

Preplanned Studies

Relationship between Maternal Postpartum Intention to Breastfeed and Actual Breastfeeding Duration — Four Provinces, China, 2015–2017

Chunying Zhang¹; Wei Zhao¹; Xiaoping Pan¹; Jiangli Di¹; Aiqun Huang^{1,†}

Summary

What is already known about this topic?

Several studies have reported that maternal antenatal intention to breastfeed is a strong predictor of actual breastfeeding duration. However, little research has investigated whether maternal postpartum intention also extends breastfeeding duration.

What is added by this report?

Maternal postpartum intention to breastfeed was a protective factor for extending actual breastfeeding duration after controlling potential confounders.

What are the implications for public health practice?

It is crucial to address and promote intrinsic and extrinsic factors that influence a mother's intention to breastfeed after delivery, thereby extending the actual breastfeeding duration.

Breast milk is universally recognized as the optimal source of nutrition for infants. The World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) recommend exclusive breastfeeding until 6 months old, with continued breastfeeding to 2 years old or beyond (1). Nevertheless, breastfeeding duration in China is still far below the global nutrition targets (2). Several studies have reported that maternal antenatal intention to breastfeed is a strong predictor of actual duration of breastfeeding (3). Maternal postpartum intention could be much more associated with actual breastfeeding duration because of shorter time intervals and fewer impeding factors present during pregnancy, compared to maternal antenatal intention. However, very little research has been done to determine if the maternal postpartum intention to breastfeed increases the duration of feeding in some mothers (4). This study was performed to examine the relationship between maternal postpartum intention and actual breastfeeding duration to provide data on the impact

of extended breastfeeding duration. Data used in this study (e.g., infants' breastfeeding status) were drawn from "Maternal and Child Health Monitoring Project", which was implemented by the National Center for Women and Children's Health of China CDC in five districts in four provinces (Hebei, Liaoning, Hunan, and Fujian) from 2015–2017. The results showed that maternal postpartum intention to breastfeed was a protective factor for extending actual breastfeeding duration. Addressing key factors influencing a mother's postnatal intention to breastfeed may be important for prolonging this duration.

The data were collected during a surveillance project founded by the Central Financial Project called the "Maternal and Child Health Monitoring Project" (2015–2019), which aimed to promote infants' health. This surveillance project was implemented by the National Center for Women and Children's Health of China CDC. Five districts in four provinces (Hebei, Liaoning, Hunan, and Fujian) were selected as monitoring sites in this project. These districts were selected based on their good compliance and their existing management systems for child health according to the requirements of the National Basic Public Health Service Project covering the whole area. Pregnant women in their third trimester were recruited as participants, and their children were followed for 3 years. To be included in the project, pregnant women had to have a gestational age between 28 and 36 weeks, have a singleton birth, and have lived in the monitoring site for more than half a year. Additionally, they would have to be registered residents at the site, be expected to live in the monitoring site until the child reaches 3 years of age and ensure their child receives routine child health care, possess a handbook for maternal health care containing complete records of antenatal examination, and agree to participate for the entire duration of the follow-up including the provision of informed consent. Pregnant women with mental illness, brain diseases, cardiovascular and cerebrovascular diseases, endocrine diseases, and cancer

were excluded. Ultimately, 2,731 mother–infant pairs were included in the project.

Of the 2,731 mother–infant pairs recruited; 228 pairs were excluded from the study because breastfeeding information was missing. Ultimately, 2,503 eligible mother–infant pairs were assessed in this study. Data on maternal postpartum intention to breastfeed were acquired from mothers 1 month after birth. Investigators collected information on breastfeeding duration at face-to-face physical examinations of infants at two follow-up time points (ages 6 and 12 months). Both maternal postpartum intentions to breastfeed and the actual duration of breastfeeding were divided into three classes: ≤ 6 months, 7–12 months, and >12 months. Breastfeeding was defined as feeding with milk (direct from the breast or expressed) with or without other drinks, formula, or other infant foods (5).

The chi-square test was used to investigate the correlation between maternal postpartum intention to breastfeed and actual breastfeeding duration. Multinomial logistic regression was performed to analyze the association between the maternal postpartum intended period of breastfeeding and the actual period of breastfeeding after controlling potential confounders that could be related to breastfeeding duration (including sex, gestational age at birth, method of delivery, birth weight, the timing of beginning complementary food, maternal age, parity, maternal education, annual family income, and region of the country). All data analyses were performed in SAS (version 9.4; SAS Institute). $P < 0.05$ was considered statistically significant.

