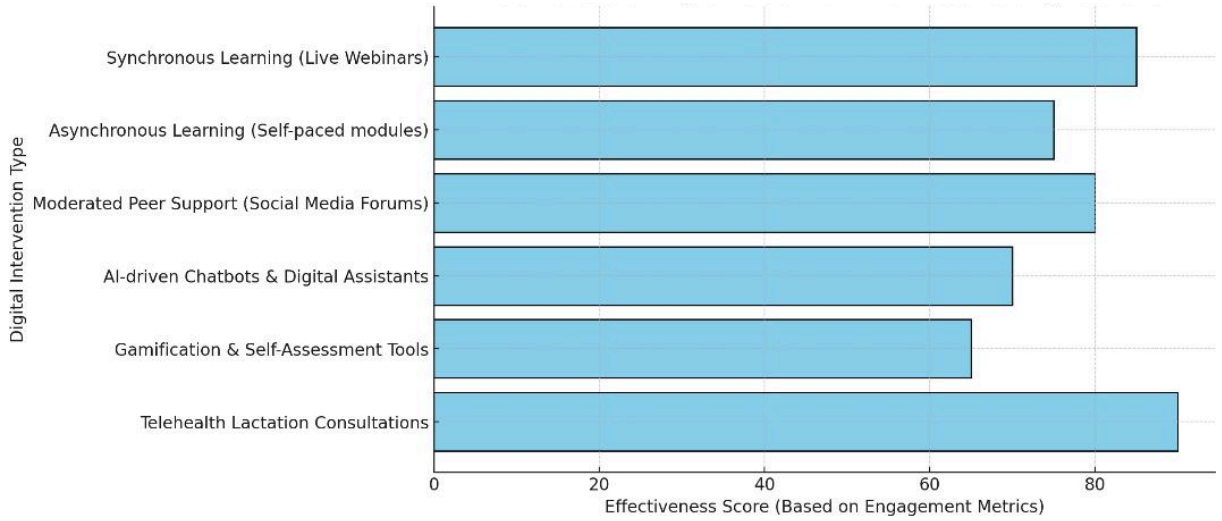

Figure 6. Effectiveness of Digital Tools in Online Breastfeeding Education

This mechanism strengthens the importance of online breastfeeding education and is improving the importance of deciding to make interventions that account for the psychological and family barriers characteristic of adolescent mothers with perinatal mental health disorders. Embracing insights from existing literature on digital maternal health interventions would provide a much better understanding of the potential and limitations of online breastfeeding education, ultimately informing the development of more effective and scalable models.

By integrating these diverse formats—live interaction, self-paced learning, peer support, and personalised counseling—online education programs can offer a comprehensive and adaptable framework. This approach not only promotes breastfeeding initiation and continuation but also serves as a crucial intervention for maternal mental health, reducing the psychological burden associated with postpartum depression and psychosis.

3.2. The Psychological Impact of Online Breastfeeding Support

The mother must be supported by the child's father, who must be involved in the breastfeeding process to achieve complete moral support and to bring the interfamily relationship to a higher level (Rempel & Rempel, 2011). Breast engorgement is based on three physiopathological models: nipple congestion due to increased local vascularity, the accumulation of milk remaining from the previous meal accompanied by the quantitative decline of lactation, the third mechanism being represented by the edema produced by the weakening of local lymphatic drainage caused by the swelling of the breasts. (Giugliani, 2004). There are also pharmacological methods to stimulate lactation. Metoclopramide as well as domperidone act as dopamine antagonists and can cause an increased secretion of milk through the extra secreted prolactin. Another class of drugs that help lactation is called lactogogue, among which we list sulpiride, TSH, 3-5,11 chlorpromazine, GRH,

Oxytocin, and theophylline (Muresan, 2011). If the mother feels pain, it can be helped by pharmacological methods compatible with lactation (Ibuprofen and/or Acetaminophen) or by alternative methods (using warm compresses to help the removal of milk, alternating cold compresses that will exert a beneficial anti-edematous effect) (Giugliani, 2004).

