

# Analysis on the current situation of twin breastfeeding and its influencing factors

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## Abstract

Studies have found that exclusive breastfeeding can not only promote the growth and development of infants, but also increase the emotional communication between mothers and infants, and reduce the incidence of maternal breast diseases. To analysis the current situation and influencing factors of breastfeeding twins. A total of 420 twin mothers delivered in our hospital from January 2019 to December 2022 were selected to investigate the situation of breastfeeding within 6 months after delivery. An electronic questionnaire was conducted, and clinical information were collected. Univariate analysis and multivariate logistic regression analysis were applied to analyze the factors influencing exclusive breastfeeding. The rate of exclusive breastfeeding was 21.90%; in the exclusive breastfeeding group, the age <35 years old, bachelor degree or above, rural areas, no nipple depression or flat, no breast distension, no postpartum depression, adequate breast milk, participation in health education during pregnancy, husband support for breastfeeding, no infant feeding difficulties, infant diarrhea, lactose intolerance and return to milk were 96.74%, 53.26%, 65.22%, 80.43%, 76.09%, 80.43%, 73.91%, 63.04%, 69.57%, 71.74%, 65.22%, 70.65%, and 66.30%, respectively. It was significantly higher than that in the non-exclusive breastfeeding group ( $P < .05$ ). The score of Edinburgh Postpartum Depression Scale (EPDS) was  $(8.08 \pm 1.03)$  in the exclusive breastfeeding group, which was significantly lower than that in the non-exclusive breastfeeding group ( $P < .001$ ), while the score of Perceived Social Support Scale (PSSS) was  $(67.32 \pm 9.92)$ , which was significantly higher than that in the non-exclusive breastfeeding one ( $P < .001$ ). Logistic regression analysis showed that age, education level, nipple depression or flat, breast tenderness, postpartum depression, breast milk volume, health education training during pregnancy, husband support for breastfeeding, PSSS score, infant diarrhea, lactose intolerance, and delectation were the influencing factors of exclusive breastfeeding ( $P < .001$ ). Our findings suggest that various factors were associated with a low rate of exclusive breastfeeding in twin births, such as age, educational level, and social support. Corresponding measures should be formulated for intervention to promote exclusive breastfeeding.

**Abbreviations:** EPDS = Edinburgh Postpartum Depression Scale, PSSS = perceived social support scale.

**Keywords:** breast-feeding, current situation investigation, influence factor, twins

## 1. Introduction

Breast milk has always been the most suitable food for infants, which can provide the best nutrition for newborn infants within 6 months. The World Health Organization advocates exclusive breastfeeding for infants under 6 months for its high nutritional contents and immune active substances.<sup>[1,2]</sup> Recent studies have found that the rapid development of industrialization and changes in modern attitudes have led to a decrease in maternal physical function and significant mood swings after childbirth, thus leading to a decrease in breast milk production, which has an impact on breastfeeding.<sup>[3]</sup> A study reported that the rate of exclusive breastfeeding up to 6 months of age was significantly lower than that of first-born mothers, suggesting that the rate

and duration of exclusive breastfeeding in China was still not optimistic.<sup>[4,5]</sup>

With the advancements in reproductive technology and the increasing prevalence of multiple pregnancies in recent years, the birth of twins has become increasingly common worldwide.<sup>[6]</sup> The arrival of twins brings double the joy to every family, but it also presents double the challenges. Particularly in the crucial and natural aspect of breastfeeding, mothers of twins often face more pressure and difficulties.<sup>[7]</sup> Previous studies have indicated that the breastfeeding rates for twin infants are relatively lower, and the duration of breastfeeding is shorter.<sup>[8]</sup> The reasons behind this are multifaceted, encompassing physiological, psychological, and social factors.<sup>[7,9]</sup> For instance, some twin mothers may choose to supplement with formula feeding due to fears of insufficient breast

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

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milk production, or they may experience feelings of frustration and loneliness due to inadequate family and social support. Although there have been a lot of studies focusing on the influencing factors of breastfeeding, the studies on the current situation of twin breastfeeding in clinic are still few, especially the analysis of the influencing factors of twin breastfeeding. In this study, the questionnaire was used to collect and sort out the relevant data of twin maternal families in the region, and analyze the influencing factors of exclusive breastfeeding with the aim of providing a basis for clinical implementation of interventions to improve the rate of exclusive breastfeeding in twin births.