The sociodemographic characteristics of the study population are shown in Table 1.

Of the mothers who intended to breastfeed up to 6 months, only 50.72% were still breastfeeding at 6 months after birth, compared to 89.58% of mothers who had intended to breastfeed for 7 to 12 months and 94.30% of mothers who had intended to breastfeed for more than 12 months. There was a positive correlation between maternal postpartum intention to breastfeed and actual breastfeeding duration (Pearson contingency coefficient=0.42; $P < 0.05$) (Table 2).

As shown in Table 3, after adjustment for confounding factors, multinomial logistic regression showed that relative to mothers intending to breastfeed less than 6 months at 1 month after birth, the intention to breastfeed more than 6 months or more than 12 months was a protective factor for extending

actual breastfeeding duration to more than 6 months [$OR=5.77$, 95% confidence interval (CI)=4.04–8.24; $OR=8.61$, 95% $CI=5.93$ –12.50, respectively] and to more than 12 months ($OR=9.47$, 95% $CI=6.09$ –14.75; $OR=21.26$, 95% $CI=13.84$ –32.66, respectively).

Moreover, the timing for beginning complementary food, parity, and region of the country was statistically significantly associated with actual breastfeeding duration ($P < 0.05$). Starting complementary food ≥ 6 months, multiparity, and living in South China were protective factors for longer breastfeeding duration.

DISCUSSION

In the monitored regions, 87.06% and 50.46% of mothers continued breastfeeding at 6 months and 12 months, respectively, which was far below global nutrition targets. The result of this study suggests that health guidelines and education should continue to be strengthened in monitoring regions to extend the duration of breastfeeding. In addition, this study found that maternal intention to breastfeed 1 month after birth was a protective factor for extending actual breastfeeding duration after controlling potential confounders, which implied that promoting a mother's postnatal intention to breastfeed may be an essential measure for extending breastfeeding duration. Furthermore, regional variation was also seen in breastfeeding duration, the reasons for which might be different rates of maternal postpartum intention among the regions. The rate of maternal postpartum intention to breastfeed until 7–12 months was 37.78% in Liaoning and 69.87% in Hunan.

Li et al. determined that the mean duration of breastfeeding in China from 2007–2018 was only 10 months and a wide gap in the prevalence of breastfeeding remained among different cities (6), consistent with this study. Studies in China conducted in Shihezi (7) and Sichuan (8) also reported a positive association between maternal postpartum intention and actual breastfeeding duration. In a study in Thailand, mothers who intended to breastfeed more than 6 months after delivery were more likely to be breastfeeding at 6 months (4). In another study, infants whose mothers had the postpartum intention to breastfeed longer than 6 months were more likely to have been breastfed at 6 months (9); our results are consistent with these findings. Furthermore, even if mothers have a strong intention to breastfeed, they cannot achieve successful breastfeeding in reality because they are primiparous, concerned about the

TABLE 1. Sociodemographic characteristics of 2,503 mother–infant pairs in five districts of four provinces (Hebei, Liaoning, Hunan, and Fujian) in China from 2015–2017.

Sociodemographic characteristic	Total (n=2,503)	
	Number	Proportion (%)
Sex of infants		
Male	1,329	53.10
Female	1,174	46.90
Gestational age at birth (week)		
<37	87	3.48
≥37	2,416	96.52
Method of delivery		
Vaginal	1,325	52.94
Cesarean	1,178	47.06
Birth weight of infants (kg)		
<2.50	67	2.68
2.50–4.00	2,313	92.41
>4.00	123	4.91
Timing for starting complementary food (month)		
<6	1,572	62.80
≥6	931	37.20
Maternal age (year)		
<25	339	13.54
25–29	1,220	48.74
30–34	675	26.97
≥35	269	10.75
Parity		
Primiparous	1,156	46.18
Multiparous	1,347	53.82
Maternal education		
Less than high school	804	32.12
High school	650	25.97
College or above	1,049	41.91
Annual family income (CNY)		
<30,000	347	13.86
30,000–49,999	671	26.81
50,000–79,999	616	24.61
≥80,000	864	34.52
Missing	5	0.20
Region of the country*		
North China	630	56.85
South China	450	43.15

Abbreviation: CNY=China Yuan.

