

ORIGINAL RESEARCH ARTICLE

Breastfeeding self-efficacy among new mothers: Associations with childbirth experience, family intimacy, and postpartum lactation yield

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Hongfeng Zhu, Li Huang, Xinju Li and Qi Wu*

Department of Obstetrics, Anhui Women's and Children's Medical Center (Hefei Maternal and Child Health Hospital), Hefei 230001, China.

*For Correspondence: Email: Wqi_hefei@163.com; Phone: 18919642160

Abstract

This study explores the relationship between breastfeeding self-efficacy, childbirth experience, family intimacy, and postpartum lactation yield in 168 mothers who gave birth at Hefei Maternal and Child Health Hospital. Participants were divided into high and low self-efficacy groups based on their scores on the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF). Data on childbirth experience, family intimacy, and lactation yield were collected. Correlation and logistic regression analyses revealed that breastfeeding self-efficacy positively correlated with childbirth experience, family intimacy, and lactation yield. The high self-efficacy group showed significantly better childbirth experiences, stronger family intimacy, and higher lactation yield compared with the low self-efficacy group. Primiparity, childbirth experience, family intimacy, and postpartum lactation yield were identified as independent factors influencing breastfeeding self-efficacy. These findings highlight the importance of improving childbirth experiences, enhancing family intimacy, and supporting lactation yield to boost maternal self-efficacy in breastfeeding, ultimately contributing to higher breastfeeding success rates (*Afr J Reprod Health* 2026; 30 [14]: 46-56).

Keywords : Breastfeeding; self-efficacy; childbirth experience; family intimacy; postpartum lactation yield

Résumé

Cette étude explore la relation entre l'auto-efficacité de l'allaitement maternel, l'expérience de l'accouchement, l'intimité familiale et la production lactée post-partum chez 168 mères ayant accouché à l'Hôpital Maternel et Infantile de Hefei. Les participantes ont été réparties en groupes à auto-efficacité élevée et faible selon leurs scores à l'échelle abrégée d'auto-efficacité de l'allaitement maternel (Breastfeeding Self-Efficacy Scale-Short Form, BSES-SF). Des données concernant l'expérience de l'accouchement, l'intimité familiale et la production lactée ont été recueillies. Les analyses de corrélation et de régression logistique ont montré que l'auto-efficacité de l'allaitement maternel était positivement corrélée à l'expérience de l'accouchement, à l'intimité familiale et à la production lactée post-partum. Le groupe à auto-efficacité élevée présentait une expérience de l'accouchement significativement meilleure, une intimité familiale plus forte et une production lactée plus importante que le groupe à faible auto-efficacité. La primiparité, l'expérience de l'accouchement, l'intimité familiale et la production lactée post-partum ont été identifiées comme des facteurs indépendants influençant l'auto-efficacité de l'allaitement maternel. Ces résultats soulignent l'importance d'améliorer l'expérience de l'accouchement, de renforcer l'intimité familiale et de soutenir la production lactée afin d'accroître l'auto-efficacité maternelle en matière d'allaitement, contribuant ainsi à augmenter les taux de réussite de l'allaitement maternel. (*Afr J Reprod Health* 2026; 30 [14]:46-56).

Mots-clés: Allaitement maternel ; auto-efficacité ; expérience de l'accouchement ; intimité familiale ; production lactée post-partum

Introduction

Breastfeeding is a key measure for safeguarding the health of both mother and baby; it not only provides infants with comprehensive nutritional support and immune protection, but also helps to promote

postpartum uterine involution and reduce the risk of developing breast and ovarian cancer^{1,2}. However, in clinical practice, issues such as delayed initiation of breastfeeding, low continuation rates and insufficient milk supply persist. Breastfeeding behaviour is influenced not only by physiological

factors but is also closely linked to the mother's psychological state, delivery experience and family environment.^{3,4} How to effectively improve breastfeeding success rates has become a key issue in the field of obstetric nursing.

