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DOI: <https://doi.org/10.22141/2224-0551.18.8.2023.1656>

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Modern baby breastfeeding trends

For citation: *Child's Health*. 2023;18(8):565-571 doi: 10.22141/2224-0551.18.8.2023.1656

Abstract. *Breastfeeding is a critical aspect of infant care that provides numerous benefits for both infants and mothers. The socio-cultural changes of the 21st century require optimisation of this practice and research into the physiological stages of milk secretion, including the hormonal regulation of lactation and factors that influence breast secretion, which is crucial for supporting breastfeeding and improving the overall well-being of infants and mothers. The purpose of the work was to investigate current views on breastfeeding support through a comprehensive review of the existing literature, with a particular focus on studies on the physiological stages of milk secretion during pregnancy and breastfeeding. We used bibliographic, analytical and regulatory search methods. The review contributes to the deepening of knowledge and understanding of breastfeeding, emphasising its importance for newborn care and maternal well-being. The material covers a wide range of factors that influence lactation as a physiological process and breastfeeding as a social practice. The findings highlight the physiological basis of the lactation process: the key role of prolactin and oxytocin in initiating and maintaining milk secretion, internal (hormonal imbalances, breast anatomy and surgery), and external factors such as the mother's somatic condition, including gestational diabetes and polycystic ovary syndrome. The positive aspects of breastfeeding for both the child and the mother are analysed. The various positive effects of this practice on the child are considered, including the most favourable balance of nutrients in the mother's milk, the formation of passive immunity and the maintenance of a healthy intestinal microbiota. Particular attention is paid to the changing views on infant feeding in light of social and economic changes in the early 21st century, including the growing role of artificial formula and the challenges of natural feeding in the workplace. Practical implications: it provides a basis for developing evidence-based interventions to improve the breastfeeding experience and well-being of both infants and mothers while informing healthcare professionals, policymakers, and support groups.*

Keywords: *lactation; hormonal control; physiological stages; child's immunity; factors of influence*

Introduction

Throughout history, breastfeeding has been an integral part of infant care, providing optimal nutrition and immune support while forging a strong bond between mother and child. However, modern lifestyles and societal changes have presented new challenges for breastfeeding mothers. In response to these challenges, modern approaches and trends in breastfeeding support have emerged to optimise the breastfeeding experience for both infants and mothers. These trends include information programmes, support groups, workplace support programmes for mothers, and other health initiatives.

Studies by V.V. Bila et al. [1] and R.V. Marushko et al. [2] demonstrate that breastfeeding provides a range of benefits for the growth, immunity, and development of the infant. It also has health benefits for the mother, including a reduced risk of premenopausal breast cancer, early weight loss from

pregnancy, and reduced risk of postpartum haemorrhage and osteoporosis. Multiple complex factors influence the decision to start and continue breastfeeding, including factors that are “external” to the woman, such as cultural beliefs. For many years, breastfeeding has been an integral part of life and, like any long-term practice, has been influenced by historical processes and the cultural context of different eras. O.O. Starets et al. [3], O.E. Abaturon and A.O. Tovarnytska [4] argue that the tradition of breastfeeding for women is closely linked to numerous factors, not only medical but also physical, emotional, and psychological. Consequently, the decision to breastfeed, as well as the act of breastfeeding itself, can be subject to socio-cultural stereotypes and prejudices. These negative implications about breastfeeding are one of the many components of cultural barriers that limit women and infants' ability to reap the health benefits that breastfeeding can provide.

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S.J. Grundy et al. [5] highlight the steady increase in breastfeeding prevalence in several countries following improved information campaigns, particularly at the public health level. Nevertheless, the rates have varied across countries, largely due to economic and sociocultural differences. The decision to initiate breastfeeding is complex and influenced by numerous factors: medical factors, formula marketing campaigns, socio-cultural and historical backgrounds, limited social support for working parents, mental and/or physical health problems, history of sexual abuse or trauma, and gender identity. An understanding of the medical importance of breastfeeding and the factors that may affect a woman's willingness or ability to breastfeed is essential for prenatal counselling.

The main objective of this work is to comprehensively examine current trends in breastfeeding, with a particular focus on the physiological stages of milk secretion during pregnancy and breastfeeding, the hormonal control of lactation, and factors that may affect milk secretion. By conducting a thorough review of existing literature and research, this study provides an evidence-based view of optimising breastfeeding practices and promoting successful breastfeeding for both infants and women.

Bibliographic, analytical methods, and regulatory search were used in the study to carry out the following. Literature review and synthesis: the information obtained as a result of the above literature search was synthesised and summarised. This allowed for a comprehensive study of current trends in breastfeeding, including measures to protect, encourage and support breastfeeding, and the impact on infant health and maternal well-being. The literature on social, cultural, and economic influences on breastfeeding was searched using Web of Science, PubMed and Science Direct in periods spanning from 2014 to 2023. The queries included various combinations related to infant feeding type/process (breastfeeding, breast milk, formula feeding, formula, artificial feeding, infant feeding, bottle feeding), behaviour (initiation, continuation, cessation, stopping, duration, decision, choice, reason) and influences (social, cultural, economic, political, industrial, environmental, health care providers, public, health care). Studies examining social, cultural, and economic influences on breastfeeding at the public health level were included. Conversely, studies focusing on the physiological properties of breast milk, health impacts, and physiological complications/obstacles were excluded. The search for studies was limited to English and Ukrainian.

