KNOWLEDGE OF BREASTFEEDING AND ASSOCIATED FACTORS IN LACTATING MOTHERS WITH CHILDREN BELOW 6 MONTHS OLD IN 2023 AT E HOSPITAL, HANOI, VIETNAM

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Breastfeeding is a natural and effective way to protect mothers' and children's health. This research aims to evaluate knowledge of breastfeeding among mothers with their children under 6 months old visiting the E Hospital, a tertiary hospital in Hanoi, Vietnam. A cross-sectional study was conducted using a predesignated, self-administered questionnaire based on the recommendation from the WHO. A special scaling system was employed to calibrate between different types of questions. Data was collected from the survey from 1/2023 to 10/2023 using the platform REDCap and analyzed using the software SPSS®. Among 150 women voluntarily participating in this research, only 7% have good knowledge of breastfeeding. A majority of participants understood the importance of breastfeeding, the consequences when children are not breastfed properly, how to use thawed breast milk and breastfeeding in special cases. On the other hand, most mothers did not have good knowledge of colostrum and mature milk characteristics, how to maintain and protect breast milk supply, and how to express and store breast milk after expression. The level of breastfeeding knowledge was not significantly associated with maternal age group, ethnicity, or residential area. Moreover, multiparity did not contribute to an improvement in breastfeeding knowledge ($p > 0.05$), contradicting prevailing beliefs in Vietnam.

Keywords: Breastfeeding, knowledge, cross-sectional study, associated factors.

I. INTRODUCTION

Breastfeeding is a natural but effective way to protect mothers' and children's health. Mother's milk is ideal for children below 24 months, particularly infants below 6 months. It contains all essential nutrients, including proteins, fat, carbohydrates, minerals, vitamins, with suitable ratios. Besides that, mother's milk is also a natural antiseptic, antibiotic, and antimicrobial which helps prevent infections, i.e. diarrhea and pneumonia. According to the recommendations from the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), children should be exclusively breastfed in the first six months of life.[1,2] Thereafter, breastfeeding should be continued along with nutritionally adequate and safe complementary foods.

Globally, breastfeeding can save more than 820,000 children below 5 years old *per annum*.[1] In Vietnam, it was estimated that an improved breastfeeding rate can prevent 2,000 to 8,000 newborn and infant deaths, as well as 500 deaths by breast cancer in mothers annually.[3,4]

Despite the above-mentioned benefits, the

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breastfeeding rate, particularly the exclusive breastfeeding rate is still very low. In 2020 – 2021, a report from UNICEF found that in Vietnam, only fewer than 1 per 4 children were breastfed in the first hour of life, and less than half of the children below 6 months were exclusively breastfed.[5] In other countries, especially developed ones, the rate is even surprisingly lower. For example, in Ireland, in 2022, according to UNICEF, the breastfeeding rate was only 62%, and the exclusive breastfeeding rate was 46%.[6]

One important factor in improving the situation is enhancing the mothers' knowledge of breastfeeding. However, recent studies implied that only 8% of lactating mothers received the information from medical workers, while 60% gained knowledge from public media. Bui et al. in 2020 showed that in their hospital in Nam Dinh, Vietnam only 10.5% of the pregnant women had sufficient and correct knowledge in breastfeeding.[7] Another factor that might affect breastfeeding knowledge is the mother's age. In Vietnam, due to insufficient sexual education for adolescents, recently has witnessed a high rate of adolescent pregnancy and abortion. For example, at the National Hospital of Obstetrics and Gynecology, in 2017 – 2018, adolescent pregnancy accounted for 0.5% of the total newborns.[8] The Vietnamese abortion rate is the highest in South East Asia, and ranks 5th worldwide.

The current situation has driven us to research this field. This study aimed to assess breastfeeding knowledge among lactating mothers attending our hospital and to identify factors associated with maternal breastfeeding knowledge.

II. MATERIALS AND METHODS

1. Subjects

Convenient sampling was employed. 150 lactating mothers with children under 6 months old voluntarily participated in this research. The exclusion criteria were mothers with contraindications to breastfeeding, mothers having a psychological illness, illiterate mothers and mothers who did not consent to participate.

