

Randomized Clinical Trial

Effect of care intervention with a health education form for breastfeeding on breast distension, pain, and lactation in postpartum mothers

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Abstract

BACKGROUND

Breastfeeding not only meets the nutritional needs of newborn growth and development but also promotes uterine contraction and discharge of lochia, which helps in maternal recovery. However, some mothers experience abnormal lactation and breast swelling due to a lack of breastfeeding knowledge, painful cesarean incisions, anesthesia, negative emotions, and other factors, resulting in a reduced breastfeeding rate, which adversely affects neonatal and maternal health.

AIM

To explore the effects of care intervention with a health education form for breastfeeding on breastfeeding-related conditions.

METHODS

In this study, 207 mothers with postpartum breast pain and difficulty lactating were selected and divided into intervention and control groups using a random number table. Both groups of mothers were provided with basic nursing and related treatment measures after delivery. The intervention group additionally received care intervention with a health education form for breastfeeding. The scores of lactation volume, breast distension and pain, breastfeeding rate, breastfeeding self-efficacy, treatment effect, and complication rate of the two groups were compared.

RESULTS

After treatment, the breast pain score of the intervention group was significantly lower than that of the control group, while the lactation score, score of Breastfeeding Self-Efficacy Scale Short Form scale, parent-child communication score, maternal-infant interaction score, total score of maternal-infant communication, and breastfeeding rate of the intervention group were significantly higher than those of the control group. After intervention, the overall therapeutic effect of the intervention group was better than that of the control group, and the complication rate of the intervention group was lower than that of the control group.

CONCLUSION

Breastfeeding health education and nursing intervention combined with basic clinical treatment have good clinical effects in managing postpartum breast distension and pain and increasing lactation yield.

Key Words: Breastfeeding; Health education; Nursing intervention; Breast distension and pain; Lactation

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Core Tip: The purpose of this study was to explore the effects of care intervention with a form of health education for breastfeeding on conditions related to postpartum breastfeeding, such as breast swelling, breast pain, and lactation, and found that breastfeeding health education and nursing intervention combined with basic clinical treatment had good clinical effects in the management of postpartum breast swelling and pain and in the improvement of milk yield.

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INTRODUCTION

Breast milk is the most suitable natural and healthy food for newborns and is rich in carbohydrates, lactoferrin, antibodies, and immune factors. Breastfeeding not only meets the nutritional needs of newborn growth and development but also promotes uterine contraction and discharge of lochia, which helps in maternal recovery[1,2]. Therefore, breastfeeding is recommended in clinical practice. However, some mothers experience abnormal lactation and breast swelling due to a lack of breastfeeding knowledge, painful cesarean incisions, anesthesia, negative emotions, and other factors, resulting in a reduced breastfeeding rate, which adversely affects neonatal and maternal health[3-5].

Hot compresses and massages are commonly used in the clinical management of postpartum breast distension and lactation difficulties; however, patients often fail to achieve good lactation volumes due to incorrect methods. This may cause breast injury, which in turn affects breastfeeding[6,7]. Utilizing a health education form is a scientific method of presenting health education content, including the target and time, which is more efficient than oral education[8-10]. This study aimed to investigate the effects of care intervention with a breastfeeding health education form on postpartum breast distension and lactation volumes.

MATERIALS AND METHODS

Subjects

In this study, 207 women with postpartum breast distension and difficult lactation admitted to the Department of Obstetrics of Liyang People's Hospital between August 2020 and August 2022 were selected as study subjects. They were divided into either an intervention group ($n = 104$) or a control group ($n = 103$) using a random number table. The general information of the two groups is comparable (Table 1).

The inclusion criteria were: (1) Maternal age of 22–35 years; (2) primigravida with singleton pregnancy; (3) willingness to breastfeed; (4) gestational week of delivery ≥ 37 wk; and (5) postpartum breast distension and pain, poor breast drainage, and hard nodes inside the breast on palpation. The exclusion criteria were as follows: (1) Breast tumor; (2) previous history of breast surgery; (3) mental illness or communication disorders; (4) infectious diseases such as syphilis infection, hepatitis B, or human immunodeficiency virus infection; and (5) being comorbid with other contraindications to breastfeeding. This study was approved by the local medical ethics committee, and informed consent was obtained from the patients or their families.