The study was initiated with a literature search in major databases (CINAHL, Cochrane Library, Psychology Database, JSTOR, Web of Science, EMBASE and Ovid) to explore current trends in breastfeeding, the benefits, disadvantages, and possible barriers to long-term breastfeeding. Subsequently, the search was extended to Web of Science, PubMed and Science Direct to explore the broader social, cultural, and economic influences on breastfeeding. After applying the inclusion and exclusion criteria, a descriptive literature review and synthesis were conducted to consolidate and present the key findings and themes of the relevant studies. This systematic sequence of research methods ensured a robust study of current trends in breastfeeding and its implications for infant health and maternal well-being.

Inclusion of quantitative and qualitative studies: both quantitative and qualitative studies were included in the article, as women's experiences of breastfeeding are considered a vital aspect of understanding the impact and consequences of breastfeeding practices.

Exclusion of irrelevant material: studies that did not include the intervention and relevant outcomes were excluded ($n = 1,387$) to ensure that only the most relevant studies were included. Subsequently, a systematic and thorough appraisal of the selected materials was performed. This assessment included a detailed study of the main research topics, their different directions, as well as the theoretical foundations and methodological features of the selected studies. The analysis resulted in a consolidated review of the scientific literature aimed at highlighting the complex interrelationship between physiological, social, cultural, and economic factors and breastfeeding practices. Thus, the systematic review considered a wide range of aspects related to the selected materials, including the main themes, research areas, theoretical frameworks, and methodologies of the studies. The result of this analysis was a comprehensive review of the scientific literature aimed at covering the topic of breastfeeding.

Results

Breastfeeding is a natural aspect of infant care, providing essential nutrients and fostering a strong emotional bond between mother and child. However, in recent years, due to socio-cultural transformations, breastfeeding has undergone significant changes, mainly related to the use of formula milk. There are trends towards an increase in the use of exclusive formula feeding and a decrease in the duration of exclusive breastfeeding, which raises questions about whether breastfeeding will remain the mainstay of infant care. Nevertheless, research shows that breastfeeding has many health benefits for infants, including optimal nutrition, protection against infections and reduced risk of chronic diseases. Research on current trends in breastfeeding and its impact on infant and maternal health provides a deeper understanding of this practice, the physiological processes underlying lactation, its hormonal control, and other aspects.

Recent studies have examined the impact of lifestyle factors on milk secretion. Both internal and external factors have been identified as influencing lactation. Internal factors (hormonal imbalances and maternal health conditions, such as gestational diabetes) have been shown to influence lactation success. External factors, including support for breastfeeding and cultural beliefs about it, also play a significant role. These findings are supported by a study by Feldman-Winter et al. [6], which emphasises the multifactorial nature of lactation and the importance of comprehensive support systems for successful breastfeeding.

Internal factors:

1. Hormonal imbalance: certain conditions, such as polycystic ovary syndrome, thyroid disease or certain medications, can disrupt the delicate hormonal balance necessary for successful lactation.

2. Anatomy of the mammary glands: anatomical changes, such as insufficient glandular tissue, can affect lactation or the ability to breastfeed effectively. In particular, women

with larger mammary glands and more developed parenchyma tend to have more productive lactation.

3. Maternal health: the general health and well-being of the mother, including her nutritional status and hydration, can have a significant impact on lactation.

4. Breast surgery: previous breast surgeries, especially those involving the milk ducts, can interfere with milk secretion.

External factors:

1. Frequency of breastfeeding: frequent breastfeeding or pumping stimulates the mammary glands, signalling the need for more milk.

2. Fixation and positioning: proper fixation and positioning during breastfeeding ensures effective feeding and prevents discomfort or problems with both the breast in general and the nipples in particular, which can interfere with feeding.

3. Stress and emotional well-being: high levels of stress or anxiety can hurt lactation. Creating a supportive environment for mothers is crucial for successful lactation.

4. Support and environment: a support network, including partners, family members and healthcare professionals, can have a significant impact on breastfeeding.

L. Cummins et al. [7] identified a correlation between maternal stress and breastfeeding outcomes in their study. The researchers concluded that increased stress levels are associated with lactation disorders. Breast milk is a dynamic and bioactive fluid that provides several benefits for the baby's immune system. The positive effects include:

- nutritional content: breast milk has the most optimal concentration of essential nutrients, proteins, fats and carbohydrates to meet the growth and development needs of the baby;

- antibodies and immunoglobulins: breast milk is rich in antibodies, immunoglobulins (IgA, IgG, IgM) and immune factors that form the baby's passive immunity (Fig. 1). These components help protect against infections, reduce the severity of illnesses and promote good health;

- probiotics: breast milk contains beneficial bacteria, probiotics, which contribute to the formation of a healthy gut microbiome in the baby, which is essential for a strong immune system and optimal digestive function;

- lower incidence of infections: due to the protective properties of breast milk, breastfed babies have a lower risk of respiratory and gastrointestinal infections.