Breastfeeding self-efficacy is the maternal confidence and judgment on whether they can successfully implement breastfeeding, and is the key psychological factor affecting breastfeeding⁵. Pregnant women with high self-efficacy are more likely to actively seek breastfeeding skills and actively respond to feeding difficulties, so as to obtain better feeding experience and effect⁶. Therefore, exploring the relationship between breastfeeding self-efficacy and other perinatal indicators is of great significance for the development of targeted nursing interventions. The sense of childbirth experience is a subjective evaluation of the delivery process, which directly affects the postpartum psychological state and parenting confidence⁷. Family intimacy reflects the emotional connection and support between family members⁸. Postpartum lactation is an important basis for successful breastfeeding⁹. However, there are few studies on the relationship between breastfeeding self-efficacy and childbirth experience, family intimacy and postpartum lactation.

Based on this, this study explores the correlation between maternal breastfeeding self-efficacy and childbirth experience, family intimacy and postpartum lactation yield, aiming to provide a basis for clinical construction of breastfeeding support programs oriented to improve self-efficacy.

Methods

Research subjects

A retrospective study was conducted involving 168 women who gave birth at the Hefei Maternal and Child Health Hospital between August 2024 and January 2025. According to the empirical guidelines for logistic regression analysis, the sample size should be at least 10 to 20 times the number of independent variables. This study included a total of nine independent variables, requiring a sample size of at least 90 to 180 cases. A total of 168 cases were ultimately included,

thereby meeting the analytical requirements. Inclusion criteria were: (1) age ≥ 20 years; (2) singleton, full-term pregnancy (37–42 weeks' gestation); (3) vaginal delivery or caesarean section without serious delivery complications; (4) Stable vital signs postpartum, with no severe pregnancy or delivery complications; (5) Willingness to breastfeed and ability to do so postpartum; (6) Complete clinical records, questionnaires and lactation-related data.

Exclusion criteria were: (1) Multiple gestation, preterm or post-term pregnancy; (2) Severe complications such as postpartum haemorrhage or severe pre-eclampsia; (3) Neonatal abnormalities requiring referral for treatment, rendering breastfeeding impossible; (4) Mental illness, cognitive impairment or communication difficulties; (5) Contraindications to breastfeeding, such as breast disease or nipple abnormalities; (6) Missing medical records, incomplete questionnaire data or interrupted follow-up. There were no cases of loss to follow-up throughout the study, and all clinical data and questionnaire scores for the study participants were complete, with no missing values.

Grouping method

The Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF)¹¹ was used to assess the mothers. The scale comprises 14 items and employs a 5-point Likert scale (1 = completely lack confidence, 5 = always confident), with a total score ranging from 14 to 70. A higher score indicates a higher level of breastfeeding self-efficacy among the mothers.

By consulting medical records and nursing records, BSES-SF scale data completed within 48 to 72 hours after delivery were collected retrospectively. They were grouped by the median of the total score of the scale: those with a score $\geq$ median were in the high self-efficacy group, and those with a score $<$ median were in the low self-efficacy group^{12,13}. The median BSES-SF score of 168 pregnant women in this study was 42 points, including 93 cases in the high self-efficacy group and 75 cases in the low self-efficacy group.

Data collection

All data from the questionnaires used in this study were collected from routine clinical nursing

indicators in the hospital's obstetrics department. These were completed by the responsible nurse, with the guidance of the clinical care pathway, during the postnatal hospital stay, and were archived as part of the medical records. The following data were retrospectively collected by reviewing hospital electronic medical records, nursing assessment forms and archived questionnaire data:

General information: age, body mass index (BMI), educational level, average monthly household income, parity, method of delivery, etc.

Breastfeeding self-efficacy: assessed using the BSES-SF. According to medical records, this questionnaire was completed under the guidance of the responsible nurse within 48 to 72 hours postpartum and archived as part of the clinical nursing records. Data from this questionnaire were retrieved for this study for the purposes of grouping and subsequent analysis.