2. Methods

Research design

A descriptive, cross-sectional study was conducted with convenient sampling.

Measurement

Knowledge of breastfeeding was assessed from the survey. Details of the survey were given in the Supporting Information. The survey consisted of two parts: personal data and the questionnaire. The respondents' data (age, living area, profession, parity, ethnic group, educational level) was collected and treated under Vietnam's laws. For the age group classification, we were interested in two groups: those between 18 (legal married age for women according to the Vietnamese law) to 35 years old, and those above 35 years old (advanced maternal age).[9] Advanced maternal age was known to be a risk factor of pregnancy.[10] The questionnaire consisted of 31 questions, and each correct answer gave 1 point. The questionnaire was constructed from the WHO's Infant and Young Child Feeding and previous research.[1,11] As this research was small and local (at the E Hospital), we considered only two levels of knowledge: "Good" and "Not good". Participants' knowledge was categorized using Bloom's cutoff point, i.e. "Good" if the score was higher than 80%.[12,13] Participants were thus considered as having "good knowledge of breastfeeding" if they obtained 24 or more points.

Data collection

Data was collected using the REDCap platform by the authors from January 2023 to

October 2023. Collected data were analyzed using IBM SPSS® 20.0. Descriptive statistical analysis was performed by calculating maximum, minimum, mean, standard deviation, frequency, and percentage. Chi-Square test, Fisher's exact test, and T-test were employed to compare means and assess differences between obtained proportions. A significance level of $p < 0.05$ was considered statistically significant.

3. Research ethics

This project was approved on the 7th of September, 2023, for research by the Committee of Ethics and Science of E Hospital (Decision number 3185/QD/BVE).

Mothers participating in the study were clearly informed about the purpose and significance of the survey, which aimed to protect and improve community health, with no other intent.

Researchers were ready to provide information related to child healthcare and nutrition whenever mothers needed it after the survey.

After the survey, mothers would promptly receive explanations and advice on any breastfeeding-related issues they might have questions about.

All participating mothers had the right to refuse or withdraw from the study at any time without facing any discrimination. Personal information was kept strictly confidential.

III. RESULTS

1. General features of the research subjects

150 lactating mothers participated in this research. 91.1% were between 18 to 35 years old (the normal age). Most of the participants live in the urban area, and more than half had higher education. 70% of mothers had already given birth to at least one child.

2. Knowledge of mothers with children below 6 months old visiting the E Hospital

Knowledge of definition and importance of breastfeeding

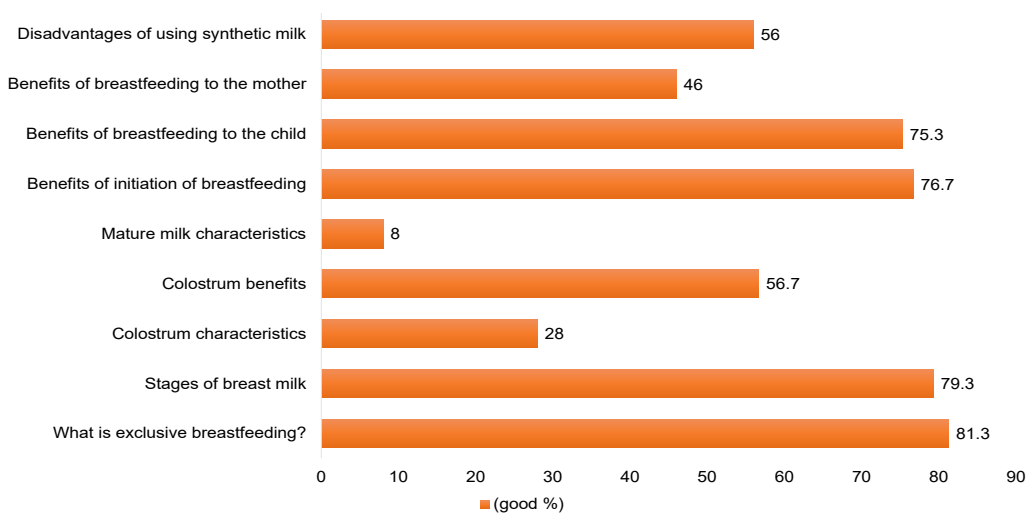

Chart 1. Good knowledge of definition and importance of breastfeeding

Most mothers understood correctly about the exclusive breastfeeding definition (81.3%), stages of human milk (79.3%), benefits of breastfeeding to the child (75.3%), and benefits of early initiation of breastfeeding (76.7%). On the other hand, most participants did not have good knowledge about the characteristics of mature milk (8%) and colostrum (28%).