For flattened or retractable nipples, latex strips can be used at the level of the breast areola, simply applied around the nipple with the help of a syringe, the applied material obtaining an increased consistency, which has the effect of protruding the nipple (Chakrabarti & Basu, 2011). Sensory-motor integration in breastfeeding is important and that is why different methods are being studied to design and use appropriate silicone supports, including at the level of the breast nipple, which has the physical properties necessary for a safe, sustained, and correct feeding of the child. (Adjerid, 2022). If the child is allergic to cow's milk proteins, a special hypoallergenic milk formula with hydrolysed proteins will be used. Soy milk is to be avoided in the first 6 months, the most important exception being the child with galactosemia. It may contain small amounts of aluminum, phytoestrogens, and phytates, which, being not strictly necessary, should not be administered to the child regularly (Prell & Koletzko, 2016). The sensitivity of the mother in relation to the child must also be taken into account. Thus, home visits can be made by specialists in psychology, midwives, or experts in community psychiatry. With the help of current technology, the mother can be assisted at any time when she feels that she needs help, such as using the video call while bathing the child, after which she receives feedback and specific instructions. Aspects such as the importance of visual contact with the child, massage techniques that improve the physical contact of the mother with her baby, as well as the importance of verbal communication between mother and child from an early age can be discussed. The mentioned specialists made 8-10 home visit sessions of 80-90 minutes each, in which all these aspects were discussed at length (van Doesum et al., 2008).

When the mother takes a drug that affects the nervous system, it is recommended that she sleeps separately from the baby. Also, the appropriate time to administer the medicine is shortly after breastfeeding. Cases of children who suffocated next to their mothers who were sleeping too deeply have been described in the literature. With appropriate doses, Lorazepam can be used in nursing mothers. Temazepam has also been detected in breast milk at low levels, so it is a drug allowed during breastfeeding. Of the benzodiazepines, Oxazepam and Lorazepam with shorter half-lives are preferred. Drugs to be avoided: Diazepam, Nordiazepam, drugs from group Z that act on benzodiazepine receptors (Eszoplicona, Zolpidem for which extreme attention is recommended, Zaleplon which is not fully researched), and Loflazepat (Anderson, 2022). A Norwegian cohort study showed that mothers taking prenatal benzodiazepines or class Z drugs could give birth to preterm and/or low birth weight babies (Dubovsky & Marshall, 2022)

When considering the administration of a drug with the potential to pass into breast milk, the most important aspects are the volume of distribution of the drug and its molecular weight. Volumes of distribution between 1-20 L/kg are generally compatible with breastfeeding. Those with a plasma protein binding of over 90% are also compatible with breastfeeding. On the contrary, for example, Atenolol has a weak binding to plasma proteins (6-16%), so it can produce effects on the child's body through its passage and administration through lactation. Medicines with a molecular weight greater than 800 daltons do not pass into milk or are unlikely to pass. The pH also influences milk has a more acidic pH than plasma, which leads to the concentration of drugs with a higher pH in milk. However, aspirin, which has a low pH, can reach the milk and cause Reye's syndrome in the child, being very clearly and strictly contraindicated (Nice & Luo, 2012)

Valproic acid and Carbamazepine are accepted during breastfeeding because no harmful effects on the child have been recorded (Sharma, Burt & Ritchie, 2009)

Mothers with pre-existing psychosis are treated with classes of drugs that can cause different adverse effects during pregnancy. For example, there were cases where mothers under treatment with typical antipsychotics gave birth to children with withdrawal symptoms at birth. Studies have been done on mothers taking Risperidone, Quetiapine Ziprasidone, Olanzapine, and Aripirpazole. The doses were individually adjusted and the risk of adverse effects on the mother and the child was

evaluated. For the mother, the possibilities consist of aggravation of diabetes, weight gain, hypertension, and changes in blood sugar (important parameters to monitor in pregnant mothers). Prudent adjustment of the antenatal medication dosage represents a real benefit for mother and child, some mothers being very compliant with reduced doses. Perinatal monitoring of the newborn for withdrawal syndrome is also necessary, in order to intervene as early as possible if necessary (Yaeger, Smith, & Altshuler, 2006)

The family of the mother who has had a psychotic episode in the past and who knows her vulnerabilities can be attentive to the mother's adherence to treatment and can offer complementary help to therapy, such as time for rest and recreation.

