Correlation Among Maternal and Infant Factors, Social Support and Breastfeeding Self-efficacy: A Cross-sectional Study in Indonesia

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Article

Correlation Among Maternal and Infant Factors, Social Support and Breastfeeding Self-Efficacy: A Cross-Sectional Study in Indonesia

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Abstract: Background: Breastfeeding self-efficacy is a critical factor influencing the initiation and continuation of breastfeeding among mothers. Low self-efficacy affects mothers' ability to sustain breastfeeding. Several studies have investigated the factors influencing breastfeeding self-efficacy, but none have interconnected maternal, infant, and social support factors. **Aims:** This study aimed to measure the correlation between maternal and infant factors, social support, and breastfeeding self-efficacy. **Methods:** A cross-sectional approach was employed in Jember, Indonesia, among 200 breastfeeding mothers. The study population consisted of mothers 17-42 years old who were breastfeeding and who met the following inclusion criteria: mothers who have babies aged 1-6 months, term pregnancy history, wanted pregnancy, and baby weight born ≥ 2500 grams. Maternal and infant factors and social support were determined through interviews and questionnaires. Breastfeeding self-efficacy was examined using The Breastfeeding Self-efficacy Scale Short. The multiple logistic analysis was used for multivariate analysis. **Results:** Of a total of 200 breastfeeding mothers, 63% had low breastfeeding self-efficacy, and 59.5% of mothers did not exclusively breastfeed. The multiple logistic regression indicated that 74.2% of the factors included in the model influenced breastfeeding self-efficacy. Positive correlations were observed between breastfeeding self-efficacy and feeding type (OR=6.603), breastfeeding frequency (OR=6.220), breastfeeding intention (OR=4.993), and family type (OR=4.001). **Conclusion:** feeding type, breastfeeding frequency, and family support were the important factors that support breastfeeding self-efficacy.

Keywords: breastfeeding self-efficacy; infant; maternal; social support

1. Introduction

Breastmilk is widely recognized as the best nutrition for infants aged 0-6 months due to its numerous benefits for both the infant and the mother [1]. The advantages of breastfeeding extend to both short- and long-term outcomes, encompassing physical, mental, and financial aspects [2]. Exclusive breastfeeding for the first six months of life is a widely recommended practice by the World Health Organization (WHO) [3]. Exclusive breastfeeding protects infants from infections such as diarrhea, pneumonia, and asthma. It can lower the frequency of otitis media, malnutrition, and length of hospitalization, which is the leading cause of death in infants under the age of five [4]. Moreover, exclusive breastfeeding has been associated with reduced rates of postpartum depression [5].

Exclusive breastfeeding is still a special problem in Indonesia. In 2021, the national coverage of exclusive breastfeeding for infants in Indonesia was 71.58%, whereas The Ministry of Health aimed to increase the target to 80% [6]. The national rate of exclusive breastfeeding among children under 2 years was 52.0% in 2017 [7]. Exclusive breastfeeding coverage can be significantly influenced by

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breastfeeding self-efficacy (BSE). BSE is the belief in a mother's capability and confidence to successfully breastfeed her infant [8]. Several studies have emphasized the vital role of BSE in the success of exclusive breastfeeding. Mothers with higher levels of self-efficacy are more committed to exclusive breastfeeding and are more likely to continue breastfeeding despite facing challenges [9,10]. Studies in Indonesia state that the high BSE among mothers is no more than 50% [11]. Perception of milk insufficiency and other factors related to the mother, infant, pregnancy, and breastfeeding can influence BSE [12].

Maternal factors were reported to influence BSE. Studies have emphasized the importance of maternal emotions, attitudes, knowledge, and social support in relation to BSE [7,13]. A mother's belief in her ability to control environmental demands, her physical and psychological condition postpartum, and the establishment of exclusive breastfeeding correlated with BSE [9]. Additionally, psychosocial factors like maternal confidence, intention to breastfeed, and maternal mental health impact breastfeeding outcomes through their influence on BSE [14].

