

Effectiveness of the Breastfeeding Self-efficacy and Family Support Enhancement Program among First-time Postpartum Mothers: A Randomized Controlled Trial

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Abstract: First-time mothers often lack effective breastfeeding techniques and may perceive they have insufficient milk due to inadequate experience in breastfeeding. There are limited programs for enhancing effective breastfeeding and perceived sufficient milk among first-time mothers in Thailand. This randomized controlled trial study investigated the effects of the Breastfeeding Self-Efficacy and Family Support Enhancement Program on effective breastfeeding and perceived sufficient milk among first-time mothers. The participants included 64 pairs of first-time mothers with normal labor and their family members. They were recruited from an antenatal clinic in a province of Thailand and randomly assigned to the experimental arm (n = 32) to receive the program in addition to standard care or the control arm (n = 32) to receive only standard care. Data were collected using the Demographic and Obstetric Data Questionnaires, the Bristol Breastfeeding Assessment Tool, H&H Lactation Scale for first-time mothers, and a demographic data questionnaire for family members. Data analysis was performed with descriptive statistics, Chi-square test, and two-way mixed ANOVA.

The results indicated that, after receiving the program, the mean scores on effective breastfeeding and perceived sufficient milk at days 3, 10, and 28 postpartum in the experiment group were significantly higher than before receiving the program and significantly higher than that of the control group. Nurses can integrate this program to train family members to support first-time mothers in breastfeeding continuously and increase first-time mothers' confidence in their ability to breastfeed effectively and perceive milk sufficiency. However, further testing of the program effectiveness is warranted.

Keywords: Breastfeeding, Effective breastfeeding, Family support, First-time mothers, Sufficient milk

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Introduction

Perceived sufficient milk refers to a state in which mothers believe they have an adequate breast milk supply to accommodate the baby's satiety and/or support the baby's proper weight gain.¹ Perceived insufficient milk is often reported by a large percentage of women, particularly first-time mothers across countries, ranging

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from 19% in Mexico² to 57.3% in Brazil.³ In Thailand, 61.20% of first-time mothers experienced perceived

insufficient milk.⁴ At the same time, inadequate breastfeeding support can cause uncertainty in breastfeeding. Breastfeeding recommendations from families sometimes contradict those from professionals and frequently cause failed breast milk.⁵ In the Thai context, although family members provided different kinds of support to encourage breastfeeding, they sometimes made discouraging remarks, such as telling mothers that the family had no milk-producing genes.⁶ Consequently, mothers lose confidence in breastfeeding and perceive their milk as insufficient, which is often the main reason for early breastfeeding cessation⁷ or decreased exclusivity of breastfeeding.⁸ In Thailand, perceived insufficient milk was the primary factor behind stopping breastfeeding.⁹ These situations are significant challenges that bring several unfavorable impacts.

Perceived insufficient milk results in non-exclusive breastfeeding that affects both infants and mothers. For infants, non-exclusive and shorter durations of exclusive breastfeeding lead to an increased risk of early and later-life morbidities, including diarrhea, acute respiratory infection,¹⁰ childhood obesity and death.¹¹ For mothers, non-exclusive breastfeeding can result in greater risks of breast cancer¹² and deterioration in psychological well-being.¹³ To avoid these impacts, it is essential to improve perceived sufficient milk, particularly for first-time mothers who are more likely to think that they have less milk supply when compared to multiparous mothers.¹⁴

Breastfeeding self-efficacy is a crucial factor that influences successful breastfeeding behavior. People with higher self-efficacy hold a successful viewpoint encouraging intrinsic interest and total immersion in activities.¹⁵ Mothers with higher breastfeeding self-efficacy seek to learn and master techniques, such as latching and positioning and are more perseverant to overcome breastfeeding problems.⁶ When mothers perceive that their breastfeeding self-efficacy rises, effective breastfeeding increases.

Effective breastfeeding encourages prolactin and oxytocin secretion to increase milk production,²⁰

allowing mothers to have breastfeeding confidence and perceive the baby's satiety and breastfeeding satisfaction, which can, in turn, enhance perceived sufficient milk.^{14,16} Yet, since breastfeeding is a skill socially learned within the family, this effort is also achievable through support from the family.

Family support has a major influence on a mother's successful breastfeeding. First-time mothers reported family members' advice and role modeling as a determinant of perceived sufficient milk.⁵ They valued the family's practical information about breastfeeding,¹⁷ and demonstrations on positioning and latching.¹⁸ In the context of Asia, Thailand's culture is communal, with a strong emphasis on family. Thai mothers revealed that family members supported them in every critical step of breastfeeding by providing emotional support or looking after the baby while the mothers rested.⁶ Unfortunately, family members may lack confidence in supporting breastfeeding. Family members, particularly in the early postpartum period, were not confident in holding the baby or bringing the baby to latch for breastfeeding,¹⁹ which is a barrier to the family's ability to provide effective support.²⁰

From this background, there is a need to enhance breastfeeding self-efficacy and family support for first-time mothers. Including family members in a breastfeeding program would strengthen their confidence in their ability to provide breastfeeding support for first-time mothers, which in turn enables first-time mothers to overcome breastfeeding barriers and become more confident in their ability to perform effective breastfeeding and perceive sufficient milk.

Conceptual Framework and Review of Literature

Women often start producing milk two or three days after giving birth. When the placenta is removed, a rapid reduction in progesterone, estrogen, and high amounts of prolactin occurs. The milk supply is kept

up through autocrine regulation from roughly day ten postpartum, and mature milk is produced after four weeks or 28 days of breastfeeding.²¹

This study was guided by the Social Cognitive Theory (SCT).²² The promotion of effective breastfeeding and perceived sufficient milk depends not only on the mothers but also on influences from the environment. In the SCT, the essential components include personal factors, environmental factors, and behavior.²² Personal and environmental factors influence the behaviors of persons because environmental, cognitive, and behavioral factors are interconnected.²² From this perspective, a mother's breastfeeding behavior is influenced by factors arising from the mother and the environment.

