Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Paternal and Maternal Perceptions of Father Support for Breastfeeding: Discrepancies, Correlates, and Dyadic Patterns

Wanwan Cai
The First Affiliated Hospital of Henan University of Traditional Chinese Medicine
Lin Rao
International Peace Maternity and Child Health Hospital, Shanghai Jiao Tong University School of Medicine
Jiamin Zhu
Shanghai Mental Health Center, Shanghai Jiao Tong University School of Medicine
Jiale Hu
Virginia Commonwealth University
Shu Liu
The First Affiliated Hospital of Henan University of Traditional Chinese Medicine
Caifeng Wang
caifengwang@sjtu.edu.com

Shanghai Jiao Tong University School of Nursing

Research Article

Keywords: breastfeeding, father support, parental perception, breastfeeding self-efficacy, family systems theory

Posted Date: November 23rd, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11561618/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Paternal and Maternal Perceptions of Father Support for Breastfeeding: Discrepancies, Correlates, and Dyadic Patterns

Wanwan Cai[1, 2*], Lin Rao[3*], Jiamin Zhu[4], Jiale Hu[5], Shu Liu[6#], Caifeng Wang[2#]

[1] Department of Dermatology, The First Affiliated Hospital of Henan University of Traditional Chinese Medicine, Zhengzhou, Henan, China

[2] Department of Nursing, Shanghai Jiao Tong University School, Shanghai, China

[3] Department of Nursing, International Peace Maternity and Child Health Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

[4] Shanghai Mental Health Center, Shanghai Jiao Tong University School of Medicine, Shanghai, China

[5] Department of Nurse Anesthesia, Virginia Commonwealth University, Richmond, United States

[6] Department of Nursing, The First Affiliated Hospital of Henan University of Traditional Chinese Medicine, Zhengzhou, Henan, China

Wanwan Cai, Master's degree. Address: Department of Dermatology, The First Affiliated Hospital of Henan University of Traditional Chinese Medicine, 19 Renmin Road, 450000, Zhengzhou, Henan, China. Telephone: 15036523128, E-mail address: cww1503652@163.com.

Lin Rao, Ph.D. Address: Department of Nursing, International Peace Maternity and Child Health Hospital, Shanghai Jiao Tong University School of Medicine, 1961 Huashan Road, Xuhui District, 200030, Shanghai, China. Telephone: 18616871215, E-mail addres: ireenrao@163.com.

Jiamin Zhu, Undergraduate. Address: Shanghai Mental Health Center, Shanghai Jiao Tong University School of Medicine, 600 Wanping Nan Road, Xuhui District, 200030, Shanghai, China. Telephone: 13641802995, E-mail addres: 1239435909@qq.com.

Jiale Hu, Ph.D. Address: Richmond 915, Richmond, United States. Telephone: 8045468704, E-mail addres: jhu4@vcu.edu.

Shu Liu, Ph.D. Address: Department of Nursing, The First Affiliated Hospital of Henan University of Traditional Chinese Medicine, 19 Renmin Road, 450000, Zhengzhou, Henan, China. Telephone: 13849181008. E-mail: 150852554@qq.com.

Caifeng Wang, Ph.D. Address: Shanghai Jiao Tong University School of Nursing, 227 South Chongqing Road, 200240, Shanghai, China. Telephone: 13917033151. E-mail: caifengwang@sjtu.edu.cn.

[*] Wanwan Cai and Lin Rao contributed equally to this work.

[#] Caifeng Wang and Shu Liu are the co-corresponding authors of this study.

Abstract

Background Paternal support plays a crucial role in promoting breastfeeding, yet most studies assessed this construct solely from fathers' self-reports. According to family systems theory, the couple relationship is dyadic and reciprocal, with each partner's perceptions continuously shaping the other's. However, evidence on the relationship between parental perceptions of father support remains limited, and its contributing factors are underexplored.

Aim This study aimed to examine the relationship between paternal and maternal perceptions of father support for breastfeeding, identify factors associated with any discrepancy between the two, and further explore the dyadic mechanisms underlying these perceptual patterns.

Methods A cross-sectional study was conducted at three tertiary hospitals in Shanghai, China, from October 2021 to April 2022, enrolling 354 couples who were in the early postpartum period. Both parents completed validated scales assessing paternal breastfeeding support (PBIS), breastfeeding self-efficacy (BSES-SF), and breastfeeding knowledge. Data were analyzed using paired t-tests, Pearson correlations, multiple regression, and the Actor-Partner Interdependence Model (APIM).

Results Fathers rated their breastfeeding support significantly higher than mothers did (137.83 ± 18.79 vs. 119.95 ± 24.57, $p < 0.001$), despite moderate correlations between their perceptions ($r = 0.343$, $p < 0.001$). The discrepancy was associated with paternal age, breastfeeding knowledge, and self-efficacy, as well as maternal breastfeeding self-efficacy and education. APIM revealed significant actor effects (each parent's self-efficacy influencing their own perception) but no partner effects.

Conclusion This study identifies a systematic perception gap between fathers and mothers regarding paternal breastfeeding support. This gap does not arise from cross-partner influence but reflects each partner's distinct evaluative framework. The findings underscore the need for couple-based interventions that align both partners' frames of reference—particularly by strengthening maternal breastfeeding self-efficacy and fostering shared understanding of effective father support.

Keywords: breastfeeding; father support; parental perception; breastfeeding self-efficacy; family systems theory

Background

Breastfeeding is widely recognized as the optimal feeding approach for infants, offering unparalleled

nutritional and immunological benefits. The World Health Organization (WHO) recommends exclusive breastfeeding (EBF) for the first six months of life, followed by continued breastfeeding with complementary foods up to aged two or older [1]. This recommendation is grounded in substantial evidence demonstrating that breastfeeding strengthens infant immunity, promotes brain development, and reduces the risk of childhood obesity and chronic diseases. It also lowers the risk of breast cancer, ovarian cancer, type 2 diabetes, and cardiovascular disease in mothers [2, 3, 4].

