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Association of Perinatal Depressive Symptoms with Breastfeeding

ABSTRACT

Objective: Perinatal depression (PND) refers to depressive symptoms that occur in women during pregnancy and/or postpartum and is a common perinatal mental health problem. It is unclear whether early breastfeeding behavior is associated with PND symptoms in China. Therefore, this study aimed to investigate the association between PND symptoms and breastfeeding patterns for infants based on a large cohort.

Methods: A prospective study was conducted in a community cohort from March 2021 to December 2022. In this study, maternal depressive symptoms were assessed using the Edinburgh postnatal depression scale (EPDS). The assessments were carried out 1 week before and 1 month after delivery. The socio-demographic information of the mothers, their intention to breastfeed, and their feeding status were investigated one-on-one by the hospital's trained medical staff through self-designed questionnaires. The maternity information and physical examination results were obtained through the healthcare records of the patients.

Results: A total of 442 pregnant women were included in the study, and the total detection rate of PND was 29.41%, among which the detection rate of mild PND was 24.66%, and the detection rate of severe depression was 4.75%. About 61.99% of the mothers had exclusive breastfeeding within 1 hour after delivery, and 83.71% had exclusive breastfeeding within 24 hours after delivery. The proportion of mothers with PND symptoms and those without PND symptoms who exclusively breastfed for the first time after delivery was 71.54% and 91.67%, respectively. The median duration of exclusive breastfeeding for mothers without depressive symptoms was 3(1,5) months, while the median duration of exclusive breastfeeding for mothers with depressive symptoms was 2(1,3) months, indicating that the duration of exclusive breastfeeding for mothers without depressive symptoms was longer ($P < 0.05$).

Conclusion: There was an association between perinatal depressive symptoms and exclusive breastfeeding. Addressing perinatal depressive symptoms may extend the duration of exclusive breastfeeding.

Keywords: Breastfeeding, perinatal depression, breastfeeding initiation, maternal

Introduction

Maternal perinatal mental health problems are very common, and the most common perinatal mental health problem is depression.[1,2] Perinatal depression is a serious occurrence situation and an important global public health problem. Globally, the overall incidence is 11.9%, with prenatal depression occurring at rates of 7%-12%, and postpartum depression at rates of 10%-15%, which is characterized by a large population and a significant increase over the past 10 years.[3-5] Studies have shown that the incidence of depressive symptoms that may occur in women during pregnancy ranges from 9% to 46%, the incidence of postpartum depression ranges from 3% to 43%, and the incidence of perinatal depression is high.[6-8]

Breast milk is the ideal natural food for babies. Breastfeeding not only benefits emotional development but also enhances brain and sensory development.[9,10] Breastfed children are

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less likely to be overweight or obese and are less likely to develop type 2 diabetes or other metabolic diseases when they grow up.[11] In addition, studies have shown that mothers who breastfeed also have a reduced risk of breast and ovarian cancer.[12] The exclusive breastfeeding rate of infants within 6 months of age in developed countries has been about 60%, while the exclusive breastfeeding rate of infants within 6 months of age in China is only 27.6%, which is much lower than that in developed countries.[13] Maternal factors, infant factors, and social and family factors affect the implementation of breastfeeding, and the breastfeeding situation varies across the country, but there is a big gap between the overall and the goal of "50% exclusive breastfeeding rate for infants aged 0 to 6 months" in the Program for the Development of Chinese Children (2021-2030), and far lower than the international average.[14,15] In 2021, China published a policy named Action Plan for Breastfeeding Promotion (2021-2025). The plan aims to increase breastfeeding rates and advocate social and family support for breastfeeding.

Traditionally, breastfeeding research has focused on the biomedical aspects of lactation, the incidence of breastfeeding, and the risk factors associated with the initiation and cessation of breastfeeding, often ignoring the complex web of socio-demographic, economic, cultural, and emotional factors involved in the process. Some studies have shown that maternal depression is associated with an increased risk of early interruption of breastfeeding.[16,17] In turn, other studies have shown that breastfeeding is a protective factor for mothers against the onset of depressive symptoms, and that breastfeeding disruption is a stressor that leads to the development of the disorder.[18]

Among the many factors affecting breastfeeding, perinatal depression, a common psychological problem in the perinatal period, seriously threatens the health of both mother and child. Its potential impact on breastfeeding cannot be ignored. In fact, maternal perinatal depressive symptoms may negatively affect post-delivery breastfeeding outcomes.[19,20] Some foreign scholars have explored the influence of perinatal depression on breastfeeding and the relationship between causality and effect.[21,22] While discussions on the relationship between the 2 in China were still in the initial stage, mostly theoretical analysis of related influencing factors, and there were few reports on the impact of perinatal depression on breastfeeding. The relationship between breastfeeding and perinatal depressive symptoms is complex. While some research suggests that breastfeeding may be associated with perinatal depressive symptoms, there is some controversy. Based on the importance of maternal mental health and the significance of breastfeeding for maternal and infant health, this paper aims to elaborate on the relationship between perinatal depression and breastfeeding and explore the possible influencing factors, so as to provide a basis for breastfeeding-related intervention research.

