Investigation of breastfeeding practices and influencing factors among Chinese mothers in a lactation clinic: A cross-sectional study

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Running head: Investigation of breastfeeding practice

**Abstract**

**Aim:** The aim of this study was to explore and describe the breastfeeding status and the breastfeeding problems of women visiting the lactation clinic, and identify factors that influenced maternal breastfeeding practices.

**Methods:** A cross-sectional survey was distributed to 948 Chinese mothers. Multinomial logistic regression was used to evaluate the associations between risk factors and breastfeeding patterns at different postpartum stages.

**Results:** Among 948 Chinese mothers, 389 (41.0%) visited the lactation clinic for milk supply problems, 126 (13.3%) for nipple problems, 230 (24.3%) for breast problems, 85 (9.0%) for breastfeeding methods, 69 (7.3%) for counseling related to breastfeeding knowledge, and 49 (5.1%) for infant problems. Breastfeeding problems were distinct at different postpartum stages. Within 4 weeks after delivery, participants who had no history of disease were more prone to exclusive breastfeeding (OR = 8.041, 95% CI [1.526, 42.376]) or partial breastfeeding (OR = 4.822, 95% CI [1.157, 20.103]) compared to formula feeding. Moreover, between 4 weeks and 3 months postpartum, participants whose intended breastfeeding time was shorter were more prone to formula feeding than to exclusive breastfeeding (OR = 0.379, 95% CI [0.146, 0.980]) or partial breastfeeding (OR = 0.369, 95% CI [0.139, 0.980]).

**Conclusion:** There is great need to combine a routine post-discharge lactation visit with antenatal breastfeeding instruction so as to improve breastfeeding initiation and prevent and solve breastfeeding problems better and more efficiently.

**Keywords:** breastfeeding status, breastfeeding problem, breastfeeding practice, lactation clinic

**1 INTRODUCTION**

Breastfeeding provides a lot of health benefits for infants and mothers alike.1 Due to its immunological and anti-inflammatory properties, human milk can protect mothers and children against diverse diseases.2 The Centers for Disease Control and Prevention and the American Academy of Pediatrics recommend exclusive breastfeeding for the first six months of life, and partial breastfeeding until the baby is one year old.3 Moreover, the World Health Organization (WHO) aims to obtain a 50% of exclusive breastfeeding rate by 2025, which will cut down the maternal and child mortality.4,5

With the aim of achieving this target, WHO has published recommendations to promote breastfeeding.5 All hospitals associated with birth are encouraged to provide the breastfeeding support to a great extent by implementing optimal Baby-Friendly Hospital Initiative (BFHI) breastfeeding policies, hiring specialized healthcare professionals, or implementing community peculiar programs and strategies supervised by the community leaders to support breastfeeding mothers when they got home from the maternal hospital after childbirth.5 These recommendations are essential to ensure sustaining support for breastfeeding mothers postnatally.6 Despite many efforts to promote breastfeeding in China, exclusive and continued breastfeeding rates remain lower than the WHO’s target.2 According to a cross-sectional survey of 5668 children 0-6 months in Shanghai, China, rates of exclusive breastfeeding were 56.8% at 1 month, 60.0% at 2-3 months, and only 30.3% at 6 months of age.7 Surveyed rates of exclusive and continued breastfeeding were mostly lower and do not reach the WHO’s target.

A number of factors influence a woman’s breastfeeding decision.3 Besides demographic factors and psycho-social factors (such as working, breastfeeding intention, self-efficacy and knowledge), behavioral factors, such as frequent feeding and inaccurate breastfeeding methods have been shown to play an important role in successful breastfeeding. Most first-time mothers report experiencing early breastfeeding barriers, which make it difficult to meet their desired breastfeeding targets.8 However, there are professional experts in clinical lactation, International Board Certified Lactation Consultants (IBCLCs), who provide individualized breastfeeding counseling and consultation in many countries. The professional consultation provided by IBCLCs may help to resolve breastfeeding difficulties and offer evidence-based and professional management of lactation.9 A recent study found that implementing education and post discharge lactation consultation organized by IBCLCs may enhance mothers’ breastfeeding self-efficacy and increase the rate of exclusive breastfeeding.10 Thus, there is a need to prompt hospitals to create IBCLC positions in outpatient settings to focus on breastfeeding problems and duration.