To accelerate progress, the WHO set a global nutrition target of achieving at least a 50% EBF rate among infants under six months by 2025 [5]. Although the Chinese government has implemented various measures to promote breastfeeding, including public education, service chain improvement, policy enhancement and industry regulation, the national EBF rate remains considerably below the WHO target [6]. According to the 2025 China Breastfeeding Status Survey Report, the EBF rate for infants under six months in China stands at only 34.1% [7].

Breastfeeding is a multifaceted practice influenced by a complex interplay of biological, social, and cultural factors across various levels, including the individual, family, health facility and environment [8, 9]. Among these, the role of fathers has gained increasing recognition. Fathers are recognized as key social supporters of breastfeeding [10, 11] and an important source of resources for childcare [12, 13]. Their support has been consistently linked to better breastfeeding outcomes, including higher initiation rates and longer duration [14, 15, 16].

Despite the acknowledged importance of father support, existing research has predominantly examined this construct from the paternal perspective, focusing on fathers' knowledge, attitudes, and self-efficacy regarding breastfeeding' support [17, 18, 19]. While father support plays a positive role in facilitating maternal breastfeeding, assessing it only from the father's perspective is not enough. This narrow focus may limit our understanding of how father support actually works to promote breastfeeding. Mothers are the recipients of father support. Qualitative evidence from Srisopa et al. [20] has highlighted the value of examining mothers' perceptions of father support. The support the mothers actually perceive is closely tied to their breastfeeding outcomes.

Family systems theory conceptualizes the family as an "emotional unit" composed of interconnected members [21]. Viewed as a system, the family's components engage in continuous, repetitive patterns of interaction,

maintaining a dynamic equilibrium through ongoing interplay. Emotions and behaviors within a subsystem—such as the couple subsystem—can "spill over" and influence other members within that subsystem, shaping how each partner perceives and responds to the other's support. Concurrently, the characteristics and internal states of one partner may exert "cross-effects" on the other's outcomes, highlighting the reciprocal and bidirectional nature of influence within the dyad.

Accordingly, we assumed that in breastfeeding families, parents' perceptions of paternal support mutually influence each other, and that this mutual influence shapes the effectiveness of father support. However, the relationship between paternal and maternal perceptions remain unexplored. Although Moriwaki et al. [22] developed a scale designed to assess both partners' perceptions of breastfeeding support, no empirical applications of this instrument have been reported. To date, only one study assessed both parents' perceptions of father support [23] with the Partner Breastfeeding Influence Scale (PBIS). It documented a significant perceptual gap between fathers and mothers. However, the study did not examine the underlying reasons for this discrepancy.

Therefore, this study aimed to explore the relationship between paternal and maternal perceptions of father support for breastfeeding in a cross-sectional survey in China and examine factors associated with any discrepancy between the two. Guided by family systems theory, we introduced the Actor-Partner Interdependence Model (APIM) to explore how parental characteristics influence both one's own and the partner's perceptions.

Methods

Study Design and Participants

Using the convenience sampling method, a cross-sectional descriptive study was conducted between October 2021 and April 2022 in three tertiary hospitals in Shanghai. The study was approved by the ethics committee, and informed consent was obtained from all participants. The inclusion criteria were as follows: 1) the couple had a full-term baby ($\geqslant$37 gestational weeks); 2) the mother was aged 21 years or older, and the father was aged 23 years or older (according to the legal age of marriage in China); 3) the mother breastfed her baby after delivery; and 4) the couple was able to read and comprehend the local language (Chinese). The exclusion criterion was either a mother or father separated from the family or the baby for more than one week.

Sample Size

The sample size was determined based on the number of independent variables included in the regression models. A total of 33 variables—covering sociodemographic factors, breastfeeding knowledge, self-efficacy, and PBIS subscales—were considered. Applying the 5–10 events per variable rule [24], the target sample was estimated at 165 to 330 participants. To account for a 20% non-response or invalid response rate, the sample size was increased to 198–396.

Measures

Both fathers and mothers completed separate questionnaires. The maternal questionnaire included basic demographic information (age, education, employment, and maternity leave), delivery and feeding practices, the maternal version of the PBIS, and the BSES-SF. The paternal questionnaire included basic demographic information (age, education, employment, household income, and paternity leave), the paternal version of the PBIS, the Fathers' Breastfeeding Self-Efficacy Scale-Short Form (FBSES-SF), and the Breastfeeding Knowledge Questionnaire.

Partner Breastfeeding Influence Scale (PBIS)

The PBIS was developed by Rempel (2017) and assesses five aspects of father support for breastfeeding: breastfeeding savvy, helping, appreciation, presence, and responsiveness [25]. This 33-item scale uses a 5-point Likert scale (1 = not at all, 5 = very often), yielding total scores from 33 to 165. The scale can be used to measure both maternal and paternal perceptions of father support. The Chinese version of the PBIS was translated and validated by Wang et al. [26], with Cronbach's alpha value of 0.95 and 0.94 for mothers and fathers, respectively. At the time of this survey, couples who were currently breastfeeding were invited to report their perceptions of ongoing paternal support, whereas those who had already stopped breastfeeding were invited to provide retrospective assessments based on their breastfeeding experience. In this study, the Cronbach's alpha value of PBIS was 0.96 for the paternal version and 0.97 for the maternal version.

Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF)

The BSES-SF is a revised short form of the original BSES [27], developed by Dennis et al. to evaluate mother's confidence in her ability to breastfeed her newborn [28]. It includes 14 items scored on a 5-point Likert scale, with responses ranging from 1 (not sure at all) to 5 (always or completely sure). Dennis et al. also evaluated paternal confidence in supporting breastfeeding using the BSES-SF and assessed the psychometric properties of the scale in fathers in 2018 [29]. At 6 weeks postpartum, the Cronbach's alpha value was 0.92

for the paternal version and 0.94 for the maternal version [29]. In this study, the Cronbach's coefficients were 0.94 for both paternal and maternal versions.