* North China includes Hebei and Liaoning provinces; South China includes Hunan and Fujian provinces.

TABLE 2. Correlation between maternal postpartum intention to breastfeed and actual breastfeeding duration.

Maternal postpartum intention to breastfeed (months)	Actual breastfeeding duration, <i>n</i> (%)			Total	Pearson contingency coefficient	χ^2	<i>P</i>
	≤6 months	7–12 months	>12 months				
≤6	137 (49.28)	81 (29.14)	60 (21.58)	278	0.42	536.14	<0.0001
7–12	133 (10.42)	600 (46.99)	544 (42.60)	1,277			
>12	54 (5.70)	235 (24.79)	659 (69.51)	948			
Total	324 (12.94)	916 (36.60)	1,263 (50.46)	2,503			

TABLE 3. Associations between maternal postpartum intention to breastfeed and other confounding factors with actual breastfeeding duration.

Factors	Actual breastfeeding duration (7–12 months)*		Actual breastfeeding duration (12 months)*	
	OR (95% CI)	<i>P</i>	OR (95% CI)	<i>P</i>
Maternal postpartum intention to breastfeed, months (ref. ≤6)				
7–12	5.77 (4.04–8.24)	<0.0001	8.61 (5.93–12.50)	<0.0001
>12	9.47 (6.09–14.75)	<0.0001	21.26 (13.84–32.66)	<0.0001
Sex of infants (ref. male)				
Female	1.13 (0.85–1.51)	0.394	1.16 (0.87–1.53)	0.311
Gestational age at birth, weeks (ref. <37)				
≥37	1.52 (0.73–3.18)	0.264	1.87 (0.90–3.91)	0.095
Method of delivery (ref. vaginal)				
Cesarean	0.87 (0.64–1.17)	0.354	0.86 (0.64–1.15)	0.315
Birth weight, kg (ref. 2.50–4.00)				
<2.50	0.56 (0.24–1.31)	0.181	0.49 (0.21–1.13)	0.093
>4.00	0.91 (0.46–1.80)	0.793	1.11 (0.59–2.11)	0.743
Timing for starting complementary food, months (ref. <6)				
≥6	1.85 (1.32–2.59)	0.0004	2.91 (2.08–4.06)	<0.0001
Maternal age, years (ref. 25–29)				
<25	1.49 (0.93–2.37)	0.101	1.48 (0.93–2.39)	0.100
30–34	0.83 (0.59–1.16)	0.272	0.90 (0.65–1.26)	0.537
≥35	0.83 (0.52–1.35)	0.462	0.98 (0.61–1.58)	0.928
Parity (ref. Primiparous)				
Multiparous	1.52 (1.09–2.11)	0.015	2.01 (1.45–2.79)	<0.0001
Maternal education (ref. Less than high school)				
High school	0.78 (0.54–1.11)	0.168	0.81 (0.57–1.15)	0.240
College or above	0.92 (0.63–1.35)	0.669	0.84 (0.58–1.22)	0.369
Annual family income, CNY (ref. <30,000)				
30,000–49,999	1.41 (0.88–2.25)	0.158	1.53 (0.97–2.39)	0.065
50,000–79,999	1.03 (0.64–1.63)	0.916	1.33 (0.85–2.08)	0.209
≥80,000	0.76 (0.49–1.19)	0.229	1.16 (0.75–1.78)	0.507
Region of the country (ref. North China)				
South China	5.46 (3.81–7.81)	<0.0001	0.74 (0.53–1.03)	0.076

Abbreviation: CNY=China Yuan.

* Actual breastfeeding duration <6 months is the reference category.

amount of breast milk or pain, lack professional support, or are required to return to an unsupportive work environment after giving birth (10–11). Thus, it may be that enhancing mothers' intrinsic power, including increasing their self-efficacy regarding breastfeeding, and their extrinsic support power, such as improving the support they receive from family and society for breastfeeding during the postnatal period, can enhance maternal breastfeeding postpartum intention, including breastfeeding duration intention.

