

ORIGINAL RESEARCH ARTICLE

Factors influencing breastfeeding intention among hepatitis B virus-infected mothers: An ABC-X cross-sectional analysis

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Abstract

Despite international guideline recommendations supporting breastfeeding among HBV-infected mothers, breastfeeding rates remain suboptimal. This study investigated factors influencing breastfeeding intention among HBV-infected mothers using the ABC-X theoretical framework. A hospital-based cross-sectional study was conducted from January to December 2025 among 119 HBV-infected pregnant women. Structured questionnaires assessed demographic characteristics, disease-related factors, social support, self-efficacy, stigma, breastfeeding attitudes, and breastfeeding intention. Descriptive statistics, t-tests, chi-square tests, and multivariate logistic regression were performed. Among participants, 45.3% (n = 54) intended to breastfeed. Univariate analysis showed significant differences in self-efficacy (p = 0.003) and breastfeeding attitude scores (p = 0.046) between mothers with and without breastfeeding intention. After adjustment for potential confounders, self-efficacy was the only independent predictor of breastfeeding intention (OR = 3.71, 95% CI: 1.35–10.19, p = 0.011). The prediction model showed good discrimination, with an area under the ROC curve of 0.782. Maternal self-efficacy was the strongest predictor of breastfeeding intention among HBV-infected mothers. Interventions enhancing self-efficacy and clearly communicating breastfeeding safety with immunoprophylaxis may improve breastfeeding support in this population. (*Afr J Reprod Health* 2026; 30 [20]:121-133).

Keywords : Hepatitis B virus, breastfeeding intention, self-efficacy, stigma, ABC-X model, cross-sectional study

Résumé

Malgré les recommandations des directives internationales en faveur de l'allaitement maternel chez les mères infectées par le virus de l'hépatite B (VHB), les taux d'allaitement dans cette population demeurent insuffisants. Cette étude visait à identifier les facteurs influençant l'intention d'allaiter chez les mères infectées par le VHB en utilisant le cadre théorique ABC-X. Une étude transversale menée en milieu hospitalier a été réalisée de janvier à décembre 2025 auprès de 119 femmes enceintes infectées par le VHB. Des questionnaires structurés ont permis de recueillir des données sur les caractéristiques démographiques, les facteurs liés à la maladie, le soutien social, l'auto-efficacité, la stigmatisation, les attitudes envers l'allaitement et l'intention d'allaiter. Des statistiques descriptives, des tests t, des tests du χ^2 et une régression logistique multivariée ont été utilisés. Parmi les participantes, 45,3 % (n = 54) avaient l'intention d'allaiter. L'analyse univariée a révélé des différences significatives concernant les scores d'auto-efficacité (p = 0,003) et les attitudes envers l'allaitement (p = 0,046) entre les femmes ayant ou non l'intention d'allaiter. Après ajustement des facteurs de confusion potentiels, l'auto-efficacité est apparue comme le seul prédicteur indépendant significatif de l'intention d'allaiter (OR = 3,71 ; IC à 95 % : 1,35–10,19 ; p = 0,011). Le modèle prédictif a montré une bonne capacité discriminante avec une aire sous la courbe ROC de 0,782. L'auto-efficacité maternelle constituait le principal déterminant de l'intention d'allaiter chez les mères infectées par le VHB. Des interventions visant à renforcer l'auto-efficacité maternelle et à communiquer clairement sur la sécurité de l'allaitement associé à l'immunoprophylaxie pourraient améliorer le soutien à l'allaitement dans cette population. (*Afr J Reprod Health* 2026; 30 [20]: 121-133).

Keywords: virus de l'hépatite B, intention d'allaiter, auto-efficacité, stigmatisation, modèle ABC-X, étude transversale.

Introduction

Chronic hepatitis B virus (HBV) infection remains a formidable global public health challenge, with

the World Health Organization estimating that approximately 254 million individuals were living with the virus as of 2022, resulting in over one million deaths annually¹. The perinatal period

represents a critical juncture in the epidemic, as mother-to-child transmission (MTCT) is a primary driver of HBV dissemination, particularly in endemic regions where early-life exposure carries a 90% risk of progression to chronic infection.² While the implementation of universal birth-dose vaccination and hepatitis B immune globulin (HBIG) has significantly reduced vertical transmission rates, high maternal viral load continues to pose a breakthrough risk, often requiring third-trimester antiviral prophylaxis to achieve elimination goals.³ Despite these clinical advancements, HBV-infected mothers continue to navigate a landscape of complex decisions regarding infant feeding practices.⁴ Although current evidence increasingly supports the safety of breastfeeding under appropriate immunoprophylaxis—including cases involving maternal tenofovir therapy—conflicting clinical advice and persistent socio-cultural stigmas remain significant barriers to informed postpartum choices.⁵

Current international guidelines, including those from the World Health Organization, recommend breastfeeding for HBV-infected mothers when infants receive appropriate immunoprophylaxis⁶. The evidence consistently demonstrates that breastfeeding does not increase transmission risk when proper preventive measures are implemented. Nevertheless, breastfeeding rates among HBV-infected mothers remain suboptimal across diverse geographical and cultural contexts^{7,8}. This discrepancy between scientific evidence and actual practice underscores the multifaceted nature of infant feeding decisions, which extend beyond purely biomedical considerations to encompass psychological, social, and cultural dimensions^{9,10}.