## 2. Materials and methods

### 2.1. General information

This was an observational questionnaire-based study. This study collected data from January 2019 to December 2022 for the analysis of twin mothers delivered in Chongqing Health Center for Women and Children/Women and Children Hospital of Chongqing Medical University. A total of 420 twin mothers aged 22 to 37 years, 55 of them were  $\geq 35$  years old and 365 were  $< 35$  years old. Natural childbirth 23, cesarean section 397; 360 primiparas and 60 midwives. Inclusion criteria: twins survived with both birth weights  $> 2500$ g; full-term pregnancy; neonatal mother-infant room; can cooperate to complete the relevant questionnaire survey; and informed consent of twin mothers. Exclusion criteria: High-risk infants transferred to neonatal treatment or mothers transferred to intensive care unit due to high-risk diseases leading to mother-to-child separation; maternal or family members are not willing to accept telephone interviews or answer questions are not clear; infants born with congenital defects, genetic metabolic diseases and other diseases; twin mothers have feeding taboos; and patients with mental illness history. This study was supported by

the Ethics Committee of Chongqing Health Center for Women and Children.

### 2.2. Survey methods

The questionnaire was designed by the method of evidence-based medicine, and the content of the questionnaire was formally determined after thematic discussion and revision, including age, parity, mode of delivery, BMI during pregnancy, educational level, location, monthly income per capita of the family, nipple status, breast distension, postpartum depression, breast milk volume, health education, husband support for breastfeeding, Infant feeding difficulties, and presence of sickness and hospitalization of mother and baby separation. The surveyors were trained and qualified to implement the questionnaire and ensure the confidentiality of maternal and family related information. The definition of exclusive breastfeeding is that no food other than breast milk is added to the infant, except for medication and vitamins needed for treatment.

The investigators' on-site investigation process provided explanation and helped to the puerpera. Under the supervision of the investigator, the questionnaire was filled out and recycled. After checking the questionnaire, both of them entered the computer system. During the input process, suspicious data were found to check the original questionnaire. The analysis of text data was carried out by both of them at the same time. The stage of occurrence was determined by group discussion. The final results are fed back to the respondents for further verification, and they can be interviewed again if necessary.

### 2.3. Investigation tools

The simplified Chinese version of Edinburgh Postpartum Depression Scale (EPDS)<sup>[10]</sup> was used to assess the depression of mothers, which has 10 items and a total score of 30, with  $\geq 10$

