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Original Article

The effect of postpartum family visits on the promotion of breastfeeding and improvement of maternal and infant health

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Abstract: Objective: The study was designed to explore the effect of postpartum family visits on the promotion of breastfeeding and the improvement of maternal and infant health. Methods: A total of 200 cases of parturients who gave birth in our hospital from January 2019 to January 2020 were selected as the research participants. According to a randomized, double-blinded and controlled manner, they were divided into a study group (n=100, with postpartum family visits) and a control group (n=100, without postpartum family visits). The amount of lactation, breastfeeding status, knowledge of breastfeeding health, and the incidence of maternal adverse events were compared between the two groups at different follow-up times after intervention. The physical development of infants and the occurrence of adverse events were also compared. Results: The lactation of the parturients in the study group at 28, 60, and 120 days after delivery was significantly higher than that of the control group, and the proportion of exclusive breastfeeding of the study group was higher than that of the control group (P<0.05). The comparison of 120 days after delivery showed that the knowledge of breastfeeding health and self-confidence in breastfeeding in the study group were better than those in the control group (P<0.05). The 120-day postpartum evaluation showed that there was no significant difference in the height and weight of the infants between the two groups (P>0.05). The incidence of maternal and neonatal adverse events of the study group was lower than that of the control group (P<0.05). Conclusion: Postpartum family visits for parturients can help improve breastfeeding, increase maternal knowledge of breastfeeding health, and also help reduce the incidence of various adverse events of parturients and infants, which is worthy of clinical application.

Keywords: Postpartum family visits, breastfeeding, maternal and infant health, effect

Introduction

Breast milk is the most ideal food for newborns and infants [1]. Clinical practice points out that breast milk can provide all the nutrients needed for the development of infants within 6 months of age, and the related antibodies contained in breast milk can help prevent diarrhea, pneumonia and other diseases, which is particularly important for the healthy growth of infants [2, 3]. The Global Strategy for Infant and Young Child Feeding was issued by the World Health Organization and the United Nations Children's Fund in 2002, suggesting that mothers should start breastfeeding newborns 1 hour after birth, and exclusive breastfeeding is recommended for the first 6 months. At 6 months of age, other nutritional supplements should be taken according to the needs of the baby. Breastfeeding should be maintained until 2 years of age or beyond [4].

In recent years, with the gradual opening up of the two-child policy in China, the issues of maternal and infant health have gradually attracted more attention from medical staff. From the perspectives of medicine, psychology, and economics, the implementation of breastfeeding has a positive effect on maternal and infant health, family harmony and even social progress. Therefore, the promotion and support of breastfeeding has become an important part

of maternal and infant health services [5, 6]. However, the current breastfeeding situation in China is still not ideal. In 2000, a breastfeeding survey conducted in 7 cities showed that the exclusive breastfeeding rate at 4 months was only 16.0%, and the overall breastfeeding rate was 50% [7]. In 2001, a survey conducted in 5 provinces and cities including Beijing and Hubei showed that the 4-month breastfeeding rate was 45.3%, with Beijing being the lowest at 39.2% [8]. A survey in 2006 showed that the exclusive breastfeeding rate for 4-month old infants dropped from 72% in 2002 to 65% [9], indicating that there is still a certain shortage of breastfeeding in China.

Postpartum family visits refer to a medical visit mode carried out by medical staff to the parturients, newborns and their family with the maternal family as the unit, and it is an important manifestation of the improvement of maternal health awareness in modern society [10]. An existing study pointed out that postpartum visits to parturients can help master the physical state of the parturients, facilitate timely guidance and intervention for the parturients, and help reduce the incidence of maternal adverse events [11]. This study aimed to explore the effect of postpartum family visits on the promotion of breastfeeding and the improvement of the maternal and infant health, so as to provide clinical reference for improving the prognosis of mothers and infants.

Materials and methods

General materials

A total of 200 parturients who gave birth in our hospital from January 2019 to January 2020 were selected as the research participants. According to a randomized, double-blinded and controlled manner, they were divided into a study group (n=100, with postpartum family visits) and a control group (n=100, without postpartum family visits).