In response to this need, lactation consultation clinics have been opened by IBCLCs staff in various obstetric institutions in Shanghai, China, since 2014. In practice, they have implemented major interventions to promote breastfeeding among pregnant women undergoing perinatal examinations in hospitals and as a regular part of obstetric education. These interventions include recommending that women read a book authored by the IBCLCs on breastfeeding and offering breastfeeding courses during the antenatal period, and demonstrating breastfeeding practices before discharge. However, many mothers still had various breastfeeding problems after giving birth, which may greatly increase the risk of breastfeeding cessation.

The purposes of the study were (a) to explore and describe the breastfeeding status and the breastfeeding problems of women visiting the lactation clinic, and (b) to identify the factors that influenced maternal breastfeeding practice.

**2 METHODS**

A cross-sectional design was used. In this paper, we focused on open-ended interview and used multinomial logistic regression analysis as an analytic approach. This study was approved by the Institutional Review Board (IRB) of the research hospital in 2017 (IRB Protocol Number 2016-71) and conducted from April to December 2017. Women who were interested and eligible for the study were made aware of the study details and provided informed consent. Recruitment of the participants using a convenience sampling method was conducted at a lactation clinic in a maternity hospital which is a specialized, tertiary (Grade 3, Class A) hospital in Shanghai and has approximately 9000 deliveries per year. Those diagnosed with intellectual disabilities were excluded.

Each woman completed an interview at the time of her enrollment. Interviews ranged from 30 to 40 minutes. The data were collected by the IBCLCs. Inter-rater reliability was enhanced by the development and use of a standardized assessment scheme prior to data collection to reduce the possibility of information bias. All the transcripts were reviewed and any differences reconciled by the lead researcher responsible for the data collection. The lactation clinic was open five days each week from 1:30 p.m. to 5:00 p.m. Maximizing the flexibility of the schedule increases the likelihood that all women who need breastfeeding consultation can access the IBCLC services. Appointments were available by scheduling or walk-in during the clinic’s open hours. At the lactation clinic visits, the IBCLCs first evaluated the breastfeeding pattern and investigated how breastfeeding was progressing. Then, IBCLCs recorded all of the breastfeeding related problems reported by the mothers. During this consultation, the IBCLCs answered questions and addressed any issues or concerns about breastfeeding.

Participants were asked about their feeding behaviors within the previous 24 hours. Based on the definition recommended by WHO,11 feeding patterns were characterized into three categories: exclusive breastfeeding, partial breastfeeding, and formula breastfeeding. Exclusive breastfeeding (no other liquid or solid given to infant, or including vitamins, minerals, or water given to babies in addition to breastfeeding). Partial breastfeeding was classified as high (mother’s milk ≥ 80%), medium (mother’s milk = 20-79%), or low (mother’s milk < 20%). Formula feeding referred to being fed exclusively on non-human milk.12

The investigation scale of breastfeeding practice was self-designed and was used as a routine record sheet for breastfeeding clinic by four IBCLCs. Measures include intended breastfeeding time (0-6 months, 6-12 months, or ≥ 12 months), source of breastfeeding knowledge (from medical staff, others, or none), family support for breastfeeding (good or bad), milking technique (by hand, breast pump, or none), breastfeeding related problems leading to the mother visiting the lactation clinic, such as breast milk supply problems (breast milk insufficiency, hypergalactia, hypogalactia, or different milk volume in each breast), nipple problems (sore or cracked nipples), breast problems (lactiferous duct obstruction, distending pain in breasts, mastitis, milk blister, galactapostema, different size of each breast, or supernumerary breast), breastfeeding method (poor nipple contact or frequent breastfeeding), counseling related to breastfeeding knowledge (yes or no), and infant related problems (slow weight gain, choking on milk, sucking difficulty, or other). All of the items originated from interviews with mothers.

We interviewed women to ascertain socio-demographic and obstetric characteristics at the time of enrollment, including age, education, place of residence, history of disease, medication usage, hospital where baby was born, delivery method, gestational weeks at birth, parity, neonatal birth weight, history of breastfeeding, and complications during delivery.