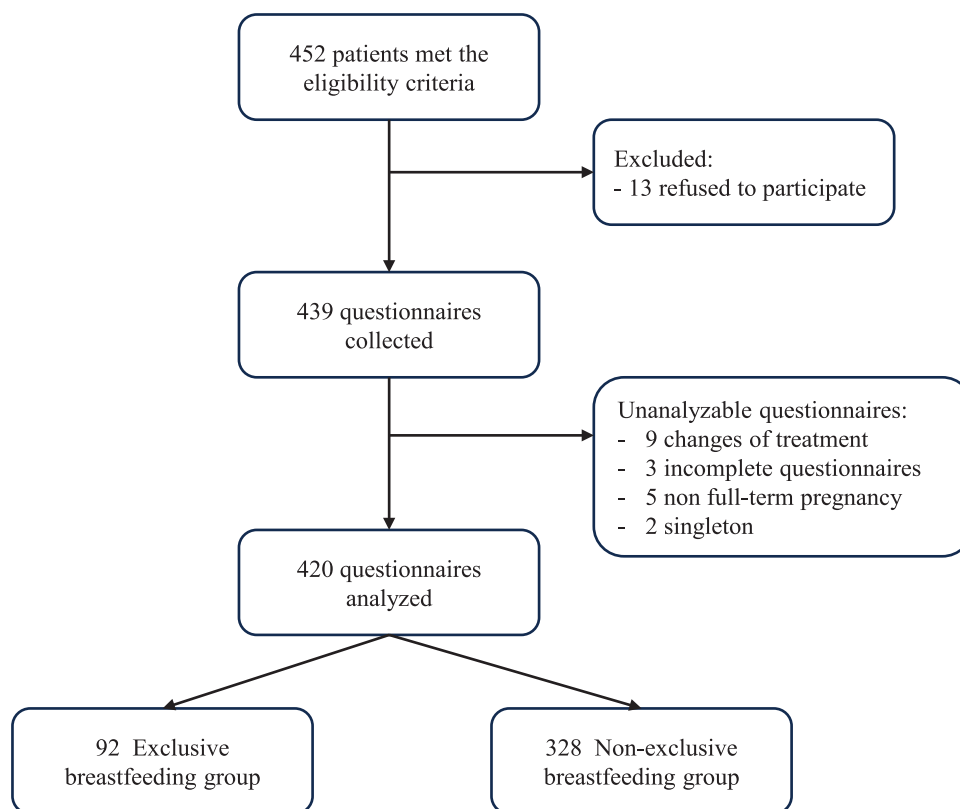


Figure 1. Study flow-chart.

being postnatal depression. The higher the score indicates the more serious the depression. The Perceived Social Support Scale (PSSS)<sup>[11]</sup> was used to evaluate the social support of mothers, which has 3 dimensions and a total score of 84. The higher the score indicates the higher the degree of social support.

#### 2.4. Statistical analysis

SPSS 22.0 software was used for statistical analysis. Measurement data were expressed as mean  $\pm$  standard deviation and compared by *t* test. Count data were expressed as n (%) and compared by  $\chi^2$  test. Multivariate logistic regression was used to

identify factors that influence breastfeeding. Power and sample size estimations was performed using the GraphPad StatMate software. The number of enrolled patients was estimated based on literature and preliminary data, and assuming a power of 0.8 to detect a difference of at least 20% with a significance of 0.05.  $P < .05$  indicated that the difference was statistically significant.

### 3. Results

#### 3.1. Exclusive breastfeeding

Of the 420 mothers, there were 840 infants, among which 184 were exclusively breastfed and 656 were non-exclusively