The interaction between the mother and the infant, as well as the mother's willingness to breastfeed, can also contribute to the improvement of BSE over time [15]. Various factors related to the infant also impact the BSE. For example, supplementation provided to a breastfed infant may lower BSE due to a mother's perception of poor performance accomplishment [16]. Additionally, past difficulties with breastfeeding can lead to a less favorable attitude toward breastfeeding and lower self-efficacy [17]. Maternal-infant interaction plays a pivotal role in shaping the mother-infant bond and fostering positive breastfeeding experiences. Early interactions, such as skin-to-skin contact, responsive feeding, and emotional attunement, have been linked to improved breastfeeding outcomes. These interactions not only promote the release of oxytocin but also enhance the infant's ability to latch and suck effectively [18]. Proper latch, suck, and swallow coordination are vital for successful breastfeeding[19]. Addressing issues like tongue tie can positively impact self-reported breastfeeding and reduce pain [20].

In addition to maternal and infant factors, several studies have highlighted the positive correlation between social support and BSE. Breastfeeding family support and social support from significant others were positively associated with BSE. Higher levels of social support were related to better BSE and increased breastfeeding success [21]. Fathers' support for the breastfeeding process has been found to positively impact mothers' breastfeeding self-efficacy and the attachment between the father and the infant [22]. Based on the research that was conducted in several countries. Breastfeeding self-efficacy is influenced by various factors, with diverse results. Moreover, there have not been many studies that comprehensively examine the maternal, infant, and social aspects of BSE. So, this study aimed to measure the correlation between maternal and infant factors, social support, and breastfeeding self-efficacy.

2. Material and Methods

2.1. Study Design

A cross-sectional approach was employed in Jember, Indonesia, among 200 lactating mothers. The research was conducted at 3 community health centers from January to July 2023.

2.2. Participants

The study population consisted of mothers 17-42 years old who were breastfeeding and who met the following inclusion criteria: mothers who have babies aged 1-6 months, term pregnancy history, wanted pregnancy, and baby weight born ≥ 2500 grams. Exclusion criteria: the mother was sick during the study. The participants were chosen using a purposive sampling technique. The sample size was determined to be 200 participants, as calculated using the Slovin formula [23] with a margin error of 5%. This was based on the population in the study area 6 months prior, which was 354 people. A total of 188 participants were deemed necessary, with an additional 10% included to account for potential dropouts. However, 4 participants were ultimately excluded based on the predefined exclusion criteria, and 3 withdrew during the study.

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2.3. Data Collection

2.3.1. Maternal and Infant Factors and Social Support

Maternal factors, such as age, education level, family type, parity, type of breastfeeding information, occupation, family income, delivery method, breastfeeding knowledge, breastfeeding culture, breastfeeding experience, and breastfeeding intention, were determined through interviews and questionnaires. Breastfeeding Knowledge questionnaires were adopted from Dukuzumuremyi et al., 2020 [24], and breastfeeding intention questionnaires were adopted from Bethel-Jaiteh, 2020 [25].

Infant factors included the infant's age, infant's weight, infant's sex, infant's feeding type, breastfeeding frequency, breastfeeding duration, latch, type of supplementation, supplementation method, infant state, output urine, and output feces were examined using a breastfeeding monitoring system (LACTOR) adapted from Ahmed and Ouzzani, 2013 [26].

Social support included preparing to breastfeed, partner support, mother-in-law or grandmother support, friend and neighbor support, physical support, emotional support, and information support. This variable was examined using questionnaires adopted from Boateng et al., 2018 [27].

2.3.2. Breastfeeding Self-Efficacy

Breastfeeding self-efficacy was examined using The Breastfeeding Self-efficacy Scale Short Form (BSES-SF) [28]. It is a questionnaire consisting of 14 items used to measure the level of confidence a person has in their ability to breastfeed. Each item begins with the statement "I can always" and is rated on a 5-point scale ranging from 1 (not confident at all) to 5 (completely confident). The total score of the questionnaire ranges from 14 to 70, with higher scores indicating greater levels of breastfeeding self-efficacy. All questionnaires were translated into the Indonesian language. In the current study, the BSE has been divided into two categories: high (greater than 50) and low (less than or equal to 50).

2.4. Analysis

Statistical analysis was conducted using SPSS version 26 (IBM Corp., Armonk, NY, USA). The Chi-square analysis was employed to examine the bivariate relationship between maternal and infant factors, social support, and BSE. The multiple logistic analysis was used for multivariate analysis. In this analysis, only variables with a significance level of $p<0.05$ in the bivariate analysis were selected. A p-value of less than 0.05 was considered to indicate statistical significance.

