Original Article

Effectiveness of a Digital Platform-Based Breastfeeding Education Intervention on Maternal Attitudes and Exclusive Breastfeeding Success: A Quasi-Experimental Study with Six-Month Follow-Up

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ABSTRACT

OBJECTIVE: To test the effect of a digital platform-based breastfeeding educational intervention on maternal attitudes toward breastfeeding and exclusive breastfeeding success over a 6-month follow-up.
METHODOLOGY: This study used a quasi-experimental, non-equivalent control-group, pretest-posttest design with a 6-month follow-up. A total of 140 pregnant women (28–40 weeks gestation, aged 18–45 years) were recruited consecutively and allocated to the intervention (digital platform-based breastfeeding education) and control (standard care) groups, based on the health facility. Breastfeeding attitudes were measured using the Breastfeeding Attitude Scale (32 items, Cronbach's α = 0.89; CVI = 0.92). Secondary variables included exclusive breastfeeding success, breastfeeding duration, and breastfeeding barriers. Measurements were conducted at baseline, postpartum, and months 1, 3, and 6. Data analysis included Repeated-Measures ANOVA, logistic regression, Chi-square tests, and Kaplan-Meier analysis. Poltekkes Kemenkes Jambi, Jambi, Indonesia, approved this study (approval number: LB. 02.06/2/1015/2 /1015/2025).
RESULTS: The intervention group reported significantly higher attitude scores after the intervention (122.4±10.8 vs 72.1±8.2, p<0.001) and at the 6-month follow-up (120.6±11.4 vs 75.6±9.8, p<0.001). Exclusive breastfeeding at six months was significantly higher in the intervention group (70.0% vs 34.3%, RR=2.04, 95%CI:1.43-2.91, p<0.001). Higher platform engagement, positive attitudes, breastfeeding self-efficacy, and family support were all significant predictors of exclusive breastfeeding success.
CONCLUSION: Maternal attitudes and exclusive breastfeeding rates with digital platform-based breastfeeding education are significantly affected, indicative of a digital approach that is an efficient and scalable intervention mechanism of optimal infant feeding practice.

KEYWORDS: Breastfeeding Education, Digital Health Intervention, Exclusive Breastfeeding, Maternal Attitudes, Mobile Health.

INTRODUCTION

The World Health Organisation (WHO) recommends providing optimal health for a child and mother during the first 6 months of life through exclusive breastfeeding, and continuing breastfeeding until age 2 or beyond[1,2]. The benefits of breastfeeding are well established, including lower risks of leukemia in children and type 2 diabetes in mothers[3,4]. Yet the global exclusive breastfeeding rate remains far from the expected target in both low- and middle-income countries and in high-income countries[5].

Several studies on breastfeeding education interventions cover multiple formats and approaches. Based on a systematic review, internet-based intervention models could effectively improve breastfeeding knowledge and attitudes in pregnant mothers, increase breastfeeding confidence, and increase the frequency of exclusive breastfeeding in women in the short term (6 weeks) and the long term (3-6 months) after birth. Furthermore, a recent review of the evidence on mobile applications promoting and supporting breastfeeding found insufficient evidence for a sustained beneficial effect of mobile application promotion and support on breastfeeding rates[6,7].

Numerous studies have examined breastfeeding education interventions across multiple formats. Internet-based intervention models can effectively improve breastfeeding knowledge, attitudes, and self-confidence among pregnant women, while also increasing exclusive breastfeeding rates both in the short term (6 weeks) and the long term (3–6 months) postpartum[8,9]. Despite this mixed evidence, digital platforms including SMS, WeChat, and dedicated breastfeeding applications have been increasingly adopted to deliver breastfeeding health education, particularly as technology access expands[9,10].

To address this, digital platforms are increasingly used to overcome challenges in providing breastfeeding education and care, particularly in response to evolving technology and expanding

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access to health knowledge. Internet intervention models represent a useful modality for delivering breastfeeding health education messages to mothers via SMS, WeChat, or dedicated breastfeeding education applications. Internationally certified lactation consultants have proposed the use of Internet-based interventions as a way forward to encourage breastfeeding[11].

