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ABOUT COVER

Peer Reviewer of *World Journal of Psychiatry*, Qing-Zhong Wang, PhD, Associate Professor, Institute of Chinese Materia Medica, Shanghai University of Traditional Chinese Medicine, Shanghai 201203, China.
wangqingzhong3@gmail.com

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Retrospective Study

Effect of cognitive behavior therapy training and psychological nursing on the midwifery process in the delivery room

Qin Shi, Jie Wang, Dan Zhao, Ling-Yan Gu

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The severe physical and psychological impact of pain on the physical and mental health of women during labor leads to increased risks and complications during childbirth, presenting a major public health concern. Some studies have shown that cognitive behavioral therapy (CBT) has a positive effect on maternal psychology during delivery, reducing stress and shortening labor time. Thus, CBT training for mothers and delivery room staff may be beneficial in minimizing complications and adverse effects during natural birth.

AIM

To investigate the clinical effects of CBT training and psychological care during delivery, and their therapeutic effects on women in labor.

METHODS

This study used a retrospective analysis and included 140 mothers admitted to the maternity ward between January 2021 and January 2023. The study subjects were randomized into two groups: control ($n = 70$) and observation ($n = 70$). Routine care, CBT training, and psychological care were provided to mothers in both groups. Psychological status scores, delivery time, and satisfaction with care pre- and post-delivery were compared, and the incidence of complications after receiving care was analyzed between the two groups.

RESULTS

Although the psychological state of both groups improved significantly in the late stages of labor, the psychological state scores of the mothers in the observation group were significantly lower than those of the mothers in the control group ($P < 0.05$). The duration of labor and incidence of complications in the observation group were significantly lower than those in the control group ($P < 0.05$). The mothers in the observation group were significantly more satisfied with nursing care during the course of labor than those in the control group ($P < 0.05$).

CONCLUSION

CBT training and psychological care for mothers in the midwifery process can effectively improve anxiety and depression, shorten labor duration, reduce postnatal complications, and improve nursing satisfaction and nurse-patient relationships. Its clinical application is effective and has popularization value, providing a new way to protect maternal mental health.

Key Words: Cognitive behavior therapy; Cognitive behavior therapy training; Psychological care; Childbirth; Mental health

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Core Tip: The application of cognitive behavior therapy training and psychological care in the delivery process can effectively improve the psychological condition of mothers, shorten labor duration, reduce the incidence of complications, and improve nurse-patient relationships and nursing satisfaction. Compared to either approach alone, the effect of the combined intervention was more significant.

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INTRODUCTION

During labor, the resulting pain causes strong psychological stimulation in women, often leading to accidents due to excessive mental stress[1,2]. Psychological factors have a strong influence on childbirth and are considered to be the fourth stage after the dilation, expulsion, and placental stages[3]. Mild anxiety is a normal psychological stress that can be accompanied by moderate activation of the sympathetic nervous system, improving the body's ability to adapt to the environment; however, the following question arises: How can excessive anxiety or stress lead to physiological alterations during labor[4,5]? First, excessive anxiety leads to a decrease in norepinephrine production, resulting in weak uterine contractions, which can, in turn, lead to obstructed labor and is a possible factor in increasing the risk of postpartum hemorrhaging[6]. Second, stress and anxiety may exacerbate contraction pain by causing a relative decrease in the mother's pain threshold. Severe pain and poor maternal mood also promote catechol secretion in the body, causing uncoordinated uterine contractions, thus impeding the ongoing labor process and increasing the chances of obstructed childbirth as well as decreasing uterine blood flow, which can also cause fetal hypoxia[7,8].