2.5. Ethical Consideration

The study protocol was approved by the Health Research Ethics Commission at the Faculty of Medicine of Universitas Brawijaya (No.11/EC/KEPK–PSPDS/01/2023).

3. Results

3.1. Maternal Factor

Of the 200 breastfeeding mothers, 96.5% were between 20-45 years old. Furthermore, 65% had given birth multiple times, 54% had high school, 85% were unemployed and 53.5% had a family income under the minimum regional wage. The breastfeeding mothers had a normal delivery experience amount 82.5%, 79.5% had high breastfeeding knowledge, 71% had a positive breastfeeding culture, 59.5% had no breastfeeding experience and 82.5% had a low breastfeeding intention. The breastfeeding self-efficacy was 63% low. The result of the data analysis, as shown in Table 1, revealed the correlation between breastfeeding self-efficacy with maternal age ($p=0.030$), family type ($p=0.020$), parity ($p=0.002$), types of breastfeeding information ($p<0.001$), breastfeeding culture ($p<0.001$), breastfeeding experience ($p<0.001$), and breastfeeding intention ($p<0.001$). The maternal factors that had the strongest relationship with breastfeeding self-efficacy were

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breastfeeding experience and breastfeeding intention with OR (95% CI) of 34.364 (15.258-77.393) and 21.988 (7.336-65.910) respectively.

Table 1. The Correlation between Maternal Factors and Breastfeeding Self-efficacy.

Variabel	Frequency (%)	Breastfeeding Self Efficacy				OR (95% CI)	p-value
		Low		High			
		n	%	n	%		
Age							
≤ 19 year	7 (3.5%)	7	100%	0	0%	1.622 (1.451-1.813)	0.0301
20-45 year	193 (96.5%)	119	61.7%	74	38.3%		
Education level							
Lower School	92 (46%)	58	63%	34	37%	1.003 (0.564-1.785)	0.991
High school or college	108 (54%)	68	63%	40	37%		
Family type							
Extended Family	104 (52%)	73	70.2%	31	29.8%	1.911 (1.068-3.418)	0.0201
Nuclear Family	96 (48%)	53	55.2%	43	44.8%		
Parity							
Primipara	70 (35%)	54	77.1%	16	22.9%	2.719 (1.410-5.241)	0.0021
Multipara	130 (65%)	72	55.4%	58	44.6%		
Types of breastfeeding information							
Handbook maternal and child or manual	36 (18%)	3	8,3%	33	91.7%	0.030 (0.009-0.104)	<0.0011
Smartphone application or breastfeeding clinic website	164 (82%)	123	75%	41	25%		
Occupation							
Employment	30 (15%)	18	60%	12	40%	0.861 (0.389-1.906)	0.712
Unemployment	170 (85%)	108	63.5%	62	36.5%		
Family income2							
Below regional minimum wage	107 (53.5)	74	69.2%	33	30.8%	1.768 (0.990-3.156)	0.053
Above regional minimum wage	93 (46.5%)	52	55.9%	41	44.1%		
Delivery type							
Sectio cesarea	35 (17.5%)	25	71.4%	10	28,6%	1.584 (0.714-3.516)	0.256
Normal	165 (82.5%)	101	61.2%	64	38.8%		
Breastfeeding knowledge							
Low	41 (20.5%)	29	70.7%	12	29.3%	1.545 (0.734-3.252)	0.250
High	159 (79.5%)	97	61%	62	39%		
Breastfeeding culture							
Yes	142 (71%)	101	71.1%	41	28.	3.252	<0.0011

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No	58 (29%)	25	43.1%	33	56.9%	(1.725-6.129)	
Breastfeeding experience							
No	119 (59.5%)	108	90.8%	11	9.2%	34.364	<0.0011
Yes	81 (40.5%)	18	22.2%	63	77.8%	(15.258-77.393)	
Breastfeeding intention							
Low	165 (82.5%)	122	73.9%	43	26.1%	21.988	<0.0011
Strong	35 (17.5%)	4	11.4%	31	88.6%	(7.336-65.910)	

[1] Multiple logistic regression stepwise method; [2] Minimum regional wage= rupiah 4.375.479.

