

A Decade of Breastfeeding Self-Efficacy Research: A Bibliometric Analysis using VOSviewer

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ABSTRACT

Introduction : A mother's confidence in her ability to breastfeed, known as breastfeeding self efficacy (BSE) is a key predictor of exclusive breastfeeding duration. This study aimed to analyze the development of BSE research and provide insights for researchers and policymakers to improve future studies.

Method : This bibliometric analysis was conducted using data from the Scopus database, one of the largest sources of peer reviewed literature. Articles were retrieved on August 7, 2024, using the keywords "Breastfeeding" AND "Self" AND "Efficacy." A total of 1,006 documents were identified. After applying inclusion criteria (English language, article or review type, published between 2014 and 2023, open access, and final publication stage), 413 documents were selected for analysis. Data were analyzed using VOSviewer version 1.6.20 based on publication year, journal source, author, country of origin, and keywords.

Results : Research on BSE has shown a consistent upward trend over the past decade, with the highest number of publications in 2023 (82 articles). The United States was the most productive country, followed by Brazil, Canada, the United Kingdom, China, and Indonesia. Most articles were published in journals focusing on lactation physiology, breastfeeding challenges, and evidence based interventions. The most cited studies emphasized the importance of partner support, coparenting, and breastfeeding safety during the COVID-19 pandemic. Keyword analysis revealed several underexplored areas, particularly the role of midwives, formula use, and BSE in mothers of preterm infants

Conclusion : This study highlights the growing global attention to breastfeeding self-efficacy as a key factor in improving maternal and child health, and points to the need for further research on underexplored areas, including the role of midwives and the impact of alternative feeding practices, to support more effective interventions and policies.

Keywords: *Breastfeeding Self-efficacy ; bibliometric analysis ; maternal health*

INTRODUCTION

Exclusive breastfeeding is defined as breastfeeding without any other food or drink. The World Health Organization (WHO) recommends exclusive breastfeeding for the first 6 months of life because of its extensive benefits in reducing the risk of infant mortality, reducing the prevalence of overweight at 2 to 5 years of age, reducing the risk of non-communicable diseases. Breastfeeding mothers also benefit by reducing the risk of breast and ovarian cancer and prolonging the lactational amenorrhea period. However, by 2022 the global exclusive breastfeeding rate will only be 48% for infants aged 0-6 months ¹.

One of the important factors affecting breastfeeding success is maternal self-efficacy or confidence in the ability to breastfeed. Breastfeeding Self Efficacy (BSE) refers to a mother's belief in her ability to initiate and sustain breastfeeding. Research shows that mothers with high BSE tend to be able to exclusively breastfeed longer and can face challenges during breastfeeding and are more persistent in breastfeeding despite obstacles^{2,3,45}. These beliefs are influenced by various factors, including previous breastfeeding experiences, observations of others' experiences, verbal persuasion or support from the environment, and physiological and emotional states^{6,7}.

With the increasing interest in the topic of BSE, a bibliometric study on “Breastfeeding Self Efficacy” is relevant to explore research trends and identify research gaps in the existing literature. A bibliometric study is a method that uses quantitative analysis to understand the development of research⁸. This analysis aims to examine the development of research on Breastfeeding Self-Efficacy which will benefit researchers and policy makers in improving the quality of research in this area. Bibliometrics is now not only limited to counting the number of publications and citations, but is also used to understand author collaboration patterns, institutional networks, topic trends, as well as relationships between countries in knowledge contributions.

Many studies on BSE have been conducted in various countries, especially in areas with low exclusive breastfeeding rates. Some relevant studies include Ahmadinezhad et al. (2024) who examined the factors that influence breastfeeding self-efficacy (BSE) in breastfeeding mothers during the Covid-19 pandemic. The results of this study showed that partner support during the postpartum period and breastfeeding intention were positively associated with BSE. In contrast, depression and formula use during breastfeeding were negatively associated with BSE. Meanwhile, fear of Covid-19 was not shown to be associated with BSE. These findings emphasize the importance of efforts to increase partner support, strengthen breastfeeding intention, and reduce depression to support successful breastfeeding during the pandemic. Research by Titaley et al., (2021) in Indonesia examined factors associated with breastfeeding self-efficacy (BSE) in mothers with children under six months. The study showed that breastfeeding problems, low education, lack of exposure to breastfeeding interventions, working outside the home, low breastfeeding knowledge, and delivery by caesarean section were significantly associated with low BSE. These findings highlight the importance of breastfeeding education and comprehensive support to increase mothers' confidence in breastfeeding. However, these studies have not explored how global publications on BSE have evolved over the past decade. Understanding the geographical distribution, institutional collaborations, trends in key themes and research gaps is essential to formulate effective international strategies and policies. This is the basis and uniqueness of this study¹¹.