Childbirth experience: assessed using the Childbirth Experience Questionnaire – Chinese Version (CEQ-C)¹⁴. The questionnaire comprises 22 items and employs a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree), with a total score ranging from 22 to 88; a higher score indicates a more positive childbirth experience for the mother. The questionnaire was completed by the mothers within 24 to 72 hours postpartum and was archived as part of the clinical nursing records.

Family intimacy: Assessed using the Family Adaptability and Cohesion Scale II – Chinese Version (FACES II-CV)¹⁵. The scale comprises 30 items, divided into 16 items for cohesion and 14 items for adaptability, using a 5-point Likert scale (1 = never, 5 = always). In this study, only the cohesion dimension was extracted for analysis. The total score ranges from 16 to 80 points; a higher score indicates closer emotional bonds and higher levels of support among family members. This scale is completed during the mother's postnatal hospital stay.

Postpartum lactation yield: Assessed whether postpartum lactation yield was adequate based on the number of breastfeeding sessions, the frequency of the infant's urination and bowel movements, and the use of formula milk within 48 hours of delivery, as recorded in the nursing notes. Referring to relevant studies^{16,17}, lactation yield was deemed

adequate if the following conditions were met: exclusive breastfeeding or only minimal supplementation with formula milk (<30 ml per feed) within 48 hours postpartum, and the infant urinated ≥ 6 times per 24 hours. After standardising the number of breastfeeding feeds, the number of urination episodes and the volume of formula milk supplementation using Z-scores, a lactation score is calculated using the following formula: Lactation score = Z(number of breastfeeding feeds) + Z(number of urination episodes) – Z(volume of formula milk supplementation). A higher score indicates more adequate lactation yield.

Principles and criteria for variable inclusion

The selection of independent and dependent variables in this study strictly adhered to the following principles: ①Relevance: The selected variables were core perinatal indicators that had demonstrated in previous domestic and international studies to have a clear association with self-efficacy in breastfeeding, and which were consistent with the logic of obstetric clinical practice; ②Measurability: All variables had established assessment scales or clinically quantifiable evaluation methods, and data could be directly extracted from clinical records; ③Principle of completeness: There were no missing values for the selected variables in the clinical data of the study participants, ensuring the validity of the statistical analysis.

The dependent variable was breastfeeding self-efficacy. The independent variables were selected in conjunction with clinical practice and ultimately included age, BMI, educational level, average monthly household income, parity, method of delivery, perception of the childbirth experience, family intimacy, and postpartum lactation yield. The aforementioned variables represent physiological, psychological and family environmental factors that influence breastfeeding behaviour.

Statistical analysis

All data analyses were performed using Statistical Product and Service Solutions 27.0 (IBM, Armonk, NY, USA). The Kolmogorov-Smirnov test was used to evaluate the normality of

continuous variables. If the variable conformed to normality, it was expressed as mean $\pm$ standard deviation (SD). If the variable does not conform to normality, it is expressed as median (interquartile range). Independent sample *t* test or Mann-Whitney U test was used for comparison between groups. Count data were expressed as frequency and percentage [*n* (%)]. Chi-square test or Fisher's exact probability method was used for comparison between groups. Pearson correlation analysis was used to evaluate the correlation between breastfeeding self-efficacy and delivery experience, family intimacy and postpartum lactation. Logistic regression analysis was performed to identify factors influencing breastfeeding self-efficacy, with BSES-SF grouping as the dependent variable. Variables with $P < 0.05$ in the univariate analysis were entered into the multivariate logistic regression model. Following a diagnosis of multicollinearity, all variance inflation factors (VIF) were < 2 , indicating that there is no severe multicollinearity. The predictive efficacy of the influencing factors of breastfeeding self-efficacy was evaluated by the receiver operating characteristic (ROC) curve. The graph was made using GraphPad Prism 10 (GraphPad Software, La Jolla, California, USA). $P < 0.05$ was considered statistically significant.

Ethical considerations

The study complied with the Declaration of Helsinki¹⁰ and has been approved by the Ethics Committee of Hefei Maternal and Child Health Hospital (Ethics Approval: YYLL20250521-YJXM-JYLL-08-1.0), dated 22 May 2025.

