ผลของโปรแกรมส่งเสริมการเลี้ยงลูกด้วยนมแม่ต่อความตั้งใจและพฤติกรรมการเลี้ยงลูกด้วยนมแม่ของมารดาที่มีทารกเกิดก่อนกำหนดระยะท้าย
Effects of Breastfeeding Promoting Program on Intention and Breastfeeding Behavior among Mothers with Late Preterm Infants

นิพนธ์ต้นฉบับ **Original Article**

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาผลของโปรแกรมส่งเสริมการเลี้ยงลูกด้วยนมแม่ต่อความตั้งใจ และพฤติกรรมการเลี้ยงลูกด้วยนมแม่ของมารดาที่มีทารกเกิดก่อนกำหนดระยะท้าย **วิธีการศึกษา:** การวิจัยแบบกึ่งทดลองศึกษาสองกลุ่มวัดก่อนและหลังการทดลอง กลุ่มตัวอย่างเป็นมารดาที่มีทารกเกิดก่อนกำหนดระยะท้ายที่รักษาในหออภิบาลทารกแรกเกิดวิกฤติ โรงพยาบาลนครนายก เลือกตัวอย่างแบบเฉพาะเจาะจงตามคุณสมบัติที่กำหนดจำนวน 30 ราย แบ่งเป็นกลุ่มควบคุมและกลุ่มทดลอง กลุ่มละ 15 ราย กลุ่มควบคุมได้รับการพยาบาลตามปกติ กลุ่มทดลองได้รับโปรแกรมส่งเสริมการเลี้ยงลูกด้วยนมแม่ครั้งละ 30 – 45 นาที จำนวน 3 ครั้ง เก็บข้อมูลทั่วไปของมารดาและทารก และใช้แบบสอบถามความตั้งใจในการเลี้ยงลูกด้วยนมแม่ และแบบสอบถามพฤติกรรมการเลี้ยงลูกด้วยนมแม่ ซึ่งมีค่าดัชนีความตรงตามเนื้อหาเท่ากับ 1 และ 0.95 ตามลำดับ และมีค่าความเชื่อมั่นสัมประสิทธิ์อัลฟาครอนบาคเท่ากับ 0.84 และ 0.92 ตามลำดับ วิเคราะห์ข้อมูลโดยการทดสอบค่าที **ผลการศึกษา:** ภายหลังการทดลอง มารดากลุ่มทดลองมีคะแนนเฉลี่ยความตั้งใจในการเลี้ยงลูกด้วยนมแม่ และคะแนนเฉลี่ยพฤติกรรมการเลี้ยงลูกด้วยนมแม่สูงกว่ามารดากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ (P-value < 0.001 ทั้งคู่) **สรุป:** โปรแกรมส่งเสริมการเลี้ยงลูกด้วยนมแม่ ช่วยให้มารดาที่มีทารกเกิดก่อนกำหนดระยะท้ายมีความตั้งใจและมีพฤติกรรมการเลี้ยงลูกด้วยนมแม่ที่ถูกต้องมากขึ้น ควรประยุกต์โปรแกรมกับมารดาที่มีทารกเกิดก่อนกำหนดระยะท้าย

คำสำคัญ: โปรแกรมการเลี้ยงลูกด้วยนมแม่; ความตั้งใจ; พฤติกรรม; การเลี้ยงลูกด้วยนมแม่; ทารกเกิดก่อนกำหนดระยะท้าย

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Abstract

Objective: To study effects of breastfeeding promoting program on intention and breastfeeding behavior among mothers with late preterm infants. **Method:** In this quasi-experimental research, two groups were compared with pretest-posttest design. The sample was 60 mothers with late preterm infants who were admitted in neonatal intensive care unit at Nakhon Nayok hospital recruited by purposive sampling. The control group (n = 30) was treated with routine care while the test group (n = 30) was trained with the breastfeeding promoting program for 30 - 45 minutes three times. Demographic data were collected. Participants were assessed using questionnaires of breastfeeding intention and breastfeeding behavior. The questionnaires had content validity index of 1.0 and 0.95, respectively, and Cronbach's alpha coefficients of 0.84 and 0.92, respectively. Data were analyzed using an independent t-test. **Results:** After the experiment, mean scores of breastfeeding intention and breastfeeding behavior of the experiment group were significantly higher than the control group (P-value < 0.001 for both). **Conclusion:** Breastfeeding promoting program improved the breastfeeding intention and behaviors in mothers with late preterm infants. The program should be applied to these mothers.

