ORIGINAL RESEARCH ARTICLE

The effects of breastfeeding education given to pregnant adolescents on postnatal breastfeeding self-efficacy and breastfeeding success

DOI: 10.29063/ajrh2025/v29i10.17

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Abstract

This study investigated the effects of structured prenatal breastfeeding education on postnatal breastfeeding self-efficacy, success, and breastfeeding behaviors among adolescent mothers. A randomized controlled trial was conducted with 106 adolescent pregnant women assigned to either an experimental or control group. The experimental group received two sessions of structured prenatal education. Data were collected using the Breastfeeding Self-Efficacy Scale–Short Form, the LATCH Breastfeeding Assessment Tool, and a standardized Breastfeeding Evaluation Form. Results showed significantly higher breastfeeding self-efficacy scores in the experimental group compared to the control group. Breastfeeding success scores at the first postpartum hour and the 4th–5th hours were also significantly higher in the experimental group. Additionally, positive breastfeeding behaviors such as initiating breastfeeding early, feeding every two hours, and alternating breasts appropriately were more frequently observed in the experimental group. These findings suggest that prenatal breastfeeding education significantly improves breastfeeding self-efficacy, success, and behavior among adolescent mothers. *(Afr J Reprod Health 2025; 29 [10]: 167-175).*

Keywords: Adolescent Pregnancy; Breastfeeding Education; Breastfeeding Self-Efficacy; Breastfeeding Success; Breastfeeding Behaviors; Randomized Controlled Trial

Résumé

Cette étude a examiné les effets d'une éducation prénatale structurée à l'allaitement sur l'auto-efficacité postnatale d'allaitement, le succès de l'allaitement et les comportements d'allaitement chez les mères adolescentes. Un essai contrôlé randomisé a été mené auprès de 106 femmes enceintes adolescentes réparties dans un groupe d'intervention et un groupe témoin. Le groupe d'intervention a reçu deux sessions d'éducation prénatale structurée. Les données ont été recueillies à l'aide de l'échelle d'auto-efficacité d'allaitement (version courte), de l'outil d'évaluation de l'allaitement LATCH et d'un formulaire standardisé d'évaluation de l'allaitement. Les résultats ont montré que les scores d'auto-efficacité et de succès de l'allaitement au cours de la première et des 4e–5e heures post-partum étaient significativement plus élevés dans le groupe d'intervention. De plus, les comportements positifs tels que l'initiation précoce, l'allaitement toutes les deux heures et l'alternance des seins étaient plus fréquents. Ces résultats montrent que l'éducation prénatale structurée améliore significativement les résultats liés à l'allaitement chez les mères adolescentes. *(Afr J Reprod Health 2025; 29 [10]: 167-175).*

Mots-clés: Grossesse à l'adolescence ; Éducation à l'allaitement ; Auto-efficacité de l'allaitement ; Réussite de l'allaitement ; Comportements liés à l'allaitement ; Essai contrôlé randomisé

Introduction

Adolescence is the transitional period from childhood to adulthood during which individuals undergo significant physical, psychological, and social changes.[1] The World Health Organization (WHO) defines adolescence as the age range between 10 and 19 years.[2] According to WHO data, approximately 21 million girls aged 15 to 19 become pregnant annually in developing countries.[3] Adolescents aged 15 to 19 account for 11% of all deliveries worldwide.[4] In Türkiye, despite regional cultural differences, adolescent pregnancies persist with significant variation across regions; they are more common in the south, central, and eastern parts compared to the west.[5,6]

Adolescent pregnant women may experience various physical and psychological problems.[7] Literature indicates that infants born to adolescent mothers are at greater risk of low birth weight, prematurity, fetal distress, asphyxia, congenital anomalies, motor and cognitive

developmental delays, severe neonatal conditions, and nutritional problems.[8,9] Furthermore, adolescent mothers tend to have lower rates of breastfeeding initiation and shorter breastfeeding duration compared to adult mothers.[10,11] Consequently, newborns of adolescent mothers are at risk of not receiving the benefits of breast milk.

