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Breastfeeding Self-Efficacy, LATCH Scores in Relation to Self-Reported Milk Flow Among Primiparous Mothers: A Cross-Sectional Study

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ABSTRACT
Introduction *Milk flow difficulties remain a concern in breastfeeding practice. Preliminary interviews in November 2025 with the coordinating midwife and head of nutrition at Pujon Community Health Center identified milk flow difficulties as one of the breastfeeding concern in the health center's service area. This study aimed to examine the associations of breastfeeding self-efficacy and LATCH scores with self-reported milk flow among primiparous mothers at Pujon Community Health Center.* ***Methods*** *This cross-sectional study involved 35 primiparous mothers selected through purposive sampling at Pujon Community Health Center, Malang Regency, Indonesia. Data were collected using the Breastfeeding Self-Efficacy Scale–Short Form (BSES-SF), the LATCH assessment tool, and a self-reported milk flow questionnaire. Spearman's rank correlation was calculated using original total scores.*
Results *Breastfeeding self-efficacy scores were positively associated with self-reported milk flow scores (Spearman's $\rho = 0.607$; 95% CI: 0.291–0.822; $p < 0.001$). LATCH scores were also positively associated with self-reported milk flow scores (Spearman's $\rho = 0.636$; 95% CI: 0.321–0.838; $p < 0.001$).*
Conclusion *These findings indicate positive associated between breastfeeding self-efficacy and LATCH scores and self-reported milk flow in the study population. Larger studies using more robust measurements are needed to confirm these associations.*

Keywords: *breastfeeding self-efficacy, latch scores, self-reported milk flow, primiparous mothers, breastfeeding*

INTRODUCTION

Breast milk offers significant benefits for infants however, breastfeeding mothers may experience various challenges during the breastfeeding process, including difficulties related to milk flow. Perceived insufficient milk supply has been reported as one of the concerns experienced by breastfeeding mothers. A systematic review by Huang et al [1], reported prevalence of PIMS among breastfeeding mothers ranged from 10% to 25%. A preliminary study conducted by Setiadewi's [2], identified several breastfeeding-related problems, including sore nipples (30%), breast engorgement (30%), insufficient milk flow (20%), flat nipples (5%), and mastitis (15%). Additionally, according to the results of Tampunolon's [3] reported that 56.2% of mothers experienced insufficient milk flow. Meanwhile, according to the (2024) East Java Provincial Health Profile data, the exclusive breastfeeding rate at 81.2% [4].

Primiparous mother may face breastfeeding challenges, including difficulties related to milk flow, because of their limited previous breastfeeding experience and skills. This is consistent with the study by Fidiawati et al. [5], reported that the novelty of the breastfeeding and limited breastfeeding skills may leave primiparous mothers less prepared for the breastfeeding process. These challenges may be associated with the breastfeeding self-efficacy, defined as a mothers confidence in her ability to breastfeed [6].

Although previous studies have examined breastfeeding self-efficacy in relation to breastfeeding success, difficulties related to milk flow remain a concern in breastfeeding practice. This is reflected in preliminary interviews conducted in November 2025 with the coordinating midwife and the head of nutrition in the Pujon Community Health Center's identified difficulties related to milk flow as one of the breastfeeding concerns in the health center's service area, alongside sore nipples and formula use. These interviews provide contextual information about local breastfeeding challenges but do not estabilsh the prevalence of milk flow difficulties among the wider population of breastfeeding mothers. Furthermore, exclusive breastfeeding cohort records maintained Pujon Community Health Center covering 10 villages in Pujon subdistrict during the period from June to November 2025, documented a total of 61 breastfeeding mothers of these, 24 (39.3%) mothers were recorded as having successfully provided exclusive breastfeeding until their infants reached 6 months of age. Exclusive breastfeeding is defined as feeding infants only breast milk during the first six months of life, without additional foods or liquids, except for oral rehydration solutions and drops or syrups containing vitamins, minerals, or medicines [7]