**Table 1**  
Comparison of clinical data between the 2 groups.

Variables	Exclusive breastfeeding group (n = 92)	Non-exclusive breastfeeding group (n = 328)	$\chi^2$	P
Age			10.012	.002
$\geq 35$ yr old	3 (3.26)	52 (15.85)		
<35 yr old	89 (96.74)	276 (84.15)		
Parity			0.084	.773
Primipara	78 (84.78)	282 (85.98)		
Parturient women	14 (15.22)	46 (14.02)		
Mode of delivery			1.035	.309
Spontaneous childbirth	7 (7.61)	16 (4.88)		
Cesarean section	85 (92.39)	312 (95.12)		
BMI during pregnancy			0.153	.696
Normal	66 (71.74)	242 (73.78)		
Abnormal	26 (28.26)	86 (26.22)		
Mode of conception			4.248	.12
Nature conceived	15 (16.30)	53 (16.16)		
Vitro fertilization/embryo transfer	31 (33.70)	77 (23.48)		
Ovulation induction and pregnancy	46 (50.00)	198 (60.37)		
Education level			8.962	.003
Junior college or below	43 (46.74)	178 (54.27)		
Bachelor, master or above	49 (53.26)	150 (45.73)		
Place of residence			25.518	<.001
Urban	32 (34.78)	210 (64.02)		
Rural	60 (65.22)	118 (35.98)		
Monthly per capita household income (yuan)			0.356	.551
$\geq 5000$ yuan	68 (73.91)	232 (70.73)		
<5000 yuan	24 (26.09)	96 (29.27)		
Sunken or flat nipples			14.1	<.001
Yes	18 (19.57)	134 (40.85)		
No	74 (80.43)	194 (59.15)		
Breast tenderness			12.011	.001
Yes	22 (23.91)	144 (43.9)		
No	70 (76.09)	184 (56.1)		
Postpartum depression			23.207	<.001
Yes	18 (19.57)	156 (47.56)		
No	74 (80.43)	172 (52.44)		
Breast milk volume			26.946	<.001
Deficiency	24 (26.09)	186 (56.71)		
Adequate	68 (73.91)	142 (43.29)		
Participate in health education and other training during pregnancy			24.902	<.001
Yes	58 (63.04)	112 (34.15)		
No	34 (36.96)	216 (65.85)		
Husband supports breastfeeding			23.769	<.001
Yes	64 (69.57)	134 (40.85)		
No	28 (30.43)	194 (59.15)		
Infant feeding difficulties			33.397	<.001
Yes	26 (28.26)	204 (62.2)		
No	66 (71.74)	124 (37.8)		
Infantile diarrhea			22.134	<.001
Yes	32 (34.78)	44 (13.41)		
No	60 (65.22)	284 (86.59)		
Lactose intolerance			23.896	<.001
Yes	27 (29.35)	31 (9.45)		
No	65 (70.65)	297 (90.55)		
Delectation			45.568	<.001
Yes	31 (33.70)	23 (7.01)		
No	61 (66.30)	305 (92.99)		

breastfed. The rate of exclusive breastfeeding was 21.90%. Figure 1 shows the study flow chart.

### 3.2. Comparison of clinical data between exclusive breastfeeding group and non-exclusive breastfeeding group

The age ( $P = .002$ ), education level ( $P = .003$ ), place of residence ( $P < .001$ ), sunken or flat nipples ( $P < .001$ ), breast tenderness ( $P = .001$ ), postpartum depression ( $P < .001$ ), breast milk volume ( $P < .001$ ), participate in health education and other training during pregnancy ( $P < .001$ ), husband supports breastfeeding ( $P < .001$ ), infant feeding difficulties ( $P < .001$ ), infantile diarrhea ( $P < .001$ ), lactose intolerance ( $P < .001$ ), and delectation ( $P < .001$ ) were found significant difference between the 2 groups (Table 1).

### 3.3. Comparison of EPDS and PSSS scores between exclusive breastfeeding group and non-exclusive breastfeeding group

The score of EPDS was significantly lower in the exclusive breastfeeding group than that in the non-exclusive breastfeeding group ( $P < .001$ ), while the score of PSSS was significantly higher than in the exclusive breastfeeding group than that in the non-exclusive breastfeeding group ( $P < .001$ ) (Table 2).

### 3.4. Multivariate logistics analysis of the factors influencing breastfeeding

Age (<35 years of age assignment 0,  $\geq 35$  years of age assignment 1), educational level (assignment 1 above undergraduate level, assignment 0 below undergraduate level), place of residence (urban assignment 0, rural assignment 1), sunken or flat nipples (yes assignment 1, no assignment 0), breast tenderness (yes assignment 1, no assignment 0), postpartum depression (yes assignment 1, no assignment 0), breast milk volume (adequate assignment 1, deficiency assignment 0), health education during pregnancy (yes assignment 1, no assignment 0), husband support for breastfeeding (yes assignment 1, no assignment 0), infant feeding difficulties (yes assignment 1, no assignment 0), PSSS score (score  $\geq 60$  points assignment 1, <60 points assignment 0) infant diarrhea (yes assigned 1, no assigned 0), lactose intolerance (yes assigned 1, no assigned 0), delectation (yes assigned 1, no assigned 0) were used as independent variables. Logistic regression analysis showed that age, education level, sunken or flat nipples, breast tenderness, postpartum depression, breast milk volume, health education during pregnancy, husband support for breastfeeding, PSSS score, infant diarrhea, lactose intolerance, and delectation were the influencing factors of exclusive breastfeeding ( $P < .05$ ) (Table 3).