Breastfeeding Knowledge Questionnaire

The Breastfeeding Knowledge Questionnaire was adapted from the original instrument developed by Zhaomin [30]. It comprises 17 items with responses coded as "Yes," "No," or "Uncertain," with one point assigned for each correct answer. The Cronbach's alpha was 0.92 in previous studies [31], whereas in this study it was 0.78.

Data collection

Two research assistants recruited potential participants from the obstetric outpatient clinics. Mothers attending their 42-day postpartum checkup, along with their accompanying spouses, were invited to participate. All participants provided written informed consent before participation. Those who agreed received a leaflet containing two QR codes—one linked to the maternal questionnaire and one to the paternal questionnaire—along with a unique serial number. The mother and her spouse scanned the QR codes to access the questionnaires independently on their mobile phones and entered their serial numbers to enable couple-level data matching. If the spouse was not present at the clinic, the mother took the leaflet home for the spouse to complete a digital informed consent. Participants who did not complete the questionnaire on site were asked to do so within one week.

Data Analysis

All statistical analyses were conducted using SPSS Statistics version 26, and statistical significance set at $p < 0.05$ (two-tailed). Sociodemographic characteristics of the participants were described using frequency and percentage distributions. A difference score was calculated for each couple by subtracting the maternal PBIS assessment from the paternal PBIS assessment, which served as an indicator of the degree of agreement or disagreement between parental perceptions of father support for breastfeeding. Descriptive statistics, including mean and standard deviation, were calculated for the difference scores at the total-, subscale- and item- score levels. Paired t-tests were conducted to compare the PBIS scores assessed by the fathers and mothers. The correlations between paternal and maternal perceptions of father support (at the total- and subscale- score levels) were analyzed with Pearson correlation coefficients. To identify factors associated with the differences in parental perceptions, univariate and multivariate analysis were performed using analysis of variance (ANOVA), independent T tests, and multiple linear regression models. To further examine how parental

characteristics influence both one's own and the partner's perceptions, we conducted APIM analyses using multilevel modeling, with PBIS scores as the outcome variable.

Results

Sociodemographic Characteristics of Participants

A total of 432 couples were initially enrolled. After excluding those who did not submit a questionnaire or provided invalid responses, 374 paternal and 365 maternal questionnaires were collected, yielding 354 matched dyads (Supplementary Figure 1). The final analytic sample comprised 354 couples, with an attrition rate of 18.1%.

Table 1 demonstrated the sociodemographic characteristics of the 354 matched couples. Over 60% of fathers and approximately half of the mothers were aged over 30 years. More than 60% of both fathers and mothers held vocational/bachelor's degrees and the majority were employed. Half of the fathers (52.0%) had 10 days of paternity leave, while less than half of the mothers (44.6%) had 158 days of maternity leave. The majority of births (59.8%) were vaginal deliveries, and more than half of the mothers (53.4%) were practicing mixed feeding at the time of data collection.

Differences and Correlations of Parental Perceptions

The mean difference score (paternal PBIS minus maternal PBIS) for the overall was 17.88 (SD = 25.29) (Table 2). Fathers reported significantly higher perceptions of father support for breastfeeding than mothers at the total, subscale and item levels (all $p < 0.01$). Paternal perceptions were positively correlated to maternal perceptions at the total and subscale score, with correlation coefficients ranging from 0.27 to 0.37 (all $p < 0.01$; Table 3). These findings indicate that although fathers and mothers showed moderate agreement in their perceptions, a systematic perceptual gap existed, with fathers consistently rating their support more favorably than their partners.

Factors Associated with Difference in Parental Perceptions

To identify factors associated with the perceptual gap, we first examined correlations between continuous variables and the difference scores (Supplementary Table 1). Paternal age was negatively correlated with the difference ($r = -0.219$, $p < 0.001$), while paternal breastfeeding knowledge ($r = 0.158$, $p < 0.001$) and paternal breastfeeding self-efficacy ($r = 0.231$, $p < 0.001$) were positively correlated. Maternal age ($r = -0.142$, $p < 0.001$) and maternal breastfeeding self-efficacy ($r = -0.427$, $p < 0.001$) were also negatively correlated with

the difference. These results suggest that younger age of the couple, higher paternal self-efficacy and knowledge, and lower maternal self-efficacy are associated with a wider perception gap.

Univariate analyses further compared the difference scores across categorical variables (Supplementary Table 2). Among paternal characteristics, lower yearly household income ($F=13.64$, $p < 0.001$) was associated with larger discrepancies. Among maternal characteristics, lower education ($F=5.56$, $p < 0.001$), unemployment ($t = -5.59$, $p < 0.001$), and mined feeding ($t = 4.83$, $p = 0.01$) were associated with larger gaps. No significant associations were found for paternal education, employment, or paternity leave, nor for maternity leave or mode of delivery.

Multivariate regression analysis (Table 4) confirmed these associations while adjusting for potential confounders. In the adjusted model, paternal age ($\beta = -0.151$, $p = 0.008$), paternal breastfeeding knowledge ($\beta = 0.152$, $p = 0.001$), and paternal breastfeeding self-efficacy ($\beta = 0.360$, $p < 0.001$) were independently associated with discrepancies in parental perceptions. Maternal breastfeeding self-efficacy showed the strongest inverse association with the perceptual gap ($\beta = -0.526$, $p < 0.001$). Maternal education also contributed independently, with higher education associated with smaller discrepancies. The pattern of associations was largely consistent across the five PBIS subscales.