This study is unique in that it is one of the first bibliometric studies to specifically map publications on BSE from 2014-2023, with a focus on open access and English language publications to make the results widely accessible and provide global benefits. The study also highlights the use of the VOSviewer tool to map collaboration networks of authors, keywords and institutions, thereby identifying collaboration opportunities and under-explored research topics. With a focus on global trends, this study is expected to contribute to the development of BSE theory, as well as support evidence-based policy formulation to improve breastfeeding success rates, particularly in countries with low exclusive breastfeeding rates.

In this era of globalization and digitalization, the need for bibliometric studies is increasingly important to ensure that BSE research can keep pace with technological advances and address public health challenges based on accurate data. Such studies are also important for directing research funding, strengthening international collaborative networks, and ensuring that evidence-based breastfeeding interventions can be more widely applied in countries with different cultural contexts.

In addition, this study also provides a state of the art in the context of BSE and bibliometric studies, by presenting a visual and integrative map of scientific publications and collaborations that has not been done in previous studies. This study is expected to answer the main research questions, namely

how the trend of BSE publications in the last decade, which countries and institutions are most productive in producing publications on BSE, as well as what are the dominant topics and research gaps that need further study. Thus, this study not only provides an overview of knowledge development, but also supports the establishment of strategic research directions in the future. The results of this study can help researchers, academics and policymakers in designing cross-country and cross-institutional research collaborations to optimize future studies on BSE.

METHOD

Study Design

This research is a bibliometric analysis study of publications related to Breastfeeding Self Efficacy (BSE). We collected BSE-related data from the Scopus database. Scopus is one of the largest databases including journals and books that provide scientific data. To avoid bias caused by daily database changes, the entire search was conducted on August 7, 2024 with the keywords “Breastfeeding” AND ‘Self’ AND “Efficacy”.

Steps of Bibliometric

In conducting a bibliometric study, the first step is to clearly define the research objectives, such as identifying publication trends, key authors, influential institutions, or research hotspots within a specific field. Once the objectives are established, it is important to select a comprehensive and reliable database for data retrieval, such as Scopus, depending on the scope of the research. The next step involves developing a search strategy by constructing appropriate search terms and Boolean operators to retrieve relevant literature, ensuring that the strategy includes keywords, a specific time range, subject areas, and document types. After that, the data collection process is carried out by exporting the metadata of the selected publications, which typically includes the title, authors, abstract, keywords, publication year, journal, affiliations, and citations. Following data collection, data cleaning and preprocessing are necessary to standardize author names, keywords, and institutional information to avoid duplication and inconsistency in the dataset. Finally, the analysis and mapping stage is conducted using bibliometric software such as VOSviewer, which can be applied to perform various analyses, including publication trends from 2014 to 2023, distribution of documents by country or territory, identification of authors with the most journal publications, documents by source, and co-citation analysis.

Inclusion Criteria

The initial search revealed 1,006 documents. Then, we restricted the literature published in the last 10 years from 2014 to 2023, literature that was in English, had completed the publication stage, public access, and document types in the form of articles and reviews. The result was 413 articles that met the inclusion criteria, which were then downloaded and analyzed regarding the number of articles per year, journal sources, authors, countries, and keywords of each article.

Data analysis

A systematic bibliometric approach was taken with a quantitative database to map the development of BSE research globally. The analysis used VOSviewer software to analyze data visualization. VOSviewer is a visualization program that features cluster analysis and has superior data presentation. VOSviewer allows readers to understand author collaboration patterns, topic trends, and relationships between concepts in the BSE literature ¹².