Studies of breastfeeding support interventions have shown a positive impact on breastfeeding initiation and continuation. I. Koksal et al. [8] demonstrated that breastfeeding support programmes, such as lactation counselling and

support groups, improved breastfeeding outcomes. These findings highlight the importance of tailored support systems to meet the diverse needs of breastfeeding mothers.

A systematic review by M.D. Russell et al. [9] on the endocrine control of lactation showed that prolactin is essential for the development of alveoli in the mammary glands, which promotes milk synthesis. The sharp decline in oestrogen and progesterone levels after childbirth causes the release of prolactin, which stimulates the secretion of colostrum and milk. A link has also been found between hormonal changes during pregnancy and lactation efficiency. Scientists have found that women with gestational diabetes have changes in their hormonal profile that lead to a delay in lactogenesis and reduced milk secretion.

Recent clinical studies have highlighted the impact of breast milk on infant immunity. The study by B. Dawod et al. [10] identified specific immune factors in breast milk that contribute to the development of the infant's gut microbiota. Scientists have shown that breast milk contains oligosaccharides and probiotics that promote the growth of beneficial bacteria in the baby's gut. These results confirm the importance of breastfeeding, emphasising the significance of breast milk in the development of the immune system. The role of breast milk in preventing the development of certain diseases has also been studied. The impact of breastfeeding on the percentage of cases of respiratory infections in infants was noted. It was found that breastfed infants had a significantly lower risk of respiratory illnesses compared to formula-fed infants. These results strongly support the protective effect of breastfeeding against infections.

Several researchers have studied innovative methods of breastfeeding support. A study of telemedicine interventions by A.I. Eidelman [11] evaluated the effectiveness of virtual lactation consultations and breastfeeding optimisation. The results showed that virtual consultations were as effective as face-to-face consultations in solving breastfeeding problems and increasing lactation duration. This result adds to the understanding of the need for quality communication

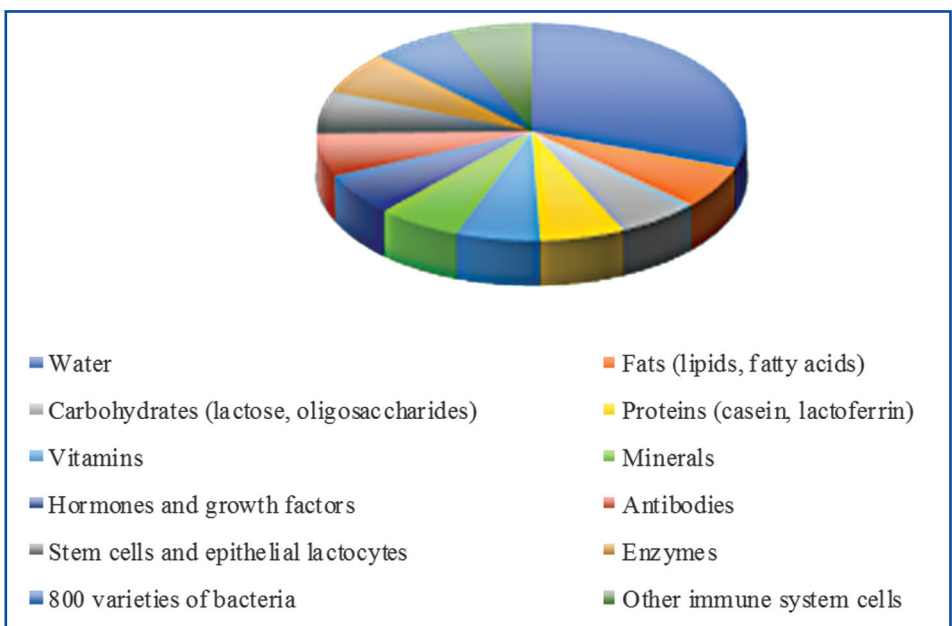


Figure 1. Breast milk components

and highlights the potential of telemedicine interventions in supporting breastfeeding. In addition, the impact of breastfeeding support groups on lactation outcomes was investigated. A systematic review by S. Sayres and L. Visentin [12] evaluated the effectiveness of mother-to-mother support programmes in initiating and continuing breastfeeding. It was found that mother-to-mother support interventions significantly increased breastfeeding rates and improved mothers' confidence. These results highlight the important role of mother-to-mother support groups in strengthening mothers' breastfeeding attitudes.

