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Effectiveness of an Integrated Nursing Program on Breast Engorgement and Perceived Self-Efficacy on Breast Feeding

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ABSTRACT: This study was a quasi-experimental research design that employed the pretest-posttest control groups design with the aim of examining the effectiveness of an integrated nursing program on breast engorgement pain and perceived self-efficacy in breastfeeding. The participants group consisted of 60 post-partum mothers with normal delivery between January and June 2025, and the research instrumentation included the integrated nursing program that contained four activities, (1) family support, (2) health responsibility, (3) problem management, and (4) social support seeking. The tools used in the experiment included the Pain Evaluation Form, the Six-Point Breast Engorgement Scale, and the Perceived Self-Efficacy in Breastfeeding Scale. The research found that mothers in the group that received the integrated nursing program were aged 20 to 44 years, with a mean age of 30.40 years. Most had completed a bachelor's degree (12 mothers or 40.00%), followed by vocational-level education (10 mothers or 33.33%). The majority had two children (17 mothers or 56.67%), had income in the range of 10,001-15,000 baht the most at 14 mothers or 46.67% and intended to exclusively breastfeed for six months the most at 12 mothers or 40.00%. The post-partum mothers who received the integrated nursing care program experienced less breast engorgement pain ($p < 0.05$) and had significantly higher perceived self-efficacy in breastfeeding ($p < 0.05$).

INTRODUCTION

Breast engorgement happens from the accumulation of milk in the alveoli. The alveoli become enlarged and subsequently compress the surrounding milk ducts to the extent that obstruction of milk flow occurs. As enlargement of the alveoli results in increased obstruction, if milk is not drained from the breasts, stasis can occur to the milk in the alveoli. Meanwhile, enlargement of the milk ducts and alveoli due to obstruction of the milk ducts causes a feedback mechanism that results in the suppression of milk production and secretion [1]. This condition is particularly common among first-time mothers, who often experience greater breast engorgement and obstruction than mothers who have given birth before. This is because first-time mothers have never produced milk or experienced the letdown reflex, resulting in poor milk secretion. They also lack knowledge and experience in preventing and managing breast engorgement when it occurs [2]. The problem of poor or insufficient milk flow is a major factor causing mothers to discontinue breastfeeding and switch to formula feeding instead [3].

Breast engorgement is a frequently encountered symptom that often begins on the second day postpartum. The time period when breast engorgement occurs is often two to seven days postpartum. Breast engorgement in postpartum mothers is divided into two types as follows: 1) Areolar engorgement, which is the engorgement of the milk ducts around the areolae that causes the areolae to become stiff and firm and for the nipples to shorten. This type of engorgement prevents infants from suckling properly from their mothers. Since the infants cannot reach the areolae, they only suckle from the nipples, thus preventing milk flow and infant milk intake. 2) Peripheral engorgement, which often occurs on the second day postpartum due to increased blood and lymph flow around the milk glands due to increased secretion of the prolactin hormone after delivery [4], which

stimulates milk production in the milk-producing cells residing in the alveoli. At this stage, fluid engorgement occurs at the surrounding tissue, and the alveoli pressure the milk ducts, thus preventing milk flow and causing breast engorgement [5]. Without assistance, increased breast engorgement can cause developing into severe engorgement, which often occurs between the period of three to seven days postpartum. At this stage, milk production is high and if milk is not drained, engorgement will occur [6]. As the alveoli become enlarged and compress the milk ducts, peripheral breast engorgement occurs. The breasts will become enlarged, stiff and firm, and subcutaneous veins will be clearly visible. If touched, the breasts will feel hot and painful with pressure. In addition, the mother might experience a low-grade milk fever, which gradually subsides within 12–24 hours. In some cases, it might also be possible to palpate the lymph nodes under the armpits. The nipples will also become swollen and firm and pulled inward until they are shortened. The mother will experience significant pain in the breasts, which will be hot with a glossy and red surface. The breasts will be hard and hurt when pressed on, and the areolas will be firm and hard [6].