The objective of this study is to determine baseline and post-intervention maternal attitudes towards breastfeeding, including exclusive breastfeeding, at various ages leading up to six months postpartum, as well as the factors that impact this intervention's success. The uniqueness of this study lies in the use of a quasi-experimental design encompassing a 6-month post-intervention follow-up period, which substantially exceeds the follow-up duration reported in previous digital breastfeeding education studies. Previous studies have predominantly used short-term follow-up periods ranging from immediately after the intervention to 3 months postpartum, thereby limiting the ability to evaluate ongoing behavioural outcomes, such as maintaining exclusive breastfeeding up to the WHO-recommended 6-month threshold. Furthermore, this study goes beyond previous methodological approaches by integrating multiple assessment modalities, including structured interviews, 24-hour dietary reminders, and validated attitude instruments, at sequential time points (initiation, 1, 3, and 6 months postpartum), and by using survival analysis techniques to examine breastfeeding duration.

METHODOLOGY

Design

A quasi-experimental, non-equivalent control group pretest-posttest design was used, extended with a 6-month post-intervention follow-up measurement. The study consisted of a baseline (pre-intervention), an immediate post-intervention, and a 6-month follow-up. Consecutive sampling was employed, whereby all eligible pregnant women presenting at selected healthcare facilities during the recruitment period were enrolled sequentially until the required sample size was achieved. Additionally, allocation to intervention and control groups was determined by healthcare facility setting (facility-level allocation) to minimize contamination between groups.

Population and Sample

The available population consists of pregnant women who received prenatal examinations at selected healthcare facilities during the period of recruitment. The study included pregnant women at 28-40 weeks of gestation, mothers aged 18-45 years, Internet-connected smartphones, and active willingness to participate in the full study series. Exclusion criteria were: medical contraindications for breastfeeding, severe pregnancy complications, history of severe psychiatric disorders, participation in other breastfeeding education programs within 6 months, and pre-defined decisions not to breastfeed. The sample size was estimated using the formula for two independent group hypothesis testing at a significance level (α; 0.05; 1-β; 0.80), resulting in 64 participants per group. When attrition rates were expected to be 10%, the sample size was increased to 70 per group, for a total of 140 participants. We used consecutive sampling, and allocation was determined by health care facility setting.

Variables

The main independent variable was the digital platform-based breastfeeding education intervention, which included educational aspects related to exclusive breastfeeding benefits, the correct method, problem management, and psychosocial support. The main dependent variable was breastfeeding attitude, assessed with a 32-item Likert scale (scores 32-160). Secondary dependent variables were exclusive breastfeeding success at different time points (initiation of exclusive breastfeeding (early), 1 month, 3 months, 6 months), duration of exclusive breastfeeding and barriers to breastfeeding. Covariate variables consisted of demographic, obstetric, psychosocial and technological factors.

Instruments

Data on age (18–24, 25–30, 31–35, 36–45 years old), education, employment status, parity, gestational age, previous breastfeeding experience, and number of years of smartphone ownership were collected in a demographic questionnaire. Breastfeeding attitudes were measured using a validated 32-item instrument on a 5-point Likert scale, designed to assess beliefs about breastfeeding benefits, perceived self-efficacy, attitudes toward breastfeeding in public, and commitment to exclusive breastfeeding. To measure exclusive breastfeeding success, the WHO operational definition was employed in structured interviews and 24-hour recall. Breastfeeding barriers were measured with a literature-based checklist that included physical barriers (sore nipples, perception of insufficient breast milk, mastitis, difficulty latching, fatigue), psychosocial barriers (diminished self-efficacy/confidence, inadequate family support services, pressure to use formula, and stress), and structural barriers (returning to work, limited access to appropriate workplace facilities, and inadequate lactation consultation services).