Knowledge of the breastfeeding initiation time

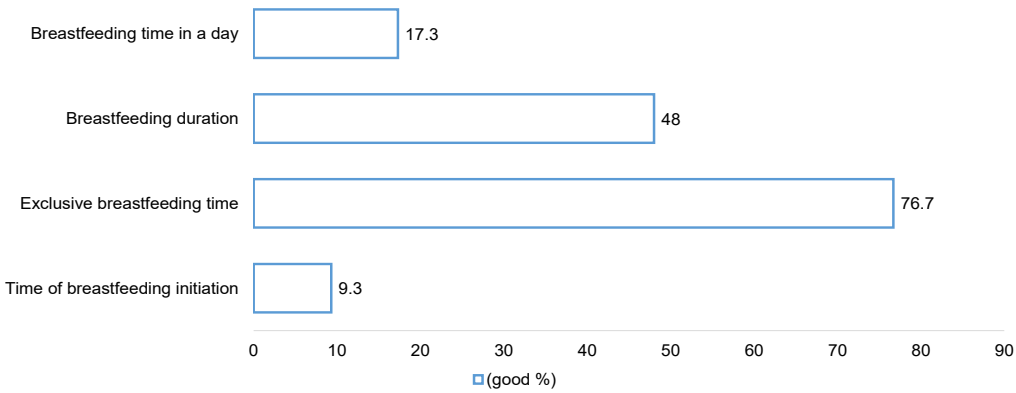

Chart 2. Good knowledge in breastfeeding initiaton time

Most participants did not have good knowledge of the time of breastfeeding initiation (9.3%) and breastfeeding time in a day (17.3%). Three-fourths of the participants knew the correct exclusive breastfeeding time, while only half of the mothers correctly understood the breastfeeding duration.

Knowledge of how to breastfeed properly

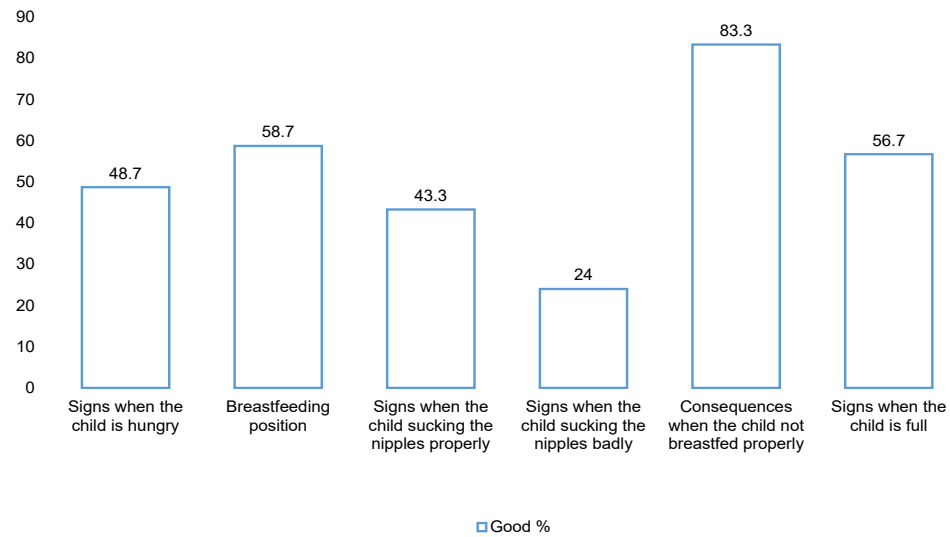

Chart 3. Good knowledge of how to breastfeed properly

Most participants had good knowledge of signs when the child is full (56.7%), and consequences when the child is not breastfed properly (83.3%). In contrast, most mothers had incorrect knowledge of signs when the child latched on badly (24%). About half of the participants knew the signs when the child was hungry (48.7%), breastfeeding position (58.7%), and signs when the child latched on properly (43.3%).