Breastfeeding intention, defined as a mother's plan or determination to breastfeed her infant, serves as a robust predictor of actual breastfeeding behavior. Understanding the determinants of breastfeeding intention is therefore critical for developing targeted interventions to promote breastfeeding initiation and continuation^{11,12}. Previous research has identified various factors influencing breastfeeding intention in general populations, including maternal age, education, social support, self-efficacy, and attitudes toward breastfeeding. However, HBV-infected mothers represent a distinct population with unique concerns

and challenges that may differentially impact their infant feeding decisions^{13,14}.

The ABC-X model provides a comprehensive theoretical framework for understanding how families adapt to stressors. In this model, 'A' represents the stressor event (HBV infection in pregnancy), 'B' denotes the family's resources (social support, self-efficacy), 'C' signifies the perception of the stressor (stigma, attitudes), and 'X' represents the adaptation outcome (breastfeeding intention)¹⁵. This theoretical perspective allows for an integrated examination of how disease-related, psychological, and social factors interact to shape infant feeding decisions.

Several knowledge gaps persist in the existing literature. First, most studies on breastfeeding determinants have focused on general populations, with limited attention to specific medical conditions such as HBV infection¹⁶. Second, research has predominantly examined isolated factors rather than employing comprehensive theoretical frameworks. Third, the relative importance of different determinants, particularly psychological factors such as self-efficacy and stigma, remains unclear in the context of HBV infection¹⁷. Fourth, culturally specific factors influencing breastfeeding decisions among HBV-infected mothers in different settings require further investigation¹⁸.

This study addresses these gaps by employing the ABC-X model to systematically examine factors influencing breastfeeding intention among HBV-infected mothers. Specifically, this study aimed to: (1) describe the prevalence of breastfeeding intention; (2) identify associated factors within the ABC-X framework; and (3) determine independent predictors of intention. The findings will inform the development of evidence-based interventions tailored to the specific needs of HBV-infected mothers, ultimately promoting optimal infant feeding practices and maternal-child health outcomes.

Methods

Study design and setting

We conducted a hospital-based cross-sectional study at Tianjin Third Central Hospital from January to December 2025. The study setting was selected based on its substantial volume of HBV-

infected pregnant women and its comprehensive antenatal and postnatal care services.

Participants

Sample size consideration and recruitment

Using an event-per-variable (EPV) criterion of 10 for logistic regression and anticipating up to 10 candidate predictors, a minimum sample size of 100 was required. Accounting for a potential 15% incomplete data, we aimed to recruit at least 115 participants. During the study period, 143 eligible HBV-infected women were approached. Of these, 15 declined participation (reasons: lack of time, $n=10$; no interest, $n=5$), and 9 provided incomplete questionnaires, resulting in a final analytic sample of 119 (recruitment rate: 83.2%).

All participants were diagnosed with chronic hepatitis B virus (HBV) infection based on positive hepatitis B surface antigen (HBsAg) for at least six months, confirmed during routine antenatal screening. Following diagnosis, each woman received standardized counseling from trained obstetric nurses, covering HBV transmission routes, immunoprophylaxis for the newborn, and the safety of breastfeeding under standard prevention measures. Women were consecutively recruited during their third-trimester antenatal visits. A research assistant explained the study purpose, verified eligibility (confirmed HBV infection, singleton pregnancy, ≥ 28 weeks gestation, age ≥ 18 years, ability to provide informed consent), and obtained written informed consent.

Data collection procedures

Data were collected through face-to-face interviews conducted by trained research assistants using structured questionnaires. The interviewers received comprehensive training on questionnaire administration, communication techniques, and ethical considerations. Each interview lasted approximately 30–45 minutes and was conducted in a private setting to ensure confidentiality. Written informed consent was obtained from all participants prior to data collection.

Theoretical framework and variable operationalization

Guided by the ABC-X model, study variables were conceptualized as follows: A (Stressor): HBV

infection status (all participants). B (Resources): Social support and breastfeeding self-efficacy. C (Perception): HBV-related stigma, breastfeeding attitudes, perceived transmission risk, and perceived family attitude. X (Adaptation Outcome): Breastfeeding intention.

This operationalization allowed us to test how resources (B) and perceptions (C) shaped adaptation (X) in the face of a health-related stressor (A).

Measures

Demographic and obstetric characteristics: We collected information on age, education level, monthly income, occupation, delivery mode, and maternity leave duration.

Disease-related factors: Data included antiviral medication use, HBV DNA levels, and self-reported route of HBV infection.

Management of HBV during pregnancy: According to the hospital's standard protocol, pregnant women with HBV DNA $\geq 200,000$ IU/mL (or ≥ 5.3 log₁₀ IU/mL) after 24–28 weeks of gestation were offered tenofovir disoproxil fumarate (TDF) 300 mg daily from 28–32 weeks until delivery. All infants received hepatitis B vaccine within 12 hours of birth and hepatitis B immune globulin (HBIG) 100 IU intramuscularly. Antiviral use was documented as “Yes/No” based on maternal self-report and medical record verification.