The present study had some limitations. First, it was conducted at five monitoring sites in four provinces of China; the results cannot be generalized to China as a whole. Second, the need to return to work after giving birth may reduce overall breastfeeding duration; however, this variable was not collected in this study. Third, the presence of maternal illness, lack of breast milk, nipple pain during breastfeeding, and other factors that can affect breastfeeding were not considered, which may have affected the accuracy of the results. Finally, maternal intention to breastfeed at 1 month after birth may be more correlated with actual breastfeeding duration, though it seems that it is more practical to educate pregnant women before delivery or those who are hospitalized after delivery and improve their intention to breastfeed compared to educate mothers at 1 month after birth and improve their breastfeeding duration.

Acknowledgements: We sincerely appreciate the support of the administrators, child health physicians, and investigators in the five monitoring regions and greatly appreciate the support of all of the families that participated in this project.

Conflicts of interest: No conflicts of interest.

doi: 10.46234/ccdcw2022.233

Corresponding author: Aiqun Huang, aqhuang@chinawch.org.cn.

¹ National Center for Women and Children's Health, Chinese Center

for Disease Control and Prevention, Beijing, China.

Submitted: October 24, 2022; Accepted: November 25, 2022

REFERENCES

1. World Health Organization. Infant and young child feeding. 2022. <https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding>. [2022-6-20].
2. Wu HH, Zhang YQ, Zong XN, Li H. Breastfeeding rates of children under two years old in nine cities of China from 1985 to 2015: a comparison between urban and suburban areas. *Chin J Perinat Med* 2019;22(7):445 – 50. <http://dx.doi.org/10.3760/cma.j.issn.1007-9408.2019.07.004>. (In Chinese).
3. Topothai C, Topothai T, Suphanchaimat R, Patcharanarumol W, Putthasri W, Hangchaowanich Y, et al. Breastfeeding practice and association between characteristics and experiences of mothers living in bangkok. *Int J Environ Res Public Health* 2021;18(15):7889. <http://dx.doi.org/10.3390/ijerph18157889>.
4. Jirakittidul P, Panichyawat N, Chotrungrote B, Mala A. Prevalence and associated factors of breastfeeding in women with gestational diabetes in a University Hospital in Thailand. *Int Breastfeed J* 2019;14:34. <http://dx.doi.org/10.1186/s13006-019-0227-8>.
5. World Health Organization. Indicators for assessing infant and young child feeding practices: definitions and measurement methods. Geneva: World Health Organization. 2021. <https://www.who.int/publications/i/item/9789240018389>.
6. Li Q, Tian JL, Xu FL, Binns C. Breastfeeding in China: a review of changes in the past decade. *Int J Environ Res Public Health* 2020;17(21):8234. <http://dx.doi.org/10.3390/ijerph17218234>.
7. Liu P, Qiao LJ, Xu FL, Zhang M, Wang Y, Binns CW. Factors associated with breastfeeding duration: a 30-month cohort study in northwest China. *J Hum Lact* 2013;29(2):253 – 9. <http://dx.doi.org/10.1177/0890334413477240>.
8. Tang L, Lee AH, Binns CW. Factors associated with breastfeeding duration: a prospective cohort study in Sichuan Province, China. *World J Pediatr* 2015;11(3):232 – 8. <http://dx.doi.org/10.1007/s12519-014-0520-y>.
9. Bosnjak AP, Grguric J, Stanojevic M, Sonicki Z. Influence of sociodemographic and psychosocial characteristics on breastfeeding duration of mothers attending breastfeeding support groups. *J Perinat Med* 2009;37(2):185 – 92. <http://dx.doi.org/10.1515/JPM.2009.025>.
10. Wallenborn JT, Perera RA, Wheeler DC, Lu J, Masho SW. Workplace support and breastfeeding duration: the mediating effect of breastfeeding intention and self-efficacy. *Birth* 2019;46(1):121 – 8. <http://dx.doi.org/10.1111/birt.12377>.
11. Symon AG, Whitford H, Dalzell J. Infant feeding in Eastern Scotland: a longitudinal mixed methods evaluation of antenatal intentions and postnatal satisfaction-the Feeding Your Baby study. *Midwifery* 2013;29(7):e49 – 56. <http://dx.doi.org/10.1016/j.midw.2012.06.017>.