The instrument used was the Breastfeeding Attitude Scale (BAS), a validated 32-item measure using a 5-point Likert scale (score range: 32–160) assessing four domains: beliefs regarding breastfeeding benefits, perceived self-efficacy, attitudes toward breastfeeding in public, and commitment to exclusive breastfeeding. Reliability testing yielded a Cronbach's alpha coefficient of 0.89, indicating excellent internal consistency. Content validity was established through expert panel review, achieving a Content Validity Index (CVI) of 0.92.

Procedures

In preparation, an extensive process of development, instrumentation and validation, enumeration and

ethical approval of the platform was undertaken. Upon recruitment, appropriate candidates received a complete research description before consenting to participate and completing baseline questionnaires. Those in the intervention group had access to all digital platforms and educational resources in text, image, video, and sound, as well as interaction options (discussion forums, virtual lactation consultations, and automatic reminders). The control group received standard care, including routine breastfeeding counselling at antenatal visits. Post-delivery interventions included postpartum measurements taken during 1-2 weeks post-delivery. After the initial postpartum follow-up, 1-, 3-, and 6-month follow-ups were conducted via direct visits to the location of birth, telephone interviews, and online questionnaires, with retention measures to limit postpartum losses to follow-up.

Data Analysis

Descriptive analysis defined participant demographics and categorized them of categorical variables (frequencies and percentages) and continuous variables (means and standard deviations). Chi-square tests and independent t-tests ($\alpha = 0.05$) were used to determine baseline equivalence. Independent t-tests assessed between-group attitudes. A repeated-measures ANOVA assessed attitude changes over time and time-group interactions, and effect sizes were reported as partial eta-squared. Predictive variables of exclusive breastfeeding at 6-month follow-up were assessed using binary logistic regression, with odds ratios reported with 95% CI. Model quality was assessed using Nagelkerke R^2, the Hosmer-Lemeshow Test, classification accuracy, and the Area Under the ROC Curve. Compared exclusive breastfeeding success rates using Chi-square tests, with Risk Ratios and Number Needed to treat. Kaplan-Meier survival analysis compared duration of exclusive breastfeeding, with Hazard Ratios from Cox proportional hazards regression.

Ethical Considerations

This study was approved by Poltekkes Kemenkes Jambi, Jambi, Indonesia (approval number: LB.02.06/2/1015/2025.

RESULTS

Both groups were matched at baseline for all demographic characteristics and attitude metrics ($p>0.05$) (**Table I; Table II**). The intervention group showed greater improvement in attitude scores (50.3-point Difference; $p<0.001$) than the control group, and this improvement was maintained at the 6-month follow-up (Table II). Logistic regression analyses revealed that the intervention group was 6.42 times more likely to achieve exclusive breastfeeding (OR = 6.42, $p < 0.001$), and significant predictors included platform involvement, attitude scores, self-efficacy, family support, breastfeeding experience, and higher education (**Table III**). The intervention group achieved greater exclusive breastfeeding success over the time period, with a median exclusive breastfeeding duration of 6 months vs 3.2 months in the control group (HR=2.18, $p<0.001$), and a decrease in the NNT from 5 to 3 (**Table IV**). Similarly, patients in the intervention group reported significantly fewer physical and psychological barriers to breastfeeding (sore nipples, perception of insufficient breast milk, low self-confidence) and more active help-seeking behavior (consulting a professional or attending support groups) (**Table V**).