Social support: It was assessed using a 3-item scale developed for this study based on dimensions (emotional, informational, and practical support) commonly found in established social support scale^{19,20}. Participants rated each item on a 5-point Likert scale (1=strongly disagree to 5=strongly agree). The internal consistency of this scale in the present sample was acceptable (Cronbach's $\alpha = 0.78$).

Self-efficacy: Breastfeeding self-efficacy was measured using the 3-item short form of the Breastfeeding Self-Efficacy Scale (BSES-SF)^{21,22}. Items were rated from 1 (not at all confident) to 5 (very confident). In this study, the Cronbach's α for the scale was 0.82.

HBV-related stigma: was evaluated using a 3-item measure adapted from prior work on chronic illness stigma^{23,24}. Items addressed perceived discrimination and internalized shame (1=strongly disagree to

5=strongly agree). The scale demonstrated adequate reliability (Cronbach's $\alpha = 0.75$).

Breastfeeding attitudes were assessed with 3 items covering perceived benefits, convenience, and societal approval. The internal consistency was 0.71.

Key cognitive variables: Participants reported their perception of HBV transmission risk through breastfeeding (categorized as yes/no/uncertain) and perceived family attitude toward breastfeeding (categorized as supportive/neutral/opposed).

Outcome variable: Breastfeeding intention was assessed using the question: "What feeding method do you plan to use for your baby in the first six months after delivery?" Response options included "exclusive breastfeeding," "mixed feeding," and "formula feeding." For analytical purposes, responses were dichotomized into "breastfeeding intention" (including exclusive breastfeeding and mixed feeding) and "no breastfeeding intention" (formula feeding only).

Statistical analysis

Data analysis was performed using R statistical software (version 4.3.0; R Core Team, 2023). Descriptive statistics were computed as means and standard deviations for continuous variables, and as frequencies and percentages for categorical variables. Group comparisons between mothers with and without breastfeeding intention were conducted using independent samples t-tests for continuous variables and chi-square tests for categorical variables.

To identify independent predictors of breastfeeding intention, multivariate logistic regression analysis was performed. First, all variables listed in Table 1 were assessed in univariate analyses. Variables showing an association with the outcome at a significance level of $p < 0.10$, along with key demographic variables (age, monthly income) deemed clinically relevant based on existing literature, were entered into an initial multivariate model. A backward stepwise selection procedure (with a variable retention criterion of $p < 0.05$) was then employed to derive the final parsimonious model presented in Table 2. Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test, and multicollinearity among predictor variables was evaluated using variance inflation factors (VIF),

with all VIF values < 2 indicating no substantial multicollinearity. The discrimination ability of the final logistic regression model was evaluated by calculating the area under the receiver operating characteristic (ROC) curve (AUC). Model performance metrics, including accuracy, sensitivity, and specificity, were derived using the optimal cut-off point determined by the Youden's index. Statistical significance was set at a two-tailed $p < 0.05$ for all analyses.

Ethical considerations

The study protocol was approved by the Institutional Review Board of Tianjin Third Central Hospital (Approval No.: IRB2025-052-02). All participants provided written informed consent after receiving detailed information about the study purpose, procedures, risks, and benefits. Confidentiality was maintained through the use of coded identifiers and secure data storage procedures. The study was conducted in accordance with the Declaration of Helsinki.

Results

Sample characteristics

The study included 119 HBV-infected mothers with a mean age of 32.1 years ($SD=5.1$). The majority had attained college or higher education (56.3%), and more than half reported monthly incomes exceeding 5000 RMB (55.5%). Most participants delivered vaginally (73.1%), and 60.5% were not using antiviral medications at the time of the study. The mean scores for psychological measures were: social support 3.2 ($SD=0.7$), self-efficacy 2.6 ($SD=0.7$), stigma 3.1 ($SD=0.9$), and breastfeeding attitude 3.0 ($SD=0.7$). Table 1 presents detailed demographic and clinical characteristics stratified by breastfeeding intention.

Breastfeeding intention prevalence

Among the 119 participants, 45.3% ($n=54$) reported intention to breastfeed, while 54.7% ($n=65$) did not intend to breastfeed. Of those intending to breastfeed, 62.9% ($n=34$) planned exclusive breastfeeding, and 37.1% ($n=20$) planned mixed feeding (Figure 1). Bar chart showing the proportion of mothers with and without breastfeeding intention.