Dyadic Analysis of Actor and Partner Effects

To further examine the dyadic processes underlying the perception gap, we conducted Actor-Partner Interdependence Model (APIM) analyses. As a prerequisite for APIM, we first examined the non-independence of the dyadic data. Table 5 shows the intercorrelations among PBIS and breastfeeding self-efficacy within and across parents. The correlation between paternal and maternal PBIS scores was significant ($r = 0.343$, $p < 0.001$), supporting the interdependence of parental perceptions and justifying the use of APIM. Paternal PBIS was correlated with both paternal FBESE ($r = 0.569$, $p < 0.001$) and maternal BESE ($r = 0.170$, $p < 0.001$).

The APIM results are presented in Figure 1 and Supplementary Table 3. The model included paternal and maternal breastfeeding self-efficacy as predictors, with paternal and maternal PBIS scores as outcomes. For actor effects, paternal breastfeeding self-efficacy significantly predicted paternal PBIS scores ($B = 0.570$, $SE = 0.092$, $p < 0.001$), and maternal breastfeeding self-efficacy significantly predicted maternal PBIS scores ($B = 0.562$, $SE = 0.102$, $p < 0.001$).

For partner effects, neither paternal breastfeeding self-efficacy predicting maternal PBIS (B = 0.025, SE = 0.120, $p = 0.587$) nor maternal breastfeeding self-efficacy predicting paternal PBIS (B = -0.004, SE = 0.078, $p = 0.922$) reached statistical significance.

Discussion

This study is among the first to explore paternal and maternal perceptions of father support for breastfeeding in a Chinese sample during the early postpartum period. It also elucidates the dyadic mechanisms underlying the perception gap using the Actor-Partner Interdependence Model (APIM). The results revealed a consistent pattern: fathers rated their breastfeeding support significantly higher than mothers did across all dimensions of the PBIS. This discrepancy was not merely a statistical artifact, as indicated by the moderate positive correlations between paternal and maternal scores ($r = 0.343$), suggesting that while couples shared some common ground, a systematic perceptual gap persisted.

Our finding that fathers rated their breastfeeding support significantly higher than mothers did mirrors the pattern reported by Gebremariam et al. [23] among Ethiopian expectant couples, despite differences in culture and perinatal stage (antenatal vs. postnatal). This replicated pattern—observed using the same instrument (PBIS) in two distinct populations—suggests that this gap in parental perceptions may be a cross-cultural phenomenon. The gap was most pronounced in the emotional support dimensions ("Presence" and "Appreciation"), a finding that aligns with both the Ethiopian study and broader literature on gender differences in emotional labor [25]. This cross-cultural convergence suggests that the perceptual gap may be a universal feature of the transition to parenthood. This gap may be particularly pronounced in contexts where traditional gender norms and emerging expectations for paternal involvement coexist, yet institutional support remains insufficient—as in contemporary urban China, where paternity leave is short and structural support for involved fatherhood is limited [32].

The significant correlation between paternal and maternal perceptions (r = 0.343) reflects the interconnectedness posited by family systems theory, indicating that both partners' perceptions are shaped within a shared relational context [21]. Concurrently, the significant perceptual gap (t = 13.30) reveals that despite this shared context, each partner maintains a distinct evaluative framework—fathers perceive their support more favorably than mothers do. Together, these two findings illustrate a key principle of family systems theory: that family members are simultaneously connected and differentiated; they are neither

identical nor independent. This pattern—both correlated and divergent—suggests a degree of mutual influence between partners' perceptions. It also provides the theoretical rationale for examining the dyadic mechanisms underlying these perceptual patterns, specifically through actor and partner effects.

Univariate and multivariate regression analyses identified distinct patterns for paternal and maternal characteristics related to the perceptual gap. Among fathers, younger age was associated with larger discrepancies, possibly reflecting less developed paternal identity and fewer caregiving experiences, which may lead to overestimation of their own support provision. Better breastfeeding knowledge and higher self-efficacy among fathers also predicted larger gaps. This counterintuitive pattern may reflect a "knowing-doing gap"—fathers with more defined internal standards may overestimate how well their knowledge and confidence translate into observable support behaviors, creating a mismatch with maternal expectations [33]. Among mothers, lower breastfeeding self-efficacy was the strongest predictor of a wider gap. This aligns with self-efficacy theory: mothers with lower confidence in their breastfeeding abilities may become more sensitive to perceived support inadequacies, potentially discounting or underrecognizing paternal efforts [28]. Maternal education also independently contributed, with higher education associated with smaller discrepancies, possibly reflecting better health literacy and communication skills for articulating support needs [34].

Both paternal and maternal breastfeeding self-efficacy exhibited significant actor effects, indicating that each parent's own self-efficacy was strongly associated with their own perception of father support. However, no significant partner effects were observed—neither paternal self-efficacy influencing maternal perceptions, nor maternal self-efficacy influencing paternal perceptions. This pattern suggests that breastfeeding self-efficacy operates primarily through intra-individual pathways rather than cross-partner transmission. This finding aligns with research in other dyadic contexts where self-efficacy predominantly exerts actor rather than partner effects [35], and reinforces the conceptualization of self-efficacy as a self-referential psychological resource [36]. Importantly, the absence of partner effects does not contradict family systems theory; rather, it refines it by specifying a boundary condition. In the context of perceived paternal breastfeeding support, each partner operates within a distinct evaluative framework, constructing largely independent "realities" of support. Therefore, the perceptual gap is not driven by direct cross-partner influence, but by differences in each partner's own frame of reference. Consequently, interventions aimed at narrowing the perceptual gap should move beyond simple strategies of "encouraging fathers to do more" or "asking mothers to be more

understanding." Instead, they should focus on aligning both partners' frames of reference—for instance, through joint education on the meaning and expression of effective father support.

The perceptual gap identified in this study aligns with the pattern reported by Gebremariam et al.[23] and extends it by identifying associated factors and dyadic mechanisms. First, it provides empirical evidence from a Chinese setting, where short paternity leave and traditional gender norms remain influential. Second, it moves beyond simply quantifying the gap to directly comparing "which" factors are associated with the gap and "how" these factors operate dyadically, thereby offering a more comprehensive understanding than prior studies. Third, the distinct patterns of actor and partner effects observed here underscore the value of dyadic designs in breastfeeding research.