Under SCT, self-efficacy is a predominant personal factor in breastfeeding. It is an individual's belief in their capacity to meet predetermined performance standards and exert control over circumstances that impact their lives. Self-efficacy can be enhanced through four sources.²³ First, mastery experience refers to personal experiences of managing efforts toward performance accomplishments. Second, vicarious experiences can be obtained through social modeling, which involves demonstrating that they can perform the behaviors like others. Competent role models, who share similar characteristics to the observers, offer observers practical skills and techniques for handling environmental demands through their conduct.²³ Third, the physical and emotional states influence how effective the persons feel at handling the situation. Stress, worry, anxiety, and dread all have a negative impact on self-efficacy and cause expectations of failure or incapacity to carry out tasks.²⁴ Therefore, people should be well-rested and relaxed before undertaking a new behavior. Lastly, verbal persuasion assures the individuals that they can complete the task. Strong encouragement can increase knowledge and confidence to inspire the initiation of actions. Verbally persuaded individuals are likelier to exert and maintain efforts than those with self-doubts.²³

Moreover, social support is an environmental factor that influences breastfeeding. Social support involves relational contents, the emotionally or instrumentally sustaining features of social connections.²⁵ Social support can be categorized into four categories: instrumental support (services and goods), informational support (information), emotional support (liking, love, and empathy), and appraisal support (knowledge pertinent to self-evaluation).²⁵ Breastfeeding support is essential for first-time mothers, especially from their closest family, as several studies highlight the importance of social support to effective breastfeeding¹⁸ and perceived sufficient milk.⁵

Previous studies investigated the effectiveness of breastfeeding self-efficacy programs on improving effective breastfeeding and perceived sufficient milk among first-time mothers, which led to increased effective breastfeeding^{16,26,27} and perceived sufficient milk.²⁸ However, most of those programs strongly emphasized breastfeeding self-efficacy. Even though one program incorporated breastfeeding self-efficacy and social support from the family, the family members were invited to engage in the program's activities in the postpartum period,¹⁶ which might be too late to increase the family members' confidence in supporting mothers. Family members can be educated to support breastfeeding as early as the antenatal period, particularly in the third trimester of pregnancy between 36–38 weeks gestational age, which is the recommended time for education about infant care and feeding.²⁹ It is thus required to evaluate an intervention that addresses the behavioral, personal, and environmental factors by enhancing mothers' breastfeeding self-efficacy and social support that engage family members as early as the antenatal period to achieve effective breastfeeding and perceived sufficient milk among first-time mothers.

Study Aim and Hypotheses

This study examined the effect of the Breastfeeding Self-Efficacy and Family Support Enhancement Program (BSFSEP) on effective breastfeeding and perceived

sufficient milk among first-time postpartum mothers. It was hypothesized that the first-time mothers receiving the BSFSEP would have higher effective breastfeeding and perceived sufficient milk mean scores at three, ten, and 28 days postpartum than before receiving the program and significantly higher than those receiving only standard prenatal and postnatal care.

Methods

Design: This study was a randomized controlled trial (RCT) with a two-group pretest–posttest control group design. This research report followed the Consolidated Standards of Reporting Trials (CONSORT).

Sampling and Settings: Power analysis was used for sample size estimation, with a power of 0.80 and a significance level of 0.05.³⁰ According to a similar previous study with an estimated effect size of 0.67,¹⁶ the sample size was 29 per group. With the addition of 10% of the sample size for possible attrition,³⁰ the sample required in this study was 64 dyads of first-time mothers with normal labor and their family members.

The sample was selected using multi-stage random sampling. First, one province was randomly selected from 22 provinces in central Thailand. Then, all 12 hospitals under the Ministry of Interior in the selected province were identified, and one hospital was randomly selected. The principal investigator (PI) approached the first-time mothers face-to-face and purposively selected them using the inclusion criteria: 1) maternal age of 20–35 years; 2) gestational age 32–36 weeks; 3) planned normal labor; 4) able to read, understand and communicate effectively in Thai; 5) living with a family member who could support to perform all activities in the program; and 6) willing to participate in the program until program completion. Exclusion criteria were: 1) abnormal labor, and 2) mother and infant have postpartum complications. If first-time mothers were interested in the study, the PI asked them to identify family members. The PI screened the identified family members based on the inclusion

criteria: 1) related to first-time mothers, either by blood or by law; 2) living with first-time mothers; 3) able to support mothers to perform program activities until program completion; 4) aged 20 years and over; 5) able to read, understand and communicate effectively in Thai; and 6) willing to participate until program completion.

Random assignments were made to place participants in the experimental and control groups by a staff member in the antenatal ward who was not involved in the trial using the permuted block design procedure with a four-block size. For a fixed block size of four and two treatments (E or C), there are six possible permutations: EECC, CCEE, ECEC, CECE, ECCE, or CEEC. In this study, the participants were 64, so the staff member used 16 blocks of four by randomly selecting one of six possible permutations to assign the participants to each group. The eligible participants were allocated into each group using sequential numbers placed in sealed opaque envelopes. Initially, 86 first-time mothers were approached, but 18 failed to meet the criteria, and four declined to participate. Throughout the study period, all of the participants remained in the study. The number of participants ultimately included in the data analysis was 32 in each group (**Figure 1**).