Breast milk is widely recognized as the optimal source of nutrition for nearly all infants, offering both short- and long-term benefits for mothers and their children. WHO recommends exclusive breastfeeding for the first six months of life, followed by continued breastfeeding alongside appropriate complementary foods until the age of two.[12] Although this recommendation is supported by many international organizations, global trends indicate that women are breastfeeding for shorter durations today.[13] Inadequate breastfeeding is associated with increased risks of infant and childhood morbidity and mortality, as well as certain chronic conditions.[14] In addition to skin-to-skin contact resulting from direct breastfeeding, breast milk contains anti-infective and anti-inflammatory components that support optimal health, protect against environmental exposures, and aid in the development of the infant's innate immune system.[15,16]

Studies have shown that initiating and maintaining breastfeeding is a significant challenge for adolescent mothers during the postnatal period, partly because they often do not fully understand its importance.[17] Research indicates that adolescent mothers have more negative attitudes, behaviors, and perceptions toward breastfeeding compared to adult mothers.[18] Since infants born to adolescent mothers face higher risks of morbidity and mortality, breastfeeding is especially critical in this population.[10] However, one of the main challenges adolescent mothers face postpartum is initiating and continuing breastfeeding. Therefore, enhanced clinical support and promotion of exclusive breastfeeding should be considered when designing interventions to improve breastfeeding rates among adolescent mothers.[19]

Numerous studies have demonstrated the positive effects of breastfeeding education on mothers' intention to breastfeed, breastfeeding self-efficacy, and reduction of breastfeeding problems.[20,21] Women with greater knowledge and more positive attitudes toward breastfeeding are more likely to breastfeed their infants and to prolong breastfeeding duration.[22,23] Prenatal breastfeeding education is an important method to encourage and prepare mothers for positive breastfeeding experiences. Furthermore, antenatal breastfeeding education increases breastfeeding initiation rates and durations.[20,21] Although the effectiveness of breastfeeding education has been extensively studied among adult women, no studies have specifically examined its effects on adolescent pregnant women. This study aims to determine the effects of breastfeeding education provided to adolescent pregnant women on breastfeeding self-efficacy and breastfeeding success.

Research hypothesis

H1: Breastfeeding education given to adolescent pregnant women affects breastfeeding self-efficacy and breastfeeding success

Methods

Procedure and participants

This study was designed as a randomized controlled trial to evaluate the effect of prenatal breastfeeding education provided to adolescent pregnant women on postnatal breastfeeding self-efficacy and breastfeeding success.

The study was conducted at a public hospital in eastern Türkiye, which provides health and delivery services for both low- and high-risk pregnant women. The hospital has a dedicated outpatient clinic for adolescent pregnancy follow-ups. Adolescent pregnant women without complications are expected to attend the clinic at least four times during the prenatal period. According to hospital records, 350 adolescents aged 16 to 19 applied to the outpatient clinic due to pregnancy, resulting in a total of 318 deliveries—239 vaginal and 79 cesarean.

Inclusion criteria were as follows: adolescents aged 16 to 19 years, primiparous, healthy with a singleton pregnancy of at least 36 weeks gestation; no communication barriers (such as not knowing Turkish or impairments in hearing, speaking, or understanding); no contraindications to vaginal delivery or breastfeeding; absence of diagnosed physiological conditions (e.g., preeclampsia, diabetes, heart disease, placenta previa, oligohydramnios) or psychological disorders; no postpartum health issues for the mother or infant; and voluntary participation. Pregnancies under 16 years of age were excluded, as such cases are considered forensic in Türkiye.

A priori power analysis was conducted using web-based software to determine the appropriate sample size. Breastfeeding self-efficacy was selected as the primary outcome. Based on Ergezen et al. (2021), who reported a mean prenatal breastfeeding self-efficacy score of 57.30 with a standard deviation of 10.46 (n=120), the required sample size was calculated as 53 participants per group.[24] This calculation assumed a five-point increase in the self-efficacy score due to the intervention, a two-sided significance level of 5%, 95% confidence interval, and 80% power to detect a difference.