Fathers' support may be more effective if it is perceived by mothers as intended. Therefore, the perception gap identified in this study has direct clinical implications, and several strategies could be prioritized to reduce the gap based on our findings: (1) Mothers' breastfeeding self-efficacy was the strongest predictor of the perceptual gap and operated through actor pathways. Therefore, confidence-building interventions targeting mothers may directly improve their perception of paternal support. (2) Interventions to improve spouse communication may help ensure that paternal support behaviors are recognized and appreciated by mothers. (3) Couples with identifiable risk profiles—such as younger fathers and mothers with lower educational attainment—may benefit from more intensive early support. (4) Couple-based educational interventions should be implemented to help parents develop a shared understanding of what constitutes effective father support.

Limitations and strengths

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference. The direction of relationships—particularly whether certain parental characteristics precede or follow perceptual discrepancies—remains to be established through longitudinal designs. Second, all measures were based on self-reports, which may be susceptible to social desirability bias, particularly given that fathers may overreport their support behaviors. Third, the sample was recruited from three hospitals in Shanghai, a metropolitan area with relatively well-established maternity and paternity policies; the findings may not be generalizable to other regions of China where such policies differ. Fourth, while our regression and APIM analyses identified patterns of associations, a substantial proportion of variance in the perception gap remained unexplained.

Unmeasured factors—such as couple communication quality, family support beyond the spouse, or infant characteristics—may also play a role.

Future research should address these limitations through several directions. First, longitudinal studies are needed to examine how the perception gap evolves across the postpartum trajectory—from early puerperium through the transition to work and beyond. Second, qualitative or mixed-methods research could explore the process by which fathers' self-efficacy is communicated to (or fails to reach) mothers, offering richer insights into the mechanisms underlying the actor effects observed in APIM. Third, future intervention studies could test whether couple-based, rather than individual, strategies are more effective in reducing the perception gap, particularly among at-risk subgroups identified in this study (e.g., couples with younger fathers and mothers with high school or lower education). Fourth, comparative studies across diverse socioeconomic and cultural contexts within China could further clarify the role of institutional factors—such as paternity leave length and workplace breastfeeding support—in shaping parental perceptions.

Despite these limitations, this study is among the first to examine paternal and maternal perceptions of father support for breastfeeding in a Chinese sample and to apply APIM to elucidate the underlying dyadic mechanisms. Its use of the same instrument (PBIS) across two populations supports the cross-cultural relevance of the gap, and its identification of modifiable targets enhances the clinical value of the findings.

Conclusion

This study reveals a consistent perception gap in father support for breastfeeding among Chinese couples in the early postpartum period: fathers perceived their support as significantly higher than mothers did. This gap was associated with fathers' age, breastfeeding knowledge, and self-efficacy, as well as mothers' educational level and breastfeeding self-efficacy. The APIM analysis further suggests that breastfeeding self-efficacy operates primarily through actor pathways rather than partner pathways in shaping perceptions of father support, underscoring the individual-centered nature of this mechanism. Interventions aimed at enhancing maternal breastfeeding self-efficacy and improving spouse communication may be promising strategies to align parental perceptions and optimize the effectiveness of father support for breastfeeding. |

List of abbreviations

WHO: World Health Organization

BSES: Breastfeeding Self-Efficacy Scale

SD: standard deviation

ANOVA: one-way analysis of variance

Declarations

Ethics approval and consent to participate

This study was approved by the Research Ethics Committee of the School of Public Health and Nursing, Shanghai Jiao Tong University (No. SJUPN-202138). All participants were voluntary and signed an informed consent prior to participating in the study.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors report no conflicts of interest in this work.

Funding

This study was supported by Nursing Research Project of Shanghai Jiao Tong University School of Medicine (Jyhz2512).

Authors' Contributions

Wanwan Cai: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Conceptualization.

Lin Rao: Resources, Methodology, Investigation, Formal analysis, Data curation.

Jiamin Zhu: Writing – review & editing, Data curation.

Jiale Hu: Supervision, Resources, Methodology.

Shu Liu: Writing – review & editing, Supervision, Methodology, Investigation, Conceptualization.

Caifeng Wang: Writing – review & editing, Supervision, Project administration, Funding acquisition, Conceptualization.

Acknowledgments

We would like to thank all couples who volunteered to participate in this study, and all those who contributed

to data collection.

Table 1. Sociodemographic Characteristics of the Couples ($N = 354$)

Items		Mothers Mean (SD) or *n* (%)	Fathers Mean (SD) or *n* (%)
Age(year)		30.21 (3.61)	31.17 (3.87)
Education	High school or lower	18 (5.1)	20 (5.6)
	Vocational/Bachelor's degree	226 (63.8)	222 (62.7)
	Postgraduate degree	91 (25.7)	83 (23.4)
	Doctoral degree	19 (5.4)	29 (8.2)
Employment	Employed	285 (80.5)	343 (96.9)
	Unemployed	69 (19.5)	11 (3.1)
Maternity leave (day) [a]	＜158	127 (44.6)	
	≥158	158 (55.4)	
Type of delivery	Vaginal delivery	205 (59.8)	
	Forceps-assisted delivery/Cesarean section	149 (40.3)	
Feeding method	Exclusive breastfeeding	108 (30.5)	
	Mixed feeding	189 (53.4)	
	Artificial feeding	57 (16.1)	
Paternity leave (day) [b]	≤10		184 (53.6)
	＞10		159 (46.4)
Household income (RMB/year)	≤150,000		83 (23.4)
	150,000-300,000		129 (36.4)
	300,001-1,000,000		121 (34.2)
	≥1,000,001		21 (5.9)

[a] $n = 285$ as 69 unemployed and part-time working mothers were excluded.