Ethical Considerations: Approvals were granted by the Research Ethics Committee of the Faculty of Nursing, Chiang Mai University (Study Code: 2021-EXP061), and the Research Ethics Committee of the Medical Service Department, Bangkok. Participants were explained the study objectives, rights of participants, potential physical and psychological risks, and benefits. Participants were free to opt out of the study or refuse to participate at any time without affecting their services or losing benefits. If they agreed to participate, they signed a consent form. Confidentiality and anonymity were preserved throughout the study, and strategies to stop COVID-19 transmission were strictly maintained.

Research Instruments: Data were collected using four instruments, with permission from the original authors.

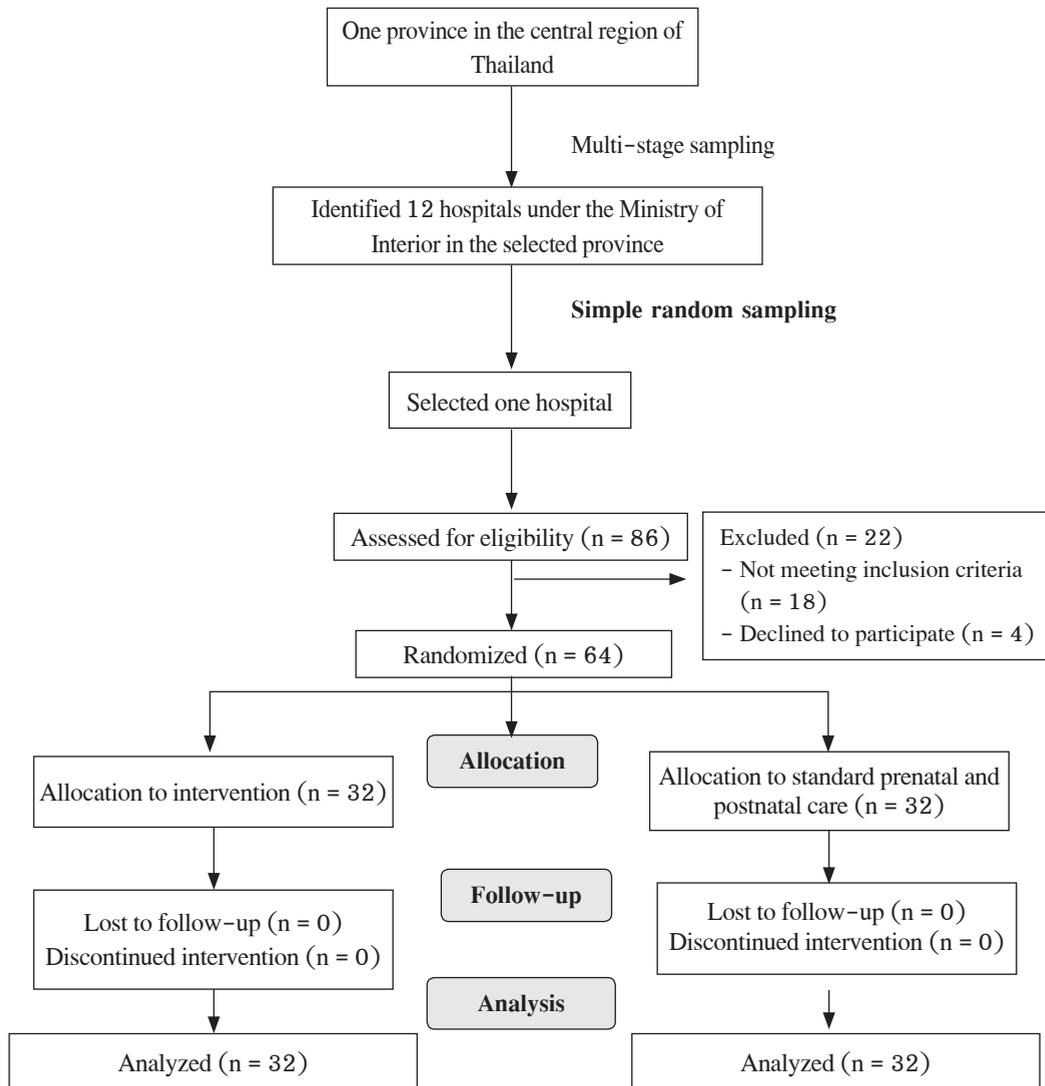


Figure 1. Flow chart of the participants throughout the trial

The Demographic and Obstetric Characteristics Questionnaire for First-time Mothers was created by the PI. It includes data about age, marital status, education level, occupation, religion, family type, family income, income sufficiency, maternity leave, infant gender, and persons helping with childcare before and after discharge.

The Demographic Characteristic Questionnaire for Family Members was created by the PI to gather demographic data on age, marital status, occupation, and religion.

The Bristol Breastfeeding Assessment Tool (BBAT), developed by Ingram et al.³¹ and translated into Thai by Singhala et al.,³² was used to assess effective breastfeeding among first-time mothers. It consists of four checklist items. The first item assesses positioning rated as 0 (poor positioning), 1 (moderate positioning), and 2 (good positioning). The second item assesses attachment/ latching rated as 0 (poor attachment), 1 (moderate attachment), and 2 (good attachment). The third item assesses sucking rated as 0 (poor sucking),

1 (moderate sucking), and 2 (good sucking). The fourth item assesses swallowing rated as 0 (poor swallowing), 1 (moderate swallowing), and 2 (good swallowing). The total possible score ranges from 0–8, with higher scores reflecting higher effective breastfeeding.³¹ Cronbach's alphas were 0.94 in the pretest with ten first-time mothers and 0.92 in the actual study. Inter-rater reliability kappa was 1 in our study.