Based on this, psychological aspects such as *breastfeeding self-efficacy* and technical aspects such as breastfeeding latch play important and relevant roles in the breastfeeding process. Previous research by Silaban et al. [8] examined the relationship between breastfeeding self-efficacy and exclusive breastfeeding success, whereas Purnamasari et al. [9] investigated the effect of lactation counseling on breastfeeding ability using the LATCH method. However, these studies focused on exclusive breastfeeding success and breastfeeding ability, respectively, rather than the relationship of these variables with milk flow. Therefore, further investigation is needed to clarify the relationships between breastfeeding self-efficacy, latch scores, and self- reported milk flow among primiparous mothers. This study aimed to examine two separate relationships at Pujon Community Health Center: the relationship between breastfeeding self-efficacy and self- reported milk flow, and the relationship between latch scores and self- reported milk flow.

METHODS

This study employed a quantitative cross-sectional correlational design. The intial population consisted of 55 primiparous breastfeeding mothers identified from a list provided by the coordinating midwife at Pujon Community Health Center. The population was screened against predefined eligibility criteria using purposive sampling. The inclusion criteria were primiparous mothers, directly breastfeeding their infants (not using expressed breast milk), having infants aged 14 days to 6 months, never having used or currently using breast milk supplements, and not being employed. Of the 55 mothers screened, 35 met all the inclusion criteria and agreed to participate in the study. The remaining 20 mothers were excluded because they did not meet one or more inclusion criteria: 10 used formula milk, 5 were employed and used formula milk, and 5 had used breast milk suplements. These exclusion categories were mutually exclusive. The final sample consisted of 35 participants. The sample size was determined based on the predefined eligibility criteria and the availability of eligible participants; no formal sample size calculation was performed. Data collection was conducted from February to March 2026.

Breastfeeding self-efficacy was measured using the 14 item *Breastfeeding Self-Efficacy Scale–Short Form* (BSES-SF), using the Indonesian-language version evaluated by Sandhi et al. [10], who reported a Cronbach's alpha of 0.90 in their psychometric validation study. This value was obtained from their validation study, not from the current study sample. Each item was rated on a 5-point Likert scale, ranging from 1 ("not at all confident") to 5 ("very confident"), yielding a total score ranging from 14 to 70. For descriptive purposes, BSES-SF

scores were categorized as low (14-32), medium (33–51), and high (52–70). These researcher-defined categories were calculated using the method proposed by Hamidi et al. [11] and were used for descriptive analysis rather than as validated clinical cutoffs.

Self-reported milk flow was assessed using a 24 item Indonesian-language questionnaire based on Puspitasari [12] and adapted by Nurhayati. The construct was operationally defined as maternal-reported signs and experiences associated with self-reported milk flow, rather than an objective measurement of breast milk production volume, flow rate, or milk transfer to the infant. The questionnaire covered six indicators: breastfeeding duration, breast condition, maternal sensations, infant responses, infant urination, and infant defecation. Responses were based on mothers' experiences throughout breastfeeding, as the questionnaire did not specify a particular recall period. Each item was rated on a 4-point Likert scale, ranging from 1 ("never") to 4 ("always"). Negatively worded items (items 2, 4, 6, 10, 11, 12, 16, 19, and 23) were reverse-scored. Total scores ranged from 24 to 96. In Puspitasari's (2016) study [12], the validity of the questionnaire was assessed using the Pearson product-moment correlation with 20 respondents. The same study reported a *Cronbach's alpha of 0.908* for the 24 item questionnaire. In this study, the cut-off score was used to by the reseacrher based on the median self-reported milk flow scores from 35 participants recruited at Pujon Community Health Center. Scores ≥78 were categorized as smooth, while scores <78 were categorized as not smooth. This sample-based categorization was used for descriptive purposes and does not represent a validated clinical cut off.

