Int J Clin Exp Med 2018;11(3):2617-2623
www.ijcem.com /ISSN:1940-5901/IJCEM0070215

*Original Article*

# Effects of nursing with information support and behavior intervention on lactation and breastfeeding success rate for primiparas

Guqin Li[1,3*], Jianxiang Cong[2*], Li Li[3], Yongmei Li[3]

*Departments of [1]Nursing, [3]Dentistry, Yantai Yuhuangding Hospital, Yantai, Shandong Province, China; [2]Reproductive Medicine Center, Yantai Yuhuangding Hospital, Yantai 264000, Shandong Province, China; [*]Equal contributors and co-first authors.*

Received December 2, 2017; Accepted January 8, 2018; Epub March 15, 2018; Published March 30, 2018

**Abstract:** Objective: To improve the breastfeeding status of primipara, including the amount of breast milk secretion and breastfeeding rate, information support and behavior intervention were evaluated in this study. Methods: One hundred primiparas were recruited from March 2016 to March 2017. The participants were divided into intervention group and control group (50 cases in each group) by random number table approach. Routine treatment was employed for both groups. For the intervention group, personalized information support and behavioral intervention were used. The self-rating anxiety scale (SAS), Edinburgh postnatal depression scale (EPDS), and breastfeeding knowledge scale were filled out by primiparas to evaluate the anxiety, depression and breastfeeding knowledge pre- and postpartum. The amount of breast milk secretion and status of breastfeeding were also assessed. Results: After behavior intervention, the SAS score (38.8±4.9) and EPDS score (5.0±1.9) in the intervention group were significant lower (P<0.05) than that in the control group (41.1±5.6 and 6.6±2.4, respectively). Moreover, after behavior intervention, the SAS and EPDS scores were significant lower than that before intervention (42.9±5.4 and 7.3±2.4, respectively) in the intervention group. The scores of breastfeeding knowledge in the both groups after intervention were significantly higher than that before intervention. After intervention, the breastfeeding knowledge (95.7±9.3) in intervention group was significantly higher (P<0.05) than that in control group (84.9±9.9). The amount of lactation in intervention group was significant more (P<0.05) than that in control group. The breastfeeding rate in the intervention group was significant higher (P<0.05) than that in the control group. There were 62.0% for exclusive breastfeeding, 4.0% for bottle feeding, and 34.0% for combined the two. For the exclusive breastfeeding rate, intervention group (62.0%) was significantly higher (P<0.05) than that in the control group (32.0%). Conclusion: Information support and behavior intervention treatment could effectively improve anxiety and depression, breastfeeding knowledge, lactation, and breastfeeding rate in primipara.

**Keywords:** Breastfeeding, primipara, information support, behavior intervention

## Introduction

Breast feeding is the safest and optimal feeding mode for infant growth [1]. Breast milk is the most ideal natural and nutritious food. It not only promotes the growth and development of infants, but also protects the baby from diseases. Also, the breast feeding can improve maternal postpartum recovery [2, 3]. Due to the lacking of breast feeding experience and knowledge of primipara, several negative emotions (such as anxiety, depression, lost the confidence of the breastfeeding) were emerged during the problems and confusion appeared. Moreover, it would induce the lacking of breastfeeding, and inflicting the health of infant [1]. The previous study showed that, several aspects (including knowledge, supporting and encouragement of breastfeeding, professional working, cesarean section, etc.) effected the breastfeeding, and induced the decreasing of breastfeeding rate [4-6]. Personalized information supports for breastfeeding would provide counselling for mothers, and improve the awareness of breastfeeding [7, 8]. Behavioral intervention could effectively promote the se-