Eligible participants were allocated to either the experimental or control group by simple random sampling according to their order of arrival at the outpatient clinic (see Figure 1). Randomization was performed using a random number generator available on the random.org website (random.org). The randomization sequence was generated on random.org and recorded in a CSV file by an independent researcher (S.A.K.). To maintain assignment confidentiality, the assignment list was stored in a password-protected file, and group assignments were only implemented after participant consent, accessed and disclosed by the researcher (S.A.K.) using the password. This procedure was planned to ensure the confidentiality of assignments.

Measures

Data were collected using the Personal Information Form, the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF), the LATCH Breastfeeding Assessment Tool, and a Breastfeeding Evaluation Form developed by the researchers. The researcher (S.A.K.) conducted face-to-face interviews with participants between March and September 2022.

At the initial meeting, participants were informed about the study by the researcher, after which the Personal Information Form and BSES-SF were administered in the breastfeeding room located on the same floor as the outpatient clinic.

The Personal Information Form collected descriptive data such as participant age, spouse's age, educational level of both participant and spouse, employment status, and income level. The BSES-SF measures mothers' perceived competence in breastfeeding and can be applied during both prenatal and postnatal periods.[21,22] The Turkish validity and reliability study was conducted by Aluş Tokat *et al*.[23] This five-point Likert-type scale consists of 14 items scored from 1 (not confident) to 5 (very confident), with total scores ranging from 14 to 70. Lower scores indicate lower breastfeeding self-efficacy. The original scale reported Cronbach's alpha coefficients of 0.87 prenatally and 0.86 postnatally.[23] In this study, prenatal and postnatal Cronbach's alpha coefficients were both 0.80. The BSES-SF was administered to participants during the prenatal period and at the postnatal 4th–5th hours. The LATCH Breastfeeding Assessment Tool, originally developed by Jensen *et al*., evaluates breastfeeding success through five items scored 0 to 2, with total scores ranging from 0 to 10.[25] Higher scores indicate greater breastfeeding success. The Turkish validation and reliability study was performed by Yenal and Okumuş (2003), reporting a Cronbach's alpha of 0.95. In the current study, the coefficient was 0.61.[26] The LATCH tool was applied at the postnatal first hour and again at the 4th–5th hours.

The Breastfeeding Evaluation Form was created by the researchers to collect specific breastfeeding-related information. It consists of five questions addressing the initiation time of breastfeeding, the first food given to the baby, breastfeeding frequency, the breast from which breastfeeding was initiated, and the time elapsed before the baby was held in the mother's arms postnatally. This form was administered to participants at the postnatal 4th–5th hours.

Data collection

Data were collected by the researcher through face-to-face interviews conducted between March and September 2022. At the initial meeting, after informing participants about the study, the Personal Information Form and the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) were administered in the breastfeeding room located on the same floor as the outpatient clinic. During the postnatal period, the LATCH Breastfeeding Assessment Tool was applied at the first hour, and the BSES-SF, LATCH, and Breastfeeding Evaluation Form were administered at the 4th to 5th postpartum hours. Blinding was not applied during data collection: the researcher who administered the intervention (S.A.K.) also conducted face-to-face interviews and administered the LATCH/BSES-SF. The reason for taking measurements in the first hour after birth (postnatal hour 1) is that relevant guidelines recommend breastfeeding within the first hour to initiate early breastfeeding, and this period is clinically critical in terms of ensuring milk production and the first feed.