The LATCH assessment tool or LATCH scores, originally developed by Jensen et al. [13], was used to assess breastfeeding through direct observation. The assessment convered of five components: L (Latch), which assesses infant attachment to the breast; A (Audible swallowing), which assesses audible swallowing during breastfeeding; T (Type of nipple), which assesses maternal nipple type; C (Comfort), which assesses maternal comfort during breastfeeding; and H (Hold), which assesses the assistance required by the mother to hold the infant during breastfeeding. Each component is scored on a scale of 0 to 2, yield a total score ranging from 0 to 10. The scoring criteria used in this study include: L (Latch), a score of 0 indicated poor latch with weak sucking, a score of 1 indicated that stimulation was required to facilitate attachment, and a score of 2 indicated good attachment with strong, rhythmic sucking. For A (Audible swallowing), scores of 0 indicated that swallowing was not audible, a score of 1 indicate that swallowing are rarely audible, and score of 2 indicates that swallowing are frequently and regularly audible. For T (Type of nipple) a scores of 0

represents an inverted nipple, a score of 2 represents a flat nipple, and a score of 3 represents a normal nipple. For C (Comfort), a score of 0 indicated nipple pain and breast engorgement, a score of 1 indicated full breasts, sore nipples, or nipple redness, and a score of 2 indicated no observable signs of discomfort. For H (Hold), scores of 0 indicated the need for full assistance, a score of 1 indicates the need for partial assistance, and a score of 2 indicates no assistance is needed at all.

The total LATCH scores was classified into three categories: low (0–3), intermediate (4–7), and high (8–10). These categories were determined by the researchers using the score-range calculation method described by Hamidi et al. [11]. This classification was used solely for descriptive purposes and is not considered a validated clinical threshold. The LATCH scores were assesssed through observation by a single researcher acting as an observer. Spearman's rank correlation analysis was performed using the raw total scores rather not the categorized scores.

Data was conducted through questionnaires and observations obtained before the recruitment process, following several stages, including: First, the researcher submitted a research permit application to the Academic and Student Affairs Department, mfollowed by a research permit application to the Malang Regency Health Office, as well as a request for ethical approval from the Health Research Ethics Committee (KEPK) of Poltekkes Kemenkes Malang, for the period from 23 February 2026 to 23 February 2027, with approval number DP.04.04/F.XII.31/0104/2026. Next, the researcher submitted the research permit documents to Pujon Community Health Center and the researcher visited potential respondents door to door, accompanied by a village midwife or local public health officer. Prior to data collection the researcher conducted a Pre-Research Consent Briefing (PSP) and all participants agreed to serve as respondents. All participants in this study were aged 18 years or older therefore, parental or guardian consent was not required. Participants independently completed the Breastfeeding Self-Efficacy Scale–Short Form (BSES-SF) quistionnaire and the self-reported milk flow questionnaire, which took approximately 10–15 minutes. After completing the questionnaire, the researcher directly observed the mother while she breastfeed her infant for approximately 5 minutes using the LATCH score. The researcher acted as the sole observer and assessed the five components based on direct observation. During the observation, the researcher did not calculated or reviewed the participants total questionnaire scores. Questionnaire scores were calculated after all data were collected. The researcher had received academic training and practical experience in breastfeeding techniques as part of the

midwifery curriculum. However, the researcher had no specific training in LATCH assessment prior to data collection, and inter-rater reliability was not evaluated. These factors are acknowledged as limitations of the study. After all questionnaires and observational assessments were completed, the researcher provided counseling, positive affirmation, and corrective feedback regarding breastfeeding practices, including proper latch technique. This counseling was provided only after data collection was completed to avoid influencing the study measurements

Statistical analyses were performed using IBM SPSS Statistics version 25. Normality was assessed using the Shapiro–Wilk test because the sample consisted of 35 participants. The BSES-SF scores ($p = 0.112$) and LATCH scores ($p = 0.093$) were normally distributed, whereas the self-reported milk flow scores were not normally distributed ($p = 0.001$). Correlation analyses were conducted using the original total scores for each instrument rather than categorized scores, categorization was used only for descriptive presentation. All statistical tests were two-sided, with a significance level of $\alpha = 0.05$. The 95% for Spearman's rho were estimated using a paired percentile bootstrap procedure with 20,000 resamples at the participant level. Scatterplots with a small amount of visual jitter were used to examine relationship patterns and clarify overlapping discrete scores. Jitter was applied for visualization purposes only and did not alter the original scores or correlation calculations.