Table I: Demographic Characteristics of Research Participants

Characteristics	Category	Intervention Group (n=70)		Control Group (n=70)		p-value
		n	%	n	%	
Age (years)						0.847
	18-24	18	25.7	17	24.3	
	25-30	28	40.0	30	42.9	
	31-35	16	22.9	15	21.4	
	36-45	8	11.4	8	11.4	
	Mean ± SD	28.4 ± 5.2		28.1±5.4		0.724
Level of education						0.912
	Elementary school	5	7.1	6	8.6	
	Junior high school	12	17.1	11	15.7	
	Senior high school	31	44.3	32	45.7	
	Diploma/ Bachelor's Degree	18	25.7	17	24.3	
	Post Graduate	4	5.7	4	5.7	
Employment Status						0.876
	Work	24	34.3	23	32.9	
	Self-employed	11	15.7	13	18.6	
	Housewife	32	45.7	31	44.3	
	Student	3	4.3	3	4.3	
Parity						0.793
	Primigravida	38	54.3	36	51.4	
	Multigravida (2-3)	26	37.1	28	40.0	
	Grand Multigravida (≥4)	6	8.6	6	8.6	
Gestational Age at Registration						0.682
	28-32 weeks	22	31.4	24	34.3	
	33-36 weeks	30	42.9	28	40.0	
	37-40 weeks	18	25.7	18	25.7	
	Mean ± SD	33.6 ± 3.1		33.4±3.2		0.691
Previous Breastfeeding Experience						0.856
	Yes	28	40.0	29	41.4	
	No	42	60.0	41	58.6	
Duration of Smartphone Ownership						0.924
	< 1 year	4	5.7	5	7.1	
	1-3 years	18	25.7	17	24.3	
	> 3 years	48	68.6	48	68.6	

Table II: Comparison of Attitude Scores Towards Breastfeeding

Measurement Time	Intervention Group (n=70)	Control Group (n=70)	Mean Difference (95% CI)	t-value	p-value
	Mean (SD)	Mean (SD)			
Baseline (Pre-Intervention)	68.9 (7.6)	68.5 (7.4)	0.4 (-2.1, 2.9)	0.31	0.756
Post-Intervention (Immediate)	122.4 (10.8)	72.1 (8.2)	50.3 (47.1, 53.5)	31.05	<0.001
6 Month Follow-up	120.6 (11.4)	75.6 (9.8)	45.0 (41.4, 48.6)	24.82	<0.001
Baseline Change to 6 Months					
Mean Difference	51.7	7.1	44.6 (40.8, 48.4)	24.82	<0.001
Repeated Measures ANOVA Analysis					
Time Effect				F = 892.4	<0.001
Group Effect				F = 684.2	<0.001
Time × Group Interaction				F = 756.8	<0.001

Table III: Predictors of Exclusive Breastfeeding Success at 6-Month Follow-up

Predictor Variables	B	SE	Wald	Odds Ratio	95% CI	p-value	VIF
Main Model							
Group (Intervention vs Control)	1.86	0.42	19.61	6.42	2.82-14.62	<0.001	1.12
Platform engagement (high vs low)[a]	1.38	0.36	14.69	3.98	1.96-8.08	<0.001	1.24
Post-intervention attitude scores	0.07	0.02	12.25	1.07	1.03-1.11	<0.001	1.45
Breastfeeding self-efficacy	0.14	0.04	12.25	1.15	1.06-1.25	<0.001	1.38
Family support (high vs low)	1.12	0.34	10.86	3.06	1.57-5.96	0.001	1.18
Previous breastfeeding experience	0.84	0.32	6.89	2.32	1.24-4.34	0.009	1.32
Education level (> high school)	0.68	0.31	4.81	1.97	1.07-3.63	0.028	1.21
Parity (multigravida vs primigravida)	0.52	0.30	3.00	1.68	0.93-3.03	0.083	1.28
Employment status (working vs not working)	-0.48	0.29	2.74	0.62	0.35-1.09	0.098	1.15
Mother's age	0.02	0.03	0.44	1.02	0.96-1.08	0.506	1.08
Model Statistics							
Nagelkerke R^2	0.58						
Hosmer-Lemeshow χ^2	7.24					0.512	
Classification accuracy	81.4%						
Sensitivity	78.1%						
Specificity	85.1%						
Area Under ROC Curve (AUC)	0.86					<0.001	

[a]*Engagement platform applies only to the intervention group (n=70)*

The p-value was calculated using the Chi-square test for categorical variables and the independent t-test for continuous variables. There was no significant difference between groups at baseline ($p > 0.05$).