Results

Comparison of general characteristics between the two groups

The results showed that there were no statistically significant differences between the two groups in terms of BMI, educational level, or average monthly household income; however, there were statistically significant differences between the two groups in terms of age, parity, and mode of delivery (Table 1).

Comparison of breastfeeding self-efficacy and childbirth experience between the two groups

The results showed that the BSES-SF score for the high self-efficacy group was (49.9 ± 5.9) points, which was significantly higher than that of the low self-efficacy group (34.0 ± 5.4) points; the difference was statistically significant. Regarding the childbirth experience, the CEQ-C score for the high self-efficacy group was (66.9 ± 8.5) points, which was significantly higher than that of the low self-efficacy group (58.0 ± 10.3) points; the difference was statistically significant (Table 2).

Comparison of family intimacy and postpartum lactation yield between the two groups

The family intimacy score for the high self-efficacy group was (59.5 ± 7.4) points, which was significantly higher than that of the low self-efficacy group (52.7 ± 8.0) points. With regard to postpartum lactation yield, the lactation yield score for the high self-efficacy group was (0.9 ± 0.8) , which was also significantly higher than that of the low self-efficacy group (-0.4 ± 0.9) (Table 3).

Correlation analysis of breastfeeding self-efficacy with childbirth experience, family intimacy and postpartum lactation yield

Pearson correlation analysis revealed that breastfeeding self-efficacy was significantly positively correlated with the perception of the childbirth experience ($r = 0.4$), family intimacy ($r = 0.4$) and postpartum lactation yield ($r = 0.6$). This indicates that higher levels of breastfeeding self-efficacy are associated with a more positive perception of the childbirth experience, higher levels of family support and more abundant postpartum lactation yield (Table 4).

Logistic regression analysis of factors influencing breastfeeding self-efficacy

The results of the univariate logistic regression analysis indicated that parity, mode of delivery, perception of the childbirth experience, family intimacy and postpartum lactation yield were all

Table 1: Comparison of general information

Indicator	High self-efficacy group (n=93)	Low self-efficacy group (n=75)	χ^2/t	P
Age, year, mean $\pm$ SD	31.3 $\pm$ 4.0	29.3 $\pm$ 4.7	3.0	<0.05
BMI, kg/m ² , mean $\pm$ SD	22.6 $\pm$ 2.3	22.4 $\pm$ 2.1	0.5	0.6
Educational level, n(%)			1.6	0.5
Junior secondary	14 (15.0)	16 (21.3)		
Senior secondary	34 (36.6)	22 (29.3)		
Undergraduate or above	45 (48.4)	37 (49.4)		
Average monthly income, n(%)			0.8	0.4
≤5000	42 (45.2)	39 (52.0)		
>5000	51 (54.8)	36 (48.0)		
Parity, n(%)			5.9	<0.05
Primiparous	42 (45.2)	48 (64.0)		
Multiparous	51 (54.8)	27 (36.0)		
Method of Delivery, n(%)			6.4	<0.05
Natural birth	53 (57.0)	28 (37.3)		
Caesarean section	40 (43.0)	47 (62.7)		

SD, standard deviation; BMI, body mass index.

Table 2: Comparison of breastfeeding self-efficacy and perceived childbirth experience

Indicator	High self-efficacy group (n=93)	Low self-efficacy group (n=75)	t	P
BSES-SF, mean $\pm$ SD	49.9 $\pm$ 5.9	34.0 $\pm$ 5.4	17.9	<0.001
CEQ-C, mean $\pm$ SD	66.9 $\pm$ 8.5	58.0 $\pm$ 10.3	6.1	<0.001

SD, standard deviation; BSES-SF, breastfeeding self-efficacy scale-short form; CEQ-C, childbirth experience questionnaire-Chinese version.

Table 3: Comparison of family intimacy and postpartum lactation volume

Indicator	High self-efficacy group (n=93)	Low self-efficacy group (n=75)	t	P
FACES II-CV, mean $\pm$ SD	59.5 $\pm$ 7.4	52.7 $\pm$ 8.0	5.7	<0.001
Lactation Yield, mean $\pm$ SD	0.9 $\pm$ 0.8	-0.4 $\pm$ 0.9	9.9	<0.001

SD, standard deviation; FACES II-CV, family adaptability and cohesion scale II-Chinese version.