Table 1: Descriptive characteristics of study participants by breastfeeding intention

Variable	Overall (n=119)	No Intention (n=65)	Yes Intention (n=54)	p-value
Age, mean (SD)	32.1 (5.1)	32.5 (4.8)	31.6 (5.4)	0.324
Education, n (%)				0.412
Junior high or below	18 (15.1)	11 (16.9)	7 (13.0)	
High school/Technical school	34 (28.6)	20 (30.8)	14 (25.9)	
College or above	67 (56.3)	34 (52.3)	33 (61.1)	
Income, n (%)				0.356
≤5000 RMB	53 (44.5)	32 (49.2)	21 (38.9)	
>5000 RMB	66 (55.5)	33 (50.8)	33 (61.1)	
Delivery mode, n (%)				0.785
Vaginal delivery	87 (73.1)	47 (72.3)	40 (74.1)	
Cesarean section	32 (26.9)	18 (27.7)	14 (25.9)	
Antiviral drug use, n (%)				0.234
No	72 (60.5)	42 (64.6)	30 (55.6)	
Yes	47 (39.5)	23 (35.4)	24 (44.4)	
HBV DNA (log), mean (SD)	2.3 (1.8)	2.5 (1.9)	2.0 (1.6)	0.456
Social support score, mean (SD)	3.2 (0.7)	3.1 (0.8)	3.4 (0.6)	0.062
Self-efficacy score, mean (SD)	2.6 (0.7)	2.3 (0.5)	2.9 (0.8)	0.003
Stigma score, mean (SD)	3.1 (0.9)	3.2 (0.8)	3.0 (0.9)	0.412
Breastfeeding attitude, mean (SD)	3.0 (0.7)	2.8 (0.8)	3.2 (0.5)	0.046
Perceived transmission, n (%)				0.238
No	19 (16.0)	9 (13.8)	10 (18.5)	
Uncertain	5 (4.2)	2 (3.1)	3 (5.6)	
Yes	95 (79.8)	54 (83.1)	41 (75.9)	
Family attitude, n (%)				0.128
Opposed	11 (9.2)	8 (12.3)	3 (5.6)	
Neutral	10 (8.4)	7 (10.8)	3 (5.6)	
Supportive	98 (82.4)	50 (76.9)	48 (88.9)	
Breastfeeding history, n (%)				0.512
No	84 (70.6)	48 (73.8)	36 (66.7)	
Yes	35 (29.4)	17 (26.2)	18 (33.3)	
Marital relationship, n (%)				0.345
Poor	3 (2.5)	2 (3.1)	1 (1.9)	
Fair	25 (21.0)	15 (23.1)	10 (18.5)	
Good	91 (76.5)	48 (73.8)	43 (79.6)	

Data are presented as mean (standard deviation) for continuous variables and number (percentage) for categorical variables. P-values for continuous variables are from independent t-tests; for categorical variables, from chi-square tests.

Univariate analysis

Univariate analysis revealed significant differences between groups in self-efficacy scores and breastfeeding attitude scores (Table 1). Participants with breastfeeding intention had significantly higher self-efficacy scores (mean=2.9, SD=0.8) compared to those without intention (mean=2.3, SD=0.5; $p=0.003$). Similarly, breastfeeding attitude scores were higher in the intention group (mean=3.2, SD=0.5) than in the no-intention group (mean=2.8, SD=0.8; $p=0.046$). No significant differences were observed in demographic

characteristics, disease-related factors, social support scores, or stigma scores between groups (Figure 2). Box plots comparing scores on four key psychological factors between mothers with and without breastfeeding intention. Self-efficacy and breastfeeding attitude scores were significantly higher in the intention group ($p<0.05$), while social support and stigma scores showed no significant differences.

Multivariate analysis

In multivariate logistic regression analysis adjusting for potential confounders, self-efficacy emerged as

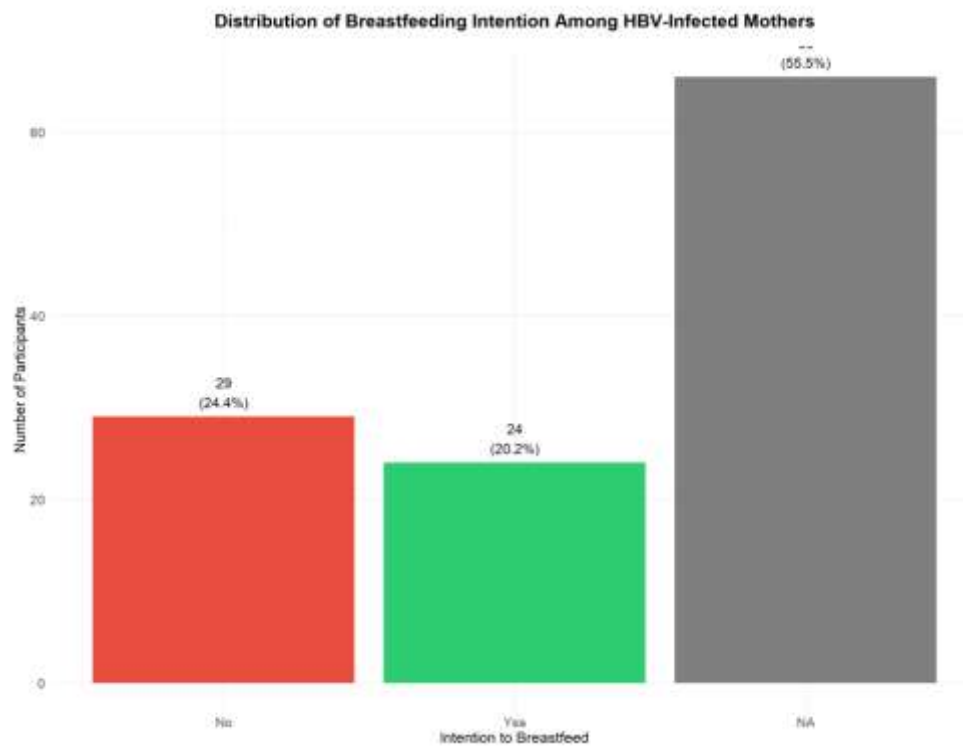


Figure 1: Prevalence of breastfeeding intention among study participants (N=119)