RESULT

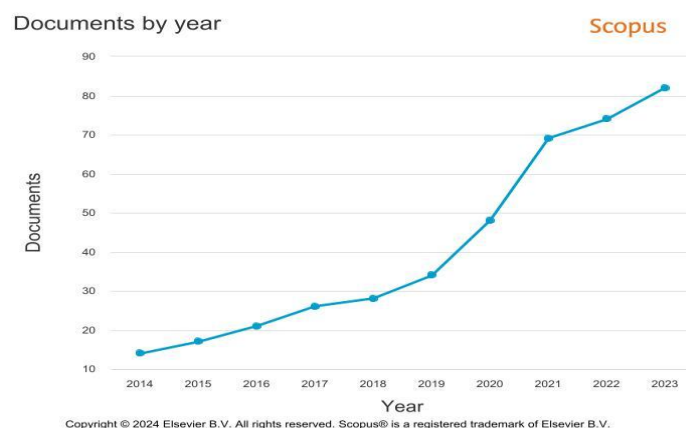


Figure 1. Publication trends from 2014-2023

Figure 1 illustrates the quantitative growth of BSE-related publications over time. Research on BSE continues to increase each year and has not experienced a decline in publications over the past 10 years. The peak of publications in 2023 was 82 articles published. Articles from 2014-2023.

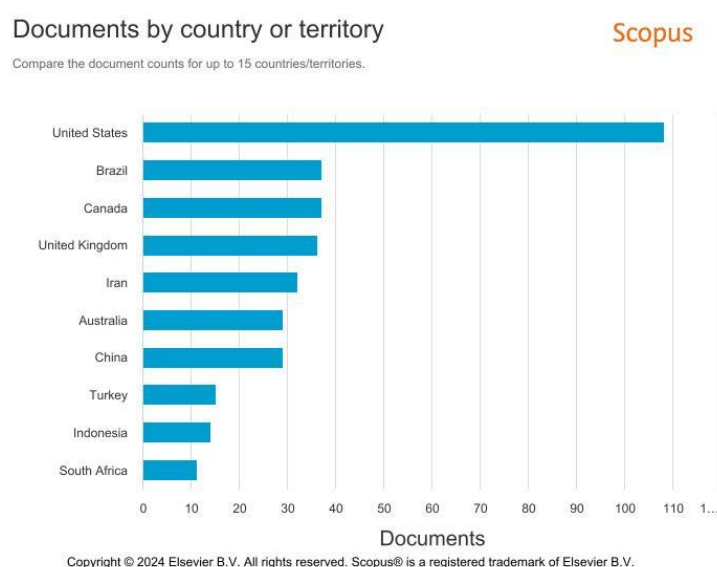


Figure 2. Document by country

Figure 2 shows that the United States ranks first with 108 publications. Followed by Brazil, Canada, and the UK with 37 publications each. Asian countries also contributed to the top 10 most productive countries for researching BSE, including China (29) and Indonesia (14).

Figure 3 shows the 10 most productive authors led by Dennis, C.L with 12 publications. Followed by Oria, M.O.B with 9 publications. Gomes-Sphonzolz,F.A., Kronborg,H., Ximenes,L.B. published 6 publications each, Young,S.L. published 5 publications and Chaves,A.F.L, Collins,S.M., Monteiro,J.C.D.S., and Perez-Ecsamilla,R. 4 publications each.