[b] $n = 343$ as 11 unemployed and part-time working fathers were excluded.

Table 2. Comparison of Parental and Maternal Perception of Father Support for Breastfeeding, Self-Efficacy, and breastfeeding Knowledge ($N = 354$)

	Range	Father	Mother	Difference scores [a]	Effect size	t [b]	*p* value
		Mean (SD)	Mean (SD)	Mean (SD)			
PBIS (overall)	33-165	137.83 (18.79)	119.95 (24.57)	17.88 (25.29)	0.71	13.30	< 0.001
Savvy	9-45	35.05 (5.39)	31.68 (7.17)	3.37 (7.38)	0.46	8.59	< 0.001
Helping	7-35	30.11 (4.24)	27.28 (5.84)	2.83 (5.81)	0.49	9.15	< 0.001
Appreciation	6-30	26.00 (4.32)	23.38 (5.14)	2.63 (5.65)	0.47	8.76	< 0.001
Presence	6-30	25.50 (3.80)	22.20 (5.11)	3.30 (5.23)	0.64	11.85	< 0.001
Responsiveness	5-25	21.18 (3.31)	19.36 (4.04)	1.82 (4.47)	0.41	7.65	< 0.001
(F)BESE [c]	14-70	55.17 (9.44)	47.23 (11.07)	/	0.65	12.30	< 0.001
Breastfeeding Knowledge	0-17	13.25 (2.78)	/	/	/	/	/

Note: PBIS the Partner Breastfeeding Influence Scale.

[a] Difference scores are the scores of paternal perceptions minus those of maternal perceptions.

[b] Paired T test.

[c] BESE is maternal breastfeeding self-efficacy and FBESE paternal breastfeeding self-efficacy assessed by (F)BESE-SF.

Table 3. Correlations of Parental Perception of Father Support for Breastfeeding ($N = 354$)

		Mothers [a]					
		PBIS (overall)	Savvy	Helping	Appreciation	Presence	Responsiveness
Fathers [a]	PBIS (overall)	0.34	0.31	0.30	0.33	0.33	0.31
	Savvy	0.33	0.34	0.27	0.31	0.29	0.27
	Helping	0.35	0.31	0.37	0.29	0.35	0.28
	Appreciation	0.27	0.24	0.20	0.30	0.24	0.27
	Presence	0.32	0.29	0.28	0.29	0.34	0.28
	Responsiveness	0.26	0.21	0.19	0.29	0.24	0.27

Note: PBIS, the Partner Breastfeeding Influence Scale.

All correlation coefficients in the table reached statistical significance with P-values < 0.001.

[a] Pearson correlation.

Table 4. Multivariate analysis of factors associated with differences in parental perceptions of father support (N = 354).

		Difference scores											
		PBIS (overall)		**Savvy**		**Helping**		**Appreciation**		**Presence**		**Responsiveness**	
		β	*p*	β	*p*	β	*p*	β	*p*	β	*p*	β	*p*
Father	**Age**	-0.151	**0.008**	-0.146	**0.012**	-0.102	0.096	-0.143	**0.022**	-0.141	**0.016**	-0.14	**0.023**
	FBSES [e]	0.360	**0.000**	0.387	**0.000**	0.265	**0.000**	0.299	**0.000**	0.319	**0.000**	0.272	**0.000**
	Breastfeeding knowledge	0.152	**0.001**	0.137	**0.002**	0.144	**0.003**	0.112	**0.022**	0.145	**0.001**	0.149	**0.002**
	Household income [a]												
	150,000-300,000	-0.063	0.303	-0.055	0.378	-0.098	0.137	-0.037	0.582	-0.039	0.533	-0.064	0.331
	300,001-1,000,000	-0.024	0.723	0.018	0.798	-0.049	0.51	-0.042	0.579	-0.006	0.931	-0.034	0.647
	≥1,000,001	-0.022	0.667	-0.041	0.427	-0.028	0.609	0.014	0.797	-0.035	0.506	0.006	0.92
Mother	**Age**	0.004	0.939	-0.016	0.789	-0.016	0.799	0.022	0.724	0.011	0.847	-0.011	0.861
	BSES [f]	-0.526	**0.000**	-0.533	**0.000**	-0.423	**0.000**	-0.434	**0.000**	-0.526	**0.000**	-0.461	**0.000**
	Education [b]												
	Vocational/Bachelor's degree	-0.216	**0.027**	-0.224	**0.025**	-0.173	0.100	-0.19	0.076	-0.196	0.050	-0.16	0.129
	Postgraduate degree	-0.253	**0.012**	-0.243	**0.018**	-0.242	**0.026**	-0.233	**0.035**	-0.224	**0.029**	-0.172	0.112
	Doctoral degree	-0.146	**0.024**	-0.101	0.126	-0.211	**0.003**	-0.094	0.188	-0.106	0.111	-0.167	**0.018**
	Employment [c]												
	Unemployed	0.092	0.054	0.035	0.473	0.088	0.088	0.115	**0.029**	0.124	**0.011**	0.069	0.181
	Feeding method [d]												
	Mixed feeding	0.020	0.701	0.009	0.859	0.051	0.356	-0.013	0.814	0.003	0.950	0.046	0.405
	Artificial feeding	0.017	0.728	0.047	0.340	0.003	0.957	-0.018	0.734	0.046	0.356	-0.018	0.737

[a] reference group: ≤150000.

[b] reference group: High school or lower.

[c] reference group: Employed.

[d] reference group: Exclusive breastfeeding.

[e] FBESE is paternal breastfeeding self-efficacy assessed by FBESE-SF.

[f] BESE is maternal breastfeeding self-efficacy assessed by BESE-SF.