All statistical analyses were performed using SPSS 26.0. Continuous variables are expressed as mean ± standard deviation, and categorical variables as frequencies. Cross tabulation and measures of association were applied using χ2 tests and Fishers exact tests, where appropriate, to explore the factors significantly associated with breastfeeding patterns. Parameters found to be statistically significant (*p* < .05) in univariate analysis were included into multinomial logistic regression models as independent variables. Due to the small number of participants over 3 months postpartum, we separately evaluated the associations between breastfeeding patterns and risk factors by calculating the odds ratios (OR) and 95% confidence intervals (CI) among the participants who were within 4 weeks postpartum and between 4 weeks and 3 months postpartum.

**3 RESULTS**

**3.1 Socio-demographic and obstetric characteristic**

Of the 980 mothers who sought lactation services during the study period at the research lactation clinic, a total of 948 women met eligibility criteria and participated in the current study. Table 1 presents the socio-demographic and obstetric characteristics of the study sample. The mean maternal age was 30.86 ± 3.57 years (range 22 - 45 years). Most (89.9%) women were primiparous women and 10.1% were multiparous. The majority of women (99.1%) delivered at ≥ 37 weeks gestational age, with 0.9% delivering at < 37 weeks gestational age. The rate of cesarean section was 26.7%, with most infants being delivered vaginally (73.3%). The mean birth weight was 3333.51g ± 531.32g (range 1960-4700g).

**3.2 Breastfeeding status**

Among the 948 participants, 216 (22.8%) were less than 4 weeks postpartum, 667 (70.4%) were between 4 weeks and 3 months postpartum, and 65 (6.8%) were more than 3 months postpartum. The breastfeeding patterns of the participants are presented in Table 2. The prevalence of exclusive breastfeeding within 4 weeks postpartum, between 4 weeks and 3 months postpartum, and over 3 months postpartum are 43.1%, 50.4%, and 82.8%, respectively. Only 10.1% of participants intended to breastfeed less than 6 months. Breastfeeding education was received from medical staff for 36.0% of women and from other sources, such as books, websites, publicity materials, and private postnatal care centers for 16.2% of participants. However, 47.8% of the participants reported that they had never received breastfeeding education. Nearly all participants (99.5%) reported that their family supports for breastfeeding were good. More than half (63.0%) of the participants never milked, 4.7% milked by hand, and 32.3% milked by breast pump.

**3.3 Breastfeeding related problems**

Table 3 summarizes all the breastfeeding related problems that led to the mothers visiting the lactation clinic. 389 participants (41.0%) visited for milk supply problems, 126 (13.3%) for nipple problems, 230 (24.3%) for breast problems, 85 (9.0%) for breastfeeding methods, 69 (7.3%) for counseling related to breastfeeding knowledge, and 49 (5.1%) for infant problems. Table 4 showed the most common breastfeeding related problems during different postnatal stages. Human milk insufficiency, poor nipple contact, sore nipples, lactiferous duct obstruction, and distending pain in breasts were most common within 3 months postpartum, while human milk insufficiency, sore nipples, lactiferous duct obstruction, and counseling related to breastfeeding knowledge were most prevalent over 3 months postpartum.

**3.4 Factors associated with breastfeeding pattern at different stage postpartum**

Table 5 presents the ORs and 95% CIs for the associations between risk factors and breastfeeding patterns at different postpartum stages. A Wald likelihood ratio test indicated that the overall equation was statistically significant and the Cox & Snell pseudo-R2 was acceptable. Only history of disease was found to be significantly associated with breastfeeding patterns within 4 weeks postpartum (*p* < .05). Participants with no history of disease were more prone to exclusive breastfeeding (OR = 8.041, 95% CI [1.526, 42.376]) or partial breastfeeding (OR = 4.822, 95% CI [1.157, 20.103]) than formula feeding. Moreover, only intended breastfeeding time was found to be significantly associated with breastfeeding pattern between 4 weeks and 3 months postpartum (*p* < .05). Participants whose intended breastfeeding time was shorter were more prone to formula feeding than to exclusive breastfeeding (OR = 0.379, 95% CI [0.146, 0.980]) or partial breastfeeding (OR = 0.369, 95% CI [0.139, 0.980]).