RESULT

Table 1. Maternal Age Distribution (N=35)

Age Group	(n)	(%)
17–25 years	26	74,3
26–35 years	9	25,7
Total	**35**	**100,0**

Note: Maternal age was the only participant charateristic collected and presented in this study.

Table 1 presents the age distribution of the 35 primiparous mothers included in the study, with 26 (74,3%) aged 17-25 years and 9 (25,7%) aged 26-35 years.

Table 2. Distribution of Breastfeeding Self-Efficacy, Latch Score Categories and Self-Reported Milk Flow (N=35)

Variable	Category	n	(%)
Breastfeeding Self-efficacy	High	23	65,7
	Medium	10	28,6
	Low	2	5,7
Total		**35**	**100,0**
	High	6	17,1

Latch Score	Intermediate	22	62,9
	Low	7	20,0
Total		**35**	**100,0**
Self-reported Milk Flow	Smooth	19	54,3
	Not Smooth	16	45,7
Total		**35**	**100,0**

Note: Categories were based on researcher-defined score ranges: BSES-SF (low: 14–32; medium: 33–51; high: 52–70), LATCH (low: 0–3; intermediate: 4–7; high: 8–10), and self-reported milk flow (not smooth: <78; smooth: ≥78). These categories are for descriptive purposes only.

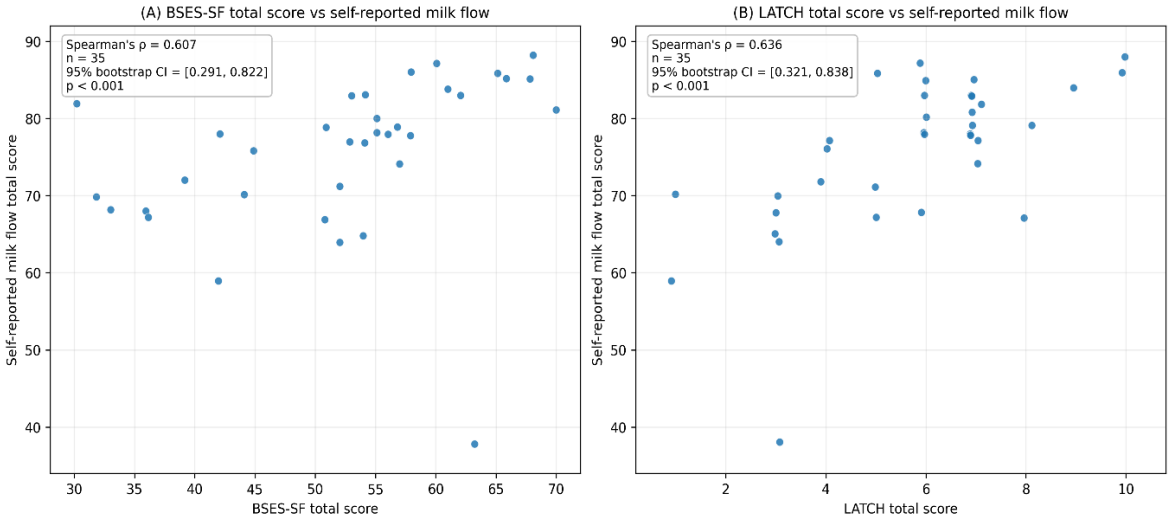
Table 2 presents the distribution of breastfeeding self-efficacy, latch score, and self-reported milk flow among the 35 participants, 23 (65,7%) had high breastfeeding self-efficacy scores, 22 (62,9%) had intermediate LATCH scores, and 19 (54,3%) reported smooth milk flow.