Table 5. Pearson correlations among PBIS and BESE in fathers and mothers. ($N = 354$)

		Fathers		Mothers	
		PBIS	FBESE	PBIS	BESE
Fathers	PBIS	1.000			
	FBESE	0.569**	1.000		
Mothers	PBIS	0.343**	**0.197****	1.000	
	BESE	**0.170****	0.307**	0.570**	1.000

Note: PBIS the Partner Breastfeeding Influence Scale, BESE Breastfeeding Self-Efficacy, FBESE Father Breastfeeding Self-Efficacy

*$P < 0.05$, **$P < 0.001$.

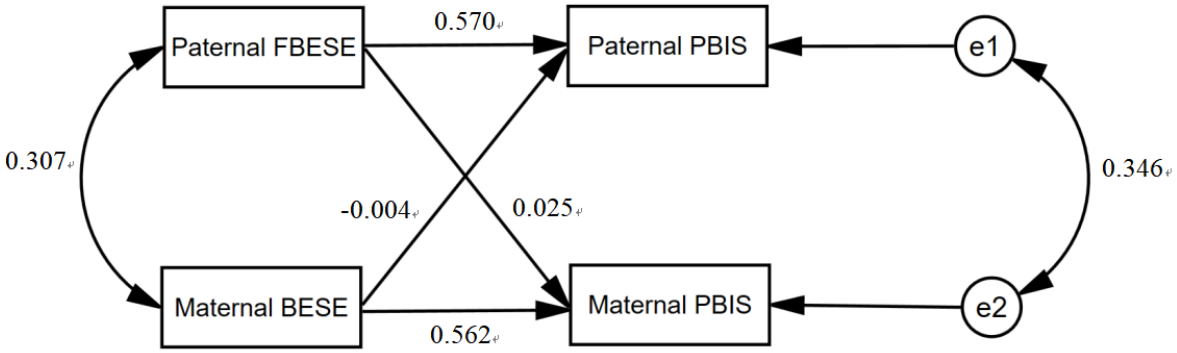


Fig 1. Actor-partner interdependence model of BESE with PBIS.

References

1.World Health Organization. Infant and young child feeding. 2023. https://www.who.int/news-room/fact-sheets/detail/breastfeeding. Accessed 12 Oct 2023.

2.Kanzawa H, Yasuhi I, Yamashita H, Yatsuhashi H. Breastfeeding Intensity and Early Postpartum Lipid Profiles Among Women With Prior Gestational Diabetes. JAMA Netw Open. 2026;9(8):e2631833. https://doi.org/10.1001/jamanetworkopen.2026.31833.

3.Mutahar R, Adisasmita AC, Djuwita R, Purwanto DJ, Anggraini R, Yeni, et al. Effect of breastfeeding on the risk of breast cancer: a meta-analysis of observational studies. Int Breastfeed J. 2026;21(1):23. https://doi.org/10.1186/s13006-025-00796-4.

4.Britten FL, Shipton E, Duke M, Duncan EL, Callaway LK. A systematic review of breastfeeding prevalence, duration and determining factors in women with type 1 and type 2 diabetes mellitus. Diabet Med. 2026;43(10):e70315. https://doi.org/10.1111/dme.70315.

5.World Health Organization. Global nutrition targets 2025: To improve maternal, infant and young child nutrition. 2014. https://www.who.int/teams/nutrition-and-food-safety/global-targets-2025. Accessed 12 Oct 2023.

6.National Health Commission of the People's Republic of China. Breastfeeding Promotion Action Plan (2021-2025). 2021. http://www.gov.cn/zhengce/zhengceku/2021-11/24/content_5653169.htm. Accessed 24 Oct 2023.

7.Bureau of Disease Control and Prevention, National Health Commission of the People's Republic of China. Report on Nutrition and Chronic Diseases of Chinese Residents (2020). Beijing: People's Medical Publishing House; 2021.

8.Li J, Nguyen TT, Wang X, Mathisen R, Fang J. Breastfeeding practices and associated factors at the individual, family, health facility and environmental levels in China. Matern Child Nutr. 2020;16 Suppl 2(Suppl 2):e13002. https://doi.org/10.1111/mcn.13002.

9.Shi H, Yang Y, Yin X, Li J, Fang J, Wang X. Determinants of exclusive breastfeeding for the first six months in China: a cross-sectional study. Int Breastfeed J. 2021;16(1):40. https://doi.org/10.1186/s13006-021-00388-y.

10. Erdoğan E, Özerdoğan N. Evaluation of the effect of the father's support on the mother's breastfeeding motivation. J Eval Clin Pract. 2025;31(3):e14156. https://doi.org/10.1111/jep.14156.

11.Koksal I, Acikgoz A, Cakirli M. The Effect of a Father's Support on Breastfeeding: A Systematic Review. Breastfeed Med. 2022;17(9):711-722. https://doi.org/10.1089/bfm.2022.0058.

12.Agrawal J, Chakole S, Sachdev C. The Role of Fathers in Promoting Exclusive Breastfeeding. Cureus. 2022;14(10):e30363. https://doi.org/10.7759/cureus.30363.

13.Gebremariam KT, Wynter K, Zheng M, Rawstorn JC, Denney-Wilson E, Laws R. Breastfeeding - a survey of fathers' support needs and preferred sources of information. Int Breastfeed J. 2024;19(1):50. https://doi.org/10.1186/s13006-024-00654-9.

14.Budiati T, Adjie S, Gunawijaya J, Setyowati S. Fathers' role in sustainability of exclusive breastfeeding practice in post-cesarean-section mothers. J Public Health Res. 2021;11(2):2744. https://doi.org/10.4081/jphr.2021.2744.