Table 1 Comparison of baseline data between two groups of patients, mean \pm SD

Group	n	Age (years)	Pregnancy BMI (kg/m ²)	Pregnancy week of delivery (weeks)	Pregnancy times	Newborn weight (g)	1-minute Apgar score	5-minute Apgar score	Natural/cesarean section
Intervention group	104	28.1 \pm 2.9	28.50 \pm 2.26	39.27 \pm 0.94	1.78 \pm 0.57	3114.2 \pm 154.0	8.98 \pm 0.48	9.23 \pm 0.42	73/31
Control group	103	27.6 \pm 3.3	28.58 \pm 1.90	39.11 \pm 1.10	1.72 \pm 0.53	3158.1 \pm 182.7	9.03 \pm 0.47	9.24 \pm 0.43	65/38
<i>t</i> / χ^2		1.158	-0.276	1.125	0.784	-1.870	-0.757	-0.169	1.169
<i>P</i> value		0.248	0.783	0.262	0.434	0.063	0.450	0.866	0.280

BMI: Body mass index.

Treatment and nursing interventions

Both groups were given basic nursing and related therapeutic measures after delivery, and the mothers were instructed to apply hot compresses and massage their breasts. Education methods included outpatient obstetric education, breastfeeding bulletin board displays, and bedside instructions by nurses. In the case of acute mastitis, breastfeeding was suspended, and antibiotics such as penicillin and cephalosporin were administered after emptying the milk.

Puerperae in the intervention group were additionally given care intervention with a breastfeeding health education form. They were instructed to strictly follow the contents of the form and sign the confirmation after completing the operations. The contents of the breastfeeding health education forms include: (1) Advantages of breastfeeding; (2) how to breastfeed; and (3) the treatment of breast distension and pain. The procedures for the treatment include: (1) Clean care: A cotton towel soaked in warm water is used to wipe the breasts to keep them clean and dry; (2) passive activities: The puerpera lies down, holds the breast with the index finger and thumb apart in a circular grip, and pushes around the breast 3–5 times, alternating between both breasts; (3) massaging the acinus and lobules of the breast: The four fingers except the thumb are combined, the breast is lifted with the left hand, and massage is applied around the areola using 2–3 strokes of right ventral rotation, alternating between the two breasts; (4) massaging the breast ducts: The index and middle fingers are used to massage the breast along the ducts longitudinally from the root toward the nipple 2–3 times, alternating between the two breasts; and (5) massage to promote lactation: The right index finger and thumb encircle the breast, while the left thumb and index finger squeeze the areola 5–7 times, alternating between the two breasts. The body surface of the breast ducts is gently patted to promote blood circulation.

Observation indicators

We compared the differences in lactation volume scores, breast distension scores, breastfeeding rates, breastfeeding self-efficacy scores, treatment effects, and complication rates between the two groups at different time points after delivery.

Lactation volume score: Lactation volume was assessed before and 1 day and 3 days after treatment based on the mother's breastfeeding. A lactation score of 3 was assigned to high lactation, where milk was still expressed when the mother's breast was squeezed again after breastfeeding, and a lactation score of 2 was assigned to medium lactation, where milk was no longer expressed when the mother's breast was squeezed again after breastfeeding but the baby did not cry after breastfeeding. A score of 1 was given for low lactation, where no milk was discharged after breastfeeding, the baby cried because of the lack of milk, and a milk substitute was added. A score of 0 was given for no lactation at all, where no milk was discharged when the breast was squeezed before breastfeeding.

Breast distension score: This score was based on maternal subjective breast patency, with a score of 10 for severe pain and 0 for no pain, with higher scores indicating more pronounced breast distension.

The Breastfeeding Self-Efficacy Scale Short Form (BSES-SF)[11] was used to assess patients' breastfeeding self-efficacy before and 3 days and 5 days after treatment. The BSES-SF scale involves 14 questionnaire items; each item scores between 1 and 5, and the total score of the BSES-SF scale ranges from 5 to 70. Higher scores indicate better maternal breastfeeding efficacy.