DISCUSSION

The homogeneity between the two groups was demonstrated by p-values > 0.05 for all variables compared with baseline. This consistency is indeed crucial in experimental investigations to ensure that differences in outcomes are due to the intervention and not to confounding factors[12]. Most population members were 25–30 years (40.0% vs 42.9%), were high school educated (44.3% vs 45.7%), were housewives (45.7% vs 44.3%), and were primigravida (54.3% vs 51.4%).

The gestational age of enrolment was 33.6 ± 3.1 weeks at the time of enrolment in the intervention group and 33.4 ± 3.2 weeks in the control group. This is a particularly advantageous time for breastfeeding education interventions with pregnant women at this age, as they are already getting ready for childbirth and starting to breastfeed[13]. Of the participants, 68.6% (both groups) had their smartphone in use for more than 3 years, which constitutes a relatively high percentage of people's knowledge of digital technology, which is an appropriate condition for digital platform-based interventions' success, an important indicator for the success of the interventions in which digital technologies are needed[14].

Repeated Measures ANOVA analysis revealed a significant time effect (F=892.4), group effect (F=684.2), and time × group interaction (F=756.8). This is also consistent with the findings of Alkhaldi et

Table IV: Exclusive Breastfeeding Success Rate at Various Time Points

Point in Time	Intervention Group (n=70)	Control Group (n=70)	ARR (%)	Risk Ratio (95% CI)	NNT	p-value
	n (%)	n (%)				
Early Initiation of Breastfeeding (< 1 hour)	62 (88.6)	48 (68.6)	20.0	1.29 (1.08-1.54)	5	0.004
Exclusive Breastfeeding for 1 Month	64 (91.4)	52 (74.3)	17.1	1.23 (1.06-1.43)	6	0.008
Exclusive Breastfeeding for 3 Months	58 (82.9)	38 (54.3)	28.6	1.53 (1.20-1.95)	4	<0.001
Exclusive Breastfeeding for 6 Months	49 (70.0)	24 (34.3)	35.7	2.04 (1.43-2.91)	3	<0.001
Survival Analysis (Kaplan-Meier)						
Median duration of exclusive breastfeeding (months)	6.0 (IQR: 5.0-6.0)	3.2 (IQR: 1.5-5.0)				<0.001[b]
Mean duration of exclusive breastfeeding (months)	5.2 ± 1.4	3.1 ± 1.8				<0.001
Hazard Ratio (stopping exclusive breastfeeding)[c]	Ref	2.18 (1.52-3.12)				<0.001

[b]*Log-rank test*
[c]*Hazard Ratio derived from Cox proportional hazards regression. The intervention group serves as the reference category (HR = 1.00). An HR of 2.18 (95% CI: 1.52–3.12) for the control group indicates that mothers in the control group had a 2.18-fold higher hazard (instantaneous risk) of discontinuing exclusive breastfeeding at any given time point, after accounting for censoring. Equivalently, the intervention group demonstrated a 54% reduction in the hazard of breastfeeding cessation (1 − 1/2.18 = 0.54)*