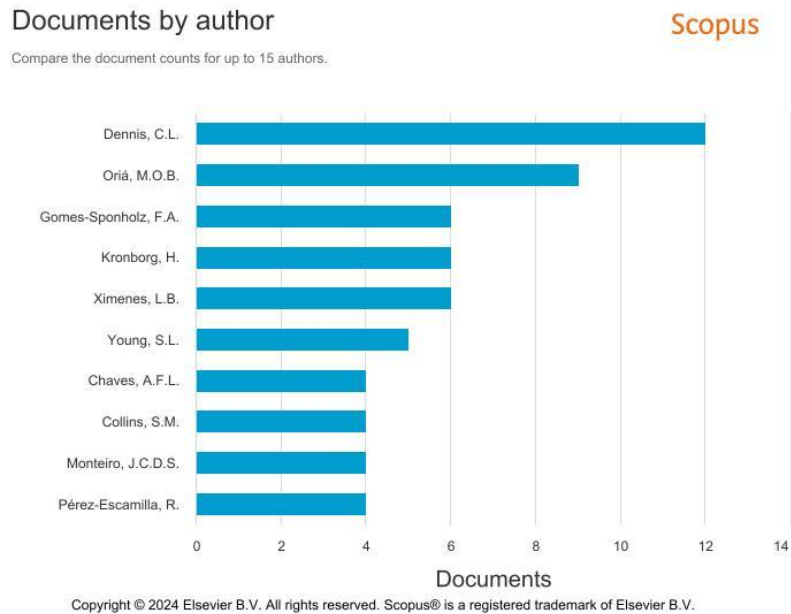


Figure 3. The author with the most journal publications

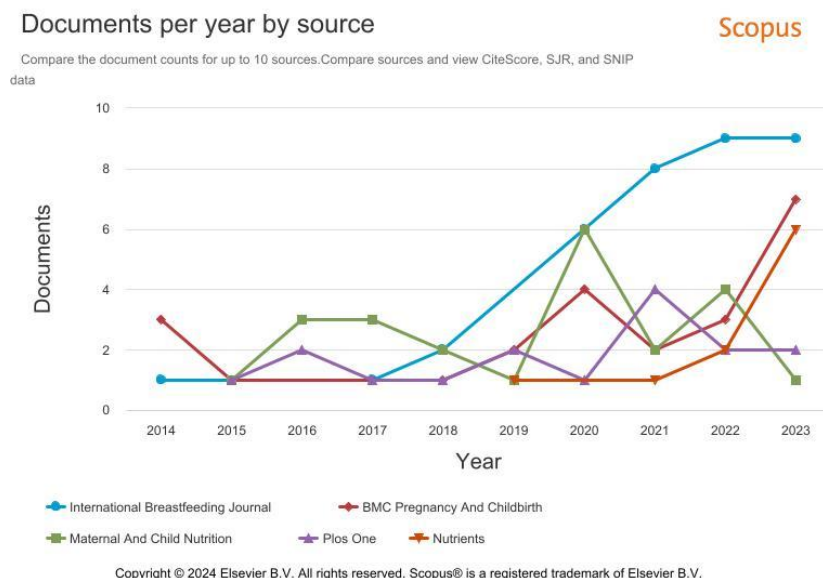


Figure 4. Document per year by source

Journal sources that have productivity over the past 10 years are International Breastfeeding Journal, BMC pregnancy and childbirth, Maternal and child nutrition, Plos one, and Nutrients. From the figure presented, it appears that the International Breastfeeding Journal shows a significant increase in publications each year. The journal covers lactation physiology, risk identification, breastfeeding barriers, and breastfeeding problem management. The journal aims to support efforts to improve breastfeeding success through comprehensive understanding and evidence-based interventions. This makes it a key reference for researchers who want to access the latest research in this field. Research on BSE also appears in other journals with a broader focus including BMC Pregnancy and Childbirth, Maternal and Child Nutrition, Plos One, and Nutrients.

Table 1. **co-citation analysis**

Artikel	Title	Citation
Halperin, S. A., Ye, L., MacKinnon-Cameron, D., Smith, B., Cahn, P. E., Ruiz-Palacios, G. M., ... & Zubkova, T. (2022). <i>The Lancet</i> .	<u>Final efficacy analysis, interim safety analysis, and immunogenicity of a single dose of recombinant novel coronavirus vaccine (adenovirus type 5 vector) in adults 18 years and older: an international, multicentre, randomised, double-blinded, placebo-controlled phase 3 trial</u>	147
Abbass-Dick, J., Stern, S. B., Nelson, L. E., Watson, W., & Dennis, C. L. (2015). <i>Pediatrics</i> .	Coparenting breastfeeding support and exclusive breastfeeding: A randomized controlled trial	111
Ghaheri, B. A., Cole, M., Fausel, S. C., Chuop, M., & Mace, J. C (2017). <i>The Laryngoscope</i> .	Breastfeeding improvement following tongue-tie and lip-tie release: A prospective cohort study	102
Francis D. O., Krishnaswami, S., & McPheeters, M. (2015). <i>Pediatrics</i> .	Treatment of ankyloglossia and breastfeeding outcomes: A systematic review	102
Coates, R., Ayers, S., & De Visser, R. (2014). <i>BMC pregnancy and childbirth</i> .	Women's experiences of postnatal distress: A qualitative study	96
Otsuka, K., Taguri, M., Dennis, C. L., Wakutani, K., Awano, M., Yamaguchi, T., & Jimba, M. (2014). <i>Maternal and child health journal</i> .	Effectiveness of a breastfeeding self-efficacy intervention: Do hospital practices make a difference?	95
Emond, A., Ingram, J., Johnson, D., Blair, P., Whitelaw, A., Copeland, M., & Sutcliffe, A. (2014). <i>Archives of Disease in Childhood-Fetal and Neonatal Edition</i> .	Randomised controlled trial of early frenotomy in breastfed infants with mild-moderate tongue-tie	94
Tuthill, E. L., McGrath, J. M., Graber, M., Cusson, R. M., & Young, S. L. (2017). <i>Journal of human lactation</i> , 32(1), 35-45.	Breastfeeding Self-efficacy: A Critical Review of Available Instruments	80
Feenstra, M. M., Kirkeby, M. J., Thygesen, M., Danbjørg, D. B., & Kronborg, H. (2018). <i>Sexual & Reproductive Healthcare</i> .	Early breastfeeding problems: A mixed method study of mothers' experiences	77
Quin, C., Estaki, M., Vollman, D. M., Barnett, J. A., Gill, S. K., & Gibson, D. L. (2019). <i>Scientific reports</i> , 8(1), 8283.	Probiotic supplementation and associated infant gut microbiome and health: A cautionary retrospective clinical comparison	76