The Mother-to-Child Communication Assessment Scale was used to score mother-to-child communication, which mainly assesses three aspects: Parent-child communication, environment creation, and mother-to-child interaction. Each aspect is scored between 1 and 4 points. The higher the score, the better the mother-to-child communication.

Clinical efficacy: Cure was considered if the maternal breast hardness, redness, swelling, and pain completely disappeared, breast milk was discharged smoothly, and the babies finished breastfeeding after treatment; valid was considered if the maternal breast redness and swelling disappeared, the pain level was significantly reduced, the breast hardness became smaller and softer, and the breast milk could be discharged smoothly; and invalid was considered if the maternal pain and breast hardness did not change, and the breast redness and swelling did not improve.

Statistical methods

The data were processed with SPSS version 21.0. The BSES-SF scale scores, age, body mass index, breast distension scores, lactation volume scores, and other count data that conformed to a normal distribution are statistically described using the mean \pm SD. The above measurement data were compared using the independent samples *t*-test. Count data (efficacy, breastfeeding rate, and delivery mode) are described as the number of cases (percentages), and the χ^2 test was used for comparative analysis between groups for non-hierarchical count data. The Mann-Whitney *U* test was used to compare hierarchical count data. Statistical significance was set at $P < 0.05$.

RESULTS

Comparison of breast pain score and lactation volume score between the two groups

Before intervention and 1 day after intervention, no statistically significant differences were observed in the breast distension or lactation volume scores between the two groups ($P > 0.05$). However, 3 days after intervention, the breast distension score of the intervention group was significantly lower than that of the control group ($P < 0.05$), and the lactation volume score was significantly higher than that of the control group ($P < 0.05$) (Table 2).

Comparison of BSES-SF score between the two groups

Before intervention, there was no statistically significant difference in the BSES-SF scale scores between the two maternal groups ($P > 0.05$); after 3 days and 5 days of intervention, the BSES-SF scale scores of the intervention group were significantly higher than those of the control group ($P < 0.05$) (Figure 1 and Table 3).

Comparison of breastfeeding rate between the two groups

After 3 days and 5 days of intervention, the breastfeeding rate in the intervention group was significantly higher than that of the control group ($P < 0.05$) (Table 4).

Comparison of treatment effect between the two groups

When the effect was evaluated after 5 days of intervention, the overall efficacy of the intervention group was significantly better than that of the control group ($P < 0.05$) (Table 5).

Comparison of mother-infant communication scores between the two groups

Before intervention, there was no significant difference in parent-child communication score, environment creation score, mother-infant interaction score, and mother-infant communication score between the two groups ($P > 0.05$). After 7 days of intervention, the parent-child communication score, mother-child interaction score, and total score of mother-child communication in the intervention group were significantly higher than those of the control group ($P < 0.05$) (Table 6).

Comparison of complication rate between the two groups

During the intervention, the complication rate in the intervention group was significantly lower than that of the control group (1.92% vs 8.74%, $P < 0.05$) (Table 7).

DISCUSSION

Breastfeeding is a healthy, economical, and convenient method of feeding, which is not only beneficial to the growth and development of the newborn but also helps the uterus rejuvenate and facilitates maternal postpartum recovery[12,13]. Early postpartum lactation is mainly dependent on suckling by the newborn to stimulate the brain to secrete prolactin, which stimulates milk production[14,15]. Breast distension commonly occurs 2–5 days after delivery, with galactostasis in the connective tissue of the breast due to failure to breastfeed in a timely and adequate manner, combined with negative postpartum emotions and an improper diet[16,17]. If breast swelling is not treated in time, it can lead to conditions such as breast abscess, mastitis, blockage of the ductus lactiferi, and even systemic infection with fever and sepsis, requiring suspension of breastfeeding and anti-infection treatment, thus causing greater physical and mental pain to the puerpera [18,19]. In cases of breast swelling, the nipple tends to shorten, and the areola becomes hardened, leading to difficulty in suckling by the newborn and further aggravating galactostasis. Local hot compresses and breast massage are the preferred methods for the clinical management of breast swelling and pain; however, their effectiveness is often suboptimal[20,21]. This can be attributed to inadequate mastery of breast massage methods or reluctance to undergo breast massage due to fear of pain. The conventional nursing intervention methods for education include outpatient obstetric education, breastfeeding bulletin board display, and nurse bedside instruction. However, the effect of these educational efforts is unsatisfactory[22,23].