Inclusion criteria: (1) Primiparae aged 25-35 years; (2) Full-term and full-weight infants with a gestational age of 38-41 weeks; (3) Maternal consciousness was clear and mothers were able to cooperate with the investigation; (4) The maternal medical records were complete; (5) The study was reported to and approved by Ordos Institute of Technology Ethics Association; (6) The parturients participating in the study signed the informed consent.

Exclusion criteria: (1) Parturients with multiple pregnancies; (2) Newborns with Apgar score ≤ 7; (3) Parturients with mental illness; (4) Parturients with drug or alcohol dependence; (5) Parturients with severe diseases.

Rejection criteria: (1) Parturients who were lost during the survey; (2) Parturients who asked to withdraw during the study.

Intervention method

The parturients in the control group simply received regular hospital nursing and follow-up after discharge, followed by regular follow-up visits as required, and physical review and physical examination of the newborns were performed.

The parturients in the study group had added postpartum family visits on the basis of the care that the control group recieved. The specific measures were as follows: (1) A health file was established for each parturient to record in detail their address, contact information, *etc*., and a dedicated personnel was responsible for communication with the parturient, so as to achieve regular visits, give guidance at any time, and home guidance when necessary; (2) In postpartum family visits, language explanations and action demonstrations were focused on to provide guidance to the parturients, with face-to-face communication and hand-to-hand demonstrations with the parturients to ensure the correct breastfeeding posture; well-feeding of parturients was actively encouraged, parturients' breastfeeding issues were replied to in real time, a breastfeeding group was established if necessary, and the breastfeeding success rate of parturients was increased and their confidence in breastfeeding was established through the exchange of experiences; (3) Parturients were instructed to express milk and store milk when they went out or while at work, the mothers were guided to face the propaganda about formula milk and milk substitutes by the milk powder distributors rationally, and the parturients' strong awareness of insisting on breastfeeding regardless of difficulties was cultivated; (4) A diet plan was formulated with reasonable nutrition matching according to the actual situation of the parturients, and parturi-

ents were asked to eat more protein such as beans, milk, and eggs to ensure that their diet was nutritious and diversified to meet the needs of the body.

Observation indicators and evaluation standards

Postpartum lactation of the parturients: Follow-up visits were conducted on the two groups of parturients at 7, 28, 60, and 120 days postpartum. The daily lactation amount of the parturients in the two groups was recorded, and the breastfeeding status was registered (divided into exclusive breastfeeding, mixed feeding and artificial feeding), and the inter-group follow-up lactation amount and breastfeeding status were compared.

Analysis of postpartum conditions of parturients and newborns

Both groups were evaluated on their breast milk health knowledge and breastfeeding self-confidence at 120 days postpartum. The evaluation of knowledge of breast milk health was carried out by a self-made scale in the hospital, which included knowledge points such as puerperal hygiene, breastfeeding, the supplementation of supplementary food, and planned immunization. The full score of the scale was 100 points. A higher score indicated better health knowledge of the parturients. The Breastfeeding Self-efficacy Scale (BSES) [12] included 33 items, all using a 5-level scoring method, which belonged to the Linker Self-Rating Scale. The total score of the scale was the sum of the scores of each item. A higher score indicated stronger self-confidence of the parturients.

Two indicators of height and weight were selected in the evaluation of the newborns' condition. The height and weight of the two groups of newborns were recorded at 120 days postpartum, and the inter-group differences were compared.

Comparison of incidence of adverse events between parturients and newborns

The incidence of various adverse events in the two groups after intervention was counted, and the inter-group differences were compared. Among them, maternal adverse events mainly included insufficient breast milk, chapped nipples, mastitis, and neonatal adverse events which mainly included red buttocks, umbilical infection, diarrhea, jaundice, and eczema, *etc*. After statistics, the inter-group differences of the incidence of adverse events of parturients and newborns were compared.

Statistical methods

SPSS22.0 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY, US) statistical software was used to analyze the data collected in the study, in which the measurement data were expressed in the form of mean ± standard deviation (mean ± SD), and the normal distribution and the homogeneity of variance test were carried out. T-test was used for data that met a normal distribution or homogeneity of variances, and approximate *t* test was used for uneven variance data. *Chi*-square test was used for the inter-group difference of count data. $P<0.05$ indicated that the difference was statistically significant. The plotting software used in this study was Graphpad Prism 8.3 [13].