Table 1 lists some of the most cited articles in studies on breastfeeding self-efficacy. One of the articles with the highest number of citations was "Women's experiences of postnatal distress: A qualitative study" with 96 citations published in the journal BMC Pregnancy and Childbirth. BMC Pregnancy and Childbirth is one of the most prolific journals over the past 10 years, demonstrating its high relevance in pregnancy and birth related research.

In Figure 5 produces 6 clusters from the analysis using VOSviewer. Cluster 1 is red which consists of 54 items including adult, anxiety, behavior change, body mass, covid-19, health education, mental health, postpartum period, pregnancy. Cluster 2 in green consists of 39 items with keywords education, health care facility, infant nutrition, maternal age, parity pregnant women, socioeconomics. Cluster 3 in blue consisting of 37 items with keywords breastmilk, breastfeeding self efficacy, caesarean section, comparative study, postpartum depression, hospitalization, vaginal delivery. Cluster 4 produces 37 yellow items some keywords include artificial milk, breastfeeding support, infant feeding, male,

DISCUSSION

Total Articles from 2014-2023

The peak of publications in 2023 was 82 articles published. This shows the amount of attention given by researchers around the world. The increase in the number of publications each year indicates that BSE is an area of research that is increasingly relevant and gaining attention from researchers. This suggests that researchers and health practitioners are increasingly recognizing the importance of psychological factors in breastfeeding and their impact on maternal and infant health. The results of mapping BSE publication trends in the last decade show that research in this area is gaining global attention. The finding of the dominance of publications from developed and some developing countries indicates the potential for cross-country collaboration that can be optimized to support global breastfeeding policies.

Notably, the sharp increase in publications from 2020 onwards may be associated with the impact of the COVID-19 pandemic on maternal and child health. One of the most highly cited articles during this period is the study by Halperin et al (2022) titled *“Final efficacy analysis, interim safety analysis, and immunogenicity of a single dose of recombinant novel coronavirus vaccine (adenovirus type 5 vector)”*, published in *The Lancet* with 187 citations. Although the main focus of the article is on vaccine efficacy, it highlights the inclusion of pregnant and lactating women in global health responses, bringing attention to this population and stimulating related research—including psychological aspects such as breastfeeding self-efficacy.

Similarly, the study by Riad et al (2021), *“COVID-19 vaccine acceptance of pregnant and lactating women (PLW) in Czechia: An analytical cross-sectional study”*, which has been cited 69 times, underscores vaccine hesitancy, anxiety, and the need for educational and psychosocial support among pregnant and lactating women. This concern has driven increased research interest in factors that enhance maternal readiness and confidence in caring for infants, particularly in breastfeeding.

These findings suggest that the pandemic acted as a catalyst for global awareness around maternal mental health and breastfeeding. As a result, BSE emerged as a relevant area of study, especially in exploring education-based, technological, and community-driven interventions. The predominance of publications from high-income countries and select developing nations further indicates opportunities for cross-national collaboration in developing culturally appropriate, evidence-based breastfeeding support policies.