3.2. Infant Factor

Regarding infant characteristics, 52.5% were female, 65.5% were between 4-6 months old, 59.5% had partial breastfeeding, 61% had formula milk supplementation with 69.5% gave to infants by bottle, as shown in Table 2. The logistic regression revealed the correlation between BSE with infant birth weight (p=0.010), feeding type (p<0.001), breastfeeding frequency (p<0.001), breastfeeding duration (p<0.001), infant latch (p<0.001), type Supplementation (p<0.001), infant urine output (p<0.001), and infant feces output (p<0.001). The infant factors that had the strongest relationship with BSE were breastfeeding frequency, infant latch, and type of supplementation with OR (95% CI) of 28.636 (12.950-63.321), 28.630 (12.625-63.224) and 25.714 (11.949-55.338) respectively.

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Table 2. The Correlation between Infant Factors and Breastfeeding Self-efficacy.

Variable	Frequency (%)	Breastfeeding Self Efficacy				OR (95% CI)	p-value
		Low		High			
		n	%	n	%		
Age							
1 – 3 month	69 (34.5%)	40	58%	29	42%	0.722	0.285
4 – 6 month	131 (65.5%)	86	65.6%	45	34.4%	(0.397-1.313)	
Birth weight							
2.50-2.99	84 (42%)	61	72.6%	23	27.4%	2.081	0.010
3.00-4.50	116 (58%)	65	56%	51	44%	(1.138-3.806)	
Sex							
Male	95 (47.5%)	57	60%	38	40%	0.783	0.403
Female	105 (52.5%)	69	65.7%	36	34.3%	(0.440-1.391)	
Feeding type							
Partial breastfeeding	119 (59.5%)	108	90.8%	11	9.2%	34.364	<0.001
Exclusive breastfeeding	81 (40.5%)	18	22.2%	63	77.8%	(15.258-77.393)	
Breastfeeding frequency							
≤ 8 times per day	116 (58%)	105	73.1%	11	42.9	28.636	<0.001
8-12 times per day	84 (42%)	21	25%	63	75%	(12.950-63.321)	
Breastfeeding duration							
≤ 10 menit	154 (77%)	111	72.1%	43	27.9%	5.335	<0.001
10-15 menit	46 (23%)	15	32.6%	31	67.4%	(2.623-10.850)	
Latch							
Poor Latch	120 (60%)	101	90.5 %	19	9.5%	28.630	<0.001
Good Latch	80 (40%)	25	31.3%	55	68.8%	(12.625-63.224)	
Type Supplementation							
Formula	122 (61%)	108	88.5%	14	11.5%		<0.001
Express milk; pasteurized human milk	78 (39%)	18	23.1%	60	76.9%	25.714 (11.949-55.338)	
Supplementation method							
Bottle	139 (69.5%)	88	63.3%	51	36.7%	1.044	0.891
Cuffeder, supplemental set	61 (30.5%)	38	62.3%	23	37.7%	(0.561-1.946)	
Infant state							
The condition of a crying baby is difficult to calm	97 (48%)	69	71.1%	28	28.9%	1.989 (1.106-3.574)	0.021
The condition of a crying baby can be calmed	103 (51.5%)	57	55.3%	46	44.7%		
Output urine							
< 6 times per day	132 (66%)	110	83.3%	22	16.7%	16.250	<0.001
≥ 6 times per day	68 (34%)	16	23.5%	52	76.5%	(7.882-33.503)	
Output feces							
Pale yellow	113 (56.5%)	99	87.6%	14	12.4%	15.714	<0.001
Gold yellow	87 (43.5%)	27	31%	60	69%	(7.643-32.308)	

[1] Multiple logistic regression stepwise method.

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3.3. Social Support Factors

Table 3 showed that 67.5% of breastfeeding mothers had no preparation for breastfeeding. The majority (71%) of social support was given by husbands, and there was low physical and emotional support. The data analysis showed that BSE correlated with preparation for breastfeeding (p<0.001), husband and mother-in-law support (p<0.001), and physical and emotional support (p<0.001). The factors that had the strongest correlation were husband support and physical support, with the OR (95%CI) of 3.252 (1.725-6.129) and 3.252 (1.725-6.129) respectively.