Keywords: breastfeeding promoting program; intention; behavior; breastfeeding; late preterm infants

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Introduction

Breast milk contains valuable nutrition for growth and development, especially for preterm infants.[1] Breast milk comprises antibodies that can prevent infection. Secretory IgA that can prevent intestinal infections, especially necrotizing enterocolitis (NEC) in infants, which is a major problem of the gastrointestinal tract with a high mortality rate among preterm infants.[2-4] The World Health Organization (WHO) required countries worldwide to enhance the rate of exclusive breastfeeding for 6 months with age-appropriate food until 2 years or more. A common goal has been set to improve the rate of exclusive breastfeeding for 6 months by 50% within 2025.[5]

The report on Global Breastfeeding Statistics in 2013 revealed that the 6- month exclusive breastfeeding rate worldwide was 37% and that preterm infants were breastfeed for 6 consecutive months by only 2%.[5] In Thailand, in 2019, the rate of exclusive breastfeeding for six months was only 14%, and only 34% of infants were breastfeed within the first hour after birth.[6] This indicates that the promotion of breastfeeding by the WHO has not been achieved although

exclusive breastfeeding has been promoted along with the promotion and preparation of mothers with preterm infants who could not breastfeed.[7] However, mothers with late preterm infants often faced more obstacles since their infants had a different breastfeeding ability, compared with full-term infants, thus difficult exclusive breastfeeding.[8]

Late preterm infants were born between 34 weeks and 36 weeks 6 days of gestation. This group of infants was approximately 80%.[9] They are similar in development and appearance to full-term infants in terms of birth weight, Apgar score, and environmental response.[10] Therefore, they are treated like full-term infants. In fact, late preterm infants could not effectively be breastfed since the coordination between sucking, swallowing and breathing of late preterm infants is not complete. Despite the development of complete coordination, they could not strongly suck, refused to suck, or sucked the areola and nipples of the mother in the mouth for a long time, leading to a small amount of milk.[8] Moreover, late preterm infants are exposed to greater health risks than full-term infants due to the defects of the body, such as ineffective breathing, easily-changing body temperature, hypoglycemia, low weight, jaundice, and infection resulting in longer hospital stays. In some cases, infants who showed no signs of abnormalities were discharged from the hospital early but had to return to the hospital with various complications such as yellow body and low weight affecting the long-term health status of the late preterm infants including the development of the brain and intelligence.[11] Therefore, the promotion of breastfeeding among late preterm infants is crucial.

According to the study of breastfeeding problems among mothers with late preterm infants, the mothers breastfeed the infants late since infants are separated from their mothers immediately after birth to assess possible complications and the mothers did not express breast milk during the first period. This was the main reason why the mother's body could not stimulate the secretion of milk. When mothers started breastfeeding, most infants slept for a long time, were difficult to wake up, and had little sucking force, affecting the milk production process. Therefore, the mothers produced little milk as well as improper breastfeeding behavior, such as the method of expressing breast milk,[12] how to hold an infant, how to put a baby to the breast, and how to stimulate an infant to suck.[13] These were reasons why mothers refused to breastfeed since they thought the infants were full. So, they felt insecure about breastfeeding their infants, possibly leading to the early end of breastfeeding.[14,15] However, mothers believe that formula milk could replace breast milk and improve the infant's weight better than breast milk causing mothers to stop breastfeeding or start breastfeeding along with formula milk or give only formula milk to infants.[16]

The study on the causes of improper breastfeeding behavior in preterm infants discovered that the main factor was the mother's lack of breastfeeding intention,[17] negative attitudes, and a lack of family support, especially from the husband.[18] Problems related to late preterm infants not being breastfeed or being breastfeed for a short period of time relied on both maternal and infant factors.[19] In particular, mothers must have a high level of intention to successfully breastfeed.[17,20,21] The study of Sangin et al (2020)[22] found that breastfeeding intention was a significant predictor of breastfeeding behavior (P-value < 0.05). According to Ajzen's (2002) Theory of Planned Behavior (TPB),[23] it was believed that successful breastfeeding must be based on the mother's intention to act on that particular behavior. Intention determinations included positive attitudes, family support, and perceived behavioral control. It can be said that an individual with the intention to practice any health behavior, a positive attitude toward that behavior, knowledge and understanding, and family support was more likely to act on that behavior and an individual will have the intention of practicing it well only when they recognize that they can control such behavior. According to the review of recent research, it was recommended that the program should be enhanced with a focus on increasing the awareness of families to support mothers' breastfeeding.[24] When the mothers received the program, they expressed confidence and intention in breastfeeding despite having to work outside the home. Besides, the study of Chaiyanan (2016)[25] discovered that mothers with self-confidence about breastfeeding preterm infants at a high level would practice proper and effective breastfeeding behavior for preterm infants.