MAIN POINTS

- *About 29.41% of mothers developed PND in the perinatal period in our study.*
- *Most mothers had a preference for exclusive breastfeeding.*
- *Perinatal depression may decrease the likelihood of exclusive breastfeeding.*

Material and Methods

Sample and Participants

In this study, all patients who delivered at the Maternal and Child Health Hospital from March 2021 to December 2022 were consecutively selected. Inclusion criteria: (1) age 18-45 years old; (2) give birth in the maternal and child health hospital, and complete all routine examinations during pregnancy; (3) pregnancy outcome of a single live birth; and (4) all mothers voluntarily participate and sign the informed consent. Exclusion criteria: (1) patients with a previous diagnosis of mental illness such as depression and (2) main survey information (feeding style). Loss of feeding intention, depression, and prolactin levels. This study was approved by the Ethics Committee of the Second People's Hospital of Fuzhou Maternal and Child Health Hospital (Approval No: 20210211). All subjects gave their informed consent for inclusion before they participated in the study.

Participants were assessed with the Edinburgh Postnatal Depression Scale (EPDS) 1 week before delivery, and their demographic information was obtained. At delivery, participants' mode of delivery, parity, oxytocin level, and wishes regarding feeding practices were collected. The Edinburgh Postnatal Depression Scale (EPDS) was assessed at 1 month after delivery, and participants' feeding practices and duration of breastfeeding were collected at the 6-month postpartum follow-up.

Measures

In this study, maternal depressive symptoms were assessed 1 week before and 1 month after delivery to describe the symptoms during pregnancy and within 4 weeks postpartum, respectively, using the EPDS, which is a scale developed by Cox et al. in 1987 for the screening of depression during pregnancy.[23,24] After the scale was introduced in clinical practice, number of studies have shown that EPDS can be used not only for postpartum depression screening but also for pregnancy depression screening.[25,26]

The EPDS scale consists of 10 questions related to fun, mood, anxiety, self-blame, fear, insomnia, sadness, self-injury, crying, and coping ability. Each question has 4 response choices, representing different degrees (0-3 points). Thus, the total score for each question is 0-3, that is, the total score for all questions is 0-30. The higher the score, the more pronounced the symptoms of PND. EPDS ≥ 10 was regarded as PND. Both assessments were less than 10, meaning that there was no PND. If one was above 10, it was considered that there was PND, while a positive result prevailed. If both were ≥ 10, the higher result was taken for the study. The reliability coefficients (Cronbach's alpha) for the EPDS in the study sample were 0.87. The socio-demographic information of the mothers, their intention to breastfeed, and their feeding status were investigated one-to-one by the hospital's trained medical staff through self-designed questionnaires.

The maternity information and physical examination results were obtained through healthcare records of the patients, including type of delivery, parity, and oxytocin levels. Infant feeding data were obtained from birth to 24 months of age through a self-administered follow-up diary. Determination of breastfeeding status: exclusive breastfeeding refers to the feeding of infants within 6 months of birth, only with the mother's milk, without adding any other dairy

products or animal milk. Breastfeeding was measured using a questionnaire designed to collect a child's dietary history and to measure the time and duration of breastfeeding initiation.

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) version 27.0 (IBM SPSS Corp.; Armonk, NY, USA) was used for statistical analysis. Continuous variables were first tested for a normal distribution using the Shapiro–Wilk method. If it was a normal distribution (when used parametric test), descriptive statistics were presented as mean ± SD. If it was not a normal distribution (when used non-parametric test), it was given as median [M (Q1-Q3)]. Categorical variables were presented as frequency and percent [n(%)]. The differences in normally distribution (oxytocin levels) variables between groups were compared using Student's *t*-test. Variables (age) with a skewed distribution were compared using the Mann–Whitney *U*-test. Categorical variables were tested using Pearson chi-square tests. $P < .05$ was considered statistically significant.