Knowledge of human milk maintenance and protection, how to express and store after expression

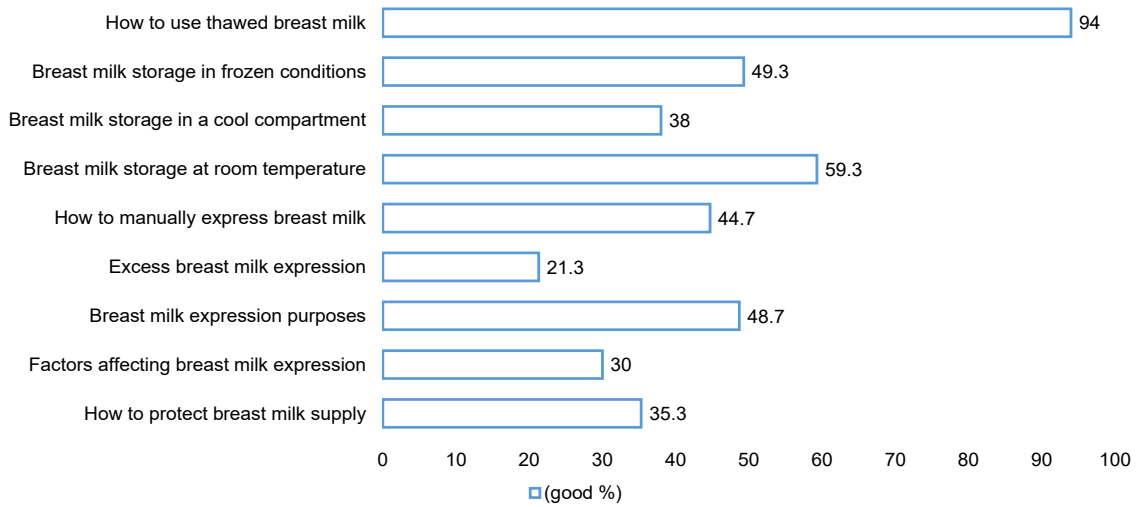

Chart 4. Good knowledge of human milk maintenance and protection, how to express and store after expression

94% of participants knew how to use the thawed milk, and 59.3% had good knowledge of how to store human milk at room temperature. In contrast, fewer than half of the participants understood correctly about human milk storage in a cool compartment (38%), human milk expression purposes (48.7%), and excess milk expression (21.3%). Most participating mothers did not know how to protect their human milk supply (35.3%), and the factors affecting human milk expression (30%).

Knowledge of breastfeeding in special cases

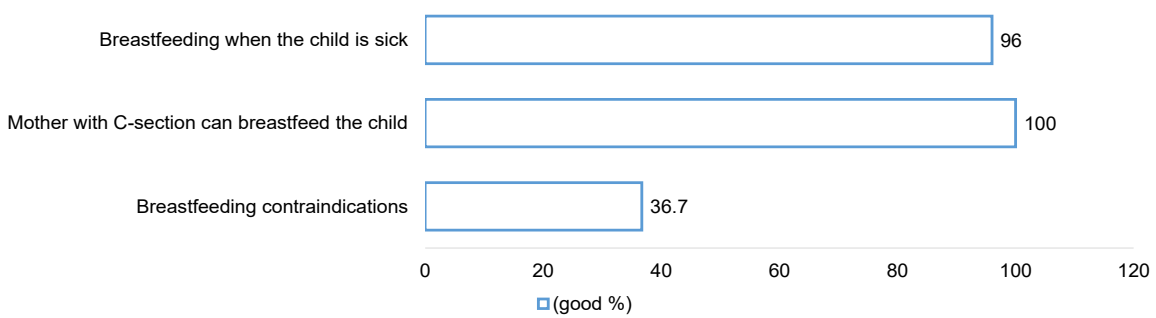

Chart 5. Good knowledge of breastfeeding in special cases

Most participants knew they could breastfeed their child when the child was sick and a mother with C-section can breastfeed. However, about two-thirds of the participants did not correctly understand the breastfeeding contraindications.