Previous surveys have shown that more than 90% of pregnant women experience labor pain, physiological changes during pregnancy, and anxiety prior to delivery. Mothers who are fearful of a natural birth are more likely to develop other psychological conditions after birth, such as postnatal depression, than those who are not[9]. Incidences of obsessive-compulsive disorder and generalized anxiety disorder are also much higher in postpartum women than in those who have not given birth[10]. Especially in China, since the implementation of the two-child policy, the incidence of postpartum depression has increased significantly. Statistics show that the annual incidence of postpartum depression in China is 5.36%-11.09%[11]. However, numerous studies have demonstrated that timely and effective psychological interventions during labor can significantly reduce maternal fear and tension and increase the rate of successful delivery. Natural childbirth, led by midwives, reduces the risks of pregnancy[12]. Midwives are primarily responsible for providing health education to mothers and their families during labor and delivery, increasing mothers' confidence in a smooth delivery through constant encouragement and reassurance, and by reducing fear, pain, and anxiety[13]. A previous study found that cognitive behavioral therapy (CBT) training before childbirth can help reduce anxiety and tension, decrease the duration of childbirth, and improve mothers' quality of life[14]. Psychological care, however, is aimed at changing the mother's psychological condition during childbirth and is targeted to help improve her mood and reduce fear of a natural birth, thus reducing the incidence of adverse birth events. However, to the best of our knowledge, only a few studies have combined CBT training and psychological care to provide childbirth assistance.

This study used a retrospective approach to investigate the clinical effects of CBT training and psychological care for mothers during assisted delivery and provide new insights into reducing labor complications as well as safeguarding mothers' physical and mental health.

MATERIALS AND METHODS

Study design, setting, and participants

This retrospective study included 140 women who had previously received CBT training and psychological care from midwives as study subjects in the hospital. Subjects who received combined care were included in the observation group

($n = 70$), and those who received either psychological care or CBT training alone were included in the control group ($n = 70$). The psychological status scores, delivery time, and satisfaction with nursing care were compared pre- and post-delivery and the rate of complications after receiving nursing care were analyzed in both groups. The study subjects met the following criteria: (1) Single full-term vaginal births; (2) complete, true, and valid clinical data; (3) signed informed consent form subjects and their families after being informed of the study purpose and content; (4) no history of psychiatric or psychological disorders, or language or cognitive impairment; and (5) no serious comorbidities. The attending physicians met the guidelines for vaginal delivery.

The control group was selected from among the subjects who received either CBT training or psychological care only during the midwifery process, whereas the observation group received both. Except for the noted cognitive and/or psychological interventions, the same care model was applied to both groups.

Regarding routine nursing care, the nursing staff conducted consistent routine nursing care for all mothers, including the following: (1) Providing health education to the mothers and their families (*i.e.*, informing them of the relevant precautions and popular knowledge related to childbirth); (2) assisting the mother in the correct position during labor, instructing her to breathe and exert herself reasonably, and answering her questions about the childbirth process; and (3) enhancing the monitoring of maternal vital signs during labor, instructing family members and mothers to implement postnatal care, and instructing mothers to pay attention to rest, scientific diet, and good hygiene.

Regarding CBT training, when a mother is admitted to the hospital for delivery, the nursing staff learn about her cognitive and comprehension abilities. This, in turn, allows for the adoption of various informational approaches, such as lectures, videos, props and models, and health education manuals to help her grasp the delivery-related knowledge, making her comprehensively aware of the advantages and disadvantages of vaginal delivery and cesarean section, and helping enhance her confidence in delivery. The following is an overview of the instructions: (1) During the first stage of labor, close attention is paid to the mother's labor contractions, instructing her to conduct breathing training and leading her to a free position where she chooses to stand, squat, sit, or lay down while waiting for delivery to provide favorable conditions for the fetus's head to descend, rotate, and be delivered; (2) During the second stage of labor, when the vagina is fully dilated, the recorded video is played back to correctly guide exertion, while changes in the vital signs are closely observed. If abnormalities are found, the doctor is promptly informed and helps in strictly implementing an aseptic operation to avoid infection during labor and the contraction period, to guide the food and water, and to maintain good stamina to lead the head of the fetus to the crown; and (3) During the third stage of labor, when the placenta is delivered, the presence of soft birth canal laceration is checked and, if present, timely suture treatment is provided. At the end of childbirth, the mother is closely monitored, especially for any instances of vaginal bleeding, and guidance for perineal cleansing, supplemented by abdominal massage, is provided to promote contractions and reduce bleeding. If a vaginal delivery is not possible, the mode of delivery should be changed according to the actual situation to avoid irreversible and serious consequences.