Table 4: Correlation between breastfeeding self-efficacy and perceived childbirth experience, Family Intimacy, and postpartum lactation volume

Indicator	r	P
CEQ-C	0.4	<0.001
FACES II-CV	0.4	<0.001
Lactation Yield	0.6	<0.001

CEQ-C, childbirth experience questionnaire-Chinese version; FACES II-CV, family adaptability and cohesion scale II-Chinese version.

significant predictors of breastfeeding self-efficacy. Specifically, primiparity and caesarean section were associated with an increased risk of low breastfeeding self-efficacy, whereas vaginal

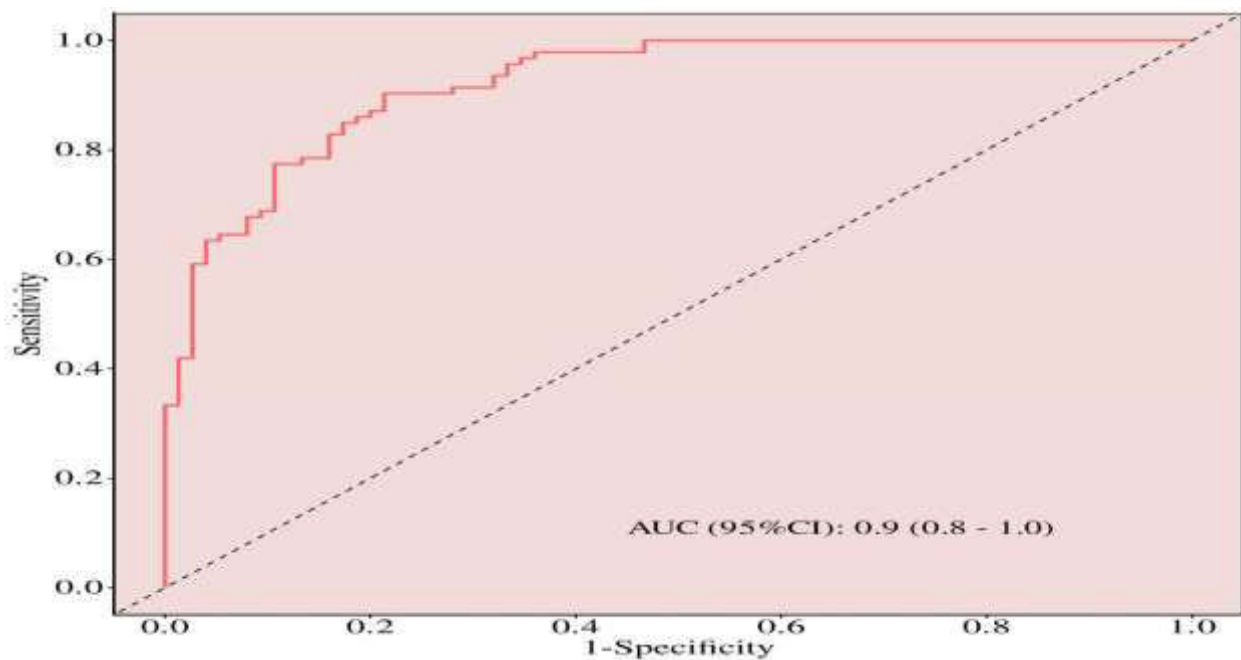
delivery, a more positive perception of the childbirth experience, family intimacy and higher postpartum lactation yield acted as protective factors for breastfeeding self-efficacy.

Variables with $P<0.05$ in the univariate analysis were included in the multivariate logistic regression analysis. The results showed that primiparity, perception of the childbirth experience, family intimacy and postpartum lactation yield were independent predictors of maternal breastfeeding self-efficacy. However, natural birth was not statistically significant in the multivariate analysis and did not emerge as an independent predictor of breastfeeding self-efficacy (Table 5).