The promotion of breastfeeding among mothers with ordinary newborns has been studied. Most studies aimed to investigate mothers who work outside the home. The study of Na Ayutthaya (2009)[26] examined the effects of the breastfeeding promoting program among first-time mothers who work outside the home based on the Theory of Planned Behavior with the promotion of attitudes, subjective norm, and perceived behavioral control. The findings suggested that mothers in the experimental group had longer breastfeeding

times than mothers in the control group and overall breastfeeding behavior was significantly better than the control group (*P*-value < 0.001). Similarly, the study of Pichianwilia (2014)[27] examined the effects of the breastfeeding promoting program based on the Theory of Planned Behavior among mothers working outside the home along with the promotion of attitudes, subjective norm, and perceived behavioral control by training skills for mothers to gain more self-confidence. The experimental results showed that the experimental group's breastfeeding proportions and exclusive breastfeeding behavior scores were significantly higher than the control group (*P*-value < 0.01 and 0.001, respectively). Both studies only promoted full-term infants only. Thus, breastfeeding was easier for preterm infants whose suckling ability was not effective.

Based on the literature review, the concept related to breastfeeding intention among mothers with preterm infants by Chaiwat et al (2018)[12] who studied the effects of the breastmilk expression promoting program of mothers with preterm infants included the promotion of attitudes of mothers and families and perceived self-efficacy in breast milk expression. It was found that mothers in the experimental group had a high level of breast milk expressing intentions and proper and consistent milk expression behavior better than the control group with a statistical significance (*P*-value < 0.001), but this study only focused on milk expression behavior. Regarding the study of breastfeeding behavior in late preterm infants, a study by Arthibenyakul et al (2017)[13] studied the effects of the perceived self-efficacy program on breastfeeding of late preterm infants including teaching, demonstration, and return demonstration on how to breastfeed an infant, breast milk expression and glass feeding by hand off technique. It was found that mothers in the experimental group had significantly higher breastfeeding efficiency than mothers in the control group (*P*-value < 0.05), but the breastfeeding rate in the experimental group and the control group were similar (*P*-value > 0.05). However, this study did not modify attitudes of mothers and families and excluded husbands who were the most important individuals in the family from taking part in breastfeeding. This affected mothers' intention and long-term breastfeeding behavior since the mothers needed time for breast milk expression and breastfeeding until infants could suck the breast.

Moreover, it was found that promoting mothers with late preterm infants to repeat the practice until they were confident that they could practice breastfeeding and continued to monitor problems in breastfeeding would allow mothers to maintain proper breastfeeding behavior despite being at home.[28,29] The literature review in Thailand has not yet found any specific activities to promote mothers with late preterm infants to continue breastfeeding, in particular, to encourage mothers to have the intention and perceived behavioral control with focusing on families, especially husbands, to take part in supporting mothers to breastfeed. This is because the baby was in the hospital so that mothers can breastfeed properly and could maintain breastfeeding behavior for late preterm infants continuously.

Hence, the researcher aimed to develop and test the benefits of a breastfeeding promoting program for mothers with late preterm infants based on Ajzen's (2002) Theory of Planned Behavior (TPB) consisting of 3 key concepts namely 1) promotion of mother and family attitudes, 2) promotion of family participation in breastfeeding, and 3) promotion of mothers' perceived behavioral control. It was expected that this study would help mothers to achieve continuous and effective intention and breastfeeding behavior, resulting in healthy infants with no complications.

Specifically, this present study aimed to compare the mean scores of 1) breastfeeding intentions and 2) breastfeeding behaviors of mothers with late preterm infants who received the breastfeeding promoting program in addition to the usual care (test group) and those who received only the usual care (control group). Accordingly, it was hypothesized at the end of the breastfeeding promoting program, 1) scores of breastfeeding intentions and scores of breastfeeding behaviors in the test group were higher than those in the control group.