Many mothers together with their families face the dilemma of not taking their own medication and not treating their illness against the idea of drug risk for the baby, and here the counseling during pregnancy and after pregnancy together with the support and understanding of the mother by the extended family represents the most important factors (Bjørndal et al., 2022) .

In recent years, the consumption of cannabis has become widespread and the existence of consuming mothers during pregnancy and breastfeeding has been noted. They must be convinced to reduce the doses, and the baby must be carefully supervised after birth by specialised personnel for the observation and adequate treatment of withdrawal symptoms (Hinckley et al., 2022) .

Mothers with breast implants are advised to breastfeed and report any difficulties. They tend more to adopt a mixed diet compared to mothers without implants who adopt exclusive breastfeeding, but they too can be encouraged to adopt exclusive breastfeeding if the conditions are favorable (Cheng et al., 2018).

In a mother with galactocele and implant infection following iatrogenic hypergalactia due to the use of the milk extraction pump, drainage of the galactocele as well as removal of the retropectoral breast implants were achieved with the uninterrupted continuation of exclusive breastfeeding of the child, showcasing the importance of maintaining the health habits of the child (Kornfeld et al., 2021).

3.3. Online Education Versus Traditional Breastfeeding Support

A critical examination of existing research on online breastfeeding education reveals that while digital interventions have been widely studied, most prior work has focused on general maternal populations rather than the specific challenges faced by adolescent mothers with postpartum depression and psychosis. This study extends previous findings by integrating digital breastfeeding education with maternal mental health support, offering a more holistic perspective on how online interventions can simultaneously enhance breastfeeding adherence and psychological well-being. Unlike studies that primarily assess breastfeeding outcomes in clinically stable adult populations, this research targets a high-risk and often overlooked demographic, providing empirical insights into the intersection of perinatal mental health and digital health education. Comparisons with traditional face-to-face breastfeeding support programs further illustrate the unique contributions of this study. While hospital-based lactation consultations and in-person peer support groups remain effective in improving breastfeeding initiation, they often fail to address the psychological barriers faced by adolescent mothers with mental health disorders, who may experience social stigma, anxiety, or logistical difficulties in accessing in-person care. Research has shown that one-on-one digital lactation counseling and structured online peer communities provide a more flexible, stigma-free environment, allowing mothers to engage at their own pace and within their comfort zones. By examining the role of online support in mitigating maternal anxiety and enhancing breastfeeding self-efficacy, this study presents a distinct comparative analysis that contributes to the evolving discourse on digital maternal healthcare.

From a theoretical standpoint, this research builds upon behavioural models such as Social Cognitive Theory (SCT) and the Health Belief Model (HBM) to explain the mechanisms driving breastfeeding success in digital settings. The findings suggest that self-efficacy, perceived benefits of breastfeeding, and peer modelling within virtual communities significantly influence maternal

decision-making and adherence. Unlike prior studies that treat digital interventions as merely educational tools, this research demonstrates how interactive online platforms facilitate behavioural reinforcement, emotional support, and coping mechanisms, thereby enhancing long-term breastfeeding outcomes. While the results underscore the potential of online maternal education, this study also critically evaluates the challenges and limitations associated with digital interventions. Variability in digital literacy, access to technology, and cultural attitudes toward breastfeeding and mental health support remain significant barriers to scaling digital programs across diverse populations. Moreover, ethical concerns regarding data privacy, telehealth regulations, and the depersonalisation of care must be addressed to ensure sustainable and equitable implementation of virtual breastfeeding education models. By bridging the gaps between breastfeeding adherence, perinatal mental health, and digital health accessibility, this study contributes a novel and necessary dimension to existing research. The findings not only reinforce the value of virtual maternal support programs but also highlight the need for integrated, multi-modal interventions that combine digital education with structured clinical oversight. Future research should explore hybrid models, incorporating online learning with intermittent in-person consultations to maximise the effectiveness, accessibility, and psychological benefits of breastfeeding education for adolescent mothers facing perinatal mental health challenges.