15.Feldman JS, Natale BN, Shaw DS, Nordahl KB, Janson H, Nærde A. Duration of Breastfeeding and

506 Supportive Paternal Caregiving in Early Childhood and the Potential Mediating Function of Maternal
507 Caregiving. J Dev Behav Pediatr. 2023;44(4):e309-e314. https://doi.org/10.1097/dbp.0000000000001175.
508 16.White BK, Giglia RC, Burns SK, Scott JA. Investigating Maternal Perspectives of Breastfeeding Support
509 Targeted Towards Fathers in the Milk Man Mobile App Intervention. Matern Child Health J. 2023;27(5):954-
510 964. https://doi.org/10.1007/s10995-023-03616-5.
511 17.Aktaş Reyhan F. The effect of breastfeeding education with digital storytelling on fathers' breastfeeding'
512 self-efficacy. J Eval Clin Pract. 2025;31(1):e14102. https://doi.org/10.1111/jep.14102.
513 18.Kushwaha A, Jacob AM. Fathers' Attitudes Toward Mothers with Infants and its Association with
514 Exclusive Breastfeeding in a Rural Community of Karnataka. Indian J Community Med. 2024;49(2):433-437.
515 https://doi.org/10.4103/ijcm.ijcm_422_23.
516 19.Pereira TL, Rajendran PD, Nantsupawat A, Shorey S. Fathers' breastfeeding knowledge, attitudes, and
517 involvement in the Asian context: A mixed-studies review. Midwifery. 2024;131:103956.
518 https://doi.org/10.1016/j.midw.2024.103956.
519 20.Srisopa P, Lucas R. Maternal perception of paternal breastfeeding support: A secondary qualitative analysis.
520 Midwifery. 2021;102:103067. https://doi:10.1016/j.midw.2021.103067
521 21.Bowen M. The use of family theory in clinical practice. Compr Psychiatry. 1966;7(5):345-374.
522 https://doi.org/10.1016/s0010-440x(66)80065-2.
523 22.Moriwaki C, Haku M. Development of a Breastfeeding Support Scale for Couples. J Med Invest.
524 2016;63(1-2):96-103. doi:10.2152/jmi.63.96
525 23.Gebremariam KT, Zelenko O, Mulugeta A, Gallegos D. A cross-sectional comparison of breastfeeding
526 knowledge, attitudes, and perceived partners' support among expectant couples in Mekelle, Ethiopia. Int
527 Breastfeed J. 2021;16(1):3. https://doi.org/10.1186/s13006-020-00355-z.
528 24.Harrell FE. Regression modeling strategies: with applications to linear models, logistic and ordinal
529 regression, and survival analysis. 2nd ed. Cham: Springer; 2015.
530 25.Rempel LA, Rempel JK, Moore KCJ. Relationships between types of father breastfeeding support and
531 breastfeeding outcomes. Matern Child Nutr. 2017;13(3):e12337. https://doi.org/10.1111/mcn.12337.
532 26.Wang XJ, Zeng TY, Yuan MM, Chen Y, Zhang K, Tu AQ. Current Status and Influencing Factors of Spousal
533 Support for Breastfeeding among Postpartum Women. Mil Nurs. 2021;38(5): 9-12.

https://doi.org/10.3969/j.issn.1008-9993.2021.05.003.

27.Dennis CL, Faux S. Development and psychometric testing of the Breastfeeding Self-Efficacy Scale. Res Nurs Health. 1999;22(5):399-409. https://doi.org/10.1002/(sici)1098-240x(199910)22:5<399::aid-nur6>3.0.co;2-4/.

28.Dennis CL. The breastfeeding self-efficacy scale: psychometric assessment of the short form. J Obstet Gynecol Neonatal Nurs. 2003;32(6):734-744. https://doi.org/10.1177/0884217503258459.

29.Dennis CL, Brennenstuhl S, Abbass-Dick J. Measuring paternal breastfeeding self-efficacy: A psychometric evaluation of the Breastfeeding Self-Efficacy Scale-Short Form among fathers. Midwifery. 2018;64:17-22. https://doi.org/10.1016/j.midw.2018.05.005.

30.Zhao M. A study on breastfeeding self-efficacy and its influencing factors among primiparas in Beijing [master's thesis]. Beijing: Chinese Academy of Medical Sciences & Peking Union Medical College; 2008.

31.Wang XF, He Q, Qin Y, Li Y, Liu C. The effect of workplace social capital on breastfeeding behavior of working women - mediating role based on family support. Chinese Journal of Health Statistics. 2021;38(02): 273-275. https://doi.org/10.3969/j.issn.1002-3674.2021.02.029.

32.Nie J, Zhang L, Song S, Hartnett AJ, Liu Z, Wang N, et al. Exclusive breastfeeding in rural Western China: does father's co-residence matter?. BMC Public Health. 2021;21(1):1981. https://doi.org/10.1186/s12889-021-12025-8.

33.Draman N, Mohamad N, Yusoff HM, Muhamad R. The decision of breastfeeding practices among parents attending primary health care facilities in suburban Malaysia. J Taibah Univ Med Sci. 2017;12(5):412-417. https://doi.org/10.1016/j.jtumed.2017.05.005.

34.Brandstetter S, Atzendorf J, Seelbach-Göbel B, Melter M, Kabesch M, Apfelbacher C, et al. Sociodemographic factors associated with health literacy in a large sample of mothers of newborn children: cross-sectional findings from the KUNO-Kids birth cohort study. Eur J Pediatr. 2020;179(1):165-169. https://doi:10.1007/s00431-019-03483-9.

35.Zeng J, Zheng QX, Wang QS, Liu GH, Liu XW, Lin HM, et al. Father support breastfeeding self-efficacy positively affects exclusive breastfeeding at 6 weeks postpartum and its influencing factors in Southeast China: a multi-centre, cross-sectional study. BMC Public Health. 2024;24(1):2698. https://doi:10.1186/s12889-024-20136-1.

562 36.Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev. 1977;84(2):191-
563 215. https://doi:10.1037//0033-295x.84.2.191.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryFigure1.docx
- SupplementaryTable1.docx
- SupplementaryTable2.docx
- SupplementaryTable3.docx