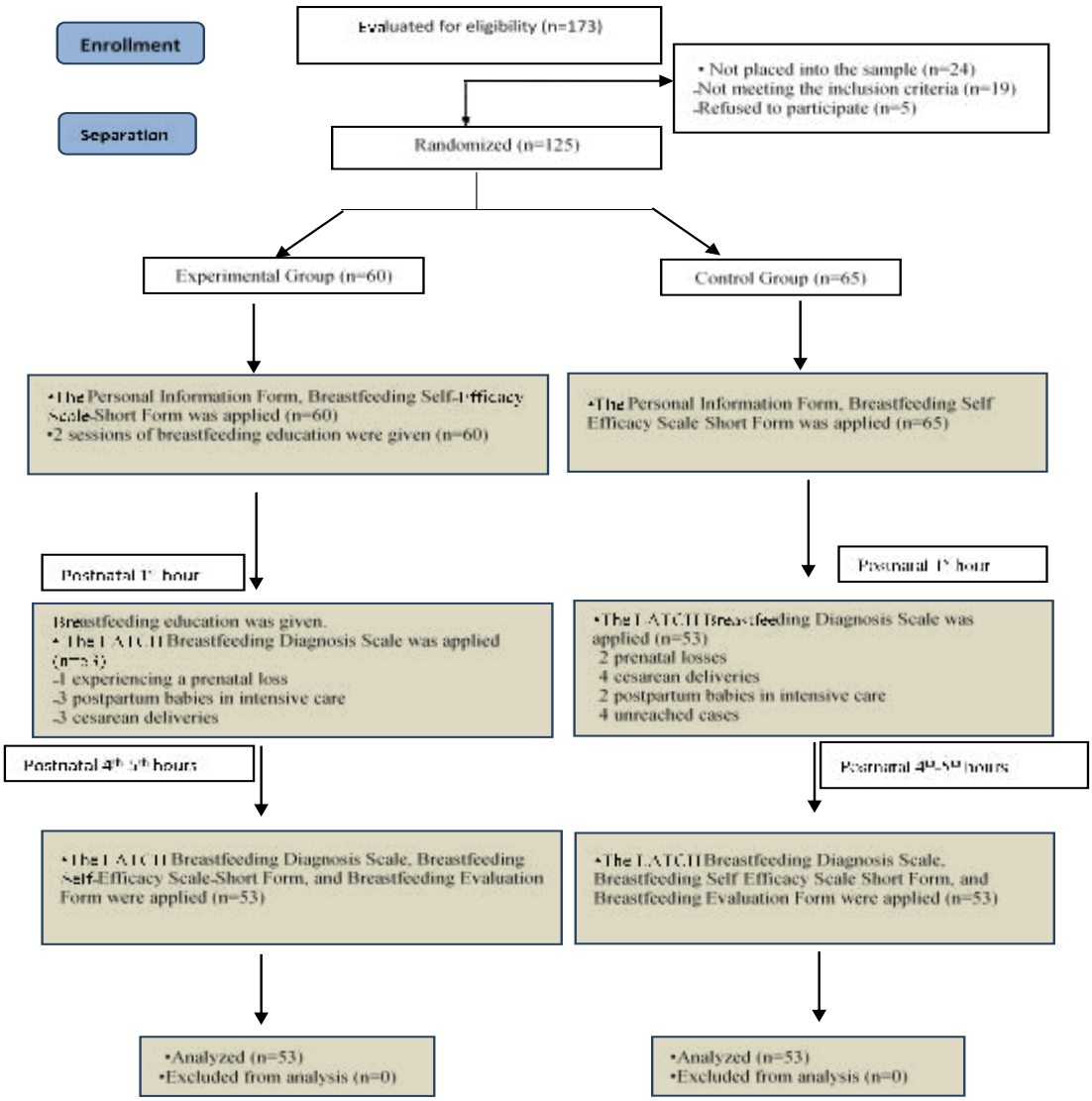

Figure 1: Allocation of participants into the groups according to the CONSORT 2010 flow diagram.

Additionally, the rationale for conducting a second assessment at 4–5 hours is to ensure the initial adaptation of the newborn and mother and to capture changes in breastfeeding techniques following the initial adaptation.

Intervention

In this study, breastfeeding education was delivered individually by the researcher (S.A.K.). The education consisted of two structured sessions conducted during the first meeting in the hospital's nursing room. Each session lasted approximately 30–40 minutes, with a 10-minute break between sessions. The training included demonstrations using infant and breast models. At the conclusion of the sessions, participants received a booklet prepared by the researcher containing the educational content. The training content was developed based on expert opinions from five faculty members. Additionally, a 30-minute reminder session was provided by the same researcher within the first half-hour after delivery.