Some studies have highlighted the role of cultural trends and social norms in shaping breastfeeding practices. Social, cultural, and economic factors have been found to have a significant impact. Y. Vandenplas [13] and R. Qiu et al. [14] highlighted that personal beliefs and societal norms about breastfeeding influence mothers' decisions. K.L. Westerfield et al. [15] found the impact of maternal employment and access to lactation support in the workplace on breastfeeding duration. Some researchers have focused on breastfeeding experiences in different cultural contexts. In particular, on cultural practices and beliefs that influence breastfeeding decisions and feeding practices, highlighting the need for culturally sensitive breastfeeding support programmes. The economic aspects of breastfeeding have also been explored. A study by N.C. Rollins et al. [16] found a relationship between maternal employment and breastfeeding duration. According to the study, the length of maternity leaves and lactation support in the workplace are associated with an increase in the percentage of exclusive breastfeeding. These results draw attention to the impact of employer policies on breastfeeding outcomes.

Discussion

M. Sattari et al. [17] investigated the physiological stages of lactation during pregnancy and breastfeeding, which revealed a complex interplay of hormonal factors. Prolactin, a hormone secreted by the pituitary gland, plays a crucial role in initiating and maintaining lactation. Increased levels of oestrogen and progesterone during pregnancy prepare the mammary gland for secretion. After childbirth, a decrease in these hormones and an increase in prolactin levels stimulate the production of colostrum, the first milk, which gradually turns into full milk over several days. The process of lactogenesis, in particular lactogenesis II, heralds the start of full milk secretion. This transition from colostrum to mature milk is regulated by hormones, and the timing and success of the transition are individual. Several factors, such as the mode of delivery, early skin-to-skin contact, and frequency of breastfeeding, influence the onset and course of lactogenesis II. Women with gestational diabetes often suffer from delayed lactogenesis II, which leads to a delay in the time of mature milk secretion. The endocrine control of lactation is mainly regulated by prolactin and oxytocin. Prolactin stimulates the development of alveoli in the mammary glands, which plays a crucial role in milk secretion. Prolactin levels are highest in the early postpartum period and gradually decrease thereafter. Oxytocin, which is released in response to sucking, triggers the release of milk, allowing the baby to access the milk that is stored in the breast. It is worth noting

that the positive feedback system between sucking and the release of oxytocin ensures the continuous release of milk. The mother-infant duo plays a crucial role in regulating the release of oxytocin, as the emotional bonding and comfort experienced during breastfeeding further stimulate oxytocin production. However, this feedback mechanism is affected by stress and anxiety, which can interfere with the release of oxytocin, potentially affecting milk production and milk flow.

Several internal and external factors affect milk secretion. L.E. Carr et al. [18] identified that internal factors include hormonal imbalances, breast anatomy, and the presence of medical conditions such as gestational diabetes. Women with gestational diabetes often experience insulin resistance and hyperglycaemia, which can affect the hormonal regulation of lactation, leading to suboptimal secretion. It should be added that maternal stress and anxiety, which are common in the postpartum period, also lead to changes in milk composition and quantity. In turn, I. Magro et al. [19] identified that external factors such as breastfeeding support and cultural beliefs about breastfeeding play a significant role in breastfeeding success. The authors of this study agree that adequate support from healthcare professionals, lactation consultants and support groups will have a positive impact on breastfeeding outcomes. Conversely, incorrect cultural beliefs and stigmatisation of breastfeeding in society will be a barrier to breastfeeding initiation and continuation. In addition, the availability and accessibility of maternity leave and workplace lactation support had a significant impact on breastfeeding continuation rates, with women with workplace support and longer maternity leave more likely to continue breastfeeding for the recommended six months.

Breast milk is the source of immunity for babies, providing a unique blend of essential nutrients, antibodies, immunoglobulins, and probiotics. These components play an important role in the development of the child's immune system and protect against a wide range of infections. The presence of IgA in breast milk provides local protection in the baby's intestines, protecting against gastrointestinal infections. R. Omranipour and M. Vasigh [20] in their study demonstrated the protective effect of breastfeeding against respiratory tract infections, otolaryngological infections, gastrointestinal diseases, infectious diseases. The authors of this study agree that breastfed babies are at a lower risk of developing chronic diseases, such as asthma and other allergic diseases, later in life. It is important to note the positive impact of breastfeeding on the health of infants. Exclusive breastfeeding during the first six months of life has been associated with a lower risk of childhood obesity, type 2 diabetes, and cardiovascular disease in adulthood. Breastfeeding also plays a role in cognitive development. In particular, breastfeeding has been linked to higher scores on cognitive tests and improved academic performance in later years. The emotional bond during breastfeeding also contributed to a sense of security and attachment between mother and child, which had a positive impact on the child's social and emotional development.

Although the positive effects of breastfeeding have largely outweighed the negative, sporadic cases of potential risks

have been identified. In cases where the mother has been infected with certain diseases, breastfeeding may not be recommended. In particular, a study by M.L. Gianni et al. [21] showed that the transmission of infectious agents through breast milk can pose a threat to the health of the child. In such situations, alternative feeding methods or special precautions may be advised. In addition, as noted by I. Levene and F. O'Brien [22] in their study of measures to protect, promote and support breastfeeding, the appearance of nipple discomfort or pain and breast engorgement may lead to some problems with breastfeeding. Although these issues are usually temporary and manageable, they can potentially affect breastfeeding and contribute to early weaning.