Table 5: Logistic regression analysis of factors influencing breastfeeding self-efficacy

Variables	Univariate analysis		Multivariate analysis	
	P	OR (95%CI)	P	OR (95%CI)
Age	0.5	1.0 (0.9-1.1)		
BMI	0.6	1.0 (0.9-1.1)		
Educational level				
Junior secondary		1.0 (Reference)		
Senior secondary	0.2	1.8 (0.7-4.3)		
Undergraduate or above	0.4	1.4 (0.6-3.2)		
Average monthly income				
≤5000		1.0 (Reference)		
>5000	0.4	1.3 (0.7-2.4)		
Parity				
Multiparous		1.0 (Reference)		1.0 (Reference)
Primiparous	<0.05	2.2 (1.2-4.0)	<0.05	2.8 (1.1-7.2)
Method of Delivery				
Caesarean section		1.0 (Reference)		1.0 (Reference)
Natural birth	<0.05	2.2 (1.2-4.1)	0.1	2.2 (0.9-5.6)
CEQ-C	<0.001	1.1 (1.0-1.2)	<0.001	1.1 (1.0-1.2)
FACES II-CV	<0.001	1.1 (1.1-1.2)	<0.001	1.1 (1.0-1.2)
Lactation Yield	<0.001	4.6 (3.0-7.1)	<0.001	4.6 (2.7-7.9)

OR: odds ratio; CI: confidence interval; BMI, body mass index; CEQ-C, childbirth experience questionnaire-Chinese version; FACES II-CV, family adaptability and cohesion scale II-Chinese version.



ROC curve for breastfeeding self-efficacy

Using the independent predictors of breastfeeding self-efficacy identified through multivariate logistic regression analysis (primiparity, perception of the childbirth experience, family intimacy and

postpartum lactation yield) as diagnostic indicators, an ROC curve was plotted to assess the predictive performance of the combined assessment in determining the level of breastfeeding self-efficacy among mothers. The results showed that the combined predictive AUC for primiparity,

perception of the childbirth experience, family intimacy and postpartum lactation yield was 0.9 (95% CI: 0.8–1.0), indicating that these independent factors possess good predictive power for breastfeeding self-efficacy (Figure 1).

Discussion

This study examined the relationship between breastfeeding self-efficacy and the perception of the childbirth experience, family intimacy, and postpartum lactation yield. The results indicate that the scores for the childbirth experience, family intimacy, and postpartum lactation yield in the high self-efficacy group were significantly higher than those in the low self-efficacy group. Furthermore, breastfeeding self-efficacy was found to be significantly positively correlated with all three factors. Primiparity, the childbirth experience, family intimacy, and postpartum lactation yield were identified as independent influencing factors of breastfeeding self-efficacy, providing a basis for clinicians to develop targeted breastfeeding plans.

This study found that self-efficacy regarding breastfeeding was significantly positively correlated with the perception of the childbirth experience and acted as an independent protective factor, which is consistent with the findings of previous studies.¹⁸ As the perception of the childbirth experience represents a mother's subjective psychological evaluation of the labour process, a positive childbirth experience helps to enhance her self-confidence and sense of competence, and this psychological state may extend further into the postnatal breastfeeding process.¹⁹ Furthermore, when mothers receive adequate support during labour, feel a sense of autonomy and successfully complete the labour process, their positive self-assessment of their own capabilities is correspondingly enhanced, thereby strengthening their confidence in breastfeeding. Conversely, if the labour process involves traumatic experiences, a lack of support or a perceived loss of control, this may undermine mothers' trust in their own abilities, thereby affecting their breastfeeding self-efficacy.^{20,21} Consequently, clinical care should focus on optimising the childbirth experience; for example, by providing compassionate care, pain relief during labour, and

ongoing psychological support throughout the labour process, to help mothers develop a positive experience of childbirth and lay a solid psychological foundation for subsequent breastfeeding.