Regarding psychological care, prior to delivery, women often experience negative psychological emotions, such as anxiety and depression, due to labor pain and fear for fetal safety. Nursing staff must comprehensively assess changes in their psychological emotions, determine the influencing factors, and provide targeted guidance and encouragement, allowing mothers to maintain a normal or positive state of mind prior to delivery. During labor, an entire process of encouragement and guidance for women is implemented to alleviate such adverse emotions and emotional stress. Post-delivery, the mother is informed promptly of the successful completion of the delivery process to eliminate her worries. Simultaneously, the mother and baby are placed in the same room as soon as possible, and breastfeeding is started as early as possible to help with breast milk secretion and support the mother's adaptation to motherhood.

Measurement of variables

The psychological state score, delivery time, and satisfaction with nursing care before and after delivery in both patient groups were compared, and rates of complications after receiving nursing care were analyzed. The psychological state score is comprised of the self-rating anxiety scale (SAS) and self-rating depression scale (SDS); the lower the score, the better the psychological state of the patient. The duration of childbirth in both groups included the average duration of the first, second, and third stages. Incidence of postpartum complications in the two groups included weak contractions, postpartum hemorrhage, and postpartum depression. Satisfaction with nursing care was assessed using a self-developed scale with four dimensions: basic nursing care, nursing methods, nursing intervention, and nursing care attitude. The scores showed a positive correlation with satisfaction with nursing care; the higher the scores, the higher the satisfaction with nursing care.

Statistical analysis

Data in this study were statistically analyzed using SPSS 26.0. Continuous data conformed to the normal distribution described by means and percentages, median range (interquartile range) was used to describe continuous variables with skewed distributions, and categorical variables were summarized as numbers and percentages (%). Differences between two groups of quantitative data were analyzed using *t*-tests, and multiple groups of data were analyzed using chi-square tests. Analyses were set to a significance level of $\alpha = 0.05$, and differences were specified as statistically significant at $P < 0.05$.

RESULTS

Baseline data and pathological characteristics

A total of 140 subjects were included in the study. The baseline data of the study subjects were collected for comparison, which showed no statistically significant difference between age, weight, domicile, number of births, or gestational weeks between the two study groups ($P > 0.05$), and the data of the two groups were comparable. The mean age of the study subjects in the observation group was 27.23 ± 1.46 years, the mean weight was 72.91 ± 5.44 kg, the gestational period was 39.41 ± 1.22 wk, and the number of births was 1.23 ± 0.30 . In the control group, the mean age of the study subjects was 27.25 ± 1.25 years, the mean weight was 72.91 ± 5.44 kg, the gestational period was 39.25 ± 1.30 wk, and the number of births was 1.18 ± 0.21 . The characteristics of the study subjects are presented in [Table 1](#).

Mental status scores before and after delivery in both groups

The psychological state scores of the mothers before and after delivery were assessed in both groups, and the results showed no statistically significant differences from those of the mothers before delivery. After childbirth, the SAS and SDS scores of the observation group were significantly higher than those of the control group ($P < 0.05$). The mental status results are presented in [Table 2](#).

Comparative analysis of delivery time in the two groups

Labor duration was recorded in both groups, showing differences from the first stage of childbirth onwards, with a significant decrease in childbirth time in the observation group compared with the control group ($P < 0.05$). The findings show that the combined intervention was effective in shortening childbirth time ([Table 3](#)).

Incidence of complications in both groups

Statistics on the incidence of complications during delivery in both groups showed that in the observation group, two (2.86%) women had postpartum depression, three (4.29%) had postpartum hemorrhage, three (4.29%) had weak contractions, and the total incidence of complications was eight (11.43%). In the control group, 10 (14.29%) mothers developed postpartum depression, seven (10.0%) had postpartum hemorrhage, and 11 (15.71%) developed contraction weakness; the overall complication rate was 28 (40.0%). There was a statistically significant difference in the incidences of complications between the two groups ($P < 0.05$). The complications results are presented in [Table 4](#).

Comparative analysis of nursing satisfaction

Both groups of mothers were asked to rate their satisfaction with nursing care during childbirth. Subjects rated their satisfaction in four dimensions: basic nursing care, nursing methods, nursing intervention, and nursing care attitude. The results show that nursing care satisfaction in the observation group was higher than that in the control, and the difference was statistically significant ($P < 0.05$). The results are presented in [Table 5](#).