Results

Comparison of differences in general clinical data of parturients and newborns between the two groups

A total of 200 primiparae were included in this study, aged 25-35 years, with an average age of (29.98±2.32) years. The inter-group differences of general clinical data of the parturients in the two groups, such as age and delivery method, gender, weight, gestational age and height of the newborns, *etc*. were compared. The results showed that the inter-group differences of parturients and newborns in the above-mentioned data were not statistically significant ($P>0.05$), indicating that the two groups were comparable (**Table 1**).

Comparison of postpartum lactation of parturients

Postpartum days 7, 28, 60 and 120 were selected as the observation points to compare the lactation and breastfeeding status of the two groups. The results showed that from 7 days postpartum to the end of follow-up at 120 days, the daily lactation amount of parturients in the study group was significantly higher than

Table 1. Comparison of general clinical indicators between parturients and newborns between the two groups ($\bar{x}$±s)/[n (%)]

General clinical indicators		Study group (n=100)	Control group (n=100)	t/X^2	*P*
Average age of parturients		29.97±2.21	30.01±2.01	0.134	0.894
Ways of delivery	Vaginal delivery	78	75	0.25	0.617
	Caesarean	22	25		
Gender of the newborns	Male	59	60	0.021	0.885
	Female	41	40		
Weight of the newborns (kg)		3.19±0.43	3.21±0.39	0.345	0.73
Gestational age of the newborns (week)		39.29±1.43	39.31±1.32	0.103	0.918
Height of the newborns (cm)		50.19±2.11	49.98±2.31	0.671	0.503

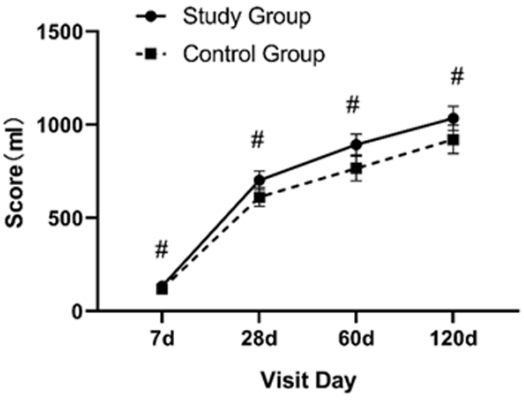

Figure 1. Comparison of postpartum lactation of parturients between the two groups. The comparison showed that from 7 days postpartum to the end of follow-up of 120 days, the daily lactation amount of parturients in the study group was significantly higher than that of parturients in the control group, and the inter-group difference was statistically significant (*P*<0.05). # represented that the inter-group difference of the same index was statistically significant.

that of parturients in the control group, and the inter-group difference was statistically significant (*P*<0.05) (**Figure 1**). A comparison of the differences in breastfeeding between the two groups found that with the extension of the follow-up, the proportion of exclusive breastfeeding in the study group had increased. At the three observation points of 28, 60 and 120 days postpartum, the exclusive breastfeeding rate in the study group was significantly higher than that in the control group (*P*<0.05) (**Figure 2**).

Analysis of postpartum condition of parturients and newborns

The conditions of the parturients and newborns in the two groups were evaluated at 120 days postpartum. The results showed that at 120 days postpartum, the scores of maternal health knowledge awareness and BSES of the study group were significantly higher than those of the control group, and the inter-group difference was statistically significant (*P*<0.05) (**Figure 3A**). Measurement and inter-group comparison of the height and weight of the two groups of newborns at 120 days postpartum showed that the difference in height and weight of the two groups of newborns at 120 days postpartum was not significant (*P*>0.05) (**Figure 3B**).

Comparison of incidence of adverse events between parturients and newborns

According to the statistics of various adverse events in the 120 days postpartum of the parturients and the newborns, the study group had 2 cases of insufficient breast milk, 2 cases of chapped nipple, and 1 case of mastitis, with the total incidence of adverse events of 5.00%. The control group had 19 cases of insufficient breast milk, 8 cases of chapped nipple, and 3 cases of mastitis, with the total incidence of adverse events of 30.00%. The inter-group difference was significant (*P*<0.05) (**Table 2**). A comparison of the incidence of adverse events within 120 days postpartum of newborns showed that the study group had 1 case of red buttocks, 1 case of eczema, and 1 case of jaundice, with the total incidence of 3.00%, while the control group had 5 cases of red buttocks, 2 cases of umbilical infection, 5 cases of eczema, and 5 cases of jaundice, with the total incidence of 17.00%. The inter-group difference was also statistically significant (*P*<0.05) (**Table 3**).