This study confirms that there is a significant positive correlation between family intimacy and self-efficacy for breastfeeding, and that family closeness acts as an independent protective factor for self-efficacy for breastfeeding. Family intimacy reflects the emotional bonds, support and trust between family members. During the postpartum period, new mothers face multiple pressures, including physical recovery, role transition and parenting responsibilities; support from family members, particularly spouses, plays a crucial role during this time.^{22,23} Members of high-cohesion families are often better able to understand the mother's emotional needs, provide practical childcare assistance, and offer emotional encouragement and recognition; this support system helps to boost the mother's confidence in breastfeeding.^{24,25} Existing research also shows that family support is closely related to breastfeeding self-efficacy, and mothers with high levels of family support are more likely to adhere to breastfeeding.²⁶ Therefore, in clinical practice, nursing staff should pay attention to the assessment of family support resources, encourage family members to participate in breastfeeding education, and help establish a supportive family environment to enhance maternal self-efficacy.

In this study, postpartum lactation yield showed the highest correlation coefficient with breastfeeding self-efficacy and was identified as the strongest independent protective factor. Lactation yield directly influences infant growth; mothers with sufficient lactation yield receive positive feedback during breastfeeding, such as effective suckling by the newborn and normal weight gain, which in turn continuously reinforces their confidence in feeding. Conversely, insufficient lactation yield can easily lead to feelings of frustration, anxiety and even premature cessation of breastfeeding.^{27,28} From the perspective of self-efficacy theory, lactation yield is not only a physiological indicator, but also a basis for judging maternal feeding ability. When mothers observe that their babies urinate fully, gain weight well, and

do not need to frequently add formula milk, their judgment of whether they can successfully breastfeed will be more positive, thereby strengthening their sense of self-efficacy.²⁹ Therefore, identifying high-risk groups for insufficient lactation yield at an early stage and providing timely lactation support interventions—such as early skin-to-skin contact, guidance on feeding on demand, breast massage and nutritional support—can help increase postpartum lactation yield, thereby providing physiological support for enhancing self-efficacy in breastfeeding.

This study found that being a primipara is an independent risk factor for low self-efficacy regarding breastfeeding. Compared with multiparas, primiparas lack relevant experience of breastfeeding and are less able to anticipate the various issues that may arise during the feeding process; consequently, they are more prone to a lack of confidence, which in turn reduces their self-efficacy.^{30,31} In clinical practice, particular attention should be paid to the group of primiparas; through systematic breastfeeding education, they should be helped to accumulate successful experiences and enhance their sense of self-efficacy. In addition, univariate analysis showed that natural childbirth was a protective factor for breastfeeding self-efficacy, but it did not reach statistical significance in multivariate analysis. It is speculated that this result is related to the influence of confounding factors. In clinical practice, primiparas are more inclined to choose cesarean section, and primipara itself is a risk factor for low self-efficacy. There is a certain correlation between the two. After controlling other variables, the independent influence of delivery mode on breastfeeding self-efficacy is weakened. The follow-up study can further carry out stratified analysis to explore the effect of delivery mode on breastfeeding self-efficacy under different parity.

Study strengths and limitations

This study has several strengths. First, it comprehensively examined multiple modifiable factors (childbirth experience, family intimacy, and lactation yield) associated with breastfeeding self-efficacy in a single cohort, providing a holistic view of the determinants. Second, the use of validated

scales (BSES-SF, CEQ-C, FACES II-CV) and a composite lactation score enhanced the reliability of measurements. Third, the sample size met the requirements for logistic regression analysis, and complete data with no loss to follow-up strengthened the internal validity.