**Table 1.** Participant information of two groups

| Item | Intervention group (n=50) | Control group (n=50) | $t/X^2$ | P |
|---|---|---|---|---|
| Age | 28.0±3.7 | 27.3±3.8 | 1.015 | 0.313 |
| Education | | | 0.162 | 0.687 |
| High school or less | 21 | 23 | | |
| College or above | 29 | 27 | | |
| Family income (dollars) | | | 0.220 | 0.896 |
| <450 | 13 | 11 | | |
| 450-750 | 20 | 21 | | |
| >750 | 17 | 18 | | |
| Delivery mode | | | 0.161 | 0.688 |
| Natural birth | 28 | 26 | | |
| Caesarean section | 22 | 24 | | |
| Occupation | | | 0.426 | 0.808 |
| Company employee | 31 | 33 | | |
| Freelancer | 17 | 16 | | |
| Housewife | 2 | 1 | | |
| Breastfeeding guidance | | | 0.543 | 0.461 |
| Yes | 45 | 47 | | |
| No | 5 | 3 | | |

cretion of lactation, help the mothers with nipple sag, and improve the confidence of breastfeeding [6, 9].

Attributed to the publicity and education of health care staff in China, and the exploration of novel improvement approaches, the breastfeeding rate was increased in recent years. However, the anxiety or depression of primipara in prenatal and postnatal periods, and the low amount of lactation would affect the breastfeeding rate, which needs to be improved in the future. In this study, information support and behavioral intervention care were employed to improve the emotion of puerpera, which would increase the amount of lactation and breastfeeding rate.

## Materials and methods

### *Participant information*

This study has got approval from local ethical committee. One hundred primiparas were recruited from March 2016 to March 2017 in this study. The inclusion criteria were consisted of (A) from 20 to 35 years-old, (B) birth of a single child with a gestational age of 37 weeks to 42 weeks, (C) willing to breastfeed, and understanding and signing the informed consent, (D) education levels with junior high school or above. The exclusion criteria consisted of (A) persons with serious illness, (B) persons with mental illness or mental disorders, (C) not willing to join in this study. The participants were divided into the intervention group and control group (50 cases in each group). There were no significant differences (all P>0.05) in age, education level, family income, delivery mode, occupation, and instructions of breast-feeding between the two groups (**Table 1**).

### *Medication scheme*

Both groups were given routine obstetric care. For the intervention group, personalized information support and behavioral intervention treatment were performed as follows.

*Information support:* The breastfeeding knowledge and the request of pregnant women was evaluated after admission. According to the assessment results, the information support scheme was developed [7]. Health education for breastfeeding knowledge and information was provided, including the propaganda column in ward, breastfeeding guide booklets, breastfeeding class, and one-to-one breastfeeding advice. The good relationship and effective communication with pregnant women was established and maintained. The confidence of breastfeeding and psychological state was understood timely. The health education was strengthened when less confidence of participant was appeared. The benefits and approaches of breastfeeding were explained. The mothers who owned experience of breastfeeding were invited and gave talks to improve the confidence of participants.

When anxiety, depression and other negative emotions appeared, specific help and psychological counseling was performed. Psychotherapist was participated for intervention when necessary [8]. The mobile discussion group for breastfeeding was built and maintained, which consisted of obstetrical staff and participants. After continually pushing the breastfeeding knowledge in mobile group, it facilitat-

**Table 2.** Comparison SAS scores between intervention and control group

| Group | Case | Before intervention/routine treatment | After intervention/routine treatment | t | P |
|---|---|---|---|---|---|
| Intervention group | 50 | 42.9±5.4 | 38.8±4.9 | 3.952 | 0.000 |
| Control group | 50 | 43.4±5.8 | 41.1±5.6 | 1.967 | 0.052 |
| t | | 0.447 | 2.219 | | |
| P | | 0.656 | 0.029 | | |

Note: SAS, self-rating anxiety scale.

ed the communication, counseling and learning for participants. The problems of breastfeeding could be discussed and solved by certain specialists in time [7]. The public account on mobile website was built. The breastfeeding knowledge and new progress were published regularly. It provided a quality learning platform for participants.

*Behavior intervention:* The guidance of the breastfeeding was taught as follows. Early exposure between maternal and infant was performed after birth. Within 30 min after birth, the nurse demonstrated the correct breastfeeding method to help the infant intake the breast milk, and promote the lactation of the mother. The breastfeeding skills (such as correct posture) of the mother were guided. The nurse also helped the infant to learn the correct and effective action for ingestion breast milk [8].