Table 3. The correlation between Social Support and Breastfeeding Self-efficacy.

Variable	Frequency (%)	Breastfeeding Self Efficacy				OR (95% CI)	p-value
		Low		High			
		n	%	n	%		
Prepare to perform breastfeeding							
No	135 (67.5%)	97	71.9%	38	28.1%	3.169	<0.0011
Yes	65 (32.5%)	29	44.6%	36	55.4%	(1.711-5.869)	
Social support resourche							
Husband support							
No	142 (71%)	101	71.1%	41	28.9%	3.252	<0.0011
Yes	58 (29%)	25	43.1%	33	56.9%	(1.725-6.129)	
Mothers-in-law support or grandmother							
No	138 (69%)	98	71%	40	29%	2.975	<0.0011
Yes	62 (31%)	28	45.2%	34	54.8%	(1.599-5.535)	
Friends and Neighbors support							
No	41 (20.5%)	29	70.7%	12	29.3%	1.545	0.250
Yes	159 (79.5%)	97	61%	62	39%	(0.734-3.252)	
Type of social support							
Physical Support							
Low	142 (71%)	101	71.1%	41	28.9%	3.252	<0.0011
High	58 (29%)	25	43.1%	33	56.9%	(1.725-6.129)	
Emotional support							
Low	136 (68%)	96	70.6%	40	29.4%	2.720	0.0011
Hight	64 (32%)	30	46.9	34	53.1%	(1.472-5.026)	
Informational support							
Low	79 (39.5%)	51	64.6%	28	35.4%	1.117	0.712
High	121 (60.5%)	75	62%	46	38%	(0.620-2.014)	

[1] Multiple logistic regression stepwise method.

Multiple logistic regression analysis yielded a statistically significant adjusted final model based on the stepwise method (p<0.001, R2 =0.742) (Table 4). This model indicated that 74.2% of the factors included in the model influenced BSE. Positive correlations were observed between BSE and feeding type (OR=6.603), breastfeeding frequency (OR=6.220), breastfeeding intention (OR=4.993), and family type (OR=4.001).

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Table 4. Multiple logistic regression models for associations of maternal factors, infant factors, and Social support with Breastfeeding Self-efficacy.

Variables	β	p-value	OR	(95%CI)		R2
				LL	UL	
Family type	1.387	0.006	4.001	1.480	10.819	0.7421
Breastfeeding intention	1.608	0.031	4.993	1.156	21.556	
Feeding type	1.888	0.002	6.603	2.032	21.455	
Breastfeeding frequency	1.828	0.002	6.220	1.975	19.583	
Latch	0.942	0.065	2.566	0.943	6.982	

β, beta; OR, odd ratio; CI, confidence interval; LL, lower limit; UL, upper limit. [1] Logistic regression models with stepwise method were adjusted for maternal age, parity, Types of Breastfeeding information, Breastfeeding culture, Breastfeeding experience, breastfeeding preparation, husband support, mother-in-law support, physical support, emotional support, Infant birth weight, Breastfeeding duration, Type of infant supplementation, Infant state, infant urine output, and infant feces output.

4. Discussion

This study aimed to find out simultaneously the influence of maternal factors, infant factors, and support factors on breastfeeding self-efficacy. Multivariate analysis showed that breastfeeding self-efficacy correlated with breastfeeding frequency and family type.

In this study, the factor most strongly correlated with BSE was feeding type, with the mothers who exclusively breastfed their infants having higher BSE. Breastfeeding self-efficacy refers to a mother's confidence in her ability to breastfeed her child. It is a crucial determinant of breastfeeding initiation, duration, and exclusivity. Various feeding types can significantly impact a mother's BSE [29]. Additionally, BSE is associated with maternal perception of milk adequacy for the baby [12]. Several studies have emphasized the vital role of BSE in the success of exclusive breastfeeding. Mothers with higher levels of self-efficacy are more committed to exclusive breastfeeding and are more likely to continue breastfeeding despite facing challenges [9,10]. Higher breastfeeding self-efficacy was reported among mothers who practice exclusive breastfeeding. The confidence gained from successfully breastfeeding without supplementation reinforces their belief in their capability [4].