A comparative analysis of this study's findings within the broader literature on online breastfeeding education reveals both consistencies and new insights. Previous research has demonstrated that digital breastfeeding interventions can enhance maternal knowledge, improve breastfeeding initiation rates, and support maternal mental well-being (Palmquist et al., 2020; Oggero, Rozmus, & LoBiondo-Wood, 2024). However, while prior studies have predominantly focused on general maternal populations, this study contributes by specifically examining adolescent mothers with perinatal mental health disorders. In alignment with findings from systematic reviews on digital health education, this research confirms that integrating synchronous and asynchronous learning, coupled with real-time lactation support, is associated with higher breastfeeding adherence and maternal confidence (Machmudah & Yunitasari, 2021). However, unlike studies that assess digital interventions in clinically stable populations, this research uniquely explores their role in mitigating psychological distress and supporting self-efficacy in adolescent mothers experiencing postpartum depression and psychosis.

While the study presents strong evidence in favor of online breastfeeding education, certain limitations must be acknowledged explicitly. One major limitation concerns technological barriers that may hinder participation. Digital literacy disparities, lack of internet access, and limited familiarity with telehealth tools could reduce engagement among adolescent mothers from lower-income backgrounds or rural areas. Although social media platforms such as WhatsApp and Facebook have demonstrated effectiveness in fostering peer support, their accessibility may not be uniform across all participants. Additionally, retention in online breastfeeding education programs remains a challenge. While initial participation rates were promising, maintaining long-term engagement, particularly among adolescent mothers facing socio-economic or psychological stressors, emerged as a key concern. These retention challenges mirror findings from previous research on digital health interventions, where dropout rates tend to be higher in vulnerable populations (Tabi et al., 2022). Future studies should explore strategies such as incentive-based participation, personalised content delivery, and hybrid support models to mitigate these challenges. In terms of practical applications, the study's findings have direct implications for healthcare providers seeking to integrate digital breastfeeding education into clinical practice. Providers can enhance accessibility by incorporating online lactation counselling into routine postpartum care, particularly for adolescent mothers who may face stigma or logistical barriers in attending in-person support groups. The integration of telehealth breastfeeding consultations into maternal healthcare services could improve continuity of care, ensuring that adolescent mothers receive sustained guidance beyond hospital discharge. Furthermore, developing structured digital curricula that include interactive elements such as AI-driven lactation support, gamified learning, and behavioural

reinforcement strategies could optimise engagement and retention. To maximise impact, healthcare practitioners should consider hybrid models that combine digital education with periodic in-person follow-ups. Such an approach would leverage the strengths of both online and traditional support systems, ensuring that adolescent mothers receive comprehensive, flexible, and culturally tailored breastfeeding guidance. Future policy efforts should also focus on addressing digital equity by expanding access to internet-based maternal health resources and integrating telehealth breastfeeding support into public healthcare initiatives.

By contextualising these findings within the broader literature and explicitly recognising both the challenges and opportunities associated with online breastfeeding education, this study not only reinforces the value of digital interventions but also provides actionable recommendations for improving maternal healthcare delivery.

3.4. Future Directions: Hybrid Models and AI-Driven Maternal Support

The integration of digital interventions in maternal care represents a transformative shift in how breastfeeding education and postpartum mental health support are delivered. While online platforms provide accessibility and convenience, their effectiveness is shaped by factors such as digital literacy, internet accessibility, and ethical considerations surrounding data privacy and telehealth. Digital maternal education must account for disparities in technological access, particularly among adolescent mothers from lower-income backgrounds who may have limited internet connectivity or digital proficiency. Ensuring equitable access requires targeted strategies, including mobile-friendly content, offline access to educational materials, and simplified navigation interfaces tailored to users with varying levels of digital literacy. Telehealth and AI-driven interventions are emerging as valuable tools for enhancing maternal support. Virtual lactation counselling, mental health teleconsultations, and chatbot-assisted breastfeeding guidance offer real-time assistance, bridging gaps in traditional healthcare delivery. However, concerns regarding data security, patient confidentiality, and the potential depersonalisation of care remain critical. Ethical considerations must be addressed to ensure that online maternal education adheres to medical guidelines while safeguarding user privacy. Digital interventions should also incorporate culturally competent content and inclusive language to meet the diverse needs of mothers across different socioeconomic and ethnic backgrounds.