Conceptually, according to the Ajzen's (2002)[23] Theory of Planned Behavior., the breastfeeding behaviors were the result of intentions to perform and the intention to perform any activity emerged from consideration based on a good attitude, subjective norm, or family support especially from the husband. Besides, perceived control could assist them to perform appropriate behaviors. In addition, perceived behavioral control directly affected successful behaviors by educating mothers and husbands who participated in the program to create a positive attitude towards breastfeeding and promoting husbands to take part in supporting mothers and promote participation in breastfeeding. These could motivate mothers for breastfeeding intentions. When the

mothers had a positive attitude towards breastfeeding, the husband took part in breastfeeding, and the mothers practiced breastfeeding, the mothers would have more confidence and perceived behavioral control for breastfeeding leading to further enhanced breastfeeding intention and behaviors.

Methods

In this quasi-experiment study, the study population was mothers with late preterm infants. It was conducted from April 2022 to September 2022 at Nakhon Nayok Hospital, Thailand, which is a general hospital. The study aimed to examine mothers with preterm infants between 34 - 36 weeks of gestation who were admitted to the neonatal intensive care unit at Nakhon Nayok Hospital. The effect size of the sample was calculated from a large effect size of 0.80 found in a study of Chaiwat et al (2018).[12] With a type I error of 5% and a power of 99%, a sample size based on the Cohen's comparison of the two means was 15 participants per group of Cohen (1988).[30,31] Participants were selected using a purposive sampling according to the specified criteria. To be eligible, they had to be the mother experienced spontaneous vaginal delivery during the first 24 hours with no postpartum complications that were an obstacle to breastfeeding (e.g., such as postpartum hemorrhage shock, high blood pressure of more than 150/100 mmHg, substance abuse and HIV positive blood test results), be 20 years old or older, able to read and write in Thai, and have the husband who was able to participate in the activities.

Exclusion for the mothers

the mother cannot participate in all stages of the activity and the husband cannot participate in all 2 activities, 2) the preterm infant experiences complications and cannot be breastfeed, such as NPO and receiving formula milk to increase body weight.

For **infants**, they had to have no obstacles from breastfeeding including cleft lip and cleft palate, congenital heart disease, and the use of ventilators or continuous positive airway pressure (CPAP) and be exclusively breastfeed. Regarding the **exclusion criteria**, 1) the infant cannot participate in all stages of the activity and the husband cannot participate in all 2 activities, 2) the preterm infant experiences complications and cannot be breastfeed, such as NPO and receiving formula milk to increase body weight.

Research instruments

Researcher instruments included the breastfeeding promoting program and the tools to collect data and assess breastfeeding intention and behaviors. The details are as follows.

The breastfeeding promoting program

The breastfeeding promoting program was a systematically planned activity developed based on literature reviews and related research according to Ajzen's (2002) Theory of Planned Behavior with 3 key concepts of 1) promotion of mothers' and fathers' positive attitudes on breastfeeding by education and exchange of knowledge on breastfeeding, 2) promotion of husband participation in breastfeeding by supporting and encouraging mothers in breastfeeding, and 3) promotion of mothers' perceived behavioral control, including breast milk expression and breastfeeding to enhance mothers' confidence in breastfeeding. All activities were conducted 3 times in 3 days, and each time took 30 – 45 minutes. The evaluation of the postpartum mothers on the fourth day took 15 minutes.

The program included 1) learning materials on breastfeeding for mothers with late preterm infants, 2) 3 videos, namely "Breast Milk… The Best" with a length of 5.21 minutes, "Expressing…Collecting…Stocking…Milk for the Baby" (7.11 minutes), and "Holding a Baby… Proper Breastfeeding" (10.11 minutes) from the Breastfeeding Center of Thailand, 3) a set of 18 flip-flops with advice on "Breastfeeding" from the Breastfeeding Center of Thailand, and 4) a handbook on breastfeeding for late preterm infants. These materials were developed based on literature reviews.

Data collection and breastfeeding intention and behavior assessment tools

The **first part** of the questionnaire collected the mothers' personal information consisting of age, educational background, marital status, number of children, number of members in the household, occupation, income, child care assistant, and experience of breastfeeding. The questionnaire also collected the information about the birth of the infant from the patient history file in the Neonatal Intensive Care Unit consisting of date and time of delivery, gestational age, birth weight, Apgar score, and preliminary diagnosis.

The second part assessed breastfeeding intention. The questionnaire was developed based on Ajzen's (2002) Theory of Planned Behavior. It consisted of breastfeeding intention, intention to express breast milk, and intention to try breastfeeding an infant, with one question each. The response was a 4-point scale ranging from 1-disagree, to 2-slightly agree, 3-moderately agree, and 4-most agree. With the total score of 3 – 12 points, higher scores indicates higher levels of intention to breastfeeding.

