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The influence of breastfeeding technique education on knowledge of lactation problem prevention

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ABSTRACT

Background: *Proper breastfeeding techniques are essential for maintaining optimal breast milk production. Incorrect application of these techniques may result in nipple trauma and discourage mothers from breastfeeding. Inadequate breastfeeding can lead to infant malnutrition, increased susceptibility to illness, and, in severe cases, mortality. Health education serves as an effective strategy for postpartum mothers, as it provides knowledge that fosters behavioral change and reduces the risk of exclusive breastfeeding failure.*
Objectives: *This study aimed to evaluate the effect of breastfeeding technique education on improving postpartum mothers' knowledge in preventing lactation problems.*
Methods: *A quantitative study with a pre-experimental design, specifically a one-group pretest–posttest approach, was conducted. The sample comprised 26 respondents selected through total sampling. Data were analyzed using univariate methods to describe knowledge levels before and after the intervention, and bivariate methods to assess differences between the two measurement points. The Wilcoxon test was applied because the data were not normally distributed ($p < 0.05$).*
Results: *The findings revealed a significant effect of breastfeeding technique education on the improvement of postpartum mothers' knowledge in preventing lactation problems, with a p-value of 0.000 ($< \alpha = 0.05$).*
Conclusions: *Providing education and information on breastfeeding techniques, supported by healthcare professionals, particularly midwives, is crucial. This intervention has been demonstrated to be an effective strategy for enhancing breastfeeding success and preventing lactation-related problems.*

KEYWORD*: breastfeeding technique; effect of education; knowledge; lactation problems; postpartum mothers*

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INTRODUCTION

The First 1,000 Days of Life (HPK) is often known as the "window of opportunity" or "golden age," because during this phase—from pregnancy to the age of two—there is accelerated growth and development not seen at other ages. Nutritional fulfillment during this period significantly determines the quality of a child's growth and development. Therefore, mothers must maintain a healthy diet from pregnancy onward to support optimal fetal development. After birth, global recommendations recommend exclusive breastfeeding for the first six months, followed by continued breastfeeding until the age of two years (1).

Globally, the average exclusive breastfeeding coverage for infants under six months is only 40%, and only 23 countries have achieved the 60% target. This situation is quite concerning, especially in the Americas, where only 6% of countries have achieved greater than 60% exclusive breastfeeding coverage (2). According to the Indonesian Basic Health Research Data (RISKESDAS), of the total 2.3 million infants under 6 months in Indonesia in 2021, only 52.5%, or half, received exclusive breastfeeding. This figure represents a 12% decrease compared to 2019. Furthermore, the breastfeeding initiation rate (IMD) also decreased from 58.2% in 2019 to 48.6% in 2021 (3). Exclusive breastfeeding coverage in Indonesia in 2021 was recorded at 56.9%, with the highest achievement in West Nusa Tenggara (82.4%) and the lowest in Maluku (13%). Several provinces, such as Maluku, Papua, Gorontalo, West Papua, and North Sulawesi, have not yet achieved the national target (4). Meanwhile, West Java recorded 68.09% coverage in 2020, an increase from the previous year, with the highest achievement in Cirebon City at 109.66% (5). In Bekasi Regency, exclusive breastfeeding coverage in 2021 reached 72.59%, an increase from 65.53% in 2020 and 58.3% in 2019 (6).

Breastfeeding is a crucial factor influencing infant health. Challenges in breastfeeding can impact the success of exclusive breastfeeding and influence the baby's long-term growth and development. One factor determining the success of exclusive breastfeeding is breastfeeding experience. For primiparous mothers, this experience is often accompanied by pressure from both themselves and their environment, thus requiring the ability to initiate and maintain breastfeeding despite limited infrastructure support (7).

Breast care is a procedure performed to maintain breast health. Breast care is essential for mothers after childbirth, as it significantly impacts breast milk production. The purpose of breast care is to improve blood circulation, prevent blocked milk ducts, and facilitate milk flow. The hormones that influence breast milk production are prolactin and oxytocin (8). The success of exclusive breastfeeding is greatly influenced

by maternal knowledge. Good knowledge fosters a positive attitude and consistent breastfeeding behavior. Conversely, a lack of understanding often leads mothers to stop breastfeeding early, replace it with formula, or provide inappropriate complementary foods (9). Research shows that incorrect breastfeeding techniques, such as improper latch, are a common cause of lactation problems such as sore nipples, pain, and breast engorgement (10). Correct breastfeeding techniques play a crucial role in preventing these problems and ensuring optimal nutrition for the baby. Proper positioning and attachment will prevent sore nipples, increase baby comfort, and reduce the risk of regurgitation (11). Unfortunately, many breastfeeding mothers still lack this understanding, resulting in barriers to breastfeeding (12).