Table V: Reported Breastfeeding Barriers and Challenges at 6-Month Follow-up

Obstacles/Challenges	Intervention Group (n=70)	Control Group (n=70)	χ^2	φ	p-value
	n (%)	n (%)			
Physical Barriers					
Sore/painful nipples	18 (25.7)	32 (45.7)	6.12	0.21	0.013
Perception of breast milk as insufficient	12 (17.1)	28 (40.0)	8.96	0.25	0.003
Mastitis/breast swelling	8 (11.4)	14 (20.0)	1.94	0.12	0.164
Difficulty attaching	10 (14.3)	26 (37.1)	9.42	0.26	0.002
Mother's fatigue	22 (31.4)	34 (48.6)	4.24	0.17	0.039
Psychosocial Barriers					
Lack of self-confidence	8 (11.4)	24 (34.3)	10.18	0.27	0.001
Lack of family support	14 (20.0)	18 (25.7)	0.64	0.07	0.424
Pressure to give formula milk	16 (22.9)	28 (40.0)	4.72	0.18	0.030
Stress/anxiety	12 (17.1)	22 (31.4)	3.82	0.17	0.051
Structural Barriers					
Back to work	18 (25.7)	20 (28.6)	0.14	0.03	0.708
Lack of breastfeeding facilities in the workplace	12 (17.1)	14 (20.0)	0.19	0.04	0.663
Lack of access to lactation consultations	6 (8.6)	22 (31.4)	11.02	0.28	0.001
Strategy to Overcome Obstacles					
Searching for information from the platform	58 (82.9)	N/A[a]	-	-	-
Consultation with health workers	42 (60.0)	28 (40.0)	5.60	0.20	0.018
Support from family	48 (68.6)	44 (62.9)	0.52	0.06	0.471
Join a support group	24 (34.3)	12 (17.1)	5.36	0.20	0.021

Respondents may report more than one barrier. φ (Phi coefficient): 0.10 = small effect, 0.30 = medium effect, 0.50 = large effect. [a]Not applicable to the control group because they did not have access to the platform

al.'s research. Both positive attitudes toward breastfeeding as a predictor of exclusive breastfeeding practices were positive (28.4% variance accounted for; Nagelkerke R^2)[15].

The logistic regression model indicated that interventions were 6.42 times more likely to achieve exclusive breastfeeding success than the control group (OR=6.42; 95% CI: 2.82-14.62; p<0.001). Other significant predictors were high platform engagement (OR=3.98; p<0.001), post-intervention attitude (OR=1.07; p<0.001), breastfeeding self-efficacy (OR=1.15; p<0.001), high family support (OR=3.06; p=0.001), previous breastfeeding experience (OR=2.32; p=0.009), and education beyond high

school level (OR=1.97; p=0.028).

This model demonstrated high predictive quality with a Nagelkerke R^2 of 0.58, classification accuracy of 81.4% and an AUC of 0.86. The Nagelkerke value of 0.58 suggests that the model explained 58% of the variance of exclusive breastfeeding success, exceeding some of the previous research. The Nagelkerke R^2 of 0.58 indicates a substantial proportion of explained variance. In comparison, predictive models in various clinical contexts generally yield lower values: Müller et al. reported a best R^2 of only 0.507 [16], Halicka et al. [17] obtained an R^2 of 0.45, and Zhu et al. [18] recorded an R^2 of 0.45.

We consistently observed that, while this intervention group displayed higher exclusive breastfeeding success rates than the control group at all time points, the Difference increased from 20% at early initiation to 35.7% at 6 months (ARR). The risk ratio indicated that the intervention group was more likely to exclusively breastfeed to 6 months (95% CI: 1.43-2.91; p<0.001). This finding is in line with a report by Adokiya et al. [19], which found an exclusive breastfeeding rate of 74.6% among ENVAC projects involved in communication aimed at social behaviour change, 31.7 percentage points above the national standard.

Kaplan-Meier survival analysis further supported the findings, with the median duration of exclusive breastfeeding in the intervention group being 6 months, compared with 3.2 months in the control group. A 2.18 hazard ratio (95% CI: 1.52–3.12) revealed that the control group was at more than 2 times the risk of dropping exclusive breastfeeding. The decrease in NNT from 5 to 3 indicates that the intervention becomes more effective with increasing exclusive breastfeeding duration, suggesting that support is maintained through a digital platform[20].

Compared with the control group, the intervention group reported fewer physical barriers: sore nipples (25.7% vs 45.7%, p=0.013), perceived insufficient breast milk (17.1% vs 40.0%, p=0.003), latch-on difficulties (14.3% vs 37.1%, p=0.002) and maternal fatigue (31.4% vs 48.6%, p=0.039). These findings are in line with Holanda ER d et al.'s [20] research, which assessed the association between BMI ≥30, preterm birth, and previous psychiatric illness as factors that predicted non-breastfeeding. Access to lactation consultation was the most salient Difference, as barriers to access were higher in the control group (31.4% versus 8.6%) (p=0.001, φ=0.28).