## 4. Discussion

Breastfeeding can reduce the risks of sudden infant death syndrome and infectious diseases, so many countries and related organizations worldwide advocate and encourage breastfeeding.<sup>[12]</sup> As the most ideal food for infants, breast milk is of great significance for the growth of infants, which can both strengthen the immune function of infants and be helpful for the recovery of mothers' uterus and the reduction of breast cancer incidence.<sup>[13]</sup> In recent years, the exclusive breastfeeding rate has increased worldwide, but it is still low due to the many factors that affect it.<sup>[14,15]</sup>

In this study, the status of twin breastfeeding was analyzed to investigate the influencing factors of exclusive breastfeeding in twin infants, and the exclusive breastfeeding rate of twins was found to be 21.90%. The proportion of non-exclusive breastfeeding increases with increasing age, older mothers with more

**Table 2**

Comparison of EPDS and PSSS scores between the groups.

Group	Cases	EPDS (points)	PSSS (points)
Exclusive breastfeeding group	92	8.08 ± 1.03	67.32 ± 9.92
Non-exclusive breastfeeding group	328	8.89 ± 1.10	60.20 ± 9.54
<i>t</i>		-5.129	6.271
<i>P</i>		<.001	<.001

EPDS = Edinburgh Postpartum Depression Scale, PSSS = Perceived Social Support Scale.

stressful work will have weaker confidence in breastfeeding, so more mothers choose artificial feeding.<sup>[16,17]</sup> The influence of education level and region on breastfeeding can be influenced by the fact that women with high education level are more interested in acquiring knowledge about parenting and can use multiple ways to obtain relevant knowledge, therefore are more active in participating in relevant parenting training, while women located in rural areas are more willing to breastfeed due to the influence of traditional beliefs.<sup>[18]</sup> Breastfeeding without nipple depression or flattening is more common. Women with abnormal nipple status refuse to breastfeed due to factors such as physical changes and fear of affecting beauty, which will prevent effective sucking of infants. The nipple depression or chapped can cause breast pain and psychological fluctuations on mothers in the process of breastfeeding, which can lead to abandonment of breastfeeding. Several studies also suggested that women with abnormal nipple status should be strengthened to increase the training of relevant knowledge and improve the level of breastfeeding.<sup>[19-22]</sup>

Women with insufficient breast milk may be more eager to give artificial feeding due to their fear of physical condition and infant condition, but this emotion will have a negative impact on maternal lactation.<sup>[23]</sup> Changes in mental behavior can have a negative effect to weaken breastfeeding self-efficacy beliefs, reducing the enthusiasm of breastfeeding.<sup>[24]</sup> Studies have confirmed that maintaining a good mentality during breastfeeding can increase confidence in breastfeeding, suggesting that attention should be paid to postpartum depression during hospitalization, while a comfortable and relaxed feeding atmosphere should be provided to help mothers change their roles and encourage them to breastfeed.<sup>[25,26]</sup> Studies have shown that the higher of the mother mastery of feeding would improve maternal feeding self-efficacy.<sup>[27,28]</sup> Therefore, medical institutions should strengthen the transmission of breastfeeding health knowledge, further refine breastfeeding guidance, and play the professional advantages of hospitals and community medical institutions.<sup>[27,28]</sup> With the development of society, most mothers returned to work 6 months after delivery. After returning to work, the care of the child requires family support, and mothers with insufficient family support feel the pressure of work and life, which will have an impact on lactation, and reduce the confidence of breastfeeding.<sup>[29,30]</sup> Therefore, during discharge education, maternal and family members, especially husbands, should actively carry out publicity and education to understand the significance of social support for breastfeeding confidence, so that families can give maternal more attention, support and understanding.<sup>[31,32]</sup>