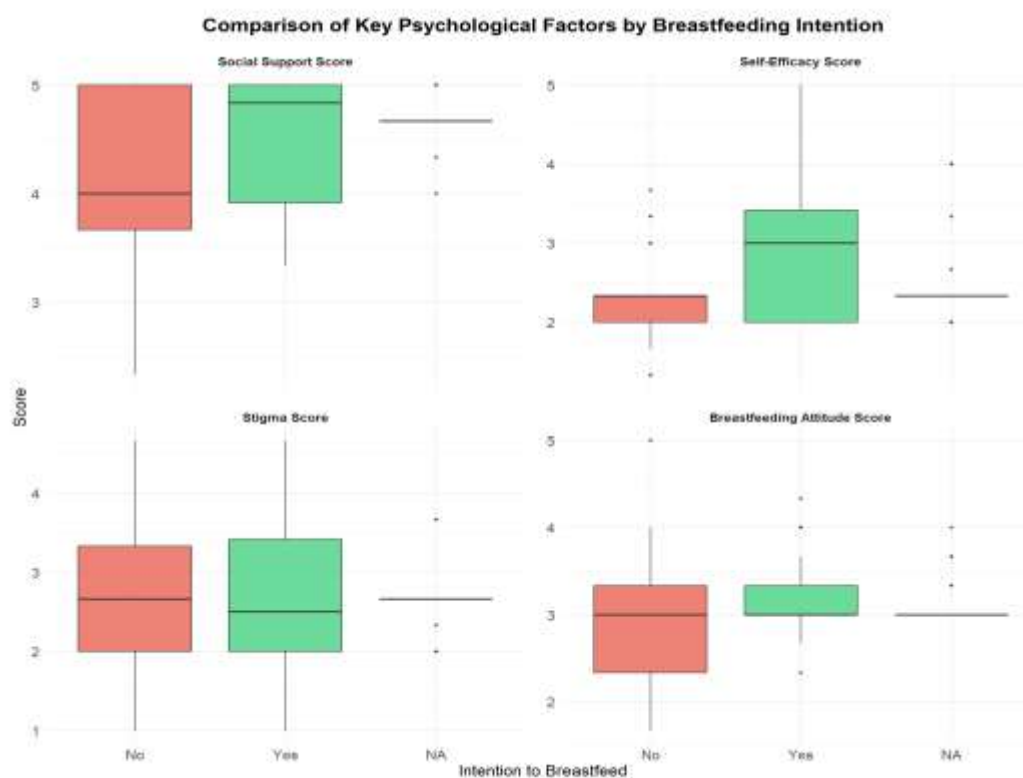
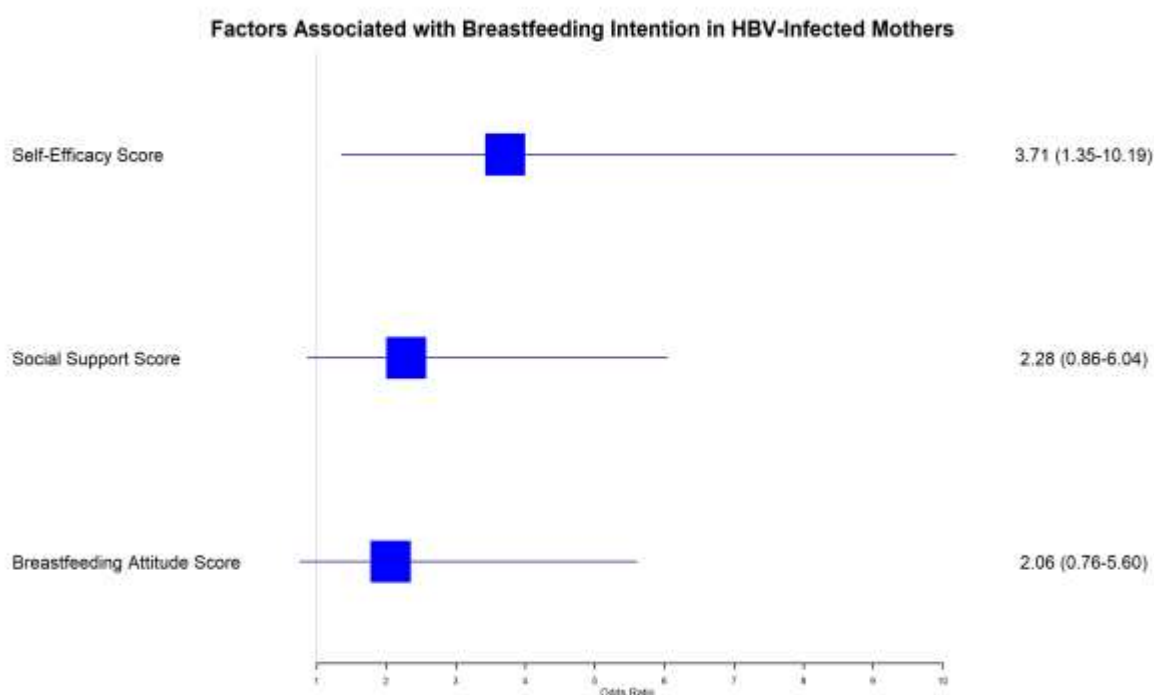