The *H&HLactation Scale* was originally developed by Hill and Humenick¹ and then developed into a 9-item version by Punthmatharith and Singh.³³ This 9-item version was used to assess perceived sufficient milk in three dimensions: maternal confidence/ commitment to breastfeeding (3 items), perceived infant breastfeeding satiety (3 items), and maternal–infant breastfeeding satisfaction (3 items). Responses are rated on a 7-point Likert scale ranging from 7 (strongly agree) to 1 (strongly disagree). The total possible score ranges from 9 to 63, with higher scores indicating higher perceived sufficient milk.³³ Cronbach's alphas were 0.93 in the pretest with ten first-time mothers and 0.84 in the actual study.

The Intervention (BSFSEP)

The BSFSEP was developed by the PI based on SCT.²² It was reviewed by a panel of five experts, including an obstetrician, two nursing lecturers specializing in obstetrics, one nurse specializing in obstetrics, and one nursing researcher. It was revised based on their suggestions. The key components of the BSFSEP included a personal factor (breastfeeding self-efficacy) and an environmental factor (social support) under SCT. It focuses on learning that occurs in a social context to enable first-time mothers to develop breastfeeding self-efficacy for effective breastfeeding and perceived sufficient milk. Moreover, family members were encouraged to understand their roles and develop self-efficacy in providing breastfeeding support to mothers. There were four sessions: session 1 in the antenatal period to enhance family support divided into two sub-sessions, and sessions 2–4 in the postnatal period to enhance breastfeeding self-efficacy of first-time mothers and strengthen family support for breastfeeding among first-time mothers.

The duration was 45 minutes for Sessions 1, 3, and 4 and 60 minutes for Session 2. Media and materials used included PowerPoint presentations and the Manual for Effective Breastfeeding and Perceived Sufficient Milk for Mothers and Family Members (**Appendix, Table 1**).

Data Collection: The PI recruited two research assistants (RAs) who were labor room nurses with at least two years of experience in mother and infant care and trained them to collect data in the pre- and post-tests. The PI visited the prenatal ward to review the medical records of the first-time mothers to recruit them and their family members as participants. After agreeing to participate, the participants completed the demographic characteristic forms. Then, the RAs visited and reviewed the medical records of the selected participants and completed the characteristic obstetric forms for participants. For the pretest of effective breastfeeding and perceived sufficient milk, at least 6–8 hours after delivery, when the participants had experienced breastfeeding and were ready, they completed the *H&HLactation Scale*, and the RAs observed breastfeeding of participants and completed the BBAT. The experimental group underwent the BSFSEP in addition to standard prenatal and postnatal care, whereas the control group only received standard prenatal and postnatal care. Single-blind was used to prevent the RAs from knowing which group the participants were assigned.

Data Analysis: Demographic and obstetric data were analyzed using frequency, percentage, mean, and standard deviation and compared using the Chi-square or Fisher's exact tests and t-test. Effective breastfeeding and perceived sufficient milk scores were compared using two-way mixed ANOVA. Before analysis, all statistical assumptions were tested, and the assumptions were not violated.

Results

There were 32 dyads of first-time mothers with normal labor and their family members in each

group. For the first-time mothers, the mean age of both groups was approximately 25. They were all married and had primary and secondary education. A large proportion of them worked as general laborers, and nearly all were Buddhist. They lived in a nuclear family with a mean family income of THB 10,000–50,000 (USD 292.23–1,461.13) per month.

They had a mean maternity leave of 61–90 days, and over half gave birth to a female infant. Their husband was identified as helping with childcare before and after discharge. No significant differences were found between the experimental and control groups regarding demographic and obstetric characteristics (Table 2).

Table 2. Characteristics of first-time mothers (N = 64)

Characteristics	Experimental (n = 32)		Control (n = 32)		p-value
	n	%	n	%	
Age (years)					0.255 ^a
20–24	14	43.75	11	34.37	
25–29	16	50.00	16	50.00	
30–34	2	6.25	5	15.63	
Mean (SD)	25.00, 3.23		25.84, 3.89		0.349 ^t
Min–Max	20–31		20–33		
Marital status					0.156 ^a
Married	32	100.00	32	100.00	
Education level					0.360 ^b
No formal education	1	3.13	1	3.13	
Primary	11	34.37	13	40.62	
Secondary	11	34.37	13	40.62	
Diploma	5	15.63	3	9.38	
Bachelor’s degree	4	12.50	2	6.25	
Occupation					0.200 ^b
General laborer	19	59.37	21	65.62	
Merchant	5	15.63	7	21.88	
Housewife	3	9.38	3	9.37	
Unemployed	5	15.62	1	3.13	
Religion					1.000 ^b
Buddhist	31	96.87	31	96.87	
Christian	1	3.13	1	3.13	
Family type					0.798 ^a
Nuclear	21	65.62	20	62.50	
Extended	11	34.38	12	37.50	
Monthly family income in THB (USD)					0.897 ^b
< 20,000 (584.45)	14	43.75	14	43.75	
20,001–29,999 (584.48–876.65)	3	9.38	4	12.50	
≥ 30,000 (876.68)	15	46.87	14	43.75	
Mean (SD)	27500, 12388.86		25350, 11241.51		0.470 ^t
Min–Max	10000–50000 (292.23–1,461.13)		10000–50000 (292.23–1,461.13)		

Table 2. Characteristics of first-time mothers (N = 64) (Cont.)

Characteristics	Experimental (n = 32)		Control (n = 32)		p-value
	n	%	n	%	
Income sufficiency					0.890 ^a
Sufficient with saving	14	43.75	15	46.87	
Sufficient without saving	8	25.00	5	15.63	
Insufficient	10	31.25	12	37.50	
Maternity leave (days)					0.902 ^a
< 30	6	18.75	6	18.75	
31-60	7	21.87	6	18.75	
61-90	12	37.51	15	46.88	
> 90	7	21.87	5	15.62	
Infant gender					0.804 ^a
Male	13	40.63	14	43.75	
Female	19	59.37	18	56.25	
Family members helping with childcare before/after discharge					0.519 ^a
Husband	15	46.87	16	50.00	
Mother-in-law	5	15.62	5	15.62	
Mother	5	15.62	6	18.76	
Sister	7	21.89	5	15.62	

Note. t = t-test, a = Chi-square test, b = Fisher's Exact test

The family members' ages ranged from 23 to 64 years old. They were married and Buddhist. They had primary and secondary education levels. They

worked as general laborers. There were no significant differences in the demographic characteristics of the family members (Table 3).