The statistically significant reductions in barriers such as difficulty attaching (φ = 0.26), lack of self-confidence (φ = 0.27), and lack of access to lactation consultations (φ = 0.28) represent clinically meaningful improvements. Research consistently demonstrates that even modest improvements in self-efficacy and access to professional lactation support are associated with substantially higher breastfeeding continuation rates[21,22]. Specifically, professional lactation support and breastfeeding education have been shown to improve six-month exclusive breastfeeding outcomes significantly [22,23].

Non-significant barriers, return to work (φ = 0.03), lack of workplace facilities (φ = 0.04), and lack of family support (φ = 0.07) reflect structural and social determinants that require systemic policy-level interventions beyond individual-level platforms. Workplace barriers necessitate organizational changes including lactation rooms, flexible schedules, and supportive policies[24].

Regarding psychosocial barriers, the intervention group reported lower confidence in their breastfeeding ability (11.4% vs 34.3%; p=0.001) and lower pressure to formula-feed (22.9% vs 40.0%; p=0.030). These findings are consistent with Obiakor et al.'s [25] report, which found that adverse social support was associated with increased risk of antepartum depression and a 3.71 increase in odds of depression for abuse during pregnancy.

Regarding coping strategies, the intervention received significantly more resources to consult health professionals (60.0% vs 40.0%, p=0.018) and engaged in support groups (34.3% vs 17.1%, p=0.021). This indicates that the digital platform has successfully increased help-seeking behavior among breastfeeding mothers, and it aligns with Chen et al. [26] study, which found that breastfeeding-friendly environmental practices are associated with a greater likelihood of continuing exclusive breastfeeding.

The results of this study have significant clinical implications for the development of digital technology-based breastfeeding promotion programs. The proposed predictive model has high discriminatory ability to identify mothers at risk of exclusive breastfeeding failure with an AUC of 0.86. It is similar to Zahid FM et al. [15], who also achieved an AUC of 0.924 for an osteoporosis risk prediction model, and better than other predictive models associated with maternal and child health.

CONCLUSION

All its objectives were successfully met in this study. To begin, the education intervention delivered via a digital platform yielded a significant improvement in maternal attitudes towards breastfeeding, with a score increase of 51.7 points in the intervention group compared to 7.1 points in the control group (p<0.001). At 6 months, the exclusive breastfeeding success rate was 70.0% in the intervention group (RR=2.04; 95% confidence interval: 1.43–2.91), compared with 34.3% in the control group. Third, measures for intervention efficacy were also included, such as high platform engagement (OR=3.98), family support (OR=3.06), and previous breastfeeding experience (OR=2.32). Regarding professional help-seeking behavior, the use of digital platforms is higher (60.0% vs 40.0%, p=0.018). Digital resources are reported to reduce barriers to accessing lactation consultation (8.6% vs 31.4%, p=0.001) and to improve maternal breastfeeding self-efficacy.

LIMITATION

A limitation of the study is that breastfeeding outcomes were likely assessed through self-report measures, which are susceptible to recall and social desirability biases, as noted in similar longitudinal breastfeeding studies. Structural barriers, such as returning to work (φ=0.03) and the lack of workplace facilities (φ=0.04), remained insignificant, suggesting that digital platform interventions cannot address systemic policy-level determinants that require organizational change.

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AUTHOR CONTRIBUTION

Rahmi A: Contributed and Responsible for study design and conceptualization, data collection and acquisition, data analysis and interpretation, and drafting the manuscript.
Asrial A: Contributed and was responsible for study design, data collection and acquisition, data analysis and interpretation, critical
revision, and drafting the manuscript.
Rusdi M: Contributed and was responsible for study design, data collection and acquisition, data analysis and interpretation, critical
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Elrifda S: Contributed and was responsible for overall research supervision and critical revision of the intellectual content of the
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