Results

A total of 466 participants were recruited, 24 of whom did not complete postpartum follow-up (could not be reached after 3 attempts to contact them by telephone and 1 attempt in person at the address provided on different dates and times) were excluded from the analysis cohort, and data from 442 participants were finally analyzed. Of all the continuous variables, only oxytocin met normality ($P = .426$).

Table 1 shows the socio-demographic, gestational, and perinatal characteristics of the women who participated in the study.

Table 1. Socio-demographic and Perinatal Characteristics (n = 442)

Variable	Participants (n)	Rate (%)
Age (years)		
<25	78	17.65
25-35	331	74.89
>35	33	7.47
Socioeconomic level		
<5000	254	57.47
5000-15 000	159	35.97
>15 000	29	6.56
Education level		
Secondary school complete	243	54.98
Higher education complete	199	45.02
Type of delivery		
Vaginal	308	69.68
Cesarean	134	30.32
Parity		
Nulliparous	296	66.97
Multiparous	146	33.03
Initiation of breastfeeding (hours)		
<1	274	61.99
1-24	96	21.72
>24	72	16.29
Breastfeeding advice		
Yes	141	31.90%
No	301	68.10%

Maternal age ranged from 17 to 43 years, with an average age of 29.01 years. The majority of mothers were aged 25-35 (74.89%), 54.98% had a high school education or less, and 57.47% had a monthly income of less than 5000. In total, 69.68% of the mothers gave birth by vaginal delivery. In total, 61.99% of the women had exclusive breastfeeding within 1 hour after delivery, and 83.71% had exclusive breastfeeding within 24 hours after delivery. In addition, only 31.90% of mothers had received breastfeeding guidance.

In this study, the total detection rate of PND was 29.41%. Table 2 compares the socio-demographic and maternal characteristics of mothers with different PND states. The results showed that age, economic level, education level, delivery mode, oxytocin level, and whether they had received breastfeeding guidance had no significant influence on PND symptoms. The rate of nulliparous was higher in PND patients (73.08% vs. 63.14%), and the difference was statistically significant ($P < .05$).

In this study, 408 participants (92.31%) expressed the desire to exclusively breastfeed (Table 3), and the proportion of participants with PND who did not want to breastfeed was higher (82.35%), with statistical significance ($P < .05$).

Table 2. Comparison of Demographic and Maternal Characteristics of Parturients with Different Psychological Statuses

	PND		
Variable	**Yes (n = 130)**	**No (n = 312)**	***P***
Age (years)	28.0 (25.0, 32.0)	29.0 (26.0, 33.0)	.095
Socioeconomic level [n (%)]			.581
<5000	73 (56.15)	181 (58.01)	
5000-15 000	46 (35.39)	113 (36.22)	
>15 000	11 (8.46)	18 (5.77)	
Education level [n (%)]			.459
Secondary school complete	75 (57.69)	168 (53.85)	
Higher education complete	55 (42.31)	144 (46.15)	
Type of delivery [n (%)]			.204
Vaginal	85 (65.38)	223 (71.47)	
Cesarean	45 (34.62)	89 (28.53)	
Breastfeeding advice [n (%)]			.906
Yes	42 (32.31)	99 (31.73)	
No	88 (67.69)	213 (68.27)	
Parity [n (%)]			.044
Nulliparous	95 (73.08)	197 (63.14)	
Multiparous	35 (26.92)	115 (36.86)	
Mean oxytocin levels (pg/mL)	18.01 ± 2.92	17.52 ± 3.46	.152

PND, Perinatal depression.

Table 3. Effect of PND Status on Intention to Exclusively Breastfeed

	PND		
Variables	**Yes (n = 130)**	**No (n = 312)**	***P***
Hoping to conduct exclusive breastfeeding* [n (%)]	101 (77.69)	307 (98.39)	<.001
Hoping to conduct non-exclusive breastfeeding [n (%)]	29 (22.31)	5 (1.61)	

*Exclusive breastfeeding is defined as babies being born drinking only breast milk.
PND, Perinatal depression.

Table 4. The Effect of Postnatal Depression on the Duration of Exclusive Breastfeeding

Variables	PND		*P*
	Yes (n = 130)	No (n = 312)	
Number of mothers with exclusive breastfeeding [n (%)]	93 (71.54)	286 (91.67)	<.001
Duration of exclusive breastfeeding (months) [M (Q1-Q3)]	2.0 (1.0, 3.0)	3.0 (1.0, 5.0)	<.001
<1 month [n (%)]	45 (34.41)	92 (29.37)	.519
1-6 months [n (%)]	71 (54.84)	192 (61.54)	
>6 months [n (%)]	14 (10.75)	28 (9.09)	

PND, Perinatal depression.