Table 3. Characteristics of the family members (N = 64)

Characteristics	Experimental (n = 32)		Control (n = 32)		p-value
	n	%	n	%	
Age (years)					0.211 ^b
20-40	16	50.00	20	62.50	
41-60	11	34.37	11	34.38	
> 60	5	15.63	1	3.12	
Mean (SD)	41.88, 14.81		38.63, 13.21		0.358 ^t
Min-Max	23-64		23-64		
Marital status					0.586 ^b
Married	30	93.75	28	87.50	
Widowed/ Divorced/ Separated	1	3.13	3	9.38	
Single	1	3.12	1	3.12	
Education level					0.693 ^b
Primary	14	43.75	17	53.13	
Secondary	14	43.75	13	40.62	
Diploma	1	3.12	0	0.00	
Bachelor's degree	3	9.38	2	6.25	

Table 3. Characteristics of the family members (N = 64) (Cont.)

Characteristics	Experimental (n = 32)		Control (n = 32)		p-value
	n	%	n	%	
Occupation					0.382 ^b
General laborer	18	56.25	22	68.75	
Merchant	13	40.62	8	25.00	
Housewife	1	3.13	2	6.25	
Religion					0.554 ^b
Buddhist	31	96.88	30	93.75	
Christian	1	3.12	2	6.25	

Note. t = t-test, a = Chi-square test, b = Fisher's Exact test

The effective breastfeeding mean scores between the experimental and control groups were compared using two-way mixed ANOVA. Both groups had no significant differences at baseline (p = 0.663). After

the program, there were significant differences between both groups at three days (p = 0.000), ten days (p < 0.001), and 28 days (p < 0.001) postpartum (Table 4).

Table 4. Comparison of effective breastfeeding and perceived sufficient milk between the experimental and control groups

Variable	Time	Group	Mean Difference	Std. Error	p-value	95% Confidence Interval for Difference	
						Lower Bound	Upper Bound
Effective breastfeeding	Baseline	Experimental - Control	0.129	0.29	0.663	-0.46	0.718
	3 days postpartum	Experimental - Control	1.065	0.23	< 0.01	0.588	1.541
	10 days postpartum	Experimental - Control	1.323	0.17	< 0.01	0.974	1.671
	28 days postpartum	Experimental - Control	2.161	0.13	< 0.01	1.9	2.423
Perceive sufficient milk	Baseline	Experimental - Control	0.063	0.643	0.923	-1.223	1.348
	3 days postpartum	Experimental - Control	2.500	0.713	< 0.01	1.076	3.924
	10 days postpartum	Experimental - Control	3.969	0.606	< 0.001	2.757	5.181
	28 days postpartum	Experimental - Control	7.344	0.700	< 0.001	5.944	8.743

Note. ^b = Bonferroni test

Moreover, the scores of effective breastfeeding within the group at baseline, 3, 10, and 28 days postpartum were tested using two-way mixed ANOVA. There were significant differences in the mean scores

of effective breastfeeding between each point of measurement in each group (F = 128.55, p < .001). The time-group interaction was also significant (F = 18.62, p < .001). (Table 5).

Table 5. Two-way mixed ANOVA within groups and between groups of effective breastfeeding and perceived sufficient milk

Variable	Source of Variance	F	Hypothesis df	Error df	p-value	Partial Eta Squared
Effective Breastfeeding ^a	Time	128.55	3	58	< 0.001	.869
	Group	48.45	1	62	< 0.001	.439
	Time* Group	18.62	3	58	< 0.001	.491
Perceived sufficient milk ^a	Time	104.85	3	60	< 0.001	.840
	Group	44.71	1	62	< 0.001	.419
	Time* Group	30.22	3	60	< 0.001	.602

Note. a = Huynh-feldt Epsilon

In addition, multiple pairwise comparisons between each measurement point were performed using the Bonferroni test. In the experimental and control groups, significant differences in effective breastfeeding scores

were found between baseline and three days postpartum (p < .001), between baseline and ten days postpartum (p < .001), and between baseline and 28 days postpartum (p < .001) (Table 6).

Table 6. Multiple pairwise comparisons of effective breastfeeding and perceived sufficient milk before the program and 3, 10, and 28 days postpartum

Variable	Group	Time	Mean Difference	Std. Error	p-value	95% Confidence Interval for Difference	
						Lower Bound	Upper Bound
Effective breastfeeding	Experimental	Time1 – Time2	-1.903	0.21	< 0.001	-2.33	-1.48
		Time1 – Time3	-3.065	0.22	< 0.001	-3.50	-2.63
		Time1 – Time4	-4.032	0.22	< 0.001	-4.47	-3.60
	Control	Time1 – Time2	-0.968	0.21	< 0.001	-1.39	-0.54
		Time1 – Time3	-1.871	0.22	< 0.001	-2.31	-1.43
		Time1 – Time4	-2.000	0.22	< 0.001	-2.43	-1.57
Perceived sufficient milk	Experimental	Time1 – Time2	-3.906	0.447	< 0.001	-4.80	-3.012
		Time1 – Time3	-6.281	0.485	< 0.001	-7.25	-5.312
		Time1 – Time4	-10.500	0.543	< 0.001	-11.586	-9.414
	Control	Time1 – Time2	-1.469	0.447	0.002	-2.363	-0.575
		Time1 – Time3	-2.375	0.485	< 0.001	-3.344	-1.406
		Time1 – Time4	-3.219	0.543	< 0.001	-4.305	-2.133

Note. ^b = Bonferroni test

Regarding perceived sufficient milk, the mean scores between the experimental and control groups were compared using two-way mixed ANOVA. The results showed no significant differences between both groups at baseline (p = 0.923). After the program, there were significant differences in the mean scores of perceived sufficient milk between both groups at

three days (p = 0.001), ten days (p < 0.001), and 28 days (p < 0.001), postpartum (Table 4).