DISCUSSION

This study compared the clinical effects of combined CBT training and psychological care for mothers during the process of assisted delivery with those of a single psychological intervention. The results demonstrated that, although the psychological state of mothers in both groups improved significantly in the later stages of labor, the psychological state scores in the observation group were significantly lower than those in the control group. The duration of labor and incidence of complications in the observation group were significantly lower than those in the control, and the satisfaction of mothers with care during the process of labor in the observation group was significantly higher than that in the control. In addition, labor duration and complication rates in the observation group were significantly lower than those in the control group, and the satisfaction rate in the observation group was significantly higher than that in the control group.

Childbirth is an important physiological process that mothers must undergo[15]. During childbirth, many mothers experience greater stress and emotional fluctuations accompanied by anxiety and fear. This leads to sympathetic nerve excitation, resulting in an increased small rate, respiratory frequency, and insufficient gas exchange in the lungs. These changes can cause uterine hypoxia and slow expansion of the uterine opening, causing difficulty in childbirth, prolonging labor duration, and increasing the rate of obstructed labor, as well as the risk of postpartum complications. Previous studies have demonstrated that both CBT training and psychological care can significantly reduce maternal anxiety and fear during labor and improve postnatal quality of life[16,17]. That is, the use of CBT training is effective in reducing maternal anxiety during the postpartum period. It has also been shown to reduce the complications of postpartum stress and depression, with follow-up showing improvements in family well-being and parent-child relationships during the postpartum period[18,19]. The results of this study show that compared to either CBT training or psychological care alone, a combination of the two is more effective in improving the psychological state of mothers after delivery and in reducing the incidence of postpartum depression.

Labor duration has been associated with childbirth complications in previous studies, and maternal anxiety during labor significantly affects its duration[20,21]. The present study showed that CBT training and psychological care during assisted labor were effective in reducing labor duration. The study also found a relative reduction in the incidence of post-delivery complications in the observation group. Moreover, increased satisfaction with care was effective in improving the relationship between mothers and caregivers, leading to mothers' increased trust in midwives during

Table 1 General information about the study population

| | Observation group (n = 70) | | Control group n = 70) | <i>t</i> / χ^2 | <i>P</i> value |
|-------------------------|----------------------------|----|-----------------------|---------------------|----------------|
| Age (yr) | 27.23 ± 1.46 | | 27.25 ± 1.25 | 0.982 | 0.902 |
| Weight (kg) | 72.91 ± 5.44 | | 72.91 ± 5.44 | 1.973 | 0.981 |
| Domicile | Urban | 56 | 55 | | 0.214 |
| | Rural | 14 | 15 | | |
| Weeks of pregnancy (wk) | 39.41 ± 1.22 | | 39.25 ± 1.30 | 0.712 | 0.131 |
| No. of deliveries | 1.23 ± 0.30 | | 1.18 ± 0.21 | 0.561 | 0.056 |

Table 2 Maternal psychological state score before and after delivery

| | Before childbirth | | After childbirth | |
|-------------------|-------------------|--------------|------------------|--------------|
| | SAS | SDS | SAS | SDS |
| Observation group | 57.25 ± 1.68 | 57.57 ± 2.55 | 51.35 ± 1.23 | 50.41 ± 1.33 |
| Control group | 57.39 ± 1.87 | 57.49 ± 2.61 | 48.78 ± 1.15 | 47.88 ± 1.21 |
| <i>t</i> | 1.241 | 0.987 | 7.812 | 6.902 |
| <i>P</i> value | 0.521 | 0.712 | < 0.001 | < 0.001 |

SAS: Self-rating anxiety scale; SDS: Self-rating depression scale.