Breast engorgement due to milk buildup in the alveoli has multiple causes. For example, in mothers who let their infants breastfeed late, milk can collect for a long time in the alveoli. In addition, anxiety and stress in the mother or pain in the mother postpartum, such as uterine pain and perineal pain, can suppress the letdown reaction, thus causing the muscle cells around the alveoli or myoepithelial cells to fail to contract and prevent milk from being secreted into the milk ducts, thereby leading to milk accumulation around the alveoli and breast engorgement. The problem of breast engorgement occurs in as many as 60–70% of postpartum mothers. Breast engorgement causes discomfort and hinders breastfeeding and may also lead to incidences of cracked nipples and mastitis, thereby contributing to ineffective breastfeeding [7]. Statistics collected from February 2021 from data in the Obstetrics and Gynecology Patient Ward 2 revealed that there was an average of 30 postpartum women recovering in the ward per day and that, of this number, 15–20 mothers were primiparous mothers and 8–10 were multiparous mothers. Furthermore, the mothers had a mean age of 16–35 years, and primiparous mothers who were younger than 20 years experienced a higher rate of breast engorgement than multiparous mothers, i.e., an average number of 10–15 mothers, and their pain levels were different. Accordingly, breast engorgement is a major hindrance to breastfeeding, since mothers who experience pain become demoralized and eventually refuse to breastfeed [8]. In addition, low perceived breastfeeding efficacy causes mothers to perceive themselves to produce insufficient milk for their infants and to consequently begin feeding their infants formula milk [9], in addition to increasing the loss of maternal role, and onset of postpartum depression, along with malnutrition, lack of immunity and various complications in the infant. Accordingly, the application of herbal compresses around the breasts can improve blood circulation, reduce inflammation, increase the rate of milk secretion and relax mothers [10]. Furthermore, teaching methods that involve breastfeeding practice such as bathing, breastfeeding and self-squeezing milk enhance mothers' confidence and promote more appropriate behavior modification [11]. Family support is also a factor that contributes to promoting post-partum mothers with emotional security [12], a sense of worth and a positive attitude toward breastfeeding and an intention to successfully breastfeed. However, only a small number of postpartum mothers receive support in performing their roles in this area, resulting in less successful breastfeeding than expected.

The use of the aforementioned methods in developing a nursing program to relieve breast engorgement pain and to promote appropriate role performance among postpartum women contributes to greater breastfeeding success.

METHOD

1. Design

This study employed a quasi-experimental research design using a pretest–posttest control group design. The sample included 60 postpartum mothers who delivered vaginally between January and June 2025. The research instrument was the integrated nursing program, which comprised four key activities: (1) family support, (2) health responsibility, (3) problem management, and (4) social support seeking. The measurement tools included the Six-Point Breast Engorgement Scale and the Perceived Self-Efficacy in Breastfeeding Scale. Experts validated the instruments for content validity and tested their reliability using Cronbach's alpha coefficient, which was 0.90. Populations: The population consisted of postpartum mothers who delivered at Lamplaimat Hospital in Buriram Province between January and June 2025. Sample: The sample group comprised 60 primiparous mothers who delivered at Lamplaimat Hospital in Buriram Province between January and June 2025. The participants were selected using purposive sampling and were divided into two groups: 30 mothers in the experimental group, who received the integrated nursing intervention program, and 30 mothers in the control group, who received routine care.

Inclusion Criteria

1. Thai mothers aged 18 years or older who were able to read and understand the Thai language.
2. Mothers with no contraindications to breastfeeding.
3. Mothers who delivered at term, with a gestational age of 37 weeks or more.
4. Willingness to participate in the study.

Exclusion Criteria

Mothers and/or infants who developed complications after participating in the study, or mothers who were unable to complete 100% of the intervention program.

2. Instrument

1. The questionnaire on perceived self-efficacy in breastfeeding contained 13 questions.
2. The Six-Point Breast Engorgement Scale, modified from the version developed by Hill and Humenick^[13]. The scale divided pain into 6 points, i.e., 1 point means normal breasts without pain symptoms, 2 points means minor pain, 3 points means presence of symptoms of engorgement without pain after pressing, 4 points means presence of symptoms of engorgement with minor pain after pressing, 5 points means presence of symptoms of engorgement with pain after pressing, and 6 means presence of symptoms of engorgement with severe pain after pressing.
3. The research instrument also included the integrated nursing program, which comprised four key activities: (1) family support, (2) health responsibility, (3) problem management, and (4) social support seeking.

3. DATA ANALYSIS

1. Descriptive statistics were used to analyze the basic data, including mean, percent and standard deviation.
2. The chi-square test was used to compare baseline characteristics.
3. The independent samples t-test was used to compare the mean scores of pain and the mean scores of perceived breastfeeding self-efficacy.