The guidance of getting out the bed at early stage, and moderate activity of primiparas were proceeded. To improve the postpartum recovery and gastrointestinal peristalsis, the primiparas were encouraged to get out the bed at early stage, and perform moderate activity. It would improve the ingestion foods of primiparas, and promote the milk secretion [6]. To feel more joy of motherhood, and build the confidence for taking care of infant, the primiparas were encouraged to participate in neonatal care [10].

The guidance of daily life for primiparas were carried out as follows. The instruction of dietary nutrition was performed to improve the breast milk secretion. Protein-rich and easily absorbed diet (such as fish and chicken soup) was recommended. To uptake various nutrients, fresh fruits were also ingested in the diet [8]. Meanwhile, adequate sleep and rest was executed during the treatment.

The instruction of breast cleaning and massage was guided to prepare the lactation. After hot compress of wet towel for 20 min, the longitudinal massage was performed along the mammary ducts through the thumb, index and middle fingers. For the mammary areola, longer time (10 min for each massage) was recommended to promote mammary gland tube patency, which would convenient the infant for uptake the breast milk [6]. To overcome the breastfeeding issues (including breast engorgement and bloating, lactiferous duct blocking, mastitis, and nipple pain), appropriate solutions were instructed for the primiparas.

*Treatment effectiveness evaluation:* The self-rating anxiety scale (SAS), Edinburgh postnatal depression scale (EPDS), and breastfeeding knowledge scale were filled out by primiparas when they arrived at hospital and postpartum 42 days respectively. The lists for investigation were recovered on the spot after carefully scanning for the missing items.

For the list of SAS, 20 items with 4 grades were recorded [11]. It was used to evaluate the subjective feelings of patients for anxiety. The frequency of the symptoms was measured as the main evaluation item. The scoring criteria for each item was shown as follows from 1 to 4. One indicated that no or very low frequency. Two demonstrated that the low frequency. Three indicated the relative high frequency, whereas 4 demonstrated the very high frequency or always anxiety. The maximal reference standardized score of SAS was 50. The higher score indicated the worse symptoms of anxiety.

For the list of EPDS, 10 items with 4 grades were measured to assess the postnatal depression of participants [12]. The items included emotion, pleasure, self-blame, depression, fear, insomnia, coping ability, sadness, crying and self-injury. Four grades (from 0 to 3) were

**Table 3.** Comparison EPDS scores between intervention and control group

| Group | Case | Before intervention/routine treatment | After intervention/routine treatment | t | P |
|---|---|---|---|---|---|
| Intervention group | 50 | 7.3±2.4 | 5.0±1.9 | 5.360 | 0.000 |
| Control group | 50 | 7.6±2.8 | 6.6±2.4 | 1.963 | 0.053 |
| t | | 0.655 | 3.768 | | |
| P | | 0.514 | 0.000 | | |

Note: EPDS, Edinburgh postnatal depression scale.

**Table 4.** Comparison breastfeeding knowledge scores between intervention and control group

| Group | Case | Before intervention/routine treatment | After intervention/routine treatment | t | P |
|---|---|---|---|---|---|
| Intervention group | 50 | 79.3±10.6 | 95.7±9.3 | 8.213 | 0.000 |
| Control group | 50 | 78.1±11.1 | 84.9±9.9 | 3.211 | 0.002 |
| t | | 0.563 | 5.632 | | |
| P | | 0.575 | 0.000 | | |

**Table 5.** Comparison amount of breast milk between intervention and control group

| Group | Case | Amount of breast milk | | |
|---|---|---|---|---|
| | | Low | Moderate | High |
| Intervention group | 50 | 2 (4.0%) | 13 (26.0%) | 35 (70.0%) |
| Control group | 50 | 11 (22.0%) | 17 (34.0%) | 22 (44.0%) |
| $X^2$ | | | 9.729 | |
| P | | | 0.008 | |

employed to indicate the severity from low to high: never (0), occasionally (1), often (2), and always (3). The recommended threshold score of EPDS was 9 for screening the postpartum depression of participants. More than 12 scores indicated the sever postpartum depression.