The third part assessed the breastfeeding behavior. The questionnaire was developed based on the literature review. With a total of 22 questions, there were questions on breast preparation (5 questions), on milk expression (8 questions), and infant breastfeeding (9 questions). The response was a 4-point rating scale ranging from 1-never practice, to 2-occasionally practice, 3-often practice, and 4-regularly practice. With the total score of 22 – 88 points, higher scores indicate a higher level of breastfeeding behavior of the mother.

Research instrument validation

The breastfeeding promoting program and the questionnaire (i.e., breastfeeding intention questionnaire and breastfeeding behavior questionnaire) were tested for content validity consistency of content, and the suitability of the language by three experts namely one pediatrician, one pediatric nursing teacher, and one breastfeeding specialist nurse. The content validity index (CVI) was determined and a criterion cutoff of 0.8[32] was used. The breastfeeding promoting program had good content validity with CVI of 1.0 and the intention and actual behavior questionnaires had good content validity with CVI of 0.95 and 1.0, respectively. The content and language were revised according to the recommendations of the experts. The breastfeeding intention and behavior questionnaires were also tested for internal consistency reliability with 10 individual mothers with characteristics comparable with the participants at the study hospital. The questionnaires had a good internal consistency reliability with Cronbach's alpha coefficients of 0.84 and 0.92, respectively.[32]

Participant ethical protection

The study was approved by the Burapha University Research Ethics Committee (approval number: IRB 3-002/2562) and the Research Ethics Committee at Nakhon Nayok Hospital (approval number: 01/2565). The researcher provided the participants with objective, benefits, process, and voluntary and confidentiality nature of the study. Written informed consent was obtained. Withdrawal from the study at any time had no negative consequences on the care they received.

Data collection procedure

The researcher met the head nurse, the head of the postpartum ward, and the head of the neonatal intensive care unit to clarify and request permission to conduct the program and collect data. The researcher started data collection by meeting with the participants to describe the objectives of the research, methods, research period, and the participants' rights protection and provide documents explaining the participants and a consent form.

The experiment and data collection

After permission from all relevant units and departments of the hospital, the researcher approached the participants for preparation. A room was prepared for mothers in the experimental group. The room was quiet without distractions during activities. Before the program, participants in both groups complete the questionnaire (pretest). The detail of conduct in each group was as follows.

In the **control group**, the participants were treated with normal nursing care according to the guidelines of Nakhon Nayok Hospital by the team of nurses in the ward as follows. For the first 24 hours after birth in the postnatal ward, the nurses educated postpartum mother's behavior and breastfeeding for mothers with sick newborns in conjunction with breast preparation practice, breast milk expression, breast milk collection, solving the problems of breast tenderness, and blind, flat, dented nipples by teaching in groups and one by one in the case of the mother not practicing it properly. This took about 30 - 60 minutes.

On the second day, the postpartum mothers and husbands visited the infants for the first time in the neonatal intensive care unit. The nurses explained the infants' conditions and treatment guidelines to the mothers and husbands and provided knowledge about late preterm infant care and breastfeeding including breast milk expression and baby breastfeeding. They were asked to scan the QR CODE on breast milk expression, breast milk collection, and breast milk delivery methods as a self-study. The demonstration was provided to the mothers to practice only when they did not practice properly. This took about 30 - 60 minutes.

On the third day, the postpartum mothers in the neonatal intensive care unit were taught by the nurses how to express breast milk and infant breastfeeding for only mothers who practiced them improperly. This took about 15 - 20 minutes.

On the fourth day, the researcher visited the postpartum mothers to assess their breastfeeding intentions and breastfeeding behaviors (post-test) and the accuracy and completeness of the data were checked. Then, the handbook of breastfeeding in late preterm infants was given and this was the end of the experiment. This took 15 minutes.

In the **test group**, the participants were treated with regular nursing care as described above along with the breastfeeding promoting program. The program activity plans were based on 3 key concepts: 1) promotion of mothers' and fathers' positive attitudes on breastfeeding, 2) promotion of husband participation in breastfeeding, and 3) promotion of mothers perceived behavioral control. The activities started from 8:00 a.m. to 6:00 p.m., with a total of 3 times and 30 - 45 minutes each time, and the 4th time was 15 minutes of evaluation. The procedures in the test group are described as follows.