Figure 2: Comparison of key psychological factor scores by breastfeeding intention status

Table 2: Multivariate logistic regression analysis of factors associated with breastfeeding intention

Variable	Adjusted OR (95% CI)	p-value
Age (years)	0.96 (0.85-1.09)	0.542
Antiviral drug use (Yes vs No)	1.82 (0.61-5.42)	0.281
HBV DNA level (log-transformed)	0.87 (0.68-1.12)	0.276
Social support score	1.42 (0.72-2.81)	0.312
Self-efficacy score	3.71 (1.35-10.19)	0.011
Monthly income >5000 RMB	1.58 (0.53-4.71)	0.412
Family attitude (Neutral vs Opposed)	0.89 (0.21-3.82)	0.875
Family attitude (Supportive vs Opposed)	2.14 (0.68-6.74)	0.193
Stigma score	0.76 (0.42-1.38)	0.372
Breastfeeding attitude score	1.85 (0.82-4.18)	0.137
Perceived transmission (Uncertain vs No)	1.93 (0.31-12.02)	0.482
Perceived transmission (Yes vs No)	1.67 (0.47-5.95)	0.426

Note: OR = odds ratio; CI = confidence interval. Reference categories: Antiviral drug use = No, Income = ≤ 5000 RMB, Family attitude = Opposed, Perceived transmission = No.

**Figure 3:** Forest plot of factors associated with breastfeeding intention

the only statistically significant independent predictor of breastfeeding intention (Table 2). Each one-point increase in self-efficacy score was associated with a 3.71-fold increase in the odds of intending to breastfeed (95% CI: 1.35-10.19, $p=0.011$). None of the other variables, including demographic characteristics, disease-related factors, social support, stigma, or breastfeeding

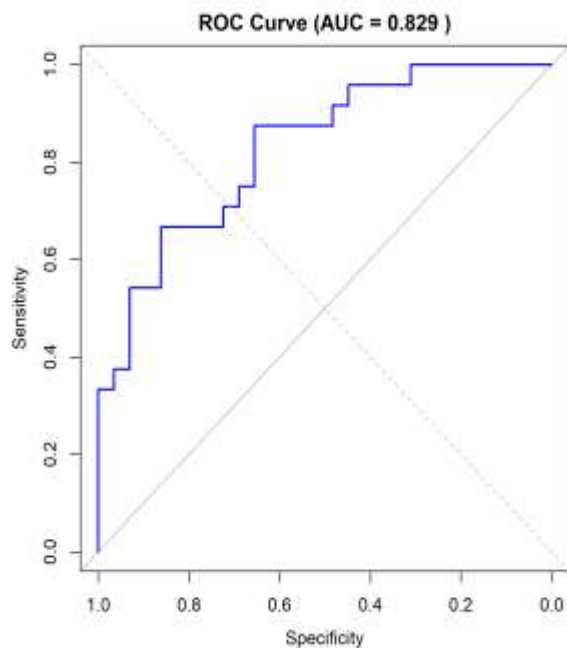
attitudes, demonstrated significant independent associations with breastfeeding intention in the multivariate model. (Figure 3).

Forest plot displaying adjusted odds ratios and 95% confidence intervals for all variables in the multivariate logistic regression model. Self-efficacy score was the only statistically significant predictor (OR=3.71, 95% CI: 1.35-10.19, $p=0.011$).

Table 3: Performance Metrics of the Prediction Model

Performance metric	Value
Accuracy	73.20%
Sensitivity	70.80%
Specificity	75.90%
AUC	0.782

Note: AUC = area under the receiver operating characteristic curve.

**Figure 4:** Receiver operating characteristic (ROC) Curve of the Prediction Model

Model performance

The final logistic regression model demonstrated good discrimination with an area under the ROC curve of 0.782 (95% CI: 0.689-0.875). The model achieved an accuracy of 73.2%, sensitivity of 70.8%, and specificity of 75.9% in predicting breastfeeding intention (Table 3, Figure 4).

ROC curve showing the discrimination ability of the multivariate logistic regression model in predicting breastfeeding intention. The area under the curve (AUC) was 0.782 (95% CI: 0.689-0.875), indicating good discriminatory power.

Discussion

This study is among the first to comprehensively investigate factors influencing breastfeeding

intention among HBV-infected mothers using the ABC-X theoretical framework. Our findings demonstrate that breastfeeding self-efficacy—a mother's confidence in her ability to breastfeed successfully—was the most robust independent predictor of intention. This aligns with a large body of research showing that higher self-efficacy is positively associated with breastfeeding intention, initiation, exclusivity, and duration across diverse populations^{25, 26}. Moreover, theory-based analyses suggest that self-efficacy accounts for significant variation in breastfeeding intention beyond sociodemographic factors, underscoring its potential as a key intervention target.