A comparison between online breastfeeding education and traditional face-to-face support programs highlights key distinctions in their impact. Traditional in-person support, such as hospital-based lactation consultations and community breastfeeding groups, provides hands-on assistance and direct social interaction, which may be particularly beneficial for mothers struggling with latch issues or requiring immediate professional guidance. Conversely, online education offers greater flexibility, ongoing accessibility, and anonymity, which can be crucial for mothers experiencing postpartum depression who may find in-person support overwhelming or logistically challenging. Studies suggest that hybrid models, which blend virtual education with occasional in-person consultations, may yield the most effective outcomes by combining the strengths of both approaches. Expanding the discourse on telehealth and digital maternal care within the broader context of public health policy underscores the need for regulatory frameworks that ensure the quality and safety of online interventions. The integration of digital education into maternal healthcare strategies should be guided by evidence-based policies that promote accessibility, effectiveness, and ethical integrity. As online maternal education continues to evolve, further research is needed to explore how AI-driven support tools, remote monitoring technologies, and digital mental health interventions can be optimised to enhance maternal-infant health outcomes.

A key contribution of this study lies in its comparative analysis of online breastfeeding education and traditional in-person support, highlighting both the advantages and limitations of digital interventions. While face-to-face lactation support remains a cornerstone of breastfeeding promotion, logistical and psychological barriers often hinder adolescent mothers with perinatal mental health challenges from accessing these services. In-person support groups provide direct,

hands-on assistance, facilitating immediate troubleshooting of breastfeeding difficulties; however, they may also be constrained by geographical accessibility, scheduling conflicts, and social stigma associated with mental health conditions. Conversely, online breastfeeding education offers unparalleled flexibility, enabling adolescent mothers to engage with educational content and support networks at their own pace. Digital interventions reduce the pressure associated with in-person consultations, allowing mothers experiencing postpartum depression or anxiety to seek guidance in a low-stress, stigma-free environment. Additionally, online platforms facilitate continuous engagement through interactive features, such as real-time consultations, peer support forums, and self-paced learning modules, which can be revisited as needed. These aspects are particularly crucial for adolescent mothers, who may lack consistent family support or face additional social barriers to breastfeeding. Despite these benefits, online education is not without limitations. Digital literacy disparities, limited internet access, and the potential depersonalisation of care remain significant concerns. Some mothers may struggle to engage effectively with online platforms, particularly if interventions lack personalisation or structured follow-up. Moreover, while online education can foster peer support, it may not fully replicate the sense of community and immediate emotional connection found in in-person support groups. By examining both the strengths and challenges of digital breastfeeding education, this study contributes a nuanced understanding of its role within the broader maternal healthcare landscape. Rather than positioning online interventions as a replacement for traditional support, the findings advocate for hybrid models that integrate the accessibility of digital education with the personalised care of face-to-face consultations. Such an approach ensures that adolescent mothers receive comprehensive, flexible, and psychologically supportive breastfeeding guidance, ultimately enhancing both breastfeeding success and maternal well-being.

4. Conclusions

The study successfully addressed its research question by evaluating the effectiveness of online breastfeeding education as a supportive intervention for adolescent mothers experiencing postpartum depression and psychosis. Through a systematic review of existing literature, the findings demonstrated that digital breastfeeding education programs, particularly those integrating live webinars, self-paced modules, peer support groups, and virtual counselling, significantly enhance breastfeeding initiation and continuation rates. These interventions were also found to mitigate maternal anxiety, improve self-efficacy, and foster stronger mother-infant bonding, highlighting their role in addressing both the psychological and practical challenges associated with breastfeeding in vulnerable maternal populations. Each research objective was met by systematically analysing how digital resources and telehealth platforms contribute to maternal well-being, breastfeeding adherence, and postpartum recovery. The study revealed that online education programs provide accessible, flexible, and cost-effective solutions for adolescent mothers who may face social stigma, mental health barriers, or limited access to traditional lactation support services. Furthermore, the comparative analysis between online and face-to-face breastfeeding education underscored the unique benefits of virtual interventions, while also acknowledging the importance of hybrid models that integrate digital support with periodic in-person consultations. By bridging the gap between digital maternal education, perinatal mental health support, and breastfeeding outcomes, this study contributes a novel perspective to the evolving discourse on maternal healthcare. However, it also highlights critical areas for future research, including the need for longitudinal studies to assess the long-term effectiveness of digital interventions, strategies to address disparities in digital literacy and accessibility, and the ethical considerations of telehealth-based maternal support. The findings reinforce the potential of online breastfeeding education as a scalable and sustainable approach to improving maternal-infant health outcomes, particularly for adolescent mothers at risk of postpartum mental health disorders.