Then, the scores of perceived sufficient milk at baseline, three, ten and 28 days postpartum within the group were tested using two-way mixed ANOVA. From the results, there were significant differences in the mean scores of perceived sufficient milk between

each point of measurement in each group ($F = 104.85$, $p < 0.001$), Moreover, the time–group interaction was significant ($F = 30.22$, $p < 0.001$), (Table 5). Multiple pairwise comparisons between each measurement point were performed using the Bonferroni test. In the experimental and control groups, significant differences in perceived sufficient milk scores were found between baseline and three days postpartum ($p < 0.001$, and $p = 0.027$, respectively), between baseline and ten days postpartum ($p < 0.001$), and between baseline and 28 days postpartum ($p < 0.001$) (Table 6).

Discussion

The findings demonstrated the effectiveness of the BSFSEP in improving effective breastfeeding and perceived sufficient milk among first–time mothers. Our results were consistent with previous studies in that the breastfeeding self–efficacy program effectively improved the effective breastfeeding practice^{26,27} and enhanced perceived sufficient milk among first–time mothers.²⁸ These significant improvements were attributable to the program’s focus on social support and self–efficacy under the SCT²² that influenced mothers’ breastfeeding behavior.

The BSFSEP highlighted the promotion of family members’ self–efficacy as early as the antenatal period so that they were prepared and confident to provide breastfeeding support for first–time mothers postpartum. Family members received health education about family support for breastfeeding, which positively influenced effective breastfeeding and perceived sufficient milk. Such support included emotional support by encouraging mothers to continue breastfeeding, informational support by seeking reliable breastfeeding information, instrumental support by helping with other daily tasks so that mothers could breastfeed, and appraisal support by observing mothers’ breastfeeding and giving constructive feedback for improvement. The engagement of family members in antenatal education is vital because the family’s lack of confidence in breastfeeding

was a barrier to their ability to provide adequate support.²⁰ Thus, family members needed to be involved in breastfeeding education for specific knowledge about their roles in supporting breastfeeding, which should be done in the antenatal period.²⁹ Family engagement in learning about breastfeeding strengthened family members’ confidence in their ability to provide breastfeeding support for first–time mothers, which enabled the mothers to overcome breastfeeding barriers and become more confident in their ability to perform breastfeeding behavior. To enhance breastfeeding support, antenatal breastfeeding education for the family could improve both effective breastfeeding³⁴ and perceived sufficient milk.¹⁴

Moreover, the BSFSEP increased first–time mothers’ breastfeeding self–efficacy through the physiological and affective state, mastery experience, vicarious experience, and verbal persuasion to help them become confident in their ability to perform effective breastfeeding, allowing mothers to perceive that they had sufficient milk. To address physiological and affective states, first–time mothers shared their concerns about breastfeeding, were listened to attentively and received advice to reduce their anxiety. These matters helped to enhance self–efficacy as individuals tend to interpret their physiological and affective states as indicative of their capability to perform a behavior.^{15,23} It is known that a mother’s mental health can affect lactation’s success, mostly by influencing milk ejection. Thus, increased psychological distress can disrupt milk flow.³⁵ Similarly, stress–relaxing interventions promoting mothers’ physical and emotional conditions could improve mothers’ confidence in their body’s capacity to make sufficient milk for the baby and lessen the negative connotations of stress and anxiety linked with inadequate milk supply.³⁶

For mastery experience, first–time mothers were taught about correct positioning, attachment, sucking, and swallowing and solutions to common problems from incorrect breastfeedings, such as breast engorgement and cracked nipples. Consistently, positioning, attachment, sucking, and swallowing were all important components

that constitute effective breastfeeding.^{31,32} Moreover, first-time mothers received breastfeeding skill training through a 10-minute VDO multimedia presentation about positioning, attachment, sucking, and swallowing, then gave a return demonstration and received feedback. Congruent with Bandura,²³ mastery experience can be enhanced by exposing people to the performance of the behavior that is an immediate and effective source of self-efficacy. Previous findings similarly showed that maternal education and training about breast problems, care, latching techniques, and breastfeeding positions led to significantly more effective breastfeeding.^{16,26} Also, breastfeeding education and skill training could increase a mother's perceived ability to produce sufficient milk.³⁷

In our study, the vicarious experience was promoted through video multimedia of a role model of a first-time mother who could overcome breastfeeding barriers, successfully perform effective breastfeeding and achieve perceived sufficient milk. Seeing others complete activities successfully can give people the confidence to complete similar tasks.^{15,23} As a result, participants were confident they could successfully perform effective breastfeeding like the role model. The use of role models was especially important for first-time mothers who lacked breastfeeding experience and tended to encounter more breastfeeding problems than experienced mothers. Similarly, vicarious experiences, which can be offered by using live or symbolic modeling to learn the proper method of breastfeeding and observing other mothers' practices, were one of the most effective means of boosting breastfeeding self-efficacy.¹⁶