ETHICAL APPROVAL

This research was approved by the Human Research Ethics Committee of the Buriram Provincial Public Health Office, approval number BRO 2025-047. The researcher explained to the participants that their participation in this study was voluntary, and they could choose to participate or not. Refusal to participate did not affect the treatment they had previously received. The research results were presented in aggregate form and used solely for academic and research purposes.

4. RESULTS

Table 1. Pretest-posttest breast pain scores of mothers in the group that received the integrated nursing program and the group that received standard nursing care.

Experiment	<i>n</i>	<i>Min</i>	<i>Max</i>	<i>X̄</i>	<i>SD</i>
Mothers who received the integrated nursing program					
Pretest	30	4	6	5.17	0.75
Posttest	30	4	6	4.43	0.57
Mothers who received standard nursing care					
Pretest	30	4	6	5.27	0.64
Posttest	30	4	6	5.17	0.53

From Table 1, it can be seen that the pretest mean breast pain score of mothers in the group that received the integrated nursing program was 5.17 (SD = 0.75), and the posttest mean breast pain score was 4.43 (SD = 0.57). Meanwhile, the pretest mean breast pain score of mothers in the group that received standard nursing care was 5.27 (SD = 0.64), and the posttest mean breast pain score was 5.17 (SD = 0.53).

Table 2. Pretest-posttest perceived breastfeeding efficacy of mothers in the group that received the integrated nursing program and the group that received standard nursing care.

Experiment	<i>n</i>	<i>Min</i>	<i>Max</i>	<u><i>X</i></u>	<i>SD</i>
Mothers who received the integrated nursing program					
Pretest	30	38.46	50.77	43.18	2.70
Posttest	30	46.15	55.38	51.08	2.58
Mothers who received standard nursing care					
Pretest	30	34.62	45.38	39.72	2.69
Posttest	30	40.77	52.31	45.28	2.19

From Table 2, it can be seen that the pretest mean perceived breastfeeding self-efficacy score of mothers in the group that received the integrated nursing program was 43.18 (SD = 2.70), and the posttest mean perceived breastfeeding self-efficacy score was 51.08 (SD = 2.58). Meanwhile, the pretest mean perceived breastfeeding self-efficacy score of mothers in the group that received standard nursing care was 39.72 (SD = 2.69), and the posttest mean perceived breastfeeding self-efficacy score was 45.28 (SD = 2.19).

Table 3. Comparison of breast pain in mothers in the group that received the integrated nursing program and the group that received standard nursing care.

Time	n	<u>X</u>	SD	t	p-value
Pretest					
Mothers who received the integrated nursing program	30	5.17	0.75	0.56	0.58
Mothers who received standard nursing care	30	5.27	0.64		
Posttest					
Mothers who received the integrated nursing program	30	4.43	0.57	5.16*	0.00
Mothers who received standard nursing care	30	5.17	0.53		

* $p < 0.05$

Table 3 shows that the pretest mean breast pain scores of mothers in the group that received the integrated nursing program and the group that received standard nursing care were not significantly different. In addition, it was found that the posttest mean breast pain scores of mothers in the two groups were significantly different at the 0.05 level, with the mean breast pain score of mothers in the group that received the integrated nursing program being lower than that of mothers in the group that received standard nursing care.

Table 4. Comparison of pretest and posttest breast pain in mothers who received the integrated nursing program.

Time	n	$\bar{X}$	SD	t	p-value
Pretest	30	5.17	0.75	4.25*	0.001
Posttest	30	4.43	0.57		

*p< 0.05

Table 4 shows that the mean breast pain scores of mothers in the group that received the integrated nursing program were significantly different before and after the intervention at the 0.05 level, with the mean breast pain score after receiving the integrated nursing program being lower than before receiving the program.

Table 5. Comparison of perceived breastfeeding efficacy of mothers before and after receiving the integrated nursing program.

Time	n	$\bar{X}$	SD	t	p-value
Pretest	30	43.18	2.58	13.01*	0.001
Posttest	30	51.08	2.71		

*p< 0.05

Table 5 shows that the mean perceived breastfeeding self-efficacy scores of mothers in the group that received the integrated nursing program before and after the intervention were significantly different at the 0.05 level, with the mean perceived breastfeeding self-efficacy score after receiving the integrated nursing program being higher than before the intervention.

Table 6. Comparison of perceived breastfeeding efficacy in mothers between the group that received the integrated nursing program and the group that received standard nursing care.