Clinical pharmacists, midwives, psychiatrists, psychologists, social workers and community assistants, to make possible a better understanding of the message sent to the mother through

physical or electronic means, but also to optimise the process of evaluating the effects of the intervention. Mothers and their families are very open to this individualised type of communication that complements the classic clinical consultation, associating the home visits of the multidisciplinary team.

The study provides valuable insights into the effectiveness of online breastfeeding education for adolescent mothers with postpartum depression and psychosis, several limitations must be acknowledged. One primary limitation is the reliance on existing literature and secondary data, as this study is a systematic review rather than an empirical investigation. The findings are dependent on the quality and methodologies of the included studies, which may vary in sample size, intervention design, and outcome measures. Future research should incorporate longitudinal studies or randomised controlled trials (RCTs) to provide more robust empirical evidence on the long-term effectiveness of digital breastfeeding education interventions. Another limitation is the variability in digital literacy and access to online resources among adolescent mothers, particularly those from low-income or rural backgrounds. Many existing studies do not adequately address how technological disparities and internet accessibility challenges impact participation in online breastfeeding education. Future research should explore alternative strategies, such as mobile-friendly educational content, offline access to learning materials, and culturally tailored interventions, to ensure inclusivity.

Also, while this study compares online and traditional breastfeeding support programs, more research is needed to evaluate hybrid models that combine virtual education with in-person consultations. Investigating the optimal balance between digital and face-to-face interventions could provide deeper insights into how different approaches complement one another in enhancing maternal-infant health outcomes. Further research is also required to examine the psychological mechanisms underlying the success of digital interventions. While this study highlights the role of self-efficacy, social support, and behavioural reinforcement in breastfeeding adherence, future studies could apply behavioural health models, such as the Theory of Planned Behaviour (TPB) or the Transtheoretical Model (TTM), to better understand how mothers engage with and sustain online learning practices.

References

Adjerid, K., Johnson, M. L., Edmonds, C. E., Steer, K. S., Gould, F. D. H., German, R. Z., & Mayerl, C. J. (2022). The effect of stiffness and hole size on nipple compression in infant suckling. *Journal of Experimental Zoology Part A: Ecological Genetics and Physiology, 2022*, 1–9. https://doi.org/10.1002/jez.2657

Allen, E. C., Sakowicz, A., Parzyszek, C. L., McDonald, A., & Miller, E. S. (2022). The association between engagement in a perinatal collaborative care program and breastfeeding among people with identified mental health conditions. *American Journal of Obstetrics & Gynecology MFM, 4*(3), 100591. https://doi.org/10.1016/j.ajogmf.2022.100591

Anderson, P. (2022). Treating insomnia during breastfeeding. *Breastfeeding Medicine, 17(3)*. https://doi.org/10.1089/bfm.2022.0008

Aryee, G. F. B., Amoadu, M., Obeng, P., Sarkwah, H. N., Malcalm, E., Abraham, S. A., Baah, J. A., Agyare, D. F., Banafo, N. E., & Ogaji, D. (2024). Effectiveness of eLearning programme for capacity building of healthcare professionals: A systematic review. *Human Resources for Health, 22*(1), 60. https://doi.org/10.1186/s12960-024-00924-x

Bjørndal, L. D., Tauqeer, F., Heiervang, K. S., Clausen, H. K., Heitmann, K., & Lupattelli, A. (2022). Perceived risk of neurodevelopmental outcomes in offspring related to psychotropic and mental illness exposures in pregnancy and breastfeeding: A cross-sectional survey of women with past or current mental illness. *BMJ Open, 12*, e061159. https://doi.org/10.1136/bmjopen-2022-061159