The primacy of self-efficacy in predicting breastfeeding intention aligns with foundational propositions of Social Cognitive Theory (SCT), which posits that perceived self-efficacy beliefs powerfully influence health behaviors by shaping motivation, goal-setting, effort expenditure, and perseverance in the face of obstacles²⁷. In this framework, individuals who are confident in their capabilities are more likely to initiate and sustain health-promoting behaviors—a principle demonstrated across multiple behavioral domains including smoking cessation, diet, and adherence to self-care regimens²⁸. In the context of breastfeeding, numerous studies have shown that maternal self-efficacy is a robust predictor of both intention and actual breastfeeding outcomes, with higher levels of confidence consistently associated with greater likelihood of initiation, exclusivity, and duration across diverse populations²⁹. For HBV-infected mothers, breastfeeding self-efficacy may be particularly crucial as they navigate both typical lactation challenges and additional infection-related concerns; our finding that self-efficacy exhibited a stronger association with breastfeeding intention than objective factors such as education or income suggests that psychological empowerment can override socioeconomic barriers in this context. Finally, from the perspective of the ABC-X family stress framework, internal resources such as self-efficacy (B) can substantially mediate a family's adaptation (X) to a stressor (A, here, HBV infection), reinforcing the importance of strengthening psychological resources to enhance positive maternal health intentions³⁰.

Notably, biomedical factors, including antiviral medication use and HBV DNA levels, did not emerge as significant predictors in our

multivariate model. This challenges the common assumption that clinical markers primarily drive infant feeding decisions among HBV-infected mothers and underscores the pivotal role of psychological and social dimensions in shaping feeding intentions. Consistent with broader breastfeeding research, psychosocial and sociodemographic characteristics such as maternal confidence, intentions, and perceived support have been shown to explain more variance in breastfeeding intention than clinical or biological markers^{31, 32}. In contexts of chronic infection, qualitative and ethnographic studies further demonstrate that beliefs about disease transmission, stigma, and cultural norms often outweigh virologic or treatment status in influencing infant feeding choices³³. Moreover, integrative biopsychosocial reviews highlight that modifiable psychological determinants, including self-efficacy and social influences, are robust predictors of breastfeeding outcomes across populations, whereas biological factors contribute comparatively less in multivariate analyses³⁴. Consequently, healthcare providers should not assume that mothers with higher viral loads or on antiviral therapy will automatically reject breastfeeding; clinical consultations should instead proactively address psychological barriers and build maternal confidence.

The absence of independent associations for social support and stigma warrants careful interpretation. While previous research in general populations consistently links social support with positive breastfeeding outcomes, our findings suggest that for HBV-infected mothers, generic social support may be insufficient unless it directly targets and enhances breastfeeding confidence. Indeed, evidence from longitudinal surveys indicates that workplace and social support may exert effects on breastfeeding outcomes indirectly through self-efficacy and intention rather than through direct effects alone³⁵. Qualitative syntheses of mothers' experiences further underscore that peer support, provided by other breastfeeding mothers, can bolster self-efficacy and practical coping, even when general support networks are weak³⁶. Consistent with intervention research, programs designed to strengthen breastfeeding self-efficacy—whether through counselling, education, or structured support—tend to improve maternal confidence and subsequent breastfeeding behaviors, suggesting that self-efficacy is a key mechanism

linking support with feeding outcomes³⁷. Moreover, randomized trials of peer counselling interventions demonstrate that targeted support can increase exclusive breastfeeding rates, reinforcing the potential utility of mentorship models that may work by enhancing maternal confidence³⁸. Finally, in specific groups such as adolescent mothers, social support has been found to correlate strongly with breastfeeding self-efficacy, highlighting how support may function primarily through psychological empowerment³⁹. Future interventions should therefore explicitly test whether support targeted at skill building—for example, through peer mentorship from successfully breastfeeding HBV-positive mothers—can more effectively enhance self-efficacy and feeding intentions.

Similarly, the non-significant association between stigma and breastfeeding intention should be interpreted with caution, given the documented impact of stigma on health behaviors in other chronic conditions. Health-related stigma has been systematically linked to adverse health behavior outcomes, yet existing stigma measurement tools vary widely in definition and dimension coverage, potentially limiting brief assessments' ability to capture multifaceted stigma experiences⁴⁰. Additionally, evidence from systematic reviews of stigma in non-communicable diseases highlights how disease-specific stigma mechanisms differentially influence engagement in care and self-management behaviors, suggesting that HBV-related stigma may manifest uniquely compared with other conditions⁴¹. Empirical research also shows that perceived stigma in healthcare settings can negatively influence patients' health service utilization and overall health status, underscoring the psychological and behavioral pathways through which stigma may operate⁴². Theoretical frameworks for health-related stigma further emphasize the complexity and contextual dependence of stigma's effects on health behaviors, supporting the need for deeper qualitative investigations into mechanisms such as fear of contagion versus moral judgment in HBV⁴³. Moreover, emerging work on internalized stigma demonstrates that stigma can undermine self-efficacy and psychological wellbeing, providing a plausible explanation for indirect effects on behavioral intentions not detectable in brief quantitative measures⁴⁴. Future qualitative studies are therefore needed to provide deeper insights into

these mechanisms, and interpretations of non-significant findings for social support and stigma should be considered alongside the methodological limitation that our brief measures may not have fully captured the multidimensional nature of these complex constructs.