General knowledge

In general, most women participating in this research did not have good knowledge of breastfeeding. The good knowledge rate was only 7%. In summary, the fields that participants are good at and not good are given in Table 1.

Table 1. Category of good and not good knowledge in breastfeeding

	Good knowledge	Not good knowledge
Contents	- Breastfeeding definition. - Consequences when children are not breastfed properly. - How to use thawed human milk. - Special cases in breastfeeding.	- Colostrum and mature milk characteristics. - Signs of children badly sucking nipples. - Maintain and protect human milk supply. - How to express and store human milk after expression.

3. Factors associated with knowledge of breastfeeding

Table 2. Factors associated with knowledge of breastfeeding

Factors		Knowledge in breastfeeding				*p*-value	OR (95%CI)
		Good		Not good			
		n	%	n	%		
Age group	From 18 to 35 years old	11	8.0	126	92.0	0.29	-
	Above 35 years old	0	0.0	13	100.0		
Living area	Urban	11	9.1	110	90.9	0.09	-
	Rural	0	0.0	29	100.0		
Parity	Primitarous	5	11.1	40	88.9	0.307	2.06 (0.60 - 7.14)
	Multiparous	6	5.7	99	94.3		
Advice	Yes	8	7.6	97	92.4	1.00	1.154 (0.29 - 4.57)
	No	3	6.7	42	93.3		

Table 2 demonstrates some factors associated with breastfeeding in this research. All mothers above 35 years old did not have good knowledge of breastfeeding. As the *p*-value is smuch larger than 0.05, no meaningful relationship exists between mothers' ages and breastfeeding knowledge. None of the rural-living mothers has good knowledge of breastfeeding. However, the difference is not pronounced, with *p*-value = 0.09 > 0.05. There is no significant difference between primiparous and multiparous women in knowledge of breastfeeding, with *p*-value = 0.307 > 0.05 and OR = 2.06. There is also no significant difference in knowledge of breastfeeding, whether mothers were advised before or not, with *p*-value = 1.00 > 0.05 and OR = 1.154.

IV. DISCUSSION

150 answers were collected from 150 mothers with children below 6 months old visiting the E Hospital. Their ages varied from 18 to 42 years old, with the average being 30 ± 4.3, and the median being 29. Among them, 91.1% were 18 to 35 years old, and only 8.9% were above 35. It is consistent with the normal childbearing age from 18 to 35.[10]

The E Hospital is located in the Hanoi capital

downtown and is a tertiary hospital. Therefore, 80.7% of the mothers visiting our department were from urban areas, and 19.3% lived in rural areas and nearby provinces. 70% of the participants were multiparous, i.e., they had already given birth to at least one child.

Among a total of 150 received answers about knowledge of breastfeeding, the average score is 15.8 ± 4.9, with the median being 16 and the spectrum covers mostly from 13 to 18. This spectrum lies in the Not-good region. In general, only 7.3% of the respondents had good knowledge of breastfeeding. This result is relatively lower than previous research from Bui et al. (10.5%) at Nam Dinh Obstetrics and Gynecology Hospital (which is only less than 100 km away from our hospital) in 2017.[7] The result is also significantly lower than the result from other research in other countries, i.e. from Norah Faleh Al-Mutairi in Saudi Arabia in 2017 (57,1%).[14] While comparing results from different research is only relative and semi-quantitative, as there are differences in various factors (sample size, questionnaire, real context…), our result was much lower than what we expected at the beginning of this research. This shows that prenatal counseling is ineffective, because previously, mothers only learned theory but did not have practical experience. Therefore, breastfeeding counseling at the time of breastfeeding is very essential.