Document by country or territory

The dominance of the United States in the number of publications related to digital breastfeeding support, as demonstrated in the bibliometric analysis, can be traced through the characteristics of the most highly cited articles originating from the country. Most of these articles address multidimensional topics that encompass medical, social, behavioral, and policy-related aspects of breastfeeding issues that consistently receive attention within the U.S. research and public health policy ecosystem.

For example, the article by Pérez et al (2022) which reviews multifactorial risk factors for self-reported insufficient milk (SRIM), highlights the role of hospital practices, maternal health status, and policy-based approaches such as the Baby-Friendly Hospital Initiative. This study utilized a large international data set and was conducted by institutions with strong research capacity reflecting the United States' advantage in research resources, infrastructure, and global networks that enable comprehensive exploration of breastfeeding issues.

Additionally, other highly cited articles focus on topics such as maternal mental health, gestational diabetes, racial disparities, and individualized behavioral interventions demonstrating a deep engagement with the complex social and public health landscape typical of the United States. For

instance, Pezley et al (2022) emphasize the importance of perinatal interventions that integrate breastfeeding support with maternal mental health, while Tran et al (2023) explore exclusive breastfeeding barriers among Black mothers through a qualitative approach.

In other words, the dominance of U.S. based publications reflects not only quantitative capacity but also the quality of research that is globally relevant, thematically broad, and solution-oriented through intervention and digital technology approaches.

The author with the most journal publications

Dennis C.L.'s contribution as the most prolific author in the field of BSE is significant because he is the main developer of BSE theory. Self efficacy theory was originally developed by Albert Bandura, a professor at Stanford University majoring in psychology. Bandura stated that self-efficacy is a belief that can encourage someone to achieve something²⁵. Self efficacy was then further examined by Dennis C.L. and faux who connected self efficacy with breastfeeding so that it became breastfeeding self efficacy. According to Dennis, BSE is one of the important psychological and motivational factors for the early success and duration of breastfeeding³. This demonstrates her commitment to understanding and advancing knowledge of how maternal self-efficacy influences breastfeeding success and provides a strong theoretical basis for research to improve BSE. The collaborative network of authors and institutions mapped through bibliometric visualization can serve as a starting point in developing strategies to strengthen BSE research and interventions in the future.

Document per year by source

BMC Pregnancy and Childbirth has contributed significantly to expanding our understanding of BSE, particularly through studies that link breastfeeding mothers' confidence with their pregnancy, labor and postpartum experiences. Articles published in the journal often highlight how education-based interventions, social support, and health care practices, including early breastfeeding initiation and skin-to-skin contact, play a role in building BSE. For example Ahmadinezhad et al. (2024) emphasized that postpartum depressive symptoms have a significant negative association with BSE, meaning that depressed mothers tend to have lower breastfeeding confidence. Meanwhile, the Maternal and Child Health Journal is an important platform to support the dissemination of maternal and child health science and practice, including research on breastfeeding interventions. One relevant study was published in this journal by Otsuka et al. (2014) who assessed the effectiveness of a breastfeeding self-efficacy intervention in the form of providing self-efficacy workbooks to pregnant women in the third trimester. The study involved 781 mothers in Japan and showed that the intervention improved BSE scores ($p = 0.037$) and exclusive breastfeeding success at 4 weeks postpartum (AOR 2.32; 95% CI 1.01-5.33), especially in Baby-Friendly Hospital certified hospitals. In contrast, in non-Baby-Friendly hospitals, the intervention did not yield positive results. This finding confirms that the success of the BSE intervention is highly dependent on supporting breastfeeding practices in health facilities.

PLOS ONE is an inclusive journal that supports the acceleration of scientific progress through the publication of rigorous, open, and widely accessible research. This journal is a forum for various studies on BSE, especially those that raise public health and policy perspectives, so that the results can provide direct benefits to society. Nutrients, on the other hand, highlights the relationship between BSE and maternal and infant nutrition interventions. Studies in this journal show how BSE can be improved through nutritional supplementation programs integrated with breastfeeding education, supporting not only exclusive breastfeeding success but also infant nutritional status. The studies in this journal reinforce the finding that a multidimensional approach that combines nutrition, education and psychosocial support has a greater impact on breastfeeding success. One study that reinforced this was conducted by Rodríguez-Gallego et al. (2024) who evaluated the effectiveness of a group intervention based on midwife support in assisting breastfeeding mothers during the postpartum period.