Table 3. Descriptive Statistics of Original Study Scores (N=35)

Variable	Valid (n)	Median (IQR)	Minimum-Maximum
Breastfeeding Self-Efficacy	35	54 (44,5-59)	30-70
Latch Score	35	6 (4-7)	1-10
Self-Reported Milk flow	35	78	38-88

Table 3 present the descriptive statistics for all three study variables. Each with 35 valid observations. The median BSES-SF score was 54 (Q1–Q3: 44.5–59; range: 30–70), the median LATCH score was 6 (Q1–Q3: 4–7; range: 1–10), and the median self-reported milk flow questionnaire score was 78 (Q1–Q3: 70–83; range: 38–88).

Figure 1. Jittered Scatterplots



(A) (B)

Figure 1 presents Jittered scatterplots showing the relationships between (A) breastfeeding self-efficacy and self-reported milk flow scores and (B) Latch and self-reported milk flow scores among 35 primiparous mothers. Spearman's rho (ρ), sample sizes (n), and 95% bootstrap confidence intervals are reported in each panel. Jitter was used for visualization only.

Table 4. Spearman's Rank Correlation Between Breastfeeding Self-Efficacy, Latch Scores and Self-reported Milk Flow

Variable pair	n analyzed	*Spearman rho* (ρ)	*95% CI*	*Two-sided p-value*
Breastfeeding Self-Efficacy and Self-reported milk flow	35	0.607	0.291-0.822	p < 0.001
Latch scores and Self – reported milk flow	35	0.636	0.321-0.838	p< 0.001

Note: The Spearman's rank correlation was calculated using the raw total scores from the BSES-SF questionnaire, the LATCH score and raw self reported milk flow questionnaire, rather than the categorized scores used in the cross-tabulations. The 95% confidence intervals were estimated using 20.000 paired participant-level bootstrap resamples. Categorization was used for decriptive purposes only.

As shown in Table 4, Spearman's rank correlation analysis showed a positive association between breastfeeding self-efficacy and self-reported milk flow scores (ρ = 0.607, n = 35, 95% CI: 0.291–0.822, p < 0.001). A positive association was also observed between LATCH scores and self-reported milk flow scores (ρ = 0.636, n = 35, 95% CI: 0.321–0.838, p < 0.001). Both analyses used the original total scores, and the confidence intervals were estimated using a participant-level bootstrap procedure.

DISCUSSION

This study found strong positive correlations between breastfeeding self-efficacy and self-reported milk flow, as well as between LATCH scores and self-reported milk flow among primiparous mothers at Pujon Community Health Center. According to Bandura's theory, self-efficacy beliefs are related to individuals' effort, perseverance, and responses to difficulties [15]. In this context, breastfeeding self-efficacy may be relevant to mothers' experiences during breastfeeding. Similarly, the association between LATCH scores and self-reported milk flow highlights the relevance of breastfeeding technique. However, the intermediate LATCH category reflects the overall score range and does not identify specific components that may require improvement. These findings suggest that breastfeeding self-efficacy and LATCH scores are relevant to the breastfeeding process, although the observed associations do not establish causality.

The present study found positive relationships between breastfeeding self-efficacy, LATCH scores, and self-reported milk flow among primiparous mothers at Pujon Community Health Center. The relationship between breastfeeding self-efficacy and self-reported milk flow is supported by Khusniyati [16], who also reported a positive relationship between breastfeeding self-efficacy and milk production smoothness among postpartum mothers. Both studies used a cross-sectional design and the BSES-SF. However, Khusniyati's [16] study included postpartum mothers with varied parity and assessed milk production smoothness using a checklist, wheras the present study focused exclusively on primiparous mothers and used a self-reported milk-flow questionnaire. These differences in the study population and outcome measurement should be considered when interpreting the findings. Regarding breastfeeding technique, Nurjannah [17] reported an association between breastfeeding technique and milk-flow smoothness among breastfeeding mothers. This finding provides related evidence on the relationship between breastfeeding practices and milk flow, although it is not directly equivalent to the present study because the measurement instruments and statistical analyses differed. Sandhi et al. [18] also examined the relationship between breastfeeding self-efficacy and perceived milk supply. However, perceived milk supply is a different concept from self-reported milk flow and should not be interpreted as a direct measure of milk production or flow smoothness. Therefore, the present study provides context-specific evidence regarding the relationships of breastfeeding self-efficacy and breastfeeding technique, assessed using the LATCH scores, with self-reported milk flow among primiparous mothers. Nevertheless, the cross-sectional design does not establish causality.