Table 3 Comparative analysis of two groups of maternal labor time

| | The first stage of labor (h) | The second stage of labor (min) | The third stage of labor (min) |
|-------------------|------------------------------|---------------------------------|--------------------------------|
| Control group | 8.26 ± 1.76 | 45.32 ± 7.25 | 9.29 ± 1.37 |
| Observation group | 6.15 ± 1.21 | 33.19 ± 5.35 | 6.33 ± 0.91 |
| <i>t</i> | 7.193 | 14.210 | 11.021 |
| <i>P</i> value | < 0.001 | < 0.001 | < 0.001 |

Table 4 Comparative analysis of the incidence of post-delivery complications between both groups

| | Postpartum depression | Postpartum hemorrhage | Weak contractions | Total incidence of complications |
|---------------------------------|-----------------------|-----------------------|-------------------|----------------------------------|
| Observation group, <i>n</i> (%) | 2 (2.86) | 3 (4.29) | 3 (4.29) | 8 (11.43) |
| Control group, <i>n</i> (%) | 10 (14.29) | 7 (10.0) | 11 (15.71) | 28 (40.0) |
| χ^2 | | | | 23.914 |
| <i>P</i> value | | | | < 0.001 |

Table 5 Comparative analysis of maternal nursing satisfaction between both groups

| | Basic nursing care | Nursing methods | Nursing intervention | Nursing care attitude |
|-------------------|--------------------|-----------------|----------------------|-----------------------|
| Observation group | 94.24 ± 2.81 | 96.91 ± 2.92 | 94.45 ± 1.91 | 97.89 ± 3.14 |
| Control group | 90.89 ± 1.12 | 91.21 ± 1.14 | 90.14 ± 0.94 | 92.94 ± 1.58 |
| <i>t</i> | 7.193 | 14.210 | 11.021 | 8.931 |
| <i>P</i> value | < 0.001 | < 0.001 | < 0.001 | < 0.001 |

labor[22].

The strength of this study is in its combined use of CBT training and psychological care, evaluated in terms of psychological status scores, labor duration, postpartum complications, and satisfaction with care. However, due to the retrospective nature of the study, the extent of support for the exact efficacy and safety of the intervention was not as high as that of a prospective study. Nonetheless, we obtained complete clinical data and avoided errors caused by incomplete data.

CONCLUSION

In conclusion, CBT training and psychological care for mothers in the midwifery process can effectively improve maternal anxiety and depression, shorten labor duration, reduce postnatal complications, and improve nursing satisfaction and nurse-patient relationships. Its clinical application is effective and has popularization value, offering a new way to protect maternal mental health.

ARTICLE HIGHLIGHTS

Research background

The severe physical and psychological impact of pain on the physical and mental health of women during childbirth, leads to increased risks and complications, presenting a major public health issue.

Research motivation

During childbirth, labor pain causes strong psychological stimulation in women, which often leads to accidents due to excessive mental stress.

Research objectives

To provide new insights into reducing accidents during childbirth and safeguarding mothers' physical and mental health.

Research methods

This study used a retrospective analysis and included 140 mothers admitted to the maternity ward between January 2021 and January 2023. The two groups were randomized: Routine care, cognitive behavior therapy (CBT) training, and psychological care were, respectively, provided to mothers in the control ($n = 70$) and the observation ($n = 70$) groups.

Research results

The results showed that although the psychological state of mothers in both groups improved significantly in the late stage of labor, that of the mothers in the observation group was significantly lower than that of mothers in the control group. The labor duration and incidence of complications in the observation group were significantly lower than those in the control group, and the satisfaction of mothers with care during the process of labor in the observation group was significantly higher than that in the control group. In addition, labor duration and complication rates in the observation group were significantly lower than those in the control group, and the satisfaction rate in the observation group was significantly higher than that in the control group.

Research conclusions

CBT training and psychological care for mothers in the midwifery process can effectively improve maternal anxiety and depression, shorten labor duration, reduce postnatal complications, and improve nursing satisfaction and nurse-patient relationships. Its clinical application is effective and has popularization value, providing a new way to protect the mental health of mothers.

Research perspectives

CBT training and psychological care were administered during the delivery process, and the clinical effects were assessed by evaluating the psychological state scores of the mothers after delivery, observing labor duration, incidence of post-delivery complications, and satisfaction with nursing care.

FOOTNOTES

Author contributions: Shi Q and Gu LY contributed equally to this work; Shi Q, Wang J, Zhao D and Gu LY designed the research study; Shi Q, Wang J, Zhao D and Gu LY performed the research; Shi Q and Gu LY contributed new reagents and analytic tools; Shi Q and Gu LY analyzed the data and wrote the manuscript; all authors have read and approve the final manuscript.

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ORCID number: Qin Shi 0009-0002-9980-8765; Ling-Yan Gu 0009-0006-0153-3716.

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