Regarding verbal persuasion, first-time mothers were persuaded to increase their confidence in their ability to perform effective breastfeeding and convince the mothers of their capability to have sufficient milk supply for their infants. Accordingly, Bandura²³ suggested that verbal persuasion can convince people of their abilities. The guidance the participants received could direct their focus on the successful aspects of breastfeeding, and they were praised for learning new and existing

breastfeeding skills. Consistent with previous research, interventions using verbal persuasion that included persuasion, guidance, and advice from healthcare providers effectively enhanced breastfeeding self-efficacy of first-time mothers.³⁷ In line with previous research, verbal persuasion helped mothers succeed in breastfeeding despite facing breastfeeding challenges.³⁸

Limitations and Recommendations

A few limitations were noted. The study was conducted on first-time mothers visiting a hospital in a province in central Thailand; thus, this might limit generalizability to other groups and settings. This program demonstrated its effectiveness to mothers who underwent normal delivery only. Mothers who delivered babies with other means may or may not get the same results. Moreover, the assessment periods of effective breastfeeding and perceived sufficient milk were three, ten, and 28 days postpartum, which might not reflect the sustainability of the program's effectiveness. Further research is recommended to investigate the program's effectiveness in other samples, such as first-time mothers with cesarean section, and measure effective breastfeeding and perceived sufficient milk in a more extended period, such as at six months postpartum, to illustrate the sustainable effect of the program better.

Conclusions and Implications

The program successfully improved effective breastfeeding and perceived sufficient milk of first-time mothers through various strategies, particularly education, demonstration, advice, role model, feedback, and verbal persuasion. The findings offer a clearer understanding of developing a program to enhance effective breastfeeding and perceived sufficient milk by focusing on first-time mothers' personal factors, environmental factors, and behavior. Nurses can integrate the program into routine nursing care to involve family members in the antenatal period to raise the family's

awareness of their roles and train them in continuously supporting first-time mothers in breastfeeding. Nurses in postpartum units can be trained to apply the program in planning the activities to increase first-time mothers' confidence in their ability to breastfeed effectively and perceive sufficient milk.

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Appendix

Table 1. The BSFSEP

Time and Objectives	Strategies/Activities
<p>At ANC Session 1 (36–38 wks.) (Total 45 minutes) Session 1.1: Family support Objectives: 1) To raise family members’ awareness of their role in providing family support to first-time mothers 2) To increase family members’ ability to provide family support to first-time mothers</p>	<p>Strategies: group education (4–6 members/group), verbal reinforcement, group discussion 1. Explain to family members the importance of family support for breastfeeding 2. Provide group education for family members about how to provide support for breastfeeding: 2.1 Emotional support: Encourage family members to listen to mothers’ concerns, express understanding, praise, and give verbal reinforcement to them; Ask family members to share their plans to support mothers 2.2 Information support: Give education about breastfeeding to family members and ask them to transfer the information to first-time mothers. Encourage family members to seek useful and reliable breastfeeding information for first-time mothers 2.3 Instrumental support: Train family members on how to provide useful assistance to mothers (holding infants, bathing, cleaning, doing household chores, preparing food) to reduce mothers’ burden; Teach them how to arrange an appropriate environment for breastfeeding 2.4 Appraisal support: Explain to family members how to observe mothers’ breastfeeding behavior and give feedback to mothers; Ask them to encourage mothers to reflect on their breastfeeding to increase breastfeeding confidence 3. Ask family members to make a commitment to provide support to mothers for breastfeeding</p>
<p>Session 1.2: Self-efficacy for family Objectives: 1) To increase breastfeeding self-efficacy of first-time mothers 2) To increase family members’ ability to provide family support to promote the breastfeeding skills of first-time mothers</p>	<p>Strategies: group education (4–6 members/group), verbal reinforcement, group discussion 1. To address physiological and affective state: – Have the family members talk about their concerns and readiness to support breastfeeding; Suggest solutions 2. To increase mastery experience: – Have family members talk about their roles to give breastfeeding support in their own context and how to help relieve the burden of mothers so that the mothers can fully focus on breastfeeding 3. To increase vicarious experience: – Have family members share their past experiences in observing other members provide breastfeeding support for mothers successfully – Have family members listen to a case with similar characteristics to the family members in this study who could successfully provide breastfeeding support in order to increase confidence that they can do it too 4. To provide verbal persuasion: – Persuade family members’ awareness of: 1) their crucial role in supporting effective breastfeeding of first-time mothers; and 2) the benefits of breastfeeding on the infants as a result of their support</p>

Table 1. The BSFSEP (Cont.)