This study, a cluster-controlled trial in Andalusia, Spain, found that an intervention combining education, psychosocial support and practical guidance from midwives not only increased the duration of exclusive breastfeeding up to 6 months postpartum ($p = 0.01$), but also increased mothers' mean perceived self-efficacy score ($p = 0.005$). These results reinforce that the integration of nutrition education, mentoring, and community-based interventions is effective in strengthening mothers' self-efficacy and long-term breastfeeding success.

The existence of BSE publications in these four journals shows that research in this field has developed in various disciplines, ranging from clinical, nutrition, health psychology, to public policy. The findings published in these journals serve not only as a reference for researchers, but also for policy makers and practitioners in designing strategies to improve breastfeeding success at the national and global levels. The dissemination of BSE studies in these cross-disciplinary journals provides opportunities for multidisciplinary collaboration to develop interventions that are more comprehensive and contextualized to the needs of mothers and infants in different parts of the world.

co-citation analysis

Based on table 1, the most cited article was "Final efficacy analysis, interim safety analysis, and immunogenicity of a single dose of recombinant novel coronavirus vaccine (adenovirus type 5 vector) in adults aged 18 years and older: an international, multicenter, randomized, double-blind, placebo-controlled trial in phase 3". Although the article focuses on the Covid-19 vaccine, its link to the health of breastfeeding mothers is the main reason why it is often cited in BSE studies. The Covid-19 pandemic has had a major impact on breastfeeding practices and the implications for the safety of the Covid-19 vaccine for breastfeeding mothers have contributed significantly²⁸.

The second top article with the most citations was titled "Coparenting breastfeeding support and exclusive breastfeeding: A randomized controlled trial". This study is highly relevant to BSE. The intervention was coparenting, a breastfeeding support program involving both parents. In BSE theory, social and environmental support are important factors that influence a mother's confidence to successfully breastfeed²⁹³⁰. This study showed that a coparenting intervention involving fathers not only increased breastfeeding duration but also increased fathers' involvement in supporting breastfeeding⁷.

Co-occurrence

The keyword co-occurrence analysis using VOSviewer software identified six thematic clusters, each reflecting distinct yet interrelated areas of research in digital breastfeeding support and self-efficacy (BSE). These clusters provide insight into both current focal points and potential gaps in the literature, offering strategic directions for future research and intervention development.

Cluster 1 groups keywords related to maternal mental and physical health, including the effects of the COVID-19 pandemic. This cluster underscores the psychological dimensions of breastfeeding self-efficacy, highlighting the importance of integrated interventions that address perinatal anxiety, depression, and overall well-being. It suggests that digital support tools should incorporate mental health components to holistically support breastfeeding mothers.

Cluster 2 focuses on socioeconomic status, education, and health service accessibility—factors that strongly influence infant nutrition and breastfeeding practices. This cluster points to the potential of digital platforms to bridge health inequities, particularly in underserved populations, by providing accessible, tailored education and support.

Cluster 3 centers on breastfeeding motivation and support, directly aligning with the conceptual core of BSE. It also references artificial feeding, suggesting ongoing tensions or decision-making challenges that mothers face. This cluster invites further exploration into how digital interventions can

enhance maternal confidence and counteract misinformation or social pressures surrounding infant feeding choices.

Cluster 5 highlights the psychological dimensions of self-efficacy, particularly among adolescents and adults, as well as the role of nurses. This suggests that interventions could benefit from age-specific tailoring and active involvement of nursing professionals as trusted facilitators of digital health content and support.

Cluster 6, containing only the term *midwife*, signals a striking underrepresentation of midwifery in the keyword network. This indicates a missed opportunity in the literature, as midwives are central figures in perinatal care. Their limited visibility in digital BSE studies suggests the need for more research integrating midwifery-led models of care within digital intervention frameworks.

Collectively, these clusters reflect the multidimensionality of breastfeeding support and reveal both strengths and blind spots in the current research landscape. They offer direction for interdisciplinary collaboration, technological innovation, and targeted policy to improve maternal and infant health outcomes globally.