**4 DISCUSSION**

Many mothers experience breastfeeding barriers to achieving their breastfeeding goals after discharge, leading to reduced rates of breastfeeding initiation and continuation and increased rate of visiting the postpartum lactation clinic.13 In our study, human milk supply problems were the most common reasons for mothers to visit the lactation clinic. Further, breast problems, nipple problems, and incorrect breastfeeding methods were also prevalent among the mothers after delivery. Our results are in line with Pemo and her colleagues’ study,14 in which breastfeeding mothers often consulted their general practitioner with respect to nipple and breast pain or the adequacy of their human milk supply. Moreover, much has been reported on human milk undersupply, with little focus on human milk oversupply issues.15 This is reflected in our results, as we see that 36.4% of the mothers complained of human milk insufficiency and only 3.6% complained of hypergalactia.

Furthermore, many breastfeeding problems are closely interrelated. As the previous study by Puapornpong et al. (2017) mentioned,16 the main causes of nipple pain were unfitting position and latching (72.3%), tongue-tie (23.2%), and oversupply (4.4%). Thus, active management, including early detection and treatment of primary breastfeeding problems, could help mothers overcome breastfeeding problems quickly and prevent secondary problems. Good breastfeeding position is an important way to reduce the nipple pain and trauma, and to ensure the mammary gland tube patency and continuous supply of human milk. Breast pain may be caused by blocked ducts, mastitis or abscesses, and early mastitis may be improved by emptying. In these cases, further support from an IBCLC may be helpful.10 As there are both common and distinct breastfeeding problems at different postpartum stages, teaching breastfeeding techniques before delivery or within the first few days after childbirth, combined with close observation of breastfeeding, are important interventions for the prevention and reduction of breastfeeding problems.

Solving breastfeeding problems is an essential part of newborn care. The majority of women halt breastfeeding earlier than they desired, mostly because they have difficulty with breastfeeding.13 Despite the interventions provided by the IBCLCs during the antenatal period and prior to discharge at this hospital, postnatal breastfeeding difficulties still occurred frequently and may be missed for those who do not participate in routine follow-up. A variety of breastfeeding-related problems may be implicated in early discontinuation of breastfeeding. A key intervention to increase breastfeeding rates and improve breastfeeding quality is to provide timely on-demand professional breastfeeding support after delivery. Our results indicate that there is great need for continued efforts of professional medical staff aimed at helping women breastfeed longer, especially among those with multiple breastfeeding problems. Thus, antenatal lactation education should be further emphasized. Moreover, breastfeeding status after discharge should be monitored and women should be provided with continued support and breastfeeding improvement interventions if necessary.

Women want to receive breastfeeding support from healthcare professionals.17 Overall, many individuals, including first-time mothers, their families, healthcare professionals, and policy-makers lack enough knowledge of the negative outcomes of suboptimal breastfeeding practices.18 To combat this problem, IBCLCs are well suited to provide education and dedicated management of lactation problems. The professional lactation education provided by IBCLCs can meet mothers’ demands for prompt breastfeeding problem-solving (within minutes or hours) and can potentially prevent early breastfeeding cessation. Recognizing the IBCLCs’ unequalled role in the targeted breastfeeding support, our hospital launched the lactation clinic in 2014 to increase access to IBCLCs as a healthcare priority. However, lack of local IBCLCs, cost, and inconvenience may limit the maternal access to lactation support. Despite the large number of births in our hospital each year, only 12.6% of mothers access IBCLC services in the lactation clinic. Thus, additional work should investigate barriers to accessing existing breastfeeding support services.

In several researches, access to an IBCLC at the delivery facility made contribution to higher rates of breastfeeding.17, 19, 20 However, in China, no previous population-based study has examined the impact of IBCLCs, nor has any previous study concentrated on the role of IBCLCs in an outpatient lactation clinic. Our study is the first study to explore the important role of IBCLCs in promoting breastfeeding, with the aim of achieving the exclusive breastfeeding rate of 50% by 2025.5 Our results suggest that obstetric clinics should expand access to and platforms for interacting frequently with IBCLCs throughout the entire perinatal period to make better use of their breastfeeding interventions.