Health education form is an efficient method that organizes the contents of health education in a form that is more effective in teaching operational details and makes it easier for patients to grasp the content of the education[24,25]. In this study, it was applied to the treatment of postpartum breast tenderness and pain. After 3 days of intervention, the breast distension and pain scores of the nursing intervention group using the breastfeeding health education form were significantly lower than those of the control group receiving conventional education and intervention, and the lactation

Table 2 Comparison of breast distension and pain scores and milk yield scores between the two groups, mean ± SD

Group	n	Breast pain score			Lactation score		
		Before intervention	1 day after intervention	3 days after intervention	Before intervention	1 day after intervention	3 days after intervention
Intervention group	104	5.76 ± 0.79	4.42 ± 0.84 ^a	2.01 ± 0.64 ^a	1.02 ± 0.20	1.70 ± 0.48 ^a	2.17 ± 0.38 ^a
Control group	103	5.79 ± 0.88	4.53 ± 0.78 ^a	2.66 ± 0.62 ^a	1.01 ± 0.26	1.60 ± 0.51 ^a	1.98 ± 0.42 ^a
t		-0.258	-0.976	-7.421	0.310	1.453	3.414
P value		0.797	0.330	0.000	0.757	0.148	0.001

^aP < 0.05 vs before treatment.

Table 3 Comparison of Breastfeeding Self-Efficacy Scale Short Form scores between the two groups, mean ± SD

Group	n	Before intervention	1 day after intervention	3 days after intervention
Intervention group	104	38.9 ± 6.3	54.3 ± 9.5 ^a	61.0 ± 5.8 ^a
Control group	103	39.4 ± 7.8	51.3 ± 8.9 ^a	54.8 ± 9.4 ^a
t		-0.508	2.344	5.717
P value		0.612	0.020	0.000

^aP < 0.05, vs before treatment.

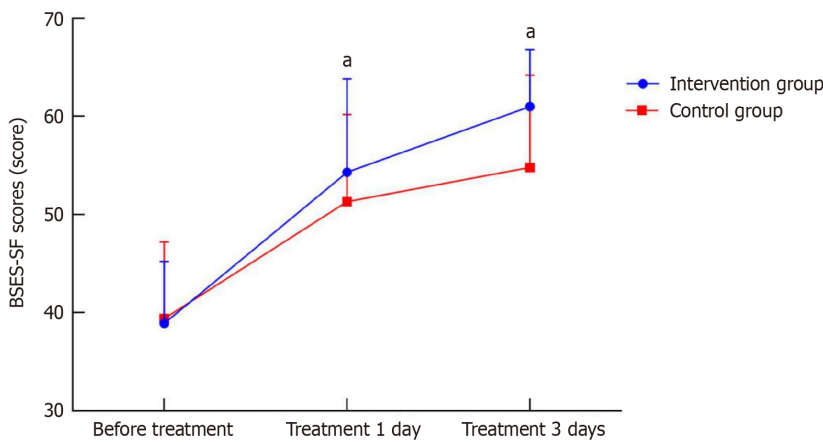


Figure 1 Trend of changes in Breastfeeding Self-Efficacy Scale Short Form scale scores in the two groups. BSES-SF: Breastfeeding Self-Efficacy Scale Short Form. ^aP < 0.05.

volume score was significantly higher than that of the conventional education and intervention group. The BSES-SF scale is a tool that reflects breastfeeding self-efficacy. This study found that after 3 and 5 days of intervention, the breast swelling scores of those who used the breastfeeding health education form were significantly lower, and the lactation scores were significantly higher than those who received the conventional education and intervention. These results suggest that breastfeeding health education combined with basic clinical treatment is effective in reducing postpartum breast distension and pain, increasing lactation volume, and improving maternal breastfeeding self-efficacy. This is due to the fact that the breastfeeding health education form can make mothers aware of the benefits of breastfeeding, motivate them to breastfeed, facilitate careful learning of the key points, and improve self-efficacy[26-28]. The health education form outlines the steps to address breast swelling and pain item by item, enabling mothers to grasp the key points of lactation and confirm the completion of each step. This can, to a certain extent, encourage mothers to engage in self-care according to the content of the health education form, thus better reducing breast swelling, increasing lactation, and improving maternal breastfeeding self-efficacy[29-31].