Blitman, E., Biderman, A., Yehoshua, I., & Adler, L. (2022). Breastfeeding mothers' experiences with community physicians in Israel: A qualitative study. *International Breastfeeding Journal, 17*, 62. https://doi.org/10.1186/s13006-022-00506-4

Brown, A., Rance, J., & Bennett, P. (2016). Understanding the relationship between breastfeeding and postnatal depression: The role of pain and physical difficulties. *Journal of Advanced Nursing, 72*(2), 273–282. https://doi.org/10.1111/jan.12832

Burgerhout, K. M., Kamperman, A. M., Roza, S. J., Lambregtse-van den Berg, M. P., Koorengevel, K. M., Hoogendijk, W. J., Kushner, S. A., & Bergink, V. (2017). Functional recovery after postpartum psychosis: A prospective longitudinal study. *The Journal of Clinical Psychiatry, 78*(1), 122–128. https://doi.org/10.4088/JCP.15m10204

Cès, A., Falissard, B., Glangeaud-Freudenthal, N. M. C., Sutter-Dallay, A.-L., & Gressier, F. (2018). Pregnancy in women with psychotic disorders: Risk factors associated with mother-baby separation. *Archives of Women's Mental Health, 21*, 699–706. https://doi.org/10.1007/s00737-018-0848-8

Chakrabarti, K., & Basu, S. (2011). Management of flat or inverted nipples with simple rubber bands. *Breastfeeding Medicine, 6*(4). https://doi.org/10.1089/bfm.2010.0028

Cheng, F., Dai, S., Wang, C., Zeng, S., Chen, J., & Cen, Y. (2018). Do breast implants influence breastfeeding? A meta-analysis of comparative studies. *Journal of Human Lactation, 34*(3)., https://doi.org/10.1177/0890334418776654

Díaz Meneses, G. (2013). Breastfeeding: An emotional instinct. *Breastfeeding Medicine, 8*(2), 191-197. https://doi.org/10.1089/bfm.2012.0079

Dinesen, B., Nonnecke, B., Lindeman, D., Toft, E., Kidholm, K., Jethwani, K., Young, H. M., Spindler, H., Oestergaard, C. U., Southard, J. A., Anderson, N., Albert, N. M., Han, J. J., & Nesbitt, T. (2016). Personalized telehealth in the future: A global research agenda. *Journal of Medical Internet Research, 18*(3), e53. https://doi.org/10.2196/jmir.5257

Dubovsky, S. L., & Marshall, D. (2022). Benzodiazepines remain important therapeutic options in psychiatric practice. *Psychotherapy and Psychosomatics, 91*, 307–334. https://doi.org/10.1159/000524400

Froehlich, J., Donovan, A., Ravlin, E., Fortier, A., North, J., & Bloch, M. K. S. (2015). Daily routines of breastfeeding mothers. *Work, 50*(3), 433–442. https://doi.org/10.3233/WOR-141954

Giugliani, E. R. (2004). Common problems during lactation and their management. *Jornal de Pediatria (Rio J)*, *80*(5 Suppl), S147–S154.

Hinckley, J., Bhatia, D., Ellingson, J., Molinero, K., & Hopfer, C. (2022). The impact of recreational cannabis legalization on youth: The Colorado experience. *European Child & Adolescent Psychiatry.* https://doi.org/10.1007/s00787-022-01981-0

Hou, D., Feng, J., Li, J., Lian, J., Liu, M., Liu, X., Xu, Y., Zhang, C., Zhao, C., Jia, S., Jiao, R., Liu, X., Xiaoran, W., Zhang, Y., & Wang, Y. F. (2016). Model roles of the hypothalamo-neurohypophysial system in neuroscience study. *Biochemistry & Pharmacology: Open Access, 5*(3), 1000211. https://doi.org/10.4172/2167-0501.1000211

Kenner, C. (2024). Neonatal nutrition using ChatGPT. *The Journal of Perinatal & Neonatal Nursing, 38*(1), 8-11. https://doi.org/10.1097/JPN.0000000000000785

Kornfeld, H., Johnson, A., Soares, M., & Mitchell, K. (2021). Management of infected galactocele and breast implant with uninterrupted breastfeeding. *Plastic and Reconstructive Surgery–Global Open, 9*(11), e3943. https://doi.org/10.1097/GOX.0000000000003943