The findings from the keyword network visualization image (Figure 6) show some research topics that are still rarely discussed but provide opportunities for subsequent researchers to be studied in more depth in the future. Considering that the topic of BSE is increasing every year, the opportunity to discuss topics that are still rarely discussed is a great opportunity for future researchers. These topics are the lack of focus on the role of midwives and nurses indicate the lack of literature on the role of midwives and nurses against BSE. This can be an area that is further explored given the importance of midwife and nurse support in the breastfeeding process and maternal health. In addition, the keywords “artificial milk” and “bottle feeding” can be topics that arise in studies that discuss the replacement of breast milk with formula milk and its impact on mothers' self-confidence in breastfeeding. The keywords “prematurity” and “neonatal intensive care unit” reflect some of the challenges in breastfeeding that can impact BSE.

The results of keyword analysis showed that the topic of the role of midwives, nurses, as well as the challenges of breastfeeding in premature infants and the use of infant formula is still rarely raised. This opens up great opportunities for researchers to delve deeper into these topics in different cultural, social, and economic contexts. This research provides an important contribution to the development of Science and technology in the field of maternal and child health, especially in formulating evidence-based interventions that can improve the success of exclusive breastfeeding at the national and international levels.

The findings are expected to encourage policymakers to develop breastfeeding intervention programs that not only focus on maternal education, but also strengthen family support, health facilities, and health workers. Governments and international institutions can take advantage of the collaboration maps presented to design more targeted research cooperation. On the other hand, academics and researchers are advised to develop in-depth studies on the role of health workers in supporting BSE, as well as to examine the influence of socio-cultural factors that can strengthen or hinder successful breastfeeding. Thus, the results of this study not only answer research problems, but also provide strategic directions in the development of Science and technology that benefit the wider community.

In conclusion This study comprehensively mapped the development of global publications related to Breastfeeding Self-Efficacy (BSE) over the past decade (2014-2023) using Scopus-based bibliometric methods and visual analysis with VOSviewer. The results of the study show that scientific attention to the topic of BSE has increased very significantly from year to year, with the peak of publication in 2023. This indicates that BSE is increasingly being considered as an important issue in supporting breastfeeding success and the health of mothers and babies globally.

The geographical distribution of the publication shows that research on BSE is dominated by developed countries such as the United States, Canada, the United Kingdom, and Brazil. Asian

countries, including China and Indonesia, also showed significant contributions despite relatively lower numbers of publications. The findings reflect broader opportunities for international collaboration to strengthen research across different cultures and socio-economic contexts. In this context, governments and research institutions in developing countries need to strengthen BSE research capacity as part of efforts to increase the number of exclusive breastfeeding.

Keyword analysis showed that BSE themes were closely related to factors such as mental health (postpartum depression, anxiety, stress), social support, exclusive breastfeeding, as well as breastfeeding challenges in special groups such as mothers with premature babies. However, some topics are still rarely raised in the literature, such as the role of midwives and nurses in supporting BSE, the effect of using formula (artificial milk) on maternal confidence, and technology-based interventions for BSE improvement. This gap is an important opportunity for future researchers to develop more in-depth, contextual, and evidence-based studies.

This research provides an important contribution in mapping the network of authors and institutions that are actively researching BSE. Key figures such as Dennis C.L. noted as the most prolific author, confirming his role as a pioneer in the development of BSE theory. Meanwhile, journals such as the International Breastfeeding Journal and BMC Pregnancy and Childbirth are the main places for the dissemination of research results in this field.

From these findings, it is suggested that BSE improvement policies and intervention programs should not only focus on maternal education, but also strengthen support from families, communities, health workers, and the health system as a whole. The results of this study are expected to be a reference in the formulation of national and international strategies to improve the success rate of exclusive breastfeeding, by promoting a multidisciplinary approach and sensitive to cultural context.

Overall, this study not only successfully answers the problems related to publication TRENDS, dominant topics, and BSE research gaps in the past 10 years, but also opens up new directions for the development of maternal and Child Health Science and technology in the future. The results of this study are expected to be the basis for policy advocacy, strengthening the capacity of health workers, and the development of more innovative intervention models to support successful breastfeeding globally.

CONCLUSION

This analysis shows that research on breastfeeding self-efficacy continues to grow across various countries and has become an important focus in efforts to support successful breastfeeding. The findings open up opportunities for further research, particularly concerning the roles of midwives, nurses, and interventions for mothers with special conditions such as premature births. These insights are expected to serve as a foundation for developing policies and practices that support maternal confidence in breastfeeding.

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CONFLICT OF INTEREST

There are no conflicts of interest.

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