Various approaches have been used to improve breastfeeding practices. The authors of this study believe it is important to assess their impact. In particular, as shown by S.A. van Dellen et al. [23], breastfeeding counselling has played a crucial role in providing guidance and support to breastfeeding mothers, especially in the first days after childbirth. The authors of this study agree with their importance, as counselling improved breastfeeding techniques, reduced maternal stress and increased the likelihood of exclusive breastfeeding. J. Fisher [24] notes in her commentary that support groups and programmes are effective in providing emotional and practical support to breastfeeding mothers. Such systems have been shown to foster a sense of community and encouragement and to empower women to overcome breastfeeding challenges and maintain exclusive breastfeeding for a long time. S. Patel and Sh. Patel [25] studied lactation support programmes in the workplace. In particular, they found that dedicated lactation rooms and flexible pumping breaks had a positive impact on breastfeeding continuation rates among working mothers. Thus, such workplaces promote not only breastfeeding but also well-being. Healthcare initiatives, including the Baby Friendly Hospital Initiative and national breastfeeding promotion campaigns [26], have been associated with increased breastfeeding rates and improved breastfeeding practices. Notably, the Baby Friendly Hospital Initiative, in particular, increased the number of mothers starting breastfeeding during hospital stays.

Cultural beliefs, societal norms, and perceptions about breastfeeding in a society have a significant impact on breastfeeding decisions and practices. In societies where breastfeeding was culturally and socially accepted, mothers were more likely to initiate and continue breastfeeding [27, 28]. However, cultural misconceptions and taboos about breastfeeding in some regions have acted as a barrier to breastfeeding initiation and continuation. Economic factors, such as maternal employment and access to maternity leave, also influence the duration of breastfeeding [29]. Women with longer maternity leave and access to lactation support in the workplace are more likely to continue exclusive breastfeeding for the recommended six months. In addition, public health interventions that address social and economic inequalities have played a key role in promoting breastfeeding practices at the community level [30–32]. Such initiatives have been aimed at improving breastfeeding support and awareness among underserved populations, reducing the breastfeeding gap between different socioeconomic groups. The inclusion of both quantitative and qualitative research

provided a holistic understanding of the experience and impact of breastfeeding. Quantitative studies have provided valuable information on breastfeeding rates, duration of exclusive breastfeeding, and the relationship between breastfeeding practices and infant health outcomes [33–36]. These studies have gathered evidence on the impact of different interventions to support breastfeeding, helping to inform the development of effective strategies to promote breastfeeding [37]. Qualitative studies have delved into the perspectives and experiences of breastfeeding mothers, emphasising the emotional and social aspects of breastfeeding. Mothers' experiences of breastfeeding were shaped by cultural norms, family support and societal attitudes towards breastfeeding. The qualitative data enriched the understanding of the complex interplay between internal and external factors that influence breastfeeding practices.

E.C. Rhodes et al. [38] used mixed-method approaches to explore the multifaceted nature of breastfeeding practices. The combination of quantitative data on breastfeeding rates and health outcomes with qualitative insights into maternal experiences enriched the findings of this study. F. Duthell et al. [39] combined quantitative data on breastfeeding rates with qualitative findings on mothers' experiences of breastfeeding. They identified barriers to breastfeeding and factors that influenced mothers' decisions to continue or stop breastfeeding [40, 41]. The findings of both studies highlight the importance of combining quantitative and qualitative data to gain a deeper understanding of breastfeeding experiences.

The study has important practical implications for breastfeeding promotion and maternal and child health. Considering the results of this study, evidence-based breastfeeding support programmes can be developed at different levels, from family to national. In summary, this study provides valuable information on current trends in breastfeeding and its impact on infant health and maternal well-being. The findings reaffirm the crucial role of breastfeeding in promoting optimal child health and development and recognise the importance of external factors that influence breastfeeding practices. The evidence-based recommendations from this study can pave the way for evidence-based interventions and policies that prioritise breastfeeding support, ultimately nurturing a healthier and happier future generation. Practical recommendations based on this research can therefore improve breastfeeding practices and promote the health of mothers and children.

Conclusions

Research on current trends in breastfeeding and its impact on infant health and maternal well-being has provided valuable information and made a significant contribution to the field of maternal and child health. Empowering mothers with knowledge about the physiological processes of lactation and the importance of breastfeeding support can lead to a more successful and rewarding breastfeeding experience. In addition, recognising the positive impact of breast milk on the child's immunity reinforces the importance of breastfeeding as a fundamental aspect of infant care.