The breastfeeding knowledge scale included the benefits of exclusive breastfeeding, skills and attentions of breastfeeding, and storage of breast milk [13]. A total of 25 items including 5 grades were employed. The grades (from 1 to 5) indicated the recognition for the specific knowledge from low to high. The total score was 125. The higher score indicated the better recognition for breastfeeding knowledge.

The amount of breast milk secretion was scaled as follows [10]. The low amount of secretion: a small amount of yellow overflow emerged after milked by hand, and not enough for infant ingestion. The moderate amount of secretion: overflow emerged after milked by hand, and enough for infant ingestion. There was no swelling of breast between lactations. The high amount of secretion: a large amount of overflow emerged after breastfeeding. There was swelling of breast between lactations.

The investigation of breastfeeding was reviewed postpartum 42 days. The types of feeding (including breastfeeding, bottle feeding or combining the two) were recorded.

*Statistical analysis:* SPSS 17.0 software was used for data analysis. The data was expressed by mean ± standard deviation (mean ± SD). The comparison between groups was conducted with independent sample t test. The counting data was tested by $X^2$. $P<0.05$ indicated statistically significant difference.

## Results

*Effects of information supports and behavioral intervention for anxiety*

After information supports and behavioral intervention for primiparas, there was significant lower SAS score ($P<0.05$) in intervention group than that in control group. Compared with the SAS score before supports and intervention, the anxiety was significantly improved ($P<0.01$) after the treatment (**Table 2**).

**Table 6.** Comparison breastfeeding rate between intervention and control group

| Group | Case | Breastfeeding | Combined the two | Bottle feeding | Rate of pure breastfeeding |
|---|---|---|---|---|---|
| Intervention group | 50 | 31 (62.0%) | 17 (34.0%) | 2 (4.0%) | 62.0% |
| Control group | 50 | 16 (32.0%) | 29 (58.0%) | 5 (10.0%) | 32.0% |
| $\chi^2$ | | | 9.203 | | 9.033 |
| P | | | 0.010 | | 0.003 |

*Effects of information supports and behavioral intervention for depression*

In this study, there was significant lower EPDS score (P<0.01) in intervention group than that in control group after the information supports and behavioral intervention. The depression was significantly improved (P<0.01) after the treatment, when compared with that before the information supports and behavioral intervention (**Table 3**).

*Effects of information supports and behavioral intervention for breastfeeding knowledge scale*

The breastfeeding knowledge scales of intervention and control groups were significantly improved (both P<0.05) than that before the behavior intervention or routine treatment. There was a significant higher score of breastfeeding knowledge (P<0.01) in intervention than that in control group (**Table 4**).

*Effects of information supports and behavioral intervention for amount of breast milk secretion*

There was significant higher amount of breast milk secretion (P<0.05) in intervention group than that in control group. The data are shown in **Table 5**.

*Effects of information supports and behavioral intervention for breastfeeding rate of primiparas*

In this study, there was significant higher (P<0.05) breastfeeding rate (including breastfeeding only and combined bottle feeding) in intervention group than that in control group. There were 62.0% breastfeeding, 4.0% bottle feeding, and 34.0% combining the two in the intervention group. Moreover, in intervention group, the breastfeeding only rate showed significant higher (P<0.05) than that in control group. The data are shown in **Table 6**.

## Discussion

The essential, high-quality nutrition could be provided by breast milk. It will improve the growth and development of infants, and promote the immunity and health of infants [13, 14]. However, the situation of breastfeeding still need to be improved now. In the previous report, the breastfeeding rate was only 18.9% within six months after birth in certain areas [15]. Also, the breastfeeding knowledge scale was still low (78.1±11.1), with the rate of 32.0%. Therefore, an active intervention was needed for primiparas to improve the recognition and behavior for breastfeeding, and promote the exclusive breastfeeding approach, then maintain health of maternal and infant [16].