Time	n	<u>X</u>	SD	t	p-value
Pretest					
Mothers who received the integrated nursing program	30	43.18	2.71	4.97*	0.00
Mothers who received standard nursing care	30	39.72	2.69		
Posttest					
Mothers who received the integrated nursing program	30	51.08	2.58	9.39*	0.00
Mothers who received standard nursing care	30	45.28	2.19		

*p< 0.05

Table 6 shows that the pretest mean perceived breastfeeding self-efficacy scores of mothers in the group that received the integrated nursing program and the group that received standard nursing care were significantly different at the 0.05 level. In addition, it was found that the posttest mean perceived breastfeeding self-efficacy scores of mothers in the two groups were also significantly different at the 0.05 level, with the mean perceived breastfeeding self-efficacy score of mothers in the group that received the integrated nursing program being higher than that of mothers in the group that received standard nursing care.

5. DISCUSSIONS

Mothers in the group that received the integrated nursing program were aged 20–44 years, with a mean age of 30.40 years. (12 mothers or 40.00%), followed by vocational education (10 mothers or 33.33%); had two children the most (17 mothers or 56.67%); had an income in the range of 10,001–15,000 baht the most (14 mothers or 46.67%); and had the intention to breastfeed for six months the most (12 mothers or 40.00%). Mothers in the group that received the standard nursing care were aged 20–40 years, with a mean age of 29.17 years. These mothers completed education with a bachelor's degree level the most (12 mothers or 40.00%), followed by vocational education (10 mothers or 33.33%); had one child the most (14 mothers or

46.67%); had an income in the range of 20,001–25,000 baht the most (15 mothers or 50.00%); and had the intention to breastfeed for six months the most (12 mothers or 40.00%).

The mean score of breast engorgement pain among mothers in the experimental group

was significantly lower than the control group. This outcome may be attributed to the integrated nursing program, which incorporates both physical and psychological pain relief methods, including the use of analgesics, the application of warm compresses^{14,15}, distraction techniques, and psychological support¹⁶. Among mothers who received all four components of the integrated nursing program, the postpartum mothers experienced pleasure, satisfaction, or relaxation. Consequently, the pituitary gland secreted endorphins, which inhibited the transmission of pain signals at the spinal level, effectively closing the pain gate¹⁸. This resulted in reduced pain perception and decreased physiological responses to pain, leading to lower breast engorgement pain scores compared to postpartum mothers who received standard care.

The mean score of perceived self-efficacy in breastfeeding among postpartum

mothers in the experimental group were significantly taller than the control group. This finding may be attributed to the integrated postpartum care program, which provides comprehensive physical and psychological support. Such support enables mothers to fulfill their maternal roles effectively, particularly through emotional support. Emotional support was provided by offering mothers love, care, and attention during the postpartum period¹⁷, which is particularly important as they transition from their previous roles to new maternal roles, accompanied by physical, emotional, and social changes. Postpartum mothers require emotional support, opportunities to express concerns, fears, and worries, and to be comforted warmly to foster confidence and motivation to perform their maternal roles fully^{19,20}. Instrumental support included assistance in the form of items, financial aid, or services, addressing the multifaceted responsibilities mothers face in maternal, family, and work roles, thereby reducing their burden²¹. Informational support was provided not only by healthcare professionals, such as doctors and nurses, through practical recommendations but also by close family members, who encouraged mothers to follow guidelines correctly and provided problem-solving guidance to promote maternal health²². Furthermore, social support was found to contribute to breastfeeding success. Nursing support, for instance, enhances mothers' awareness and confidence, as nurses provide guidance, assistance, and encouragement, enabling mothers to breastfeed with assurance²³. Therefore, postpartum mothers who receive support from spouses and family members, including assistance in breastfeeding, access to information and knowledge, material resources, praise, and encouragement after engaging in correct breastfeeding behaviors, experience increased confidence and pride in performing their maternal roles^{19–23}.

6. CONCLUSION

The integrated nursing program effectively reduced breast engorgement pain and

enhanced breastfeeding self-efficacy among postpartum mothers. Combining physical and psychological support strategies, including analgesics, warm compresses, distraction techniques, and emotional encouragement helped mothers experience less pain and greater relaxation. Comprehensive support, encompassing emotional, instrumental, informational, and social dimensions, enabled mothers to fulfill their maternal roles with increased confidence and pride. Overall, the program provides an effective approach to improving postpartum care outcomes and supporting mothers in managing both maternal and family responsibilities.

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