The results of this study confirm the importance of hormonal regulation for successful lactation, with pro-

lactin and oxytocin playing key roles in lactogenesis and milk secretion, respectively. The physiological stages of milk secretion during pregnancy and lactogenesis II after delivery have proven to be critical determinants of breastfeeding success. Understanding these processes is important for providing targeted support and interventions to breastfeeding mothers. This study highlights the need for comprehensive support systems and culturally competent initiatives to improve breastfeeding outcomes. Breast milk is a source of immunity for infants, offering essential nutrients, antibodies and immunoglobulins that protect against infections and promote optimal health. The positive impact of breastfeeding on a child's health and cognitive development is clear, underscoring the importance of exclusive breastfeeding for the recommended six months. In addition, the impact of breastfeeding support measures, workplace lactation programmes and public health initiatives has been proven. The findings demonstrate the effectiveness of these interventions in promoting breastfeeding initiation and continuation, highlighting the importance of adapted and accessible support systems.

The practical implications of this study lie in its potential to inform healthcare providers, policymakers, and support groups to develop targeted strategies that prioritise breastfeeding support and create a supportive environment for breastfeeding mothers. While this study addresses important aspects of breastfeeding practices, further research is needed to explore emerging topics such as the impact of breastfeeding during health emergencies, the experience of breastfeeding in different cultural contexts, and the long-term health outcomes of breastfed infants in adulthood. Ongoing research and international collaboration will deepen the understanding of breastfeeding practices, guiding the development of evidence-based policies and interventions that will improve the health of mothers and children worldwide.

References

1. Bila VV, Zahorodnia OS, Baryshnikova VV. Breast milk bank of Kyiv perinatal center - experience in 2022. *Reproductive health of woman*. 2023;(65):10-13. Ukrainian. doi: 10.30841/2708-8731.2.2023.278153.
2. Marushko RV, Dudina OO, Marushko TL. Analysis of the health status of children of the first year of life. *Modern Pediatrics. Ukraine*. 2020;(109):24-32. Ukrainian. doi: 10.15574/SP.2020.109.24.
3. Starets OO, Khimenko TM, Kotova NV, Ismayilova SI, Kanarova OV. Risk factors and short-term consequences of the absence or early cessation of breastfeeding in infants born preterm. *Ukrainian journal of perinatology and pediatrics*. 2023;(93):57-63. Ukrainian. doi: 10.15574/PP.2023.93.57.
4. Abaturov OE, Tovarnytska AO. Prognostic significance of the breast milk microRNA impact on the immune response of a newborn with intrauterine growth retardation. *Modern Pediatrics. Ukraine*. 2021;(113):53-61. Ukrainian. doi: 10.15574/SP.2021.113.53.
5. Grundy SJ, Hardin A, Kuller JA, Dotters-Katz S. *Breastfeeding: The Basics, the History, and Barriers in the Modern Day*. *Obstet Gynecol Surv*. 2022 Jul;77(7):423-432. doi: 10.1097/OGX.0000000000001041.
6. Feldman-Winter L, Kellams A, Peter-Wohl S, et al. Evidence-Based Updates on the First Week of Exclusive Breastfeeding Among Infants ≥ 35 Weeks. *Pediatrics*. 2020 Apr;145(4):e20183696. doi: 10.1542/peds.2018-3696.
7. Cummins L, Meedy S, Wilson V. Factors that positively influence in-hospital exclusive breastfeeding among women with gestational diabetes: An integrative review. *Women Birth*. 2022 Feb;35(1):3-10. doi: 10.1016/j.wombi.2021.03.005.
8. Koksali I, Acikgoz A, Cakirli M. The effect of a father's support on breastfeeding: a systematic review. *Breastfeed Med*. 2022 Sep;17(9):711-722. doi: 10.1089/bfm.2022.0058.
9. Russell MD, Dey M, Flint J, et al.; BSR Standards, Audit and Guidelines Working Group. British Society for Rheumatology guideline on prescribing drugs in pregnancy and breastfeeding: immunomodulatory anti-rheumatic drugs and corticosteroids. *Rheumatology (Oxford)*. 2023 Apr 3;62(4):e48-e88. doi: 10.1093/rheumatology/keac551.
10. Dawod B, Marshall JS, Azad MB. Breastfeeding and the developmental origins of mucosal immunity: how human milk shapes the innate and adaptive mucosal immune systems. *Curr Opin Gastroenterol*. 2021 Nov 1;37(6):547-556. doi: 10.1097/MOG.0000000000000778.
11. Eidelman AI. Telemedicine and breastfeeding: the time has come. *Breastfeed Med*. 2021 Apr;16(4):273-274. doi: 10.1089/bfm.2021.29180.aie.
12. Sayres S, Visentin L. Breastfeeding: uncovering barriers and offering solutions. *Curr Opin Pediatr*. 2018 Aug;30(4):591-596. doi: 10.1097/MOP.0000000000000647.
13. Vandenplas Y. Breastfeeding and its risk factors. *J Pediatr (Rio J)*. 2022 May-Jun;98(3):219-220. doi: 10.1016/j.jpmed.2021.12.005.
14. Qiu R, Zhong Y, Hu M, Wu B. Breastfeeding and reduced risk of breast cancer: a systematic review and meta-analysis. *Comput Math Methods Med*. 2022 Jan 28;2022:8500910. doi: 10.1155/2022/8500910.
15. Westerfield KL, Koenig K, Oh R. Breastfeeding: Common Questions and Answers. *Am Fam Physician*. 2018 Sep 15;98(6):368-373.
16. Rollins NC, Bhandari N, Hajeebhoy N, et al.; Lancet Breastfeeding Series Group. Why invest, and what it will take to improve breastfeeding practices? *Lancet*. 2016 Jan 30;387(10017):491-504. doi: 10.1016/S0140-6736(15)01044-2.
17. Sattari M, Serwint JR, Levine DM. Maternal implications of breastfeeding: a review for the internist. *Am J Med*. 2019 Aug;132(8):912-920. doi: 10.1016/j.amjmed.2019.02.021.
18. Carr LE, Virmani MD, Rosa F, et al. Role of Human Milk Bioactives on Infants' Gut and Immune Health. *Front Immunol*. 2021 Feb 12;12:604080. doi: 10.3389/fimmu.2021.604080.
19. Magro I, Nurimba M, Doherty JK. Headache in pregnancy. *Otolaryngol Clin North Am*. 2022 Jun;55(3):681-696. doi: 10.1016/j.otc.2022.02.013.
20. Omranipour R, Vasigh M. Mastitis, breast abscess, and granulomatous mastitis. *Adv Exp Med Biol*. 2020;1252:53-61. doi: 10.1007/978-3-030-41596-9_7.
21. Gianni ML, Bettinelli ME, Manfra P, et al. Breastfeeding Difficulties and Risk for Early Breastfeeding Cessation. *Nutrients*. 2019 Sep 20;11(10):2266. doi: 10.3390/nu11102266.
22. Levene I, O'Brien F. Fifteen-minute consultation: Breastfeeding in the first 2 weeks of life—a hospital perspective. *Arch Dis Child Educ Pract Ed*. 2019 Feb;104(1):20-26. doi: 10.1136/archdischild-2017-314633.
23. Van Dellen SA, Wisse B, Mobach MP, Dijkstra A. The effect of a breastfeeding support programme on breastfeeding duration and exclusivity: a quasi-experiment. *BMC Public Health*. 2019 Jul 24;19(1):993. doi: 10.1186/s12889-019-7331-y.
24. Fisher J. Recommendations against breastfeeding require consultation with women for effective implementation. *Lancet Glob Health*. 2023 May;11(5):e648-e649. doi: 10.1016/S2214-109X(23)00155-9.
25. Patel S, Patel S. The effectiveness of lactation consultants and lactation counselors on breastfeeding outcomes. *J Hum Lact*. 2016 Aug;32(3):530-541. doi: 10.1177/0890334415618668.
26. You H, Lei A, Xiang J, Wang Y, Luo B, Hu J. Effects of breastfeeding education based on the self-efficacy theory on women with gestational diabetes