In this study, the scores of anxiety (SAS) and depression (EPDS) in intervention group were all significant lower than that in control group. After the treatment, the scores were also significant lower before medication in intervention group. The results indicated that the anxiety and depression in various levels were normally companied with the primiparas. After the information support and behavior intervention, the anxiety and depression of primiparas were improved significantly.

According to the previous researches, the fluctuation of maternal mood was normally high along with the anxiety and depression. But the breastfeeding could improve the negative emotions [16-18]. Meanwhile, professional instruction for breastfeeding and psychological support were needed to promote the breastfeeding rate. Also, the previous studies showed that, several different reasons would induce the anxiety and depression in maternal, which then cause the decreasing of breastfeeding rate. Timely guidance and intervention were needed [2, 19, 20]. In this study, good relationship and communications between nursing staff and participant was built to learn the psychological states in time. Assistance and psychological counseling for the participant were given when anxiety, depression or other negative emotion emerged. Psychological treatment was also

necessary for the primiparas with high scale negative emotion to effectively improve the mental health [8].

In this study, the scale of breastfeeding knowledge after intervention was significantly improved than that before intervention. Also, the scale of breastfeeding knowledge in intervention group was significant higher than that in control group, which conformed with the previous study [8]. Therefore, the information support and behavior intervention could improve the breastfeeding knowledge of primiparas. And professional instruction and support of breastfeeding knowledge were needed for the maternal who lack of experiences to improve the breastfeeding rate [4, 13, 21, 22]. In this study, several different types of instruction and information support (such as breastfeeding class, brochures, online education, etc.) were employed to disseminate the breastfeeding knowledge. Through the combination of different approaches, the breastfeeding knowledge was studied continually to improve the scale of assessment and breastfeeding rate [23].

In this research, the amount of milk secretion in intervention group was significant higher than that in control group. There was significant higher breastfeeding rate in intervention group (62.0%) than that in control group (32.0%). This result was conformed with the result of Linares et al., which showed 51% for breastfeeding, 5% for bottle feeding, and 44% for combining the two [24]. The data indicated that information support and behavior intervention could improve the secretion of breast milk, and breastfeeding rate. The early report showed that, cognitive behavioral interventions could successfully promote the long-term breastfeeding of primiparas [1]. Through the behavior intervention treatment, the proper skills for breastfeeding and breast massage were guided to promote breast milk secretion and breastfeeding rate. Moreover, the information support and behavior intervention could help the primiparas to recover health psychology. It would also improve the breast milk secretion through contact and sucking at early stage [6].

In conclusion, with the anxiety, depression and lack of breastfeeding knowledge in primiparas, the information support and behavior intervention could alleviate the negative emotions, improve the breast milk secretion, breastfeeding knowledge and rate. This approach is worth a wide application in the future.

## Disclosure of conflict of interest

None.

**Address correspondence to:** Yongmei Li, Department of Dentistry, Yantai Yuhuangding Hospital, No.20 East Road, Zhifu District, Yantai 264000, Shandong Province, China. Tel: +86-0535-6691999; Fax: +86-0535-6691999; E-mail: liyongmei2829@163.com

## References

[1] Wang XL, Zhuang W, Zhao MH, Yu H, Hou YW and Wu WY. Observation of the effect of primary maternal breastfeeding cognitive behavioral intervention. Journal of Nursing (China) 2017; 24: 64-67.

[2] Sun S, Wan HW and Zhu L. Analysis of the status of self-efficacy and its influencing factors of postpartum breastfeeding in primiparas. Chinese Journal of Modern Nursing 2015; 21: 3240-3244.

[3] Issaka AI, Agho KE and Renzaho AM. Prevalence of key breastfeeding indicators in 29 sub-Saharan African countries: a meta-analysis of demographic and health surveys (2010-2015). BMJ Open 2017; 7: 141-145.