There were distinct factors associated with breastfeeding patterns at different postpartum stages. Early discontinuation of breastfeeding is associated with maternal problems, including breast pain, and unpleasant experience in breastfeeding.21 In our study, participants who had no history of disease were more prone to exclusive breastfeeding or partial breastfeeding within 4 weeks postpartum, which was consistent with the findings of Kamalifard et al. (2019).22 These results indicate that participants who have history of disease may be more concerned about their health, milk quality, and the negative effects on their babies, which may cause early breastfeeding discontinuation or adopting partial breastfeeding. Since successful breastfeeding depends on maternal physiological and psychological factors,22 our results show an important relationship between breastfeeding and maternal health. Thus, the obstetric staff should pay increased attention to mothers with history of disease and provide targeted and sustainable psychological and technical breastfeeding support aimed at reducing maternal anxiety and distress and increasing breastfeeding self-efficacy.

Additionally, mothers’ attitudes related to infant feeding are predictive of breastfeeding intent and initiation. The strongest predictor of breastfeeding cessation is low intention to breastfeed. In our study, between 4 weeks and 3 months postpartum, participants who intended to breastfeed for longer were more prone to exclusive breastfeeding or partial breastfeeding, which was compatible with Mattiello et al. (2021) and [Baumgartner](https://pubmed.ncbi.nlm.nih.gov/?term=Baumgartner+T&cauthor_id=32335805) et al. (2020).23, 24 Based on these results, a sufficient discussion of infant feeding choices and breastfeeding intentions during the prenatal period could help to identify women prone to early breastfeeding cessation. Encouraging and supporting longer maternal breastfeeding intention may be key to prolonging breastfeeding.

Moreover, we found additional breastfeeding related problems in this sample of Chinese women. First, among the multiparous women, only 55% had ever breastfed previously, indicating that 45% of women in this sample had not breastfed after their previous births. Additionally, breastfeeding problems cannot be evaluated without the consideration of both the mother and infant. For mothers who are expressing milk, mechanical pump use should also be evaluated, as abuse can affect human milk production and cause breast tissue trauma. In our study, 69.5% of mothers visited the clinic without their babies. As such, IBCLCs could not examine the breastfeeding position or baby’s contact with the mother’s nipples in the vast majority of cases. Finally, as some mothers had fed their infants immediately prior to visiting the lactation clinic, information could only be gained through suggestions and education, rather than through in-person skill building. Without direct observation of breastfeeding by the LC, guidance can only be minimal and less solution-focused. Our results indicate that, although the breastfeeding rate is higher now than in the past, barriers to effectively utilizing time with the LC may be contributing to early breastfeeding discontinuation and suboptimal effectiveness of this promising intervention.

This study has several limitations. First, the study was conducted in one hospital, which limits the generalizability of our findings. Second, breastfeeding patterns were measured based on self-report without the use of a validated instrument, which may have led to recall and/or measurement bias. As such, the association between breastfeeding patterns and risk factors may be underestimated or overestimated. Third, unmeasured confounding factors (such as breastfeeding knowledge or postpartum maternal mental health) may also affect the study findings.

**5 CONCLUSION**

The findings from this study highlight the importance of sustainable breastfeeding support from pregnancy to postpartum period, with routine breastfeeding visits after discharge being combined with prenatal breastfeeding guidance. Lactation consultants are particularly important to the development and implementation of targeted breastfeeding continuation programs during the antenatal period, as well as postpartum interventions that may lead to the improvement of breastfeeding duration and success. A routine outpatient lactation visit coordinated within a primary care practice is one essential way to support breastfeeding mothers during the postnatal period and to improve breastfeeding practice. During the lactation consultation, predictors of breastfeeding contin­uation, such as history of disease and intended breastfeeding time, need to be considered and addressed thoroughly. To promote successful and sustained breastfeeding, breastfeeding education as part of prenatal and early postpartum care must be combined into a packaged intervention with lactation consultant support to address breastfeeding problems. These recommendations are of importance to ensure sustaining support for breastfeeding mothers after childbirth.