Time and Objectives	Strategies/Activities
<p>Session 2: Self-efficacy for mothers (1st day postpartum) (60 minutes)</p> <p>Objectives:</p> <p>1) To increase breastfeeding self-efficacy of first-time mothers with normal labor</p> <p>2) To increase family members' ability to provide family support to promote the breastfeeding skills of first-time mothers</p>	<p>Strategies: Individual advice, role model, feedback, persuasion, recommendation</p> <p>1. To address physiological and affective state: Ask mothers to share concerns about breastfeeding, listen attentively, and give advice to reduce anxiety</p> <p>2. To increase mastery experience:</p> <ul style="list-style-type: none"> - Teach mothers and family members about correct positioning, attachment, sucking, and swallowing, solutions to common problems from incorrect breastfeeding - Give breastfeeding skill training for mothers and family members by showing a 10-minute VDO multimedia about positioning, attachment, sucking, and swallowing - Ask mothers to give return demonstration and give feedback <p>3. To increase vicarious experience: Show VDO multimedia about first-time mothers with similar characteristics to the mothers who can overcome breastfeeding barriers and successfully perform effective breastfeeding with sufficient milk</p> <p>4. To provide verbal persuasion: Persuade mothers about the benefits of breastfeeding and their ability to perform effective breastfeeding and have perceived sufficient milk</p>
<p>Session 3: Self-efficacy and family support enhancement (2nd day postpartum) (45 minutes)</p> <p>Objectives:</p> <p>1) To increase mothers' ability to perform effective breastfeeding and have perceived sufficient milk</p> <p>2) To increase family members' ability to provide family support to promote the breastfeeding skills of first-time mothers</p>	<p>Strategies: Individual discussion, advice, feedback</p> <p>1. Ask mothers about their breastfeeding experience after participating in the previous sessions and suggest solutions or provide breastfeeding training again if necessary</p> <p>2. Encourage mothers to breastfeed using the skills learned from the previous session; Evaluate breastfeeding and give feedback</p> <p>3. Ask family members about their roles in giving support for mothers to promote effective breastfeeding and barriers that require solutions</p> <p>4. Ask mothers about their perception of breastfeeding support to promote effective breastfeeding; Use this information to improve support from family members</p>
<p>Session 4</p> <p>Self-efficacy and family support enhancement (3rd day postpartum) (45 minutes)</p> <p>Objectives</p> <p>1) To increase mothers' ability to perform effective breastfeeding and have perceived sufficient milk</p> <p>2) To increase family members' ability to provide family support to promote the breastfeeding skills of first-time mothers</p>	<p>Strategies: Individual discussion, advice, feedback</p> <p>1. Ask mothers about breastfeeding experience after participating in previous sessions and any breastfeeding problems; Ask family members to give solutions and suggestions</p> <p>2. Encourage mothers to breastfeed using the skills learned from the previous session; Ask family members to evaluate and give feedback on breastfeeding</p> <p>3. Ask mothers and family members to discuss the satisfaction with family support for breastfeeding to reach mutual agreement and improvement in support</p> <p>4. Recommend mothers and family members to review the given manual and video multimedia</p>

ประสิทธิผลของโปรแกรมการส่งเสริมสมรรถนะแห่งตนในการเลี้ยงลูกด้วยนมแม่และการสนับสนุนจากครอบครัวในมารดาหลังคลอดครรภ์แรก: การทดลองแบบสุ่มชนิดมีกลุ่มควบคุม

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บทคัดย่อ: มารดาครรภ์แรกขาดเทคนิคการเลี้ยงลูกด้วยนมแม่อย่างมีประสิทธิภาพและรับรู้ความไม่เพียงพอของน้ำนมเนื่องจากมีประสบการณ์ในการเลี้ยงลูกด้วยนมแม่ไม่เพียงพอ ยังมีโปรแกรมจำกัดในการส่งเสริมการเลี้ยงลูกด้วยนมแม่อย่างมีประสิทธิภาพและการรับรู้ความเพียงพอของน้ำนมในมารดาครรภ์แรกในประเทศไทย การวิจัยเชิงทดลองแบบสุ่มและมีกลุ่มควบคุมนี้มีวัตถุประสงค์เพื่อศึกษาประสิทธิผลของโปรแกรมการส่งเสริมสมรรถนะแห่งตนในการเลี้ยงลูกด้วยนมแม่และการสนับสนุนจากครอบครัวต่อการเลี้ยงลูกด้วยนมแม่อย่างมีประสิทธิภาพและการรับรู้ความเพียงพอของน้ำนมในมารดาครรภ์แรก กลุ่มตัวอย่างเป็นมารดาครรภ์แรกที่คลอดปกติและสมาชิกในครอบครัว จำนวน 64 คู่ คัดเลือกจากคลินิกฝากครรภ์ในจังหวัดหนึ่งของประเทศไทย ได้รับการสุ่มเข้ากลุ่มทดลอง (n = 32) เพื่อรับโปรแกรมนอกเหนือจากการดูแลตามมาตรฐาน และกลุ่มควบคุม (n = 32) เพื่อรับการดูแลตามมาตรฐานเท่านั้น เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามข้อมูลประชากรและสถิติศาสตร์ เครื่องมือประเมินการเลี้ยงลูกด้วยนมแม่ของบริสตอล (Bristol Breastfeeding Assessment Tool) และแบบวัดการเลี้ยงลูกด้วยนมแม่ H & H (H & H Lactation Scale) สำหรับมารดาครรภ์แรก และแบบสอบถามข้อมูลประชากรสำหรับสมาชิกในครอบครัว วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา การทดสอบไคสแควร์ การทดสอบของฟิชเชอร์ การทดสอบความแปรปรวนแบบผสมสองทาง

ผลการวิจัยพบว่า หลังจากได้รับโปรแกรม คะแนนการเลี้ยงลูกด้วยนมแม่ที่มีประสิทธิภาพและการรับรู้ความเพียงพอของน้ำนมในวันที่ 3 วันที่ 10 และ วันที่ 28 หลังคลอดในกลุ่มทดลองสูงกว่าก่อนได้รับโปรแกรมและสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ พยาบาลสามารถบูรณาการโปรแกรมนี้เพื่อฝึกอบรมสมาชิกในครอบครัวให้สนับสนุนการเลี้ยงลูกด้วยนมแม่ในมารดาครรภ์แรกอย่างต่อเนื่องและส่งเสริมให้มารดาครรภ์แรกเกิดความมั่นใจในความสามารถที่จะเลี้ยงลูกด้วยนมแม่อย่างมีประสิทธิภาพและรับรู้ความเพียงพอของน้ำนม อย่างไรก็ตาม ควรมีการทดสอบประสิทธิภาพของโปรแกรมเพิ่มเติม

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คำสำคัญ: การเลี้ยงลูกด้วยนมแม่ การเลี้ยงลูกด้วยนมแม่อย่างมีประสิทธิภาพ การสนับสนุนจากครอบครัว มารดาครรภ์แรก การรับรู้ความเพียงพอของน้ำนม

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