For the first session (i.e., the first 24 hours after giving birth and husbands, 45 minutes), the attitudes of mothers and husbands were adjusted including the promotion of husband participation and maternal capacities. The researchers greeted, talked, and exchanged opinions with mothers and husbands about the benefits of breast milk. They were asked to watch the videos "Breast Milk... The Best" and "Expressing…Collecting…Stocking…Milk for the Baby." The demonstration was through a simulated breast about breast preparation, stimulation of lactation, breast massage, and breast milk expression using the principles of quick, often, and proper expression including how to store breast milk. The mothers were asked to practice with their husbands' support, and equipment was prepared for milk expression. A handbook on breastfeeding in late preterm infants was given.

For the second session (i.e., 2nd day postpartum mothers and husbands, 45 minutes), the attitudes of mothers and husbands were adjusted, and maternal capabilities were promoted using three activities. In **Activity 1** “Why breastfeeding?,” the researcher employed a set of flip-flops with advice on “breastfeeding” to provide mothers and husbands with knowledge and understanding of the benefits of breastfeeding. **Activity 2** “Exchange of Knowledge” involved opinions on the topic of whether breast milk is better than formula milk, whether breast milk can increase a baby's weight, how mothers produce enough breast milk to meet the needs of their babies, and what the impacts are if the baby is not breastfeed. **Activity 3** “Mother Can Do It" required a video "Holding a Baby… Proper Breastfeeding" and the mothers to practice holding the baby while breastfeeding with their husbands' support in terms of positioning and the use of pillows.

For the third session (i.e., 3rd day postpartum mothers, 30 minutes), the researcher viewed activities the mothers performed in the first and second sessions to provide advice to help enhance the mother’s confidence. The mothers performed breast massages, breast milk expressions, holding a baby for breastfeeding, and weighing before and after breastfeeding to track the amount of breast milk the baby consumes each time. The researcher inquired about problems and obstacles and sought solutions together to enhance mothers' confidence so that they could control their breastfeeding behavior and solve problems.

For the fourth session (i.e., 4th day postpartum mothers, 15 minutes), the researcher greeted and inquired about infant symptoms and assessed maternal readiness in terms of knowledge and confidence to continue breastfeeding along with the opportunity for mothers to ask questions. The researcher asked for cooperation in answering the breastfeeding intention questionnaire and the breastfeeding behavior questionnaire (post-test).

Data analysis

Descriptive statistics including frequency with percentage and mean with standard deviation were used to summarize characteristics and clinical status of the two groups. Differences between the two groups were tested using chi-square or Fisher's exact test, as appropriate for categorial variables and independent t-test or Mann-Witney U test, as appropriate for continuous variables. Mean scores of breastfeeding intentions and breastfeeding behaviors at the end of the study between the two groups were compared using independent t-test or Mann-Witney U test, as appropriate. Statistical significance was set at a type I error of 5% (i.e., P-value < 0.05). All statistical analyses were performed using the software program SPSS version 20.

Results

Of the total of 60 mothers, the mothers in the test and control groups had comparable mean ages (29.33 ± 7.48 and 31.73 ± 7.12 years old, respectively). Most of them were between 21-30 years old (60.0% and 53.3%, respectively). All mothers were married (100.0% in both groups). Majority of the mothers in the test group graduated from higher education level (from vocational school to bachelor's degree or higher (53.3%); while those in the control group completed basic education from kindergarten to high school and vocational school (60.0%). The majority of them were employed (i.e., employees, housewives, company employees, government employees, and state enterprise employees) (60.0% and 66.7%, respectively). Family income was between 10,001-20,000 baht per month (73.4% and 53.3%). Their childcare assistants were husbands (66.7% and 73.3%, respectively). This was their firstborn (66.7% in both groups) so they had no prior experience in breastfeeding (66.7% in both groups). The rest of them had experience in breastfeeding (33.3%) and duration of experience in breastfeeding was 3 - 6 months (80.0%). No statistically significant difference was found in any of these characteristics (P-value > 0.05).

Majority of **the infants** in the test and control groups were female (53.3% and 60.0%). Their gestational age was 35 - 35 6/7 weeks (53.4% and 66.7%, respectively). Their mean gestational age was identical (35.2 ± 0.68 and 35.2 ± 0.56, respectively). They had a lower birth weight of 2,500 grams (53.3% and 60.0%, respectively), with a mean birth weight of 2,490 ± 213.44 and 2,430 ± 196.29 grams, respectively. All infants had an Apgar score at 1 minute of 9 (100.0% in both groups) and at 5 minutes of a mean of 9.80 ± 0.41 and 9.73 ± 0.46. No statistically significant difference was found in any of these characteristics (P-value > 0.05).