Physiologically, nipple stimulation during breastfeeding triggers oxytocin release, which facilitates milk ejection, while prolactin plays a role in milk production [19]. Breastfeeding self-efficacy is related to a mother's confidence in coping with breastfeeding challenges, whereas the LATCH scores included latch, audible swallowing, nipple type, comfort, and hold during observed breastfeeding. Stress may be associated with the smoothness of milk flow [20]. However, the hormonal mechanisms underlying this association could not be determined from this study because it did not directly measure stress levels, hormone concentrations, milk production or breast milk transfer. Therefore this mecanism is considered a possible explanation for the observed association, rather than a mechanism directly proven in this study. Previous research has also reported that mothers with prior breastfeeding experience tend to be better prepared to achieve the correct breastfeeding position for their infants [21]. Another study found that 56.7% of primiparous used suboptimal breastfeeding techniques [22].

These findings are relevant to midwifery practice, particularly when assessing the support needed by primiparous during breastfeeding. The BSES-SF provides information about a mothers confidence in breastfeeding. Whereas the LATCH scores helps identifiy aspects of breastfeeding that may need improvement. Midwife cas use the result of both assessment to guide discussions with the mothers and determine the type of assessment to guide discussions with mothers and determine the type of assisstance that may be appropriate for each case.

The strengths of this study include its focus on primiparous, which provides context-specific findings on breastfeeding self-efficacy, observed breastfeeding practices, and self-reported milk flow. Another strength is the use of direct observation to assess breastfeeding practices through LATCH scores, rather than relying solely on maternal reports. Despite these strengths, several limitations should be considered. First, the cross-sectional design does not establish temporal relationships or causality. Second, the study was conducted at a single community health center, and the exclusion of working mothers may limit the generalizability of the findings. Third, breastfeeding self-efficacy and milk flow were assessed using self-reported questionnaires, which may introduce response and perception biases. As both variables were assessed through maternal reports, shared-method bias may have influenced their observed association. Furthermore, the threshold used to categorize self-reported milk flow was based on the sample median rather than an externally validated cut-off, and the LATCH categories used for descriptive analysis had not been validated as clinical classifications. LATCH scores were conducted by a single observer without specific training in the instrument, and inter-rater reliability was not assessed. In addition, the sample size was relatively small, and the analyses were not adjusted for potential confounders. Finally, participant characteristics were limited to maternal age, preventing further analysis of other factors that may be associated with the study variables

CONCLUSIONS

This study found positive associations between breastfeeding self-efficacy and self-reported milk flow, as well as between LATCH scores and self-reported milk flow, among 35 primiparous mothers at Pujon Community Health Center. As milk flow was assessed using a questionnaire, the findings reflect mothers' reported experiences and should be interpreted within the context of the population studied. Larger studies using more robust and objective measurements are needed to confirm these associations and improve the generalizability of the findings.

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AUTHOR CONTRIBUTIONS

APDC : Conceptualization, Methodology, Data Curation, Formal Analysis, Writing-Original Draft, and Writing – Review & Editing.

AM : Methodology, Investigation, Writing-Review and Editing.

HM : Supervision, Validation, and Writing-Review and Editing.

AY : Project Administration, Resources, and Supervision.

All authors have read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

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