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**CONFLICT OF INTEREST**

The authors declare no conflicts of interest.

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**TABLE 1** Socio-demographic and Obstetric Characteristics of Participants (N = 948)

|  |  |  |
| --- | --- | --- |
| Variables | | *n* (%) |
| Education |  |  |
| Secondary school or lower | | 29 (3.1) |
| Vocational college | | 112 (11.8) |
| College or above | | 807 (85.1) |
| Local residents | |  |
| Yes | | 940 (99.2) |
| No | | 8 (0.8) |
| History of disease a | |  |
| Yes | | 41 (4.3) |
| No | | 907 (95.7) |
| Using medication b | |  |
| Yes | | 35 (3.7) |
| No | | 913 (96.3) |
| Birth hospital | |  |
| Women’s Hospital, Shanghai | | 896 (94.5) |
| Other | | 52 (5.5) |
| Gestational weeks at birth | |  |
| < 37weeks | | 9 (0.9) |
| 37-41weeks | | 939 (99.1) |
| Delivery method | |  |
| Vaginal | | 695 (73.3) |
| Cesarean section | | 253 (26.7) |
| Parity history | |  |
| Primi | | 852 (89.9) |
| Multi c | | 96 (10.1) |
| History of breastfeeding | |  |
| Yes | | 50 (5.3) |
| No | | 898 (94.7) |
| Complications during delivery d | |  |
| Yes | | 9 (0.9) |
| No | | 939 (99.1) |
| Visiting with baby | |  |
| Yes | | 289 (30.5) |
| No | | 659 (69.5) |

*Note. a* History of disease means that women had diabetes, hypertension, thyroid disease, etc. before or during their pregnancy.

b Using medication means that women were taking medicine, such as lactation drugs, antihypertensives, or thyroid medication, etc. during the postnatal period.

c Multi-parity means the mother had one (n=86) or two (n=10) prior births before the current pregnancy.

d Delivery complications included postpartum hemorrhage, retained placenta, etc.

**TABLE 2** Breastfeeding Status of Participants (N = 948)

|  |  |
| --- | --- |
| Variable | *n* (%) |
| Feeding patterns within 4 weeks postpartum (*n=216*) | |
| Exclusive breastfeeding | 93 (43.1) |
| Partial feeding | 105 (48.6) |
| Formula feeding | 18 (8.3) |
| Feeding patterns between 4 weeks to 3 months postpartum (*n=667*) | |
| Exclusive breastfeeding | 336 (50.4) |
| Partial feeding | 303 (45.4) |
| Formula feeding | 28 (4.2) |
| Feeding patterns over 3 months postpartum (*n=65*) | |
| Exclusive breastfeeding | 53 (82.8) |
| Partial feeding | 11 (17.2) |
| Intended breastfeeding time | |
| 0-6 months | 96 (10.1) |
| 6-12 months | 191 (20.2) |
| ≥ 12 months | 661 (69.7) |
| Source of breastfeeding knowledge |  |
| None | 453 (47.8) |
| From medical staff | 341 (36.0) |
| From others | 154 (16.2) |
| Family support |  |
| Good | 943 (99.5) |
| Bad | 5 (0.5) |
| Milking technique |  |
| None | 597 (63.0) |
| By hand | 45 (4.7) |
| Breast pump | 306 (32.3) |

**TABLE 3** Breastfeeding Related Problems in Lactation Consultant Clinic (N = 948)

|  |  |
| --- | --- |
| Variable | *n* (%) |
| Breast milk supply problems (*n=389*) |  |
| Breast milk insufficiency | 345 (36.4) |
| Hypergalactia | 34 (3.6) |
| Hypogalactia | 6 (0.6) |
| Different milk volume in each breast | 4 (0.4) |
| Nipple problems (*n=126*) |  |
| Sore nipples | 103 (10.9) |
| Cracked nipples | 23 (2.4) |
| Breast problems (*n=230*) |  |
| Lactiferous duct obstruction | 96 (10.1) |
| Distending pain in breasts | 72 (7.6) |
| Mastitis | 40 (4.2) |
| Milk blister | 8 (0.8) |
| Galactapostema (breast abscess) | 7 (0.7) |
| Different size of each breast | 4 (0.4) |
| Supernumerary breast | 3 (0.3) |
| Breastfeeding method (*n=85*) |  |
| Poor nipple contact | 77 (8.1) |
| Frequent breastfeeding | 8 (0.8) |
| Counseling related to breastfeeding knowledge (*n=69*) | 69 (7.3) |
| Infant related problems (*n=49*) |  |
| Slow weight gain | 18 (1.9) |
| Choking on milk | 12 (1.3) |
| Sucking difficulty | 12 (1.3) |
| Other a | 7 (0.7) |