The primary aim of the breastfeeding education was to enhance breastfeeding competence and success among adolescents. Accordingly, the training content, developed in line with the literature, covered topics such as the importance and benefits of breast milk and breastfeeding, the properties of breast milk, breastfeeding physiology, breastfeeding positions, correct breastfeeding techniques, and methods.[23,24]

No intervention was applied to the control group by the researcher. No additional training was provided

to the control group by the researcher. Participants in the control group received brief training (average 10-15 minutes) from the postpartum nurse/midwife as part of the hospital's routine care protocol. This routine information typically covered the following topics: the importance and benefits of breastfeeding, breastfeeding position, feeding frequency recommendations, and referral to postpartum support services. Application and modeling during routine care were generally limited. Educational materials (booklets) for the control group were provided to them after the study and data collection.

Statistical analysis

Data were analyzed using SPSS version 25.0 for Windows. Descriptive statistics including mean, standard deviation, percentages, and frequencies were calculated. The Kolmogorov-Smirnov test assessed the normality of the data distributions from the scales. Since data were normally distributed, parametric tests were employed. The chi-square test was used to compare categorical variables between groups. Paired samples t-tests were applied for within-group comparisons of scale scores, while independent samples t-tests were used for comparisons between groups. Effect sizes were calculated using Cohen's d for statistically significant results. A p-value less than 0.05 was considered statistically significant.

Results

The study was completed with a total of 106 participants, equally divided between the experimental (n=53) and control (n=53) groups. In the experimental group, 41.6% of adolescent pregnant women were 19 years old, 52.8% of their spouses were under 24 years of age, 45.3% of the women and 41.5% of their spouses were primary school graduates, 98.1% were unemployed, and 50.9% had low-income levels. In the control group, 43.4% of the women were 18 years old, 50.9% of their spouses were under 24 years old, 43.4% of the women and their spouses were primary school graduates, 100% were unemployed, and 56.6% reported moderate-income levels. No statistically significant differences were observed between groups regarding these descriptive characteristics ($p > 0.05$) (Table 1).

Table 1: Descriptive characteristics of the participants

Descriptive Characteristics	Experimental Group (n=53)		Control Group (n=53)		Test and p values
	n	%	n	%	
Age (years)					
17	12	22.6	12	22.6	x^2=0.781
18	19	35.8	23	43.4	p=0.677
19	22	41.6	18	34.0	
Spouse's age (years)					
≤24	28	52.8	27	50.9	x^2=0.038
≥25	25	47.2	26	49.1	p=0.846
Educational level					
Primary school graduate	24	45.3	23	43.4	x^2=3.610
Middle school graduate	21	39.6	20	37.7	p=0.307
High school or higher graduate	8	15.1	10	18.9	
Spouse's educational level					
Primary school graduate	12	22.7	23	43.4	x^2=7.423
Middle school graduate	22	41.5	12	22.6	p=0.060
High school or higher graduate	19	35.8	18	34.0	
Employment					
Present	1	1.9	0	0.0	x^2=1.010
Absent	52	98.1	53	100.0	p=0.315
Income level					
Low	27	50.9	22	41.5	x^2=0.965
Moderate	25	47.2	30	56.6	p=0.617
High	1	1.9	1	1.9	

[a]Pearson's Chi-Squared Test

Table 2: Within and between-group comparisons of the BSES-SF and LATCH mean scores

	Experimental Group (n=53)	**Control Goup n=53)**	**Test[a] and p values**	**Cohen d**
BSES-SF	**Mean±SD**	**Mean±SD**		
Prenatal	53.03±4.93	53.8±6.40	t=-0.696, p=0.488	
Postnatal 4th-5th hours	65.15±2.39	57.84±3.96	t=14.910, **p<0.001**	2.235
Test[b] and p values	t=-17.835, **p<0.001**	t=-4.985, **p<0.001**		
LATCH				
Postnatal first 1 hour	7.43±1.16	5.88±1.91	t=5.015, **p<0.001**	0.980
Postnatal 4th-5th hours	8.69±0.82	7.86±1.33	t=3.864, **p<0.001**	0.751
Test[b] and p values	t=-9.3547, **p<0.001**	t=-9.616, **p<0.001**		