Table 4 shows a comparison of the duration of exclusive breastfeeding in mothers with and without symptoms of PND. For mothers with or without PND, most of them breastfed their infants during the first postpartum feeding 93(71.54%) vs. 286(91.67%). The median duration of exclusive breastfeeding for mothers without depressive symptoms was 3(1,5) months, while the median duration of exclusive breastfeeding for mothers with depressive symptoms was 2(1,3) months, indicating that the duration of exclusive breastfeeding for mothers without depressive symptoms was longer ($P < .05$). Compared to mothers without PD symptoms, mothers with PD symptoms were more likely to provide supplemental formula to their babies in the first year of life.

Discussion

Symptoms of perinatal depression occur in about 10%-20% of parturients, some of whom may require medication. The relationship between breastfeeding and perinatal depressive symptoms is somewhat controversial. Some studies have shown that breastfeeding is associated with perinatal depressive symptoms because breastfeeding requires a lot of time and energy from the mother and may cause the mother to feel tired and stressed.[16,17] Additionally, breastfeeding may also be associated with negative emotions in the mother, such as anxiety and depression.[27,28] However, some studies have shown that breastfeeding is not associated with perinatal depressive symptoms, and other factors may contribute to the occurrence of perinatal depressive symptoms, such as family economic status, marital relationship, parent–child relationship, the way the baby was born, and other factors may affect women's mood and behavior.[29,30]

This study showed that the total detection rate of depression in this region was 29.41%, among which the detection rate of mild PND was 24.66%, and that of severe PND was 4.75%, which was similar to the domestic and international levels.[31] This study shows that PND symptoms are associated with the duration of breastfeeding, which is consistent with previous findings that women with PND have a higher risk of being exclusively/partially breastfed for a shorter period.[32,33] The explanation for the association between depressive symptoms and poor feeding outcomes may be that postnatal depression may negatively affect maternal self-esteem and cognition.[34] Additionally, women with depressive symptoms may have more inadequate interactions with their newborns, such as less touch, sensitivity, and skin-to-skin contact, which in turn increases the risk of breastfeeding difficulties, lack of confidence in their ability to breastfeed their baby, and decreased satisfaction with how their baby is fed.[35] The study also found that women who did not give birth had a higher rate of depression during their first pregnancy. This may be due to the unknown and not received prenatal training, so the maternal spirit, and psychological fluctuations, are more likely to produce anxiety, excitement, panic, depression, and other pressures, thus causing harm to maternal and child health, especially when the delivery of their own cannot establish the most confident, will increase the psychological burden.[36,37] In addition, this study found that the proportion of pregnant women with PND who did not want to breastfeed was significantly higher than those without depression. Maternal with depression are more likely to have low mood, fatigue, poor diet, and poor sleep, which may cause them to be less active in breastfeeding behavior. Clinical attention should be paid to the change of maternal mood and the impact on the willingness to feed, to prevent the spontaneous interruption of breastfeeding behavior.

There were several limitations in this study. Firstly, the samples included in the current study were fairly homogeneous, as participants were primarily from 2 hospitals in the same city, had low levels of education, and had low average household incomes, representing certain segments of the population. Therefore, caution should be exercised when generalizing the results to the general population of women of childbearing age in China. Secondly, the measurement was carried out using self-assessment tools, which may have had a negative influence on our results. It is worth considering conducting clinical interviews to assess the symptoms of depression in the future. Although we have adjusted for a range of potential feeding style confounding factors, there are many other relevant prenatal and perinatal factors that were not included in our analysis, such as partner relationships, adverse life events, prenatal depressive symptoms, the efficacy of breastfeeding, and more. These unmeasured factors may influence the actual association between maternal PND symptoms and feeding patterns. In addition, the postnatal depression symptoms in this study were based on a single assessment and may not be sufficient to determine a clear longitudinal association.

Therefore, a well-designed, large-scale cohort study should be further conducted to provide a clear actionable definition of infant feeding outcomes and postpartum PND symptoms to explore longitudinal associations between PND symptoms and breastfeeding.

This study provided more evidence for the role of PND symptoms in relation to the duration of exclusive breastfeeding. Addressing perinatal depressive symptoms may extend the duration of exclusive breastfeeding.

Availability of Data and Materials: *The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.*

Ethics Committee Approval: *This study was approved by the Ethics Committee of Second People's Hospital of Fuzhou Maternal and Child Health Hospital (Approval No: 20210211).*

Informed Consent: *Informed consent was obtained from the patients who agreed to take part in the study.*

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