This study also found that after 3 and 5 days of the intervention, the breastfeeding rate was significantly higher in those who participated in the breastfeeding health education intervention than in those who participated in the conventional intervention. The overall efficacy of the breastfeeding health education intervention was better than that of those

Table 4 Comparison of breast feeding rates between the two groups, *n* (%)

Group	<i>n</i>	3 days after intervention	5 days after intervention	7 days after intervention
Intervention group	104	39 (37.50)	78 (75.00)	92 (88.46)
Control group	103	24 (23.30)	62 (60.19)	84 (81.55)
χ^2		4.928	5.182	1.939
<i>P</i> value		0.026	0.023	0.164

Table 5 Comparison of therapeutic effects between the two groups, *n* (%)

Group	<i>n</i>	Cure	Valid	Invalid
Intervention group	104	62 (59.62)	33 (31.73)	9 (8.65)
Control group	103	44 (42.72)	43 (41.75)	16 (15.53)
<i>Z</i>		-2.508		
<i>P</i> value		0.012		

Table 6 Comparison of scores for mother-infant communication between the two groups, mean \pm SD

Group	<i>n</i>	Parent-child communication		Environmental creation		Maternal-child interaction		Total score	
		Before intervention	7 days after intervention	Before intervention	7 days after intervention	Before intervention	7 days after intervention	Before intervention	7 days after intervention
Intervention group	104	2.16 \pm 0.55	3.06 \pm 0.64 ^a	2.50 \pm 0.81	2.84 \pm 0.78	2.81 \pm 0.64	3.24 \pm 0.60 ^a	7.47 \pm 1.44	9.14 \pm 1.63 ^a
Control group	103	2.25 \pm 0.61	2.84 \pm 0.72 ^a	2.63 \pm 0.76	2.76 \pm 0.80	2.88 \pm 0.73	3.03 \pm 0.68	7.76 \pm 1.51	8.63 \pm 1.50 ^a
<i>t</i>		-1.115	2.324	-1.191	0.728	-0.734	2.357	-1.414	2.342
<i>P</i> value		0.266	0.021	0.235	0.467	0.464	0.019	0.159	0.02

^a*P* < 0.05 vs before treatment.

Table 7 Comparison of complication rates between the two groups, *n* (%)

Group	<i>n</i>	Mammary duct occlusion	Acute mastitis	Complication rate
Intervention group	104	2	0	2 (1.92)
Control group	103	6	3	9 (8.74)
χ^2				4.776
<i>P</i> value				0.029

who received the conventional intervention when the outcome was evaluated after 5 days of the intervention, and the complication rate was lower in those who used the breastfeeding health education form than in those who partook in the conventional care. After 7 days of treatment, the parent-child communication score, mother-child interaction score, and mother-child communication total score in the intervention group were significantly higher than those in the control group. The above results suggest that the breastfeeding health education form and nursing intervention combined with basic clinical treatment can help increase communication between mother and child, improve the breastfeeding rate, and reduce the risk of complications such as occlusion of lactiferous ducts and acute mastitis with a better overall intervention effect. This improvement is attributed to the ability of the breastfeeding health education form and nursing care intervention combined with basic clinical treatment to reduce breast distension and increase lactation[32-35]. Increased lactation facilitates newborn suckling and helps milk evacuation, thus creating a virtuous cycle that allows for increased breastfeeding rates[36,37].

CONCLUSION

In conclusion, breastfeeding health education and nursing intervention combined with basic clinical treatment yield better clinical outcomes in treating postpartum breast distension and pain while also increasing lactation yield.

FOOTNOTES

Author contributions: Di X and Wang D designed the research; Di X and Ge XL performed the research and analyzed the data; Di X, Ge XL, and Wang D wrote the manuscript.

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