Discussion

The Children Development Guidelines formulated at the beginning of the 20th century in

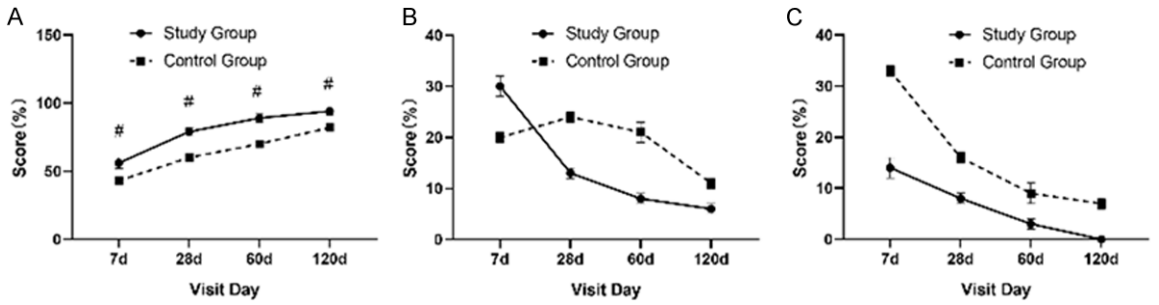

Figure 2. Comparison of the breastfeeding status of parturients between the two groups. The comparison showed that at 7, 28, 60 and 120 days postpartum, the proportion of exclusive breastfeeding in the study group (A) was significantly higher than that in the control group, and the inter-group difference was statistically significant ($P<0.05$). The proportion of mixed feeding (B) and artificial feeding (C) also changed significantly with the follow-up time. # represented that the inter-group difference in the same index and at the same time was statistically significant.

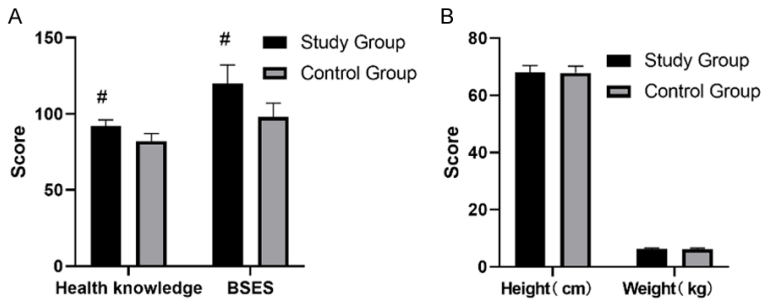

Figure 3. Comparison of conditions of parturients and newborns at 120 days postpartum between the two groups. The results showed that the maternal health knowledge and BSES score of the study group were higher than those of the control group at 120 days postpartum ($P<0.05$) (A). # represented that the inter-group difference in the same index and at the same time was statistically significant. The difference in height and weight between the two groups of newborns at 120 days postpartum was not significant ($P>0.05$) (B).

Table 2. Comparison of the incidence of adverse events in the two groups [n (%)]

Groups	Case number	Insufficient breast milk	Cracked nipples	Mastitis	Total incidence
Study group	100	2 (2.00)	2 (2.00)	1 (1.00)	5 (5.00)
Control group	100	19 (19.00)	8 (8.00)	3 (3.00)	30 (30.00)
X^2	-	-	-	-	21.645
P	-	-	-	-	<0.001

China made it clear that the infant breastfeeding rate should reach 85% in the province [14]. However, according to the China Health Service Survey conducted in 2008, the exclusive breastfeeding rate for children aged 0-6 months in China was only 27.6%, and the continued breastfeeding rate for children aged 12-15 months was only 37%, which was far below the national requirements [15, 16].