[4] Chen HJ and Yin XH. The study on the current status of breastfeeding self-efficacy and its influencing factors in primiparas. Chinese Nursing Management 2013; 13: 35-37.

[5] Yao W and Tan XX. The influence factors of breastfeeding self-efficacy and the correlation analysis with postpartum depression in primiparas. Chinese Nursing Management 2014; 14: 89-91.

[6] Zhang YB. Behavioral intervention and psychological counseling had an effect on breastfeeding and depression after cesarean section. Journal of Liaoning University of Traditional Chinese Medicine 2014; 16: 220-222.

[7] Lu YY, Gao YM, Piao L, Cong YF, Cui L and Zhang C. Study on the effect of information motivation behavior model on the self-efficacy of breast-feeding in nipple depression. Journal of Nurses Training 2016; 31: 1166-1168.

[8] Chen ZZ. The effect of information support behavior intervention on the self-efficacy of maternal breastfeeding. Contemp Med 2016, 22: 112-113.

[9] He P, Li C and Li JX. The influence of stage behavior intervention on the primiparas in nipple depression. Journal of Qilu Nursing 2016; 22: 89-90.

[10] Fang CY, Wang L and Wang LY. The effect of cognitive behavioral intervention on the successful rate of breastfeeding. China Health Industry 2015; 16: 147-149.
[11] Lu HY and Li GJ. The study of the influence of the treatment mode nursing intervention on the level of prenatal anxiety. Modern Journal of Integrated Traditional Chinese and Western Medicine 2017; 26: 898-901.
[12] Li Z, Ma WJ, Li YB, Jia H and Yang X. The research of the status of maternity parenting and the correlation with postpartum depression. Journal of Nursing Science 2017; 32: 87-89.
[13] Sun S, Wan HW and Huang R. A survey of 815 maternal for breastfeeding knowledge in Shanghai. Chinese Journal of Modern Nursing 2015; 21: 3105-3109.
[14] Wang JL. The correlation investigation between breast-feeding duration and height of infants. The Journal of Medical Theory and Practice 2015; 28: 2262-2263.
[15] Feng Y, Zhou H, Wang XL, Zhang JX and Wang Y. The situation of infant feeding and international comparative study in some parts of China. Chinese Journal of Child Health Care 2012; 20: 689-692.
[16] Hinsliff-Smith K, Spencer R and Walsh D. Realities, difficulties, and outcomes for mothers choosing to breastfeed: primigravid mothers experiences in the early postpartum period (6-8 weeks). Midwifery 2014; 30: 14-19.
[17] Borra C, Iacovou M and Sevilla A. New evidence on breastfeeding and postpartum depression: the importance of understanding women's intentions. Matern Child Health J 2015; 19: 897-907.
[18] Sharifi F, Nouraei S and Shahverdi E. The relation of pre and postnatal depression and anxiety with exclusive breastfeeding. Electron Physician 2016; 8: 3234-3239.
[19] Lv CF. The self-efficacy of maternal breastfeeding and its influencing factors. Today Nurse 2012: 101-103.
[20] Yang QL, Yong XC and Yang XY. Analysis of the influence factors on the self-efficacy of maternal breastfeeding. Chinese Nursing Research 2011; 25: 1926-1927.
[21] Yong JK. Important role of medical training curriculum to promote the rate of human milk feeding. Pediatr Gastroenterol Hepatol Nutr 2017; 20: 147-152.
[22] Trojanowska A, Brodowiczkról M and Trojanowska P. Knowledge of young women concerning the impact of natural feeding on the growth and state of health of a baby. Ann Agric Environ Med 2017; 24: 484-488.
[23] Liu J, Xiong HQ and Chen Y. Study on behavioral interventions of maternal breastfeeding in the community. Chinese General Practice Nursing 2010; 8: 1599-1600.
[24] Linares AM, Rayens MK, Gomez ML, Gokun Y and Dignan MB. Intention to breastfeed as a predictor of initiation of exclusive breastfeeding in hispanic women. J Immigr Minor Health 2015; 17: 1192-1198.