Our findings regarding breastfeeding attitudes also offer an important insight. While univariate analysis showed a significant association between positive attitudes and intention, this relationship did not persist in the multivariate model when self-efficacy was included. This pattern suggests that self-efficacy may act as a mediator in the relationship between attitudes and behavioral intention—a hypothesis that should be formally tested in future research with larger samples and more comprehensive attitude measures. Evidence from path modeling studies indicates that both attitude and self-efficacy contribute to explaining variance in breastfeeding intention, and integrated models that include self-efficacy provide better predictive power than those relying on attitude alone⁴⁵. Moreover, mediation analyses in other health behavior contexts demonstrate that self-efficacy can operate in series with attitude to influence outcome variables, supporting the plausibility of indirect effects⁴⁶. Longitudinal cohort research further illustrates that intention and self-efficacy jointly mediate associations between prior behaviors and subsequent outcomes, aligning with the notion that self-efficacy may bridge the effect of attitude on intention⁴⁷.

The clinical implications of our study are substantial. Breastfeeding promotion programs for HBV-infected mothers should prioritize self-efficacy enhancement through evidence-based strategies: (1) guided mastery experiences (e.g., prenatal hand-expression practice), (2) vicarious learning through contact with role models (HBV-positive mothers who have breastfed successfully), and (3) verbal persuasion from trusted healthcare providers, who should affirm the safety of breastfeeding with appropriate immunoprophylaxis while providing concrete strategies to overcome common lactation challenges. Training for healthcare providers in self-efficacy-based counseling techniques is essential.

Several limitations of this study must be acknowledged. First, the cross-sectional design precludes causal inferences about the relationships observed, as such designs capture associations at a

single time point without establishing temporality between predictors and outcomes⁴⁸. Second, the relatively modest sample size, though adequate for our primary analyses, may have limited statistical power to detect smaller effect sizes or interaction terms. Third, the single-center design may affect the generalizability of our findings to other settings with different cultural or healthcare contexts. Fourth, the use of self-report measures is subject to social desirability bias, which can lead to over- or under-reporting of responses in health behavior research⁴⁹. Fifth, we measured breastfeeding intention rather than actual behavior; longitudinal studies are needed to examine whether the predictors of intention also predict breastfeeding initiation and duration. Indeed, prospective research indicates that antenatal intention is a key predictor of subsequent breastfeeding behavior, underscoring the value of longitudinal designs to clarify these pathways⁵⁰. Finally, although we reported acceptable internal consistency for our brief scales, they may not capture the full complexity of constructs like stigma or social support, and future work should incorporate more comprehensive measures to better represent multidimensional psychosocial constructs.

Despite these limitations, this study makes a meaningful contribution by systematically applying the ABC-X model to understand infant feeding decisions in the context of HBV. It highlights the critical role of self-efficacy, suggesting that theories of health behavior should place greater emphasis on this construct in populations facing medical stigma. Future research directions should include: (1) longitudinal studies examining predictors of actual breastfeeding behavior, (2) intervention studies testing the efficacy of self-efficacy enhancement programs, (3) qualitative investigations into the lived experiences of HBV-infected mothers, (4) exploration of cultural and contextual moderators, and (5) examination of partner and family dynamics in feeding decisions.

Our findings carry several actionable implications. First, routine antenatal care for HBV-infected mothers should integrate brief, theory-based self-efficacy enhancement modules. For example, a 15–20 minute session incorporating guided mastery (e.g., prenatal hand-expression practice), vicarious learning (e.g., video testimonials from HBV-positive mothers who

successfully breastfed), and verbal persuasion (e.g., provider affirmation that breastfeeding with immunoprophylaxis is safe) could be easily implemented in busy clinic settings. Second, hospital administrators should consider establishing peer support groups led by trained HBV-positive breastfeeding mothers, as such mentorship may directly bolster self-efficacy. Third, national and regional guidelines should explicitly recommend that counseling for HBV-infected women address psychological barriers—not only biomedical risks—and that providers receive communication skills training to reduce stigma and build confidence. Finally, public health campaigns targeting HBV-related stigma could create a more supportive environment, indirectly facilitating breastfeeding decisions. Future intervention research should formally test these components in cluster-randomized trials.

Conclusion

In conclusion, based on our findings, routine antenatal counseling for HBV-infected women should integrate structured self-efficacy enhancement components. This could include: (1) guided mastery experiences (e.g., prenatal hand-expression practice), (2) vicarious learning through contact with successfully breastfeeding HBV-positive mothers, and (3) verbal persuasion from trusted healthcare providers affirming the safety and feasibility of breastfeeding. Future research should develop and evaluate the efficacy of such theory-based, brief interventions in clinical settings.

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Conflict of interest

The authors declare no conflicts of interest related to this research.

Data availability statement

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

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