In addition to the type of feeding, breastfeeding frequency was found to correlate with BSE. Breastfeeding frequency refers to how often a mother breastfeeds her baby in a given period, typically measured in sessions per day. The frequency can vary widely depending on the baby's age, health, and individual needs, as well as the mother's circumstances and comfort level [30]. Frequent breastfeeding sessions can enhance a mother's skills and comfort with breastfeeding, thereby boosting her confidence as a positive feedback loop. The higher BSE was associated with more frequent breastfeeding, as success in frequent sessions reinforces a mother's belief in her breastfeeding abilities [7]. Furthermore, frequent breastfeeding is essential for establishing and maintaining an adequate milk supply. A study by Swaydi et al, 2022 showed that maintaining milk removal at least eight times per 24 hours, whether through breastfeeding or pumping, is crucial for achieving adequate milk production [31].

Breastfeeding intention refers to a mother's decision or plan regarding breastfeeding her infant. It encompasses the desire and commitment to breastfeed, including the duration and exclusivity of breastfeeding. Breastfeeding intention is crucial as it sets the foundation for breastfeeding practices and can impact the initiation, duration, and exclusivity of breastfeeding [21]. Mothers with a strong intention to breastfeed are more likely to exhibit higher levels of breastfeeding self-efficacy, which in turn positively influences their breastfeeding behavior [17]. Furthermore, studies have indicated that breastfeeding intention and self-efficacy are modifiable factors that predict breastfeeding rates.

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Women who have more motivation to breastfeed, positive attitudes toward breastfeeding, higher breastfeeding self-efficacy, and perceive greater benefits of breastfeeding are more likely to exhibit behavioral intention to breastfeed [32].

Social support plays a critical role in the breastfeeding journey of mothers, influencing their initiation, duration, and exclusivity of breastfeeding. The type of family structure a mother belongs to significantly shapes the nature and extent of social support she receives. This study showed that family type correlated with BSE. This result alights with Rodríguez-Gallego, 2024, which discussed how extended family support contributes to breastfeeding success by providing practical help and cultural knowledge [10]. Moreover, a study by Kanhadilok et al, 2016 emphasizes that factors associated with the initiation and continuation of breastfeeding are not solely dependent on personal perspectives but are also influenced by social expectations and the types of support provided by family and friends. The study underscores the importance of social support, including that from family members, in shaping breastfeeding practices among mothers, indicating that family support can significantly impact breastfeeding decisions and behaviors [33]. Breastfeeding family support and social support from significant others were positively associated with BSE. Higher levels of social support were related to better BSE and increased breastfeeding success [21]. Fathers' support for the breastfeeding process has been found to positively impact mothers' breastfeeding self-efficacy and the attachment between the father and the infant [22].

Regarding the strengths, this study had a large number of samples and comprehensively analyzed the maternal, and infant factors and social support in breastfeeding self-efficacy. However, the cross-sectional analytic design precluded the possibility of drawing causal conclusions. The main finding of this study was that breastfeeding frequency and family support were the important factors that support breastfeeding self-efficacy.

This is some has limitations. Study is cross-sectional, where independent and dependent variables are measured simultaneously without further procedures. The author also recommends further research using different designs and methods with the same instrument to obtain an overview of the achievement of maternal, infant and social support factors on breastfeeding self-efficacy.

5. Conclusions

The achievement of exclusive breastfeeding for the age of 0-6 months in Jember Regency, Indonesia, still needs to be higher. This study aims to determine the factors that affect breastfeeding self-efficacy and the success of exclusive breastfeeding. Factors that affect breastfeeding self-efficacy include maternal, infant and social support factors. These findings support the recommendation of a comprehensive breastfeeding promotion strategy to improve breastfeeding self-efficacy and the success of exclusive breastfeeding coverage through various actions such as Health Education in health services.

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Institutional Review Board Statement : This study was approved by the Institutional Ethics Review Committee of Brawijaya University (code, 2664-39; 26 September 2022) and was performed in line with the principles of the Declaration of Brawijaya and its later amendments.

Informed Consent Statement: Informed consent was obtained from all individuals involved in the study.

Data Availability Statement: The data and resources utilized in the research can be obtained from the corresponding author upon reasonable request.

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