Therefore, interventions in the form of health education from health workers, particularly midwives, are urgently needed. Health education has been proven effective in increasing knowledge, improving attitudes, and shaping behaviors that support successful breastfeeding (13). Information from peers can also increase mothers' knowledge about exclusive breastfeeding and breastfeeding duration and reduce breastfeeding-related problems. Strengthening knowledge can encourage mothers to practice breastfeeding using good breastfeeding techniques, thus achieving exclusive breastfeeding for six months (14).

The higher a mother's education level, the greater her ability to absorb new information and apply it to breastfeeding practices (15). To achieve this, education is needed by health workers, particularly midwives who act as lactation counselors. The use of appropriate media for information delivery is also important for effective knowledge absorption (16). Based on this description, it can be emphasized that breastfeeding technique is a key factor in successful breastfeeding. So that by educating breastfeeding mothers, it can increase mothers' knowledge in recognizing all problems that arise during the breastfeeding process. Therefore, support from health workers through structured education is essential to improve postpartum mothers' knowledge and prevent failure in exclusive breastfeeding.

MATERIALS AND METHODS

This study used a quasi-experimental design with a one-group pretest-posttest approach. In this design, respondents were given a pretest to assess initial knowledge, then received education on breastfeeding techniques, and then a posttest was administered to determine changes in knowledge after the intervention. The research location was conducted in Karangraharja Village, North Cikarang District, in April 2025. The population in this study was all breastfeeding mothers or postpartum mothers in Karagraharja Village. The sample of this study was breastfeeding

mothers who met the inclusion criteria, or postpartum mothers ≤ 6 months, who were willing to be respondents. Meanwhile, the inclusion criteria were mothers with medical conditions that interfere with the breastfeeding process who did not attend the complete education session. The sampling technique used was total sampling, so that 26 respondents were obtained. The research instrument materials were educational materials on breastfeeding techniques, which included: correct position and latch-on, frequency and duration of breastfeeding, signs that the baby is getting enough breast milk, techniques for attaching and removing the baby, and prevention of common lactation problems (sore nipples, breast milk engorgement, mastitis). Educational media were leaflets/booklets, PPT/short videos, and demonstrations using baby dolls. The knowledge measurement instrument contained 25 questions about breastfeeding techniques and prevention of lactation problems; the questionnaire had been tested for validity and reliability. The questionnaire has been tested for validity to 26 respondents with the same characteristics, namely in Waluya village with the results of 20 questionnaire questions that were declared valid 15 questions (question no. 1,2,4,5,6,8,9,11,13, 14,15,16,17,18,19) and the reliability result of 0.846 means that > out of 0.06 means that the questionnaire is reliable. The research procedure involved respondents completing a questionnaire to assess their initial knowledge. They were then given an educational intervention on breastfeeding techniques, including interactive lectures, demonstrations of breastfeeding techniques with baby dolls, and a 45-minute question-and-answer discussion. A posttest was administered 15–30 minutes after the education was delivered to measure the increase in knowledge. Univariate data analysis was performed to describe the level of knowledge of respondents before and after the intervention in the form of frequency distribution, percentage, mean value, and standard deviation. Bivariate analysis was then performed to determine the effect of education on knowledge. The statistical test used was the Wilcoxon test, as it was not normally distributed if the p-value was <0.05. This research has been carried out an ethics test at the research ethics committee of Medika Suherman University with Ethical Feasibility Letter No:002547/Universitas Medika Suherman/ 2025.

RESULT and DISCUSSION

Univariate Analysis

Univariate analysis was used to describe each research variable separately, including respondent characteristics and the main variables assessed before and after breastfeeding technique education. The results of the analysis are presented in the form of frequency distributions, percentages, and statistical values such as

Table 1. Knowledge of postpartum mothers before the intervention

Knowledge	Pretest	%	Posttest	%
Poor	5	19.3	1	3.8
Sufficient	2	7.7	5	19.2
Good	19	73	20	77
Total	26	100	26	100

Table 2. Improvement in knowledge of postpartum mothers before and after breastfeeding technique education

	Mean	N	Std. Deviation	Std. Error Mean
Pretest Knowledge	16.08	26	3.846	0.754
Posttest Knowledge	17.62	26	3.125	0.613

mean, standard deviation, minimum, and maximum values.

Based on **Table 1**, it is known that before the Intervention, 19 (73%) respondents had good knowledge, while 5 (19.3%) respondents had poor knowledge. Meanwhile, regarding the knowledge of breastfeeding mothers after the intervention, 20 respondents (77%) had good knowledge, 1 respondent (3.8%) had poor knowledge, and 5 respondents (19.2%) had sufficient knowledge.