BSES-SF: Breastfeeding Self-Efficacy Scale-Short Form, LATCH: LATCH Breastfeeding Assessment Tool, [a]Independent samples *t*-test, [b]Paired samples *t*-test

Table 3: Comparison of the participants' postnatal breastfeeding behaviors

Behaviors	**Experimental Group (n=53)**		**Control Group (n=53)**		**Test and p values**
	n	**%**	**n**	**%**	
Time to start breastfeeding					
Within the first 30 minutes	49	92.5	45	84.9	x^2=1.504
after 30 minutes	4	7.5	8	15.1	p=0.220
First nutrition					x^2=0.153
Breast milk	50	94.3	49	92.5	p=0.696
Formula	3	5.7	4	7.5	
Breastfeeding frequency					
As the baby cries	9	17.0	20	37.7	x^2=5.744
Every 2 hours	44	83.0	33	62.3	**p=0.017**
Starting the next breastfeeding					x^2=60.571
The last breast she breastfed the baby	45	84.9	5	9.4	**p<0.001**
Other breast	8	15.1	48	90.6	
Time to hold the baby for the first time					x^2=6.468
As soon as the baby was born	43	81.1	31	58.5	**p=0.039**
Within the first hour	7	13.2	16	30.2	
Within the first 3 hours	3	5.7	6	11.3	

X^2 = Chi-square test

Table 2 presents within- and between-group comparisons of the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) and LATCH scores. Prenatal breastfeeding self-efficacy scores did not differ significantly between groups ($p > 0.05$). However, postnatal breastfeeding self-efficacy was markedly higher in the experimental group compared to controls (65.15 vs. 57.84; $p < 0.001$), with a large effect size ($\eta^2 = 2.235$). Similarly, LATCH scores at both the first hour and the 4th–5th hours postpartum were significantly greater in the experimental group than in the control group (7.43 vs. 5.88 and 8.69 vs. 7.86, respectively; $p < 0.001$). Effect size calculations indicated a strong positive impact of breastfeeding education on breastfeeding success at the postnatal first hour ($\eta^2 = 0.980$) and 4th–5th hours ($\eta^2 = 0.751$).

Postnatal breastfeeding behaviors are compared in Table 3. Statistically significant differences were observed between groups regarding breastfeeding

frequency, the breast used to initiate the next feeding, and the time taken to hold the baby for the first time postpartum ($p < 0.05$). These findings underscore the substantial influence of prenatal breastfeeding education on improving breastfeeding practices among adolescent mothers.

Discussion

The number of studies evaluating the effectiveness of breastfeeding education during the prenatal and/or postnatal periods is steadily increasing. Numerous studies involving adult women have demonstrated the positive impact of counseling and breastfeeding interventions during pregnancy on exclusive breastfeeding rates.[23,24,27] However, evidence remains limited regarding breastfeeding behaviors among adolescents, who may not fully comprehend the importance of breastfeeding compared to adults. This study revealed that prenatal breastfeeding education provided to adolescent pregnant women significantly improved breastfeeding self-efficacy and breastfeeding success during the postnatal period.