- mellitus: A CONSORT-compliant randomized controlled trial. *Medicine (Baltimore)*. 2020 Apr;99(16):e19643. doi: 10.1097/MD.00000000000019643.
27. Svyatova GS, Mirzakhmetova DD, Berezina GM, Murtazaliyeva AV. Genetic Factors of Idiopathic Recurrent Miscarriage in Kazakh Population. *J Reprod Infertil*. 2022 Jan-Mar;23(1):39-45. doi: 10.18502/jri.v23i1.8451.
28. Svyatova G, Mirzakhmetova D, Berezina G, Murtazaliyeva A. Immunogenetic aspects of idiopathic recurrent miscarriage in the Kazakh population. *J Med Life*. 2021 Sep-Oct;14(5):676-682. doi: 10.25122/jml-2021-0063.
29. Aktaeva LM, Mirzakhmetova DD, Padaiga Z. Extragenital pathologies of pregnant women in the southern regions of the Republic of Kazakhstan. *Sys Rev Pharm*. 2020;11(4):405-412.
30. Yessentayeva SY, Orakbay LZ, Adilhanova A, Yessimov N. Approaches to the use of stem cells in regenerative medicine. *Anal Biochem*. 2022 May 15;645:114608. doi: 10.1016/j.ab.2022.114608.
31. Zaychenko G, Stryga O, Sinityna O, et al. Resveratrol Effects on the Reproductive System in Ovariectomized Rats: Deciphering Possible Mechanisms. *Molecules*. 2022 Aug 2;27(15):4916. doi: 10.3390/molecules27154916.
32. Ciechanowicz P, Lewandowski K, Szyma ska E, Kaniewska M, Rydzewska GM, Walecka I. Skin and gastrointestinal symptoms in COVID-19. *Prz Gastroenterol*. 2020;15(4):301-308. doi: 10.5114/pg.2020.101558.
33. Hajiyeva NN. Clinical presentations of pain syndrome depending on the grade of CNS lesions at newborns. *Azerbaijan Medical Journal*. 2008;3:50-52.
34. Pylypchynets I. Optimal scheme for stimulating photofission of shielded nuclear materials on the Microtron M-30: a combination of theoretical and experimental studies. *Sci Her Uzhhor Univer. Ser Phys*. 2022;(52):16-26. doi: 10.54919/2415-8038.2022.52.16-26.
35. Lukianenko N, Kens O, Nurgaliyeva Z, Toguzbayeva D, Sakhipov M. Finding a molecular genetic marker for the incidence of recurrent episodes of acute obstructive bronchitis in children. *J Med Life*. 2021 Sep-Oct;14(5):695-699. doi: 10.25122/jml-2021-0052.
36. Lukianenko N, Lenha E, Spaska A, Klets T, Shevchenko T. Tactics for treating young children with pyelonephritis and vesicoureteral reflux associated with impaired fibrillogenesis. *Mol Cell Biochem*. 2023 Mar;478(3):531-538. doi: 10.1007/s11010-022-04529-7.
37. Stepanov VA, Bocharova AV, Saduakassova KZ, et al. Replicative study of susceptibility to childhood-onset schizophrenia in Kazakhs. *Genetika*. 2015 Feb;51(2):227-35. Russian.
38. Rhodes EC, Damio G, LaPlant HW, et al. Promoting equity in breastfeeding through peer counseling: the US Breastfeeding Heritage and Pride program. *Int J Equity Health*. 2021 May 27;20(1):128. doi: 10.1186/s12939-021-01408-3.
39. Duthiel F, M chin G, Vorilhon P, et al. Breastfeeding after Returning to Work: A Systematic Review and Meta-Analysis. *Int J Environ Res Public Health*. 2021 Aug 15;18(16):8631. doi: 10.3390/ijerph18168631.
40. Zharmakhanova G, Syrlybayeva L, Nurbaulina E, Baikadamova L, Eshtayeva G. Inborn errors of fatty acid metabolism (review). *Georgian Med News*. 2020 Jun;(303):161-167. Russian.
41. Zharmakhanova G, Syrlybayeva L, Kononets V, Nurbaulina E, Baikadamova L. Molecular-genetic aspects of methylmalonic aciduria development (review). *Georgian Med News*. 2021 Apr;(313):118-124. Russian.