Before the program, the mean scores of breastfeeding **intentions** of the test and control groups were not different (10.20 ± 1.08 and 10.40 ± 0.91 points, respectively) (Table 1); while the mean score of the **behavior** in the test group (88.00 ± 0.00 points) was significantly higher than that in the control group (74.67 ± 7.89 points) (P-value < 0.001). As expected, **after the program**, the **intention** mean score in the test group (11.87 ± 0.35 points) was significantly higher than that in the control group (10.47 ± 1.06 points) (P-value < 0.001). Similarly, the **behavior** mean score in the test group (88.00 ± 0.00 points) was significantly higher than that in the control group (74.67 ± 7.89 points) (P-value < 0.001) (Table 1).

Table 1 Mean scores of breastfeeding intentions and behaviors before and after the program (N = 30).

Variables	Mean (SD) (range)		df	t	P-value
	Test group (n = 15)	Control group (n = 15)			
Breastfeeding intention					
Before	10.20 (1.08)	10.40 (0.91)	28	0.548	0.588
	8 - 12	9 - 12			
After	11.87 (0.35)	10.47 (1.06)	28	4.854	< 0.001
	11 - 12	8 - 12			
Breastfeeding behavior					
Before	88.00 (0.00)	74.67 (7.89)	28	6.538	< 0.001
	88 - 88	57 - 87			
After	88.00 (0.00)	74.67 (7.89)	28	6.538	< 0.001
	88 - 88	57 - 87			

Discussions and Conclusion

The breastfeeding promoting program was found to improve scores of breastfeeding intentions and behaviors among Thai mothers with late preterm infants. Even though the within-group statistical comparisons were not done, mean scores of both the breastfeeding intentions and behaviors after the program in the mothers receiving the program were significantly higher than those receiving only the usual nursing care (P-value < 0.001 for both). This is in accordance with both research hypotheses.

Higher scores of breasting intentions and behaviors with the breastfeeding promoting program in addition to the usual nursing care could be related to the concepts of Ajzen's Theory of Planned Behavior (2002) which rely on 3 key factors namely) attitude toward behavior, 2) subjective norm, and 3) perceived behavioral control. All 3 factors could directly affect the intentions to perform behaviors and that the intention would drive the behavior.

Based on these 3 key factors, the researcher has organized activities to promote positive attitudes towards breastfeeding behaviors, namely "Breast Milk... The Best" and "Expressing…Collecting…Stocking…Milk for the Baby". The mothers and their husbands were asked to watch the videos about the benefits of breast milk as well as demonstrations and mothers practiced how to massage their breasts and express breast milk. There were also activities that allowed husbands to participate, such as the "Why Breast Milk" activity in which mothers and husbands looked at a series of flip-flops with advice along with the content "Breastfeeding" for mothers and husbands to understand the benefits of breastfeeding and

exchange opinions using the name of the activity "Exchange of Knowledge" by talking, discussing, exchanging ideas with mothers and husbands. Mothers and husbands were convinced to be aware of the value of breastfeeding with an opportunity to express their opinions for mothers to know their own and their husbands' attitudes. Finally, there were activities that create awareness of perceived behavioral control in breastfeeding, including the “Mother Can Do It” by allowing mothers to watch the video “Holding A Baby... Proper Breastfeeding” and mothers practiced accordingly with husbands' support. A handbook on breastfeeding in late preterm infants was given for mothers to review their knowledge, understanding, and practice again on breastfeeding behavior, encouraging mothers to have more confidence and feel that they could breastfeed their infants.

Moreover, sharing opinions could give mothers an opportunity to review their knowledge and opinions. As a result, mothers could perceive their own attitudes and that of their husbands as well as promote participation in breastfeeding. This would motivate mothers to breastfeed. When the mothers had a positive attitude towards breastfeeding and their husbands took part in breastfeeding, they practiced breastfeeding and further gained more confidence and perceived behavioral control in breastfeeding properly. As a result, the mothers' breastfeeding intentions were higher, leading to successfully breastfeeding the baby. This is consistent with the study of Chaiwat et al (2018)[12] who studied the effects of the breastmilk expression promoting program of mothers with preterm infants including the promotion of attitudes of mothers and families and perceived self-efficacy in breast milk expression. It was found that mothers in the experimental group had a higher level of breast milk expressing intentions than the control group with a statistical significance (*P*-value < 0.001). It could be seen that with a higher level of intentions to express breast milk, mothers would be successful in consistently proper milk expressing behavior. In addition, many studies have discovered that perceived behavioral control in breastfeeding, promotion of self-awareness, and family attitudes led to mothers having a higher intention to succeed in breastfeeding.[17,12,33]