Consistent with our findings, breastfeeding success increased significantly following prenatal education in adolescent mothers. Similar results have been reported in various studies, showing that prenatal breastfeeding education enhances postnatal breastfeeding self-efficacy.[28] Tseng *et al*. found that prenatal breastfeeding education significantly elevated breastfeeding self-efficacy.[29] A meta-analysis and systematic review of 5,678 mothers reported that breastfeeding education improved breastfeeding self-efficacy.[30] Additionally, a study involving primiparas aged 15–18 years suggested that breastfeeding education beginning during pregnancy and continuing postpartum encourages initiation and continuation of breastfeeding.[31] Another study evaluating breastfeeding education for adolescent female students demonstrated improvements in breastfeeding knowledge, attitudes, and future exclusive breastfeeding intentions.[32] Self-efficacy is influenced by personal motivation; in this study, interactive prenatal education likely enhanced participants' confidence and ability to breastfeed successfully. Breastfeeding knowledge and skills indicated that pregnant adolescents prepared themselves effectively prior to childbirth. Furthermore, as all participants were first-time mothers, receiving prenatal education may have facilitated greater breastfeeding confidence.

Another significant finding was the increase in postnatal breastfeeding success following breastfeeding education. This positive outcome may be attributed to the inclusion of breastfeeding benefits, positioning, and correct techniques in the educational content. The literature emphasizes that breastfeeding support is crucial for success and that education should cover benefits for mother and infant, breastfeeding positions, feeding frequency, and consequences of improper breastfeeding.[33,34] Likewise, several studies have confirmed that breastfeeding education enhances breastfeeding success.[27,35,36] Özgüneş (2019) reported significant increases in breastfeeding success following education, and Öztürk (2021) found prenatal education significantly improved postnatal breastfeeding outcomes.[35,37] These findings align with the current study's results, indicating that breastfeeding education effectively improves breastfeeding success.

Postnatal breastfeeding behaviors of adolescent mothers were also assessed. Breastfeeding every two hours, initiating the next feeding with the last breastfed side, and early skin-to-skin contact were significantly higher in the experimental group compared to controls. These findings suggest that breastfeeding education positively influences breastfeeding frequency, correct techniques, and awareness of skin contact benefits. This study provides evidence that breastfeeding education enhances breastfeeding behaviors as well as knowledge and skills among adolescent mothers. Similarly, a previous study implementing postnatal home visits and breastfeeding education demonstrated significant improvements in effective breastfeeding behaviors in the experimental group compared to controls.[38,39]

Limitations

This study has several limitations. First, the follow-up period was short; measurements were taken only during the first hour and between the fourth and fifth hours after birth, and long-term breastfeeding periods (e.g., 6 weeks, 6 months) could not be evaluated. Second, the study was conducted at a single public hospital, and since the participants shared similar sociodemographic characteristics (e.g., the majority were [e.g., province/distribution]), the generalizability of the results is limited. Third, since the researcher who implemented the intervention was also the data collector, blinding could not be ensured

during data collection; this may increase the risk of observer bias. To overcome these limitations, future studies are recommended that are multicenter, include a broader sociodemographic sample, and involve long-term follow-ups (e.g., 6 weeks, 3 and 6 months). Additionally, there is a need for studies where data collectors are independent of the intervention and/or blinding is applied whenever possible

Conclusion

This study demonstrated that breastfeeding education provided to adolescent pregnant women significantly enhances breastfeeding self-efficacy, breastfeeding success, and positively influences breastfeeding behaviors. Based on these findings, it is essential to initiate breastfeeding education during the last trimester of pregnancy and continue it throughout the postnatal period. Specially designed breastfeeding education programs targeting adolescent pregnant women within childbirth preparation classes should be implemented to achieve more comprehensive and detailed outcomes related to breastfeeding self-efficacy, success, and behaviors in this population. It is recommended that routine breastfeeding education (including practical demonstrations and brochures) for adolescents be added to Family Health Centers and pregnancy preparation programs as part of antenatal care; early postpartum reminder sessions be planned; and partner participation be encouraged.

Acknowledgments

We thank all pregnant women who voluntarily agreed to participate in the study.

Ethical considerations

The study procedures were approved by the İnönü University Scientific Research and Publication Ethics Committee (Decision Number: 2022/3222). Necessary permissions were obtained from the relevant institutional unit (Approval Number: E-3686945-508.01). All study procedures were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all participants prior to their involvement in the study.

Conflict of interest

The authors have no conflicts of interest to disclose.

Funding

This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors

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