Based on **Table 2**, the descriptive analysis results show that the mean pretest score for postpartum mothers' knowledge about preventing lactation problems before education was 16.08. Meanwhile, the posttest score for postpartum mothers' knowledge about preventing lactation problems after education was 17.62. This indicates an increase in breastfeeding mothers' knowledge about preventing lactation problems after receiving breastfeeding technique education.

Bivariate Analysis

Bivariate analysis was conducted to assess the relationship or difference between two variables: the independent variable (breastfeeding technique education) and the dependent variable (mothers' knowledge about preventing lactation problems). This analysis was used

Table 3. Pretest and posttest normality test

	Kolmogorov-smirnova			Shapiro-wilk		
	Statistic	df	sig	Statistic	df	sig
Postpartum mothers' knowledge before receiving breastfeeding technique education	0.268	26	0.000	0.826	26	0.001
Postpartum mothers' knowledge after receiving breastfeeding technique education	0.277	26	0.000	0.765	26	0.000

Table 4. Wilcoxon test

Knowledge	Asymp. Sig	Negative Rank	Positive Rank			Ties
			N	Mean Rank	Sum of Rank	
Pretest Posttest	0.000	0a	24b	12.5	300	2c

to determine whether the educational intervention had a significant impact on improving respondents' knowledge. Data normality test results using the Shapiro-Wilk. Because the sample size was <100, and the p-value was <0.05, the data were concluded to be non-normal. Therefore, a Wilcoxon test was performed.

Based on **Table 4** above, it shows that the results of the statistical test are known to Asymp. Sig is 0.000 (P < 0.05), so it can be concluded that the hypothesis is accepted. This means that there is a difference between the results of the Pretest and Posttest, so it can also be concluded that there is an influence on the implementation of education with increasing knowledge about the prevention of lactation problems in Karangraharja Village, North Cikarang District. Negative Rank or difference indicates that there is no value reduction from pretest to posttest value. Positive Ranks or difference (Positive) shows that there are 24 positive data (N) which means that the 24 mothers have experienced an increase in knowledge from pretest and posttest scores. The Mean Ranks or the average increase is 12.50 while the number of positive rankings or Sum of Ranks is 300.00. Ties is the similarity of pretest and posttest scores, here the Ties score is 2, so it can be said that there are 2 equal values between the pretest and posttest scores.

DISCUSSION

Based on **Table 1**. it was found that the knowledge of postpartum mothers before being given the intervention was 19 people (73%) who had good knowledge, and respondents had less knowledge, as 5 people (19.3%). While the knowledge of breastfeeding mothers after being given the intervention was 20 people (77%) who had good knowledge, respondents had less knowledge, as many as 1 person (3.8%), and respondents had sufficient knowledge, as many as 5 people (19.2%).

Based on **Table 2** the average pretest value of postpartum mothers' knowledge about preventing lactation problems before being given education was obtained with a mean = 16.08. On the other side, the results of the posttest of postpartum mothers' knowledge about preventing lactation problems after being given education had a mean = 17.62. This means that there was an increase in the knowledge of breastfeeding mothers about preventing lactation problems after receiving education on breastfeeding techniques. Based on **Table 3** data normality test using Shapiro-

Wilk because the sample was <100, and the result was a p value of < 0.05, so the conclusion was that the data was not normal, therefore the Wilcoxon test was carried out shows that the results of the statistical test are known to Asymp. Sig is 0.000 (P < 0.05), so it can be concluded that the hypothesis is accepted. This means that there is a difference between the results of the Pretest and Posttest, so it can also be concluded that there is an influence on the implementation of education with increasing knowledge about the prevention of lactation problems in Karangraharja Village, North Cikarang District. This demonstrates that the delivery of breastfeeding technique material significantly impacted the mastery of information regarding preventing lactation problems.

This finding aligns with research by Dyah Maaysari Fatwa, which showed a mean difference in respondents' knowledge before and after receiving education of 19.40, with a standard deviation of 0.734. The statistical test yielded a p-value of 0.000 (p < 0.05), indicating a significant difference in respondents' knowledge before and after education. This consistency strengthens evidence that providing systematic information can improve mothers' cognitive abilities regarding lactation management. Theoretically, increasing knowledge is the first step in developing healthy behaviors, as explained in behavior change models such as the Health Belief Model (17). Mita Puspitasari's research provides strong support for these findings by demonstrating that breastfeeding technique education significantly improves lactation success. The increase in the average score from 5.53 (adequate) to 8.40 (good) after education not only reflects a change in scores but also demonstrates a significant improvement in mothers' skills in implementing proper breastfeeding techniques. The decrease in the standard deviation from 1.471 to 0.986 also indicates that after the intervention, the variation in success among respondents decreased, indicating a more even and consistent effect of education across different groups of mothers. A p-value of 0.000 in the statistical test indicates that the change in scores was not a random result, but rather a direct effect of the education provided. These results confirm that the educational program has high intervention power and a clinically significant effect. This aligns with health behavior theory, which states that increasing maternal understanding will strengthen breastfeeding confidence and encourage more consistent breastfeeding practices (10).