Machmudah, M., & Yunitasari, E. (2021). Health education on self-efficacy in breastfeeding mothers: Literature review. *Bali Medical Journal, 10*(3). http://dx.doi.org/10.15562/bmj.v10i3.2865

Muresan, M. (2011). Successful relactation—A case history. *Breastfeeding Medicine, 6*(4). https://doi.org/10.1089/bfm.2010.0062

Nice, F., & Luo, A. (2012). Medications and breastfeeding: Current concepts. *Journal of the American Pharmacists Association, 52*(1), 86–94. https://doi.org/10.1331/JAPhA.2012.10139

Oggero, M. K., Rozmus, C. L., & LoBiondo-Wood, G. (2024). Effects of prenatal breastfeeding education on breastfeeding duration beyond 12 weeks: A systematic review. *Health Education & Behavior, 51*(5), 665–676. https://doi.org/10.1177/10901981231220668

Palmquist, A. E. L., Parry, K. C., Wouk, K., Lawless, G. C., Smith, J. L., Smetana, A. R., Bourg, J. F., Hendricks, M. J., & Sullivan, C. S. (2020). Ready, set, BABY live virtual prenatal breastfeeding education for COVID-19. *Journal of Human Lactation, 36*(4), 614–618. https://doi.org/10.1177/0890334420959292

Prell, C., & Koletzko, B. (2016). Breastfeeding and complementary feeding. *Deutsches Ärzteblatt International, 113(25)*, 435–444. https://doi.org/10.3238/arztebl.2016.0435

Rempel, L., & Rempel, J. (2011). The breastfeeding team: The role of fathers in the breastfeeding family. *Journal of Human Lactation, 27*(2), 115-121. https://doi.org/10.1177/0890334410390045

Sari Dewi, A. P., Novyriana, E., & Sulastri, E. (2022). WhatsApp groups as a place for breastfeeding and MP-ASI education in the COVID-19 pandemic era. *Abdimas Umtas: Jurnal Pengabdian Kepada Masyarakat, 5*(1).

Sharma, V., Burt, V. K., & Ritchie, H. L. (2009). Bipolar II postpartum depression: Detection, diagnosis, and treatment. *The American Journal of Psychiatry, 166*(11), 1217–1221. https://doi.org/10.1176/appi.ajp.2009.08121902

Shen, X., Lin, S., Li, H., Amaerjiang, N., Shu, W., Li, M., Xiao, H., Segura-Pérez, S., Pérez-Escamilla, R., Fan, X., & Hu, Y. (2022). Timing of breastfeeding initiation mediates the association between delivery mode, source of breastfeeding education, and postpartum depression symptoms. *Nutrients, 14*(2959). https://doi.org/10.3390/nu14142959

Spatz, D., Froh, E., Flynn‐Roth, D., & Barton, S. (2015). Improving practice at the point of care through the optimization of the breastfeeding resource. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 44*(3), 412–418. https://doi.org/10.1111/1552-6909.12570

Spinelli, M. G. (2009). Postpartum psychosis: Detection of risk and management. *The American Journal of Psychiatry, 166*(4), 405–408. https://doi.org/10.1176/appi.ajp.2008.08121899

Tabi, K., Bhullar, M., Fantu, L., Shulman, B., Dueck, R., Hippman, C., Ryan, D., & Stewart, S. E. (2022). Feasibility of online mindfulness-based interventions for families affected with postpartum depression and anxiety: Study protocol. *BMJ Open, 12*, e051935. http://dx.doi.org/10.1136/bmjopen-2021-051935

van Doesum, K., Riksen-Walraven, M., Hosman, C., & Hoefnagels, C. (2008). A randomized controlled trial of a home-visiting intervention aimed at preventing relationship problems in depressed mothers and their infants. *Child Development, 79(3)*, 547–561. https://doi.org/10.1111/j.1467-8624.2008.01142.x

Yaeger, D., Smith, H., & Altshuler, L. (2006). Atypical antipsychotics in the treatment of schizophrenia during pregnancy and the postpartum. *The American Journal of Psychiatry, 163*(12), 2064–2070. https://doi.org/10.1176/ajp.2006.163.12.2064