Received 10.10.2023

Revised 26.11.2023

Accepted 12.12.2023 ■

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Conflicts of interests. Authors declare the absence of any conflicts of interests and own financial interest that might be construed to influence the results or interpretation of the manuscript.

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Сучасні тенденції грудного вигодовування дітей

Резюме. Грудне вигодовування є критично важливим аспектом догляду за немовлятами, що забезпечує численні переваги як для немовлят, так і для матерів. Соціокультурні зміни XXI століття вимагають оптимізації цієї практики й дослідження фізіологічних етапів секреції молока, включаючи гормональну регуляцію лактації та фактори, які впливають на секрецію грудей, що має вирішальне значення для підтримки грудного вигодовування та покращення загального самопочуття немовлят і матерів. Ця робота має на меті вивчити сучасні погляди на підтримку грудного вигодовування шляхом всебічного огляду існуючої літератури з особливим акцентом на дослідженнях фізіологічних етапів секреції молока під час вагітності та годування груддю. Використовувалися бібліографічний, аналітичний методи та нормативний пошук. Цей огляд сприяє поглибленню знань і розумінню грудного вигодовування, підкреслюючи його важливість для догляду за новонародженим та благополуччя матері. Матеріал охоплює широкий спектр факторів, що впливають на лактацію як фізіологічний процес і грудне вигодовування як соціальну практику. Отримані дані підкреслюють фізіологічну основу процесу лактації: ключову роль пролактину

та окситоцину в ініціюванні та підтримці секреції молока, внутрішні (гормональний дисбаланс, анатомія грудей та хірургічне втручання), а також зовнішні фактори, такі як соматичний стан матері, включаючи гестаційний період, діабет і синдром полікістозних яєчників. Проаналізовано позитивні сторони грудного вигодовування як для дитини, так і для матері. Розглянуто різноманітні позитивні наслідки цієї практики для дитини, зокрема сприятливий баланс поживних речовин у молоці матері, формування пасивного імунітету та підтримання здорової мікробіоти кишечника. Особливу увагу приділено мінливим поглядам на вигодовування немовлят у світлі соціальних та економічних змін на початку XXI століття, включаючи зростаючу роль штучних сумішей і викиди природного вигодовування на робочому місці. Практичні наслідки: це забезпечує основу для розробки науково обґрунтованих втручань щодо покращення досвіду грудного вигодовування та благополуччя як немовлят, так і матерів, одночасно інформуючи медичних працівників, політиків та групи підтримки.

Ключові слова: лактація; гормональний контроль; фізіологічні стадії; імунітет дитини; фактори впливу