This study also found that the EPDS score of exclusive breastfeeding group was significantly lower than that of non-exclusive breastfeeding group, while the PSSS score was significantly higher than that of non-exclusive breastfeeding group. Further logistic regression analysis showed that age, educational level, nipple depression or flatness, breast tenderness, postpartum depression, breast milk volume, health education during pregnancy, husband supports for breastfeeding, and PSSS score were the influencing factors of exclusive breastfeeding. The existing studies mostly focus on the negative impact of negative emotions on breastfeeding, while the analysis of positive emotions on maternal self-efficacy



**Table 3**  
**Multivariate logistics analysis of the factors influencing breastfeeding.**

Factor	$\beta$	SE	Walds	P	OR (95% CI)
Age	-0.655	0.192	11.638	<.001	0.519 (0.357–0.757)
Education level	0.586	0.194	9.124	<.001	1.797 (1.228–2.628)
Place of residence	0.212	0.182	1.357	.221	1.236 (0.865–1.766)
Sunken or flat nipples	-1.073	0.218	24.226	<.001	0.342 (0.223–0.524)
Breast tenderness	-0.928	0.332	7.813	<.001	0.395 (0.206–0.758)
Postpartum depression	-1.872	0.554	11.418	<.001	0.154 (0.052–0.456)
Breast milk volume	2.012	0.671	8.991	<.001	7.478 (2.007–27.859)
Participate in health education and other training during pregnancy	0.772	0.206	14.044	<.001	2.164 (1.445–3.241)
Husband supports breastfeeding	0.943	0.288	10.721	<.001	2.568 (1.460–4.514)
Infant feeding difficulties	-0.224	0.182	1.515	.206	0.799 (0.559–1.142)
PSSS	1.433	0.412	12.098	<.001	4.191 (1.869–9.398)
Infantile diarrhea	0.665	0.211	9.933	<.001	1.944 (1.286–2.940)
Lactose intolerance	0.781	0.215	13.195	<.001	2.186 (1.433–3.328)
Delectation	0.572	0.182	9.878	<.001	1.772 (1.240–2.531)

PSSS = Perceived Social Support Scale.

has not been reported, so further research and analysis are needed.<sup>[33,34]</sup> Studies have found that the level of social support has an impact on breastfeeding, and women with high levels of social support feel more social attention and have more access to help, thus increasing confidence in breastfeeding and being more persistent in the process of breastfeeding, consistent with the results of this study.<sup>[35–37]</sup>

Previous studies have mainly focused on the current situation of singleton breastfeeding, and there is no analysis of the status of twin breastfeeding. This study analyzed this and investigated all aspects of factors influencing twin-birth breastfeeding, enriching the research in this field and providing a certain basis for establishing an improved breastfeeding rate. However, this study still has some limitations: First, the major limitation is the cross-sectional design does not allow making causal inferences. Second, all outcomes were self-reported by study participants. Third, the small number of patients included in this study, the single-center study, and the limited range of patient options may have biased the results. In the future, it is necessary to carry out more relevant studies among different races and countries to expand the scope of sampling, and further carry out intervention studies to verify the importance of exclusive breastfeeding.

In conclusion, in our modest attempt to illuminate the significance of twin breastfeeding, we suggest that age, education level, nipple depression or flat, breast tenderness, postpartum depression, breast milk volume, health education training during pregnancy, husband support for breastfeeding, PSSS score, infant diarrhea, lactose intolerance, and delectation were associated with a low rate of exclusive breastfeeding in twin births. Therefore, the corresponding measures are required to promote exclusive breastfeeding.

### Author contributions

**Conceptualization:** Shoucui Wang, Chaoli Peng, Daping Wang.

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**Funding acquisition:** Shoucui Wang, Mei Li, Xue Xiang.

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**Resources:** Mei Li, Xujin Guo, Ya Chen.

**Software:** Mei Li, Daping Wang, Ya Chen.

**Supervision:** Mei Li.

**Visualization:** Chaoli Peng.

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