However, several limitations should be acknowledged. Firstly, as this is a retrospective study, the associations between variables can only reveal correlations and cannot establish causality. Secondly, all study participants were recruited from the same maternal and child health hospital; the homogeneity of the geographical location, allocation of medical resources and population characteristics may limit the generalisability of the findings. As there are differences in the childbirth experiences, family support patterns and breastfeeding culture among women in different regions, the relationships between variables and the magnitude of their effects revealed in this study may differ in other healthcare settings or populations, and thus may not reflect the actual situation of a broader population. Thirdly, the assessment tools employed in this study were all self-report questionnaires completed by the mothers. Furthermore, the assessment methods for some indicators lacked objective gold standards, and as some questionnaires were completed under the guidance of different charge nurses in the clinical setting, issues such as inconsistencies in instructions and slight variations in the timing of assessments may have arisen. This introduced a degree of information bias, thereby limiting the reliability and comprehensiveness of the measurement results. Fourthly, the assessment of postpartum lactation yield in this study utilised composite indicators (frequency of breastfeeding, frequency of infant urination, and volume of formula milk supplemented). Whilst these are practical in clinical settings, their accuracy remains inferior to objective methods such as milk weighing and milk expression volume measurement. Fifth, all study indicators were assessed during the mothers' postpartum hospital stay; this constitutes a short-term, static study. The absence of long-term postpartum follow-up prevents an understanding of the dynamic patterns of breastfeeding self-efficacy, as well as the long-term effects of the childbirth experience, family intimacy and milk production on

breastfeeding self-efficacy. Future research could address the limitations of retrospective studies by conducting multicentre, large-sample prospective cohort studies; combine objective measurement indicators with subjective scales to enhance the accuracy of assessment results; and undertake long-term postnatal follow-up to explore the dynamic relationships between variables and the predictive value of self-efficacy for breastfeeding outcomes.

The findings of this study have several practical implications. At the policy level, healthcare systems should integrate breastfeeding self-efficacy enhancement into routine perinatal care protocols. This may include mandating pain relief and psychological support during labour to improve childbirth experiences, as well as developing family-inclusive breastfeeding education programs. Hospital policies should encourage family members, especially spouses, to participate in antenatal and postnatal breastfeeding classes. At the practice level, nurses and midwives should routinely assess breastfeeding self-efficacy using the BSES-SF and identify women at risk—particularly primiparous women, those with negative childbirth experiences, low family intimacy scores, or insufficient lactation yield. Targeted interventions such as early lactation support, family counselling, and trauma-informed childbirth care should be implemented. Furthermore, the composite lactation score used in this study offers a simple, clinically feasible tool for identifying inadequate lactation yield, which can guide timely supplementation and support. By addressing these modifiable factors, healthcare providers can improve breastfeeding initiation and continuation rates, ultimately promoting maternal and infant health.

In summary, maternal breastfeeding self-efficacy is closely related to childbirth experience, family intimacy and postpartum lactation yield. In clinical practice, by addressing the aforementioned factors, we can focus on first-time mothers, optimise the childbirth experience, strengthen family intimacy and promote postpartum lactation yield. This will enhance mothers' self-efficacy regarding breastfeeding, thereby increasing both the initiation and continuation rates of breastfeeding and safeguarding the health of both mother and baby.

Conclusion

Maternal breastfeeding self-efficacy is closely related to childbirth experience, family intimacy and postpartum lactation yield. Primiparity, childbirth experience, family intimacy and postpartum lactation yield are independent influencing factors of breastfeeding self-efficacy. Improving a mother's childbirth experience, enhancing family intimacy and promoting postpartum lactation yield may offer effective clinical strategies for enhancing breastfeeding self-efficacy, thereby laying the foundation for increasing the success rate of breastfeeding.

Contribution of authors

Hongfeng Zhu: Conceptualized the study, designed the methodology, and supervised the data collection process. Also contributed to the data analysis and interpretation of results, and wrote the manuscript. Li Huang: Assisted in study design, data collection, and analysis. Contributed significantly to drafting the manuscript and revising it for important intellectual content. Xinju Li: Contributed to data collection, including the administration of surveys and questionnaires. Assisted with the statistical analysis and interpretation of results. Qi Wu: Provided expertise in the interpretation of the data, critically reviewed and revised the manuscript. Supervised the overall research process and ensured the study adhered to ethical standards.

Conflict of interests

The authors declare no competing interests.

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Consent for publication

Manuscript is approved by all authors for publication.

Availability of data and materials

The data that support the findings of this study are available on request from the corresponding author.

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