As described above and elsewhere, breastfeeding is a natural but effective way to protect the mothers' and children's health. Our result in knowledge of the definition and importance of breastfeeding shows that most mothers participating in this survey had good knowledge of the definition of exclusive breastfeeding (81.3%). This value is comparable to other research worldwide (Dukuzumuremyi et al. (84%) in East Africa, Lyellu et al. in Tanzania (81%) and higher than the result from Campania (Italy) with only 71%.[15-17] In Vietnam, our result is slightly higher than Bui et al. (78% in Nam Dinh)[7] and Dang Cam Tu (74% in Hà Nam, Lào Cai, Quảng Bình).[18] However, the difference is not pronounced.

More than half of the mothers knew the benefit of colostrum to newborn development (56.7%). About 80% of participants gave correct answers in stages of the human milk. However, knowledge of colostrum and mature milk's characteristics was low, as only 8% and 28% of mothers, respectively could answer these questions well. This suggests that it would be essential to educate and advise mothers more about the stages of human milk. If mothers know more about the benefits of colostrum, they can make better decisions about how to breastfeed their children. Knowing correctly about the stages of human milk and their characteristics can optimize the time to breastfeed the children. This also reduces the malnutrition rate and other nutrition-related health problems in children.

According to the World Health Organization, early breastfeeding in the first hour of the child's life is critical. Early breastfeeding benefits both mother and child, as it can take advantage of the nutrition from colostrum. Colostrum has more antibodies, antiseptic proteins, and leukocytes than mature milk, helping the child prevent infections, allergies, and other potential diseases. Furthermore, early breastfeeding helps the mother's uterus contract quickly, creating the ability to stop bleeding and stimulating milk secretion for the mother. Our result is relatively positive, as three-fourths of the mothers had good knowledge of the benefits of giving their children human milk in the first hour of life (76.7%). Nevertheless, knowledge of

the time of breastfeeding initiation and duration of breastfeeding was surprisingly low (9.2%). This percentage is much lower than Bui et al. (58%).[7] Given that Bui's research was before the COVID pandemic, while ours was just a year after COVID time, it would be possible that the pandemic situation might affect how mothers find information about breastfeeding. Nonetheless, it must be stressed that enhancing knowledge of breastfeeding not only for the mother but also for the care takers (including family members and healthcare workers) will accelerate the early breastfeeding rate.

Most mothers had good knowledge of the benefits of breastfeeding to children (75.3%) and the disadvantages of using formula milk for children (56%). However, fewer than half of the participants knew correctly about the benefits of breastfeeding to the mother. While it is undeniable that breastfeeding is essential for the child, mentioning the benefits of breastfeeding to the mother is modest. Breastfeeding not only increases natural intimacy time and strengthens mother-child bonds but also has positive, long-term impacts on households and national and global communities, both medically and economically. It helps the mother be healthy, preventing breast cancer and regaining her body form. It also helps with contraception. Not knowing correctly about the benefits of breastfeeding to both the mother and the child, as well as the growing popularity of formula milk commercials in public media might reduce the mothers' desire to breastfeed their children, or reduce the breastfeeding time, affecting the children's healthcare quality.

About half of the participants had good knowledge of the breastfeeding position, signs when the child is sucking the nipples well, and signs when the child is full (58.7%, 43.3%, and 56.7%, respectively). Proper breastfeeding position and signs when the child is sucking the nipples well are important factors for good breastfeeding, helping the child receive enough human milk from the mother, avoiding choking and limiting bloating and vomiting. In addition, not having the right knowledge of the right position and latching can cause unnecessary damage to the mother, such as pain, cracked nipples, etc. This is one of the main reasons that many mothers do not want to breastfeed their children, as 12% of the participating mothers were afraid of pain or losing their body form. Hence, besides theoretical lectures, practical courses with models can enhance proper breastfeeding skills and help mothers face common problems in breastfeeding. Only 44.7% of the participants had good knowledge of how to express human milk manually, which is significantly lower than the results from Adhikari et al. in Nepal (88.4%), though their sample size was two times smaller (69 samples).[19] The presence of a breast pump can be an explanation for the situation. Breast pump benefits mothers, but cannot often replace manual human milk expression. Henceforth, training in manual human milk expression is still necessary.