*Note.* a Other mainly included diarrhea, breast milk jaundice, abnormal defecation, and abdominal pain.

**TABLE 4** Most Common Breastfeeding Related Problems During Different Postnatal Stages (N = 948)

|  |  |
| --- | --- |
| Variable | *n* (%) |
| ﹤4 weeks postpartum (*n = 216*) |  |
| Breast milk insufficiency | 63 (29.2) |
| Poor nipple contact | 28 (13.0) |
| Sore nipples | 24 (11.1) |
| Lactiferous duct obstruction | 24 (11.1) |
| ≥ 4 weeks and ≤ 3 months postpartum (*n = 667*) |  |
| Breast milk insufficiency | 272 (40.8) |
| Sore nipples | 69 (10.3) |
| Lactiferous duct obstruction | 63 (9.4) |
| Distending pain in breasts | 48 (7.2) |
| > 3 months postpartum (*n = 65*) |  |
| Breast milk insufficiency | 10 (15.4) |
| Sore nipples | 10 (15.4) |
| Lactiferous duct obstruction | 9 (13.8) |
| Counseling related to breastfeeding knowledge | 6 (9.2) |

**TABLE 5** Multinomial Logistic Regression Analysis for Associations between Risk Factors and Breastfeeding Patterns at Different Postpartum Stages (N = 948)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Characteristics | Variables | B | S.E. | *p* | OR | 95% C.I. for OR | |
| Lower | Upper |
| Time 1 a | Exclusive breastfeeding | Intercept |  | -.639 | 804.764 | .999 |  |  |  |
|  |  | Disease after delivery | No | 2.085 | .848 | .014 | 8.041 | 1.526 | 42.376 |
|  |  |  | (Ref Yes) | 0c |  |  |  |  |  |
|  | Partial breastfeeding | Intercept |  | 13.868 | 1.085 | <.001 |  |  |  |
|  |  | Disease after delivery | No | 1.573 | .728 | .031 | 4.822 | 1.157 | 20.103 |
|  |  |  | (Ref Yes) | 0c |  |  |  |  |  |
| Time 2 b | Exclusive breastfeeding | Intercept |  | 2.588 | .890 | .004 |  |  |  |
|  | Intended breastfeeding time | 0-6 months | -.971 | .485 | .045 | .379 | .146 | .980 |
|  |  |  | 6-12 months | .969 | .759 | .202 | 2.635 | .595 | 11.672 |
|  |  |  | (Ref ≥12 months) | 0c |  |  |  |  |  |
|  | Partial breastfeeding | Intercept |  | 1.368 | .942 | .146 |  |  |  |
|  |  | Intended breastfeeding time | 0-6 months | -.996 | .497 | .045 | .369 | .139 | .980 |
|  |  |  | 6-12 months | 1.150 | .763 | .131 | 3.160 | .709 | 14.084 |
|  |  |  | (Ref ≥12) months) | 0c |  |  |  |  |  |

*Note.* Multinomial logistic regression was used to evaluate the associations between various risk factors and breastfeeding patterns, including exclusive breastfeeding, partial breastfeeding, or formula feeding, at different postpartum stages. Reference group: Formula feeding. OR: Odds Ratio; CI: Confidence Interval.

a Time 1 is less than 4 weeks postpartum, χ2 (*df* = 12) = 22.433, p = 0.033, and Cox & Snell pseudo-R2 = 0.099.

b Time 2 is between 4 weeks and 3 months postpartum, χ2 (*df* =18) = 110.084, p = 0.000, and Cox & Snell pseudo-R2 = 0.152.