Lack of understanding proper breastfeeding techniques often leads to mothers experiencing difficulties or stopping breastfeeding earlier than recommended (18). Proper breastfeeding technique is not only related to the positioning of the mother and baby but is also a crucial physiological

factor determining successful lactation. A good latch where the baby's mouth covers most of the areola, not just the nipple provides optimal stimulation to the receptors in the nipple. This stimulation then triggers the release of the hormones oxytocin and prolactin, which play a role in the milk ejection reflex and milk production. If the position or latch is incorrect, this stimulation is less effective, which can inhibit milk flow, reduce production, and lead to problems such as nipple pain, mastitis, or engorgement.

Therefore, proper breastfeeding technique serves to prevent complications for the mother while ensuring the baby receives breast milk effectively (19). Proper breastfeeding technique is not only related to the positioning of the mother and baby, but is also a crucial physiological factor determining successful lactation. A good latch where the baby's mouth covers most of the areola, not just the nipple provides optimal stimulation to the receptors in the nipple. This stimulation then triggers the release of the hormones oxytocin and prolactin, which play a role in the milk ejection reflex and milk production. If the position or latch is incorrect, this stimulation is less effective, which can inhibit milk flow, reduce production, and lead to problems such as nipple pain, mastitis, or engorgement. Therefore, proper breastfeeding technique serves to prevent complications for the mother while ensuring the baby receives breast milk effectively.

Furthermore, mastering proper breastfeeding techniques also influences the sustainability of breastfeeding practices. Mothers who breastfeed comfortably and painlessly tend to have greater motivation and confidence to continue breastfeeding. This aligns with the concept of self-efficacy, which explains that positive experiences with an activity can increase a person's confidence to maintain that behavior. Therefore, breastfeeding techniques not only play a role in the physical aspect but also have a psychological impact that supports overall breastfeeding success.

Early Initiation of Breastfeeding (IMD) is a crucial first step in the breastfeeding process. IMD not only helps the baby recognize the nipple but also triggers the stimulation of the hormones oxytocin and prolactin, which play a crucial role in milk production and release. This means that successful breastfeeding is closely related to physiological responses that depend on proper breastfeeding practices (20). IMD is also a crucial foundation for successful exclusive breastfeeding. The skin-to-skin contact and emotional closeness that occur during IMD encourage an increase in oxytocin, thus not only supporting milk production but also helping the mother feel calmer and more confident. This emotional stability is crucial for maintaining continued breastfeeding. Therefore, a lack of education about the benefits of early initiation of breastfeeding and breastfeeding techniques can make it difficult for mothers

to maintain breastfeeding, even with strong initial intentions.

Overall, these findings suggest that education on breastfeeding techniques should be considered a key intervention in preventing lactation problems. By providing a comprehensive understanding, health workers can help mothers detect problems early, improve technique before complications arise, and maintain consistent breastfeeding. Thus, education not only increases maternal knowledge but also plays a crucial role in preventing breastfeeding failure, which is often caused by factors that can be prevented early on.

CONCLUSION and RECOMMENDATION

The results of this study demonstrate that providing education on breastfeeding techniques significantly improves postpartum mothers' knowledge and skills in preventing lactation problems. Through interventions such as counseling and demonstrations, mothers' understanding of correct breastfeeding positions and attachments improves, thereby reducing the likelihood of sore nipples, engorgement, and mastitis. Therefore, education on breastfeeding techniques can be an effective strategy to increase the success of exclusive breastfeeding and support maternal and infant health. Postpartum mothers are expected to be more proactive in participating in health education and implementing correct breastfeeding techniques to ensure optimal breastfeeding. Health workers, particularly midwives and nurses, need to increase their role in providing ongoing education through counseling, hands-on practice, and postpartum support. Healthcare institutions are advised to make breastfeeding technique education a routine program in antenatal and postnatal services, while also providing educational materials such as leaflets, videos, or practical modules to strengthen mothers' understanding. For future researchers, studies with stronger designs, larger sample sizes, and long-term evaluations are needed to assess the effectiveness of education on breastfeeding practices and infant nutritional status.

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