This study analyzed the effects of postpartum family visits on the promotion of breastfeeding and improvement of the health of parturients and infants by setting up different groups. The results showed that compared with the control group who received regular reexamination and follow-up, the study group with postpartum family visits, was significantly better than the control group in terms of lactation and exclusive breastfeeding rate, indicating that postpartum family visits were helpful to improve breastfeeding. A questionnaire survey conducted on 100 parturients showed that 95% of parturients agreed with the view that breastfeeding contributes to the development of their babies; however, a 3-month follow-up found that only 59% of the parturients were able to follow through with exclusive breastfeeding, and the remaining 41% of the parturients failed to feed because of the reasons such as lack of feeding skills, lack of feeding guidance, difficulty in persisting due to pain, and insufficient breast milk, and the scholars believe that it is extremely necessary to carry out breastfeeding knowledge and health education for primiparae [17]. The analysis of this study revealed that compared with simple postpartum follow-up, postpartum fami-

Table 3. Comparison of the incidence of adverse events in the two groups of newborns [n (%)]

Groups	Case number	Red buttocks	Umbilical infection	Eczema	Jaundice	Total incidence
Study group	100	1 (1.00)	0 (0.00)	1 (1.00)	1 (1.00)	3 (3.00)
Control group	100	5 (5.00)	2 (2.00)	5 (5.00)	5 (5.00)	17 (17.00)
X^2	-	-	-	-	-	10.889
P	-	-	-	-	-	0.001

ly visits could provide parturients with professional nursing guidance in terms of diet, feeding skills, and puerperium recovery, which can significantly improve the knowledge level of maternal nutrition and health care, and improve the diet, behavior and health of the maternal puerperium [18]. Taking breastfeeding as an example, breastfeeding was relatively unfamiliar to primiparae, and it was easily affected by the state of the infants, leading to reduced lactation, which would further increase the difficulty of breastfeeding. The postpartum family visits carried out active health education for the parturients, cultivated the importance of breastfeeding, and showed them the skills of breastfeeding, which was extremely important for primiparae. This helped cultivate the breastfeeding confidence of the primiparae and eliminate the influence of adverse psychological factors during the puerperium on breastfeeding. Therefore, both the lactation amount and the exclusive breastfeeding rate in the study group were better than those in the control group [19, 20].

This study further evaluated the status of parturients and newborns after intervention, and the results showed that the parturients in the study group were better than those in the control group in terms of breastfeeding health knowledge and breastfeeding confidence. Some scholars have pointed out that most primiparae have poor postpartum mental status due to lack of experience, and their family members were often unable to provide psychological and feeding guidance to the mothers due to lack of professional knowledge, which were important factors affecting the success rate of breastfeeding [21, 22]. The postpartum family visits in the study could help identify parturients breast tenderness and cracked nipple events as early as possible, guide the parturients to actively perform self-care and guide the infants to suck effectively, which effectively prevented the parturients from refusing to breastfeed due to breast tenderness and cracked nipples, thereby helping the parturients persist in breastfeeding [23, 24]. The comparison of the effect of maternal and neonatal adverse events in the two groups showed that postpartum family visits could also help reduce the incidence of various adverse events during both the maternal and neonatal postpartum period, and it had positive significance for improving the prognosis of parturients and newborns. A survey conducted on 80 primiparae showed that if positive postpartum recovery and nursing was be carried out for the parturients, the chances of anxiety, depression, incision infection, mastitis and other events during the puerperium were significantly reduced (50.00% vs. 10.00%) [25]. This study revealed that the reason was closely related to the postpartum family visits to provide real-time, on-site nursing guidance for the parturients, which promoted successful breastfeeding for the parturients and guided them and their family to actively work through complications during the puerperium [26].

In summary, postpartum family visits to parturients can not only help improve breastfeeding and increase their knowledge of breastfeeding health, but also help reduce the incidence of various adverse events of the parturients and newborns. All of which is worthy of clinical application. The innovation of this study is that primiparae are taken as the research subjects to explore and analyze the issue of breastfeeding, which is of high social concern, so as to provide a strong reference for intervention measures to improving the breastfeeding rate. The shortcoming of this study lied in the insufficient control of the demographic characteristics of the study group and the control group. Although possible confounding factors had been analyzed through multiple factors, there were still uncontrollable factors affecting the intervention results, which will be revised in future research.

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Disclosure of conflict of interest

None.

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