Regarding breastfeeding behaviors, mothers in the training program had higher mean scores on breastfeeding behaviors than the control group. Based on the Theory of Planned Behavior of Ajzen (2002), a positive attitude towards breastfeeding was enhanced with a focus on husbands taking part in supporting mothers and promoting participation in breastfeeding. This would motivate mothers to have the intention to breastfeed. When the mothers had a positive attitude towards breastfeeding and their husbands took part in breastfeeding, with the actual breastfeeding practice, they would gain more confidence and perceive behavioral control in breastfeeding properly. This could lead to enhanced, consistent, and sustained breastfeeding behaviors. This is consistent with a study by Chaiwat et al (2018)[12] on the promotion of mothers' and family attitudes, and perceived efficacy in breast milk expression for mothers in the experimental group. The results showed that mothers in the experimental group had proper and consistent milk expression behaviors better than the control group with a statistical significance (*P*-value < 0.001). It could be seen that behaviors were caused by the intentions to perform. With a high level of intention to express breast milk, mothers would achieve consistent breast milk expression behaviors and could maintain the amount of milk that is sufficient for the needs of the baby. It was also found that mothers with high levels of self-confidence about breastfeeding preterm infants led to positive and effective breastfeeding behavior for preterm infants.[25,13] It was also found that the duration of breastfeeding would be long when mothers had a high level of breastfeeding intentions.[15] Also, if the mothers' level of breastfeeding intentions was high, they would achieve proper breastfeeding behaviors and successfully continue breastfeeding and the baby would receive breast milk for up to 6 months.[21,26,27]

Regarding the control group with regular nursing care, it was found that the mothers in the control group had lower mean scores on breastfeeding intentions than the mothers in the experimental group and mean scores on breastfeeding behaviors were lower than the mothers in the experimental group since most mothers were taught in groups with no adjustment in the attitudes of mothers and husbands as well as feedback exchange. Therefore, mothers learned unequally and lacked self-confidence. In addition, the husbands did not take part in the activities. Consequently, the mothers could not perceive their husbands' attitudes that want them to practice breastfeeding behavior. Therefore, the mothers' breastfeeding intentions were lower than the experimental group, leading to lower breastfeeding behavior scores.

According to the study on the effects of the breastfeeding promoting program on breastfeeding intentions and behaviors

of mothers with late preterm infants, the suggestions are as follows. For nursing practice, nurses could apply the breastfeeding promoting program to mothers with late preterm infants to encourage mothers to have more breastfeeding intentions and enhance breastfeeding behaviors. This would give the baby the opportunity to receive breast milk continuously. For nursing administration, nursing executives could implement the breastfeeding promoting program as a guideline to encourage personnel in relevant departments, such as the Neonatal Intensive Care Unit (NICU), Sick Neonatal Ward (SNB), postpartum ward, and special pediatric ward to encourage mothers to achieve enhanced breastfeeding intentions and behaviors. For nursing education, instructors in nursing institutions could apply the breastfeeding promoting program to encourage students to see the benefits of promoting maternal and family attitudes, the family involvement in breastfeeding, especially the husbands together with encouraging mothers perceived behavioral control.

This present has certain limitations. Immediate evaluation after the experiment in the hospital may result in factors that differ from the follow-up when mothers take care of their children at home in real-life situations. Since the evaluation was only 4 days after giving birth regardless of follow-up on the problems and breastfeeding behaviors of the mothers as well as follow-up on breastfeeding rates after discharge. To obtain a more long-term benefits of the program, the breastfeeding promoting program should be adopted after the infant is discharged as well as monitor the problems in breastfeeding and the mother's breastfeeding behavior for 1 week, 1 month, 2 months, and 4 months after the baby is discharged, possibly up to 1 year. Finally, Breastfeeding rates after discharge should be monitored periodically for up to 6 months or longer based on the policy that supports exclusive breastfeeding for up to 6 months and continued breastfeeding along with age-appropriate food until 2 years of age.

In conclusion, the breastfeeding promoting program improved scores of breastfeeding intentions and behaviors for Thai mothers with late preterm infants.

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