Only 35.3% of the answers received showed good knowledge of human milk supply protection. The percentage was even lower for factors affecting human milk expression (30%) and excess human milk expression (21.2%). 71.3% of participants said that they did not have enough time for their children after the maternal leave, and this is one of the most popular reasons for surrendering breastfeeding. This observation stresses the role of advising in knowledge and training in breastfeeding skills, in particular in working mothers. This knowledge and these skills help lactating mothers to reintegrate into work more

efficiently without giving up breastfeeding.

We found that a vast majority of mothers knew how to use thawed milk (94%). This observation can be easily explained by the fact that most respondents (or in general, most Vietnamese women nowadays) are workers, and thawing milk is an important (if not in many cases the only) way to feed their children after the pregnancy. However, 62% of mothers surveyed still answered incorrectly about human milk storage in the cool compartment. This poses potential risks for children when using thawed milk. In many countries, i.e. the United States of America, it is mandatory by law for the business to provide break time for lactating mothers to express their human milk and a place for this purpose.[20] However, this is only required in Vietnam for enterprises with more than 1000 female workers.[21]

All participants understood that mothers who underwent C-sections could breastfeed their children. Most of them also understood correctly that sick children could be breastfed. However, two-thirds of the respondents (63.3%) did not have correct knowledge of breastfeeding contraindications. This affected both mothers and children, suggesting pre-pregnancy education, not only in enhancing the breastfeeding rate but also in contraindications. Moreover, it is crucial to provide essential help to mothers with special conditions, i.e. mothers with HIV or mothers using psychotropic drugs.

Besides assessing, we also performed statistics to analyze factors associated with breastfeeding knowledge.

We observed that there was no statistically significant evidence of the influence of age and living areas on good knowledge of breastfeeding (cf. Table 2).

In contradiction to common beliefs in Vietnam (that mothers with at least one child would have more experience in breastfeeding), our research shows that there was no significant difference between multiparous and primiparous mothers in good breastfeeding knowledge (p-value = 0.307 > 0.05, cf. Table 2). This conclusion implies that personal experience and folk beliefs are not always correct, and one should rely on knowledge based on scientific evidence.

Table 2 shows unexpected results about advising. We found that there was no relation between good breastfeeding knowledge and prenatal advice (p-value = 1.00). This finding implies that many prenatal advice activities, given by healthcare workers, were inefficient. In modern society, fake news from social media is a problem, particularly in the medical area. Henceforth, healthcare workers played a crucial role in providing correct medical information. This result suggests that healthcare workers must standardize their knowledge to prevent any misleading, even false knowledge to their patients.

Limitations

Our research has some limits:

The sample size was small. Although we tried to collect data from a relatively wide range of respondents, a small sample size may cause some bias in the research outcomes.

The participants were mothers with children visiting the hospital, so a majority of their children were sick. It could cause some anxiety and affect the answers.

Using Bloom's cutoff point with an 80% threshold for "good knowledge" is only semi-quantitative. Deeper classification into different levels (for instance, good, moderate, poor…) could also be done, but fell outside of the scope of this study as this study was small and local.

Due to limited conditions and resources, we were unable to conduct a study on mothers' practices and instead used a self-administered

questionnaire with a pre-designed set of questions. This approach may not provide a comprehensive assessment, as participants might skip questions or respond randomly.

V. CONCLUSION

Only 7% of mothers have general correct knowledge about breastfeeding. Of these, the majority of mothers have correct knowledge about the concept of breastfeeding as well as understand the importance of breastfeeding, know the consequences of improper breastfeeding, and know how to use frozen milk. In addition, the majority of mothers have incorrect knowledge about the characteristics of colostrum and mature milk, signs of good and bad latching, maintaining and protecting human milk, and how to express and store it after expressing. This study demonstrates that factors such as age, place of residence, number of births, and education level were not statistically related to knowledge about breastfeeding. Therefore, we recommend strengthening education to increase knowledge about breastfeeding. We also suggest building official communication channels on breastfeeding advice, developing scientific programs and seminars, and preventing fake news in the media.

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Conflict of interest

The authors declare no conflict of interest in this research.

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