

Original Article

Effect of high-quality nursing service in the delivery room on puerperae and newborns

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Abstract: Objective: To analyze the effect of high-quality nursing service in the delivery room on puerperae and newborns. Methods: Clinical data of 100 puerperae who came to our hospital for delivery were analyzed in this retrospective study. The puerperae were divided into an observation group (50 cases) and a control group (50 cases) according to the nursing model they received. The observation group was given high-quality nursing, and the control group was given routine nursing. The levels of blood glucose and blood pressure, scores of Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS), delivery mode, nursing satisfaction and perinatal health status were recorded and compared. Results: After childbirth, the SAS and SDS scores in the observation group were significantly lower than those in the control group (both $P < 0.05$). The amniotic fluid index of the observation group was increased significantly ($P < 0.001$). The total nursing satisfaction of the observation group was higher than that of the control group ($t = 14.324$, $P < 0.001$). The health status of neonates in the observation group was better than that in the control group ($\chi^2 = 4.762$, $P = 0.029$). After intervention, the levels of blood glucose and blood pressure in the observation group were lower than those in the control group (both $P < 0.05$). Conclusion: High-quality nursing for puerperae in the delivery room improves their negative psychological emotions, which is of significance for delivery and nursing work.

Keywords: Delivery room nursing, high-quality nursing service, puerperae, newborns

Introduction

With the development of the economy and society, people are now more aware of the importance of health. So, higher requirements are put forward nursing services. At present, the mainstream nursing mode in most Chinese hospitals is still functional nursing, with nurses performing their duties according to shifts and tasks based on doctors' advice [1]. However, this traditional nursing mode, which emphasizes treatment, physiology and technical operation, can no longer meet the modern health-care needs; for instance there is a need for preventive health care, psychological counseling and health education [2]. In 2010, the Ministry of Health in China launched a nationwide "Demonstration Project of High-Quality Nursing Service" to improve the nursing quality and nursing satisfaction in the modern era.

High-quality nursing service refers to puerperae-oriented care, which requires hospitals to

clarify the nursing responsibilities, enrich the connotation of nursing so as to improve puerperae's satisfaction with the nursing service on the basis of basic nursing care [3]. The workload in the Department of Obstetrics and Gynecology has been increasing in China in recent years, also, the puerperae and their families have put forward higher requirements for medical care [4]. Relevant studies have shown that high-quality nursing services have an important effect on the outcome of childbirth and the health status of the newborns [5]. In recent years, high-quality nursing in the delivery room has been widely applied. For newborns, a series of procedures are needed after birth. Those procedures can be painful for them, so improper operation may bring negative impacts on the neonates, such as high blood pressure and poor blood oxygen, which hinders the subsequent development of neonates and may even affect their intellectual development in serious cases. High-quality nursing in the delivery room can alleviate their

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pain [6]. High-quality nursing service aims to give psychological intervention for puerperae in addition to meeting basic maternal needs, ensuring their safety and maintaining physical comfort. Through active and effective nursing work, high quality nursing can obtain the overall coordination of support from puerperae's family and society. To carry out high-quality nursing service in the delivery room, nurses should master professional knowledge and skills, provide timely care and helpful communication to make the puerperae feel positive and satisfied. Therefore, the current traditional mode of nursing needs to change for the development of newborns wellbeing. High-quality nursing in the delivery room provides puerperae with help and active communication to meet the needs of puerperae. This nursing mode requires nurses to fully perform their duties in order to give derailed and basic nursing care and specialized care. Through the implementation of high-quality nursing services, the mental state of puerperae can be greatly improved, which is of great significance for childbirth and other nursing work [7]. To improve the quality of the delivery and the nursing satisfaction, high-quality nursing service was practiced in the delivery room in our hospital, showing significant efficacy.

Materials and methods

General information

A retrospective study was conducted in 100 puerperae who came to our hospital for delivery from April 2020 to April 2021. The puerperae were divided into an observation group (50 cases, received high-quality nursing) and a control group (50 cases, received routine nursing).

To ensure the reliability of this study, the general data were compared between the two groups of the puerperae after consent was obtained. It was found that there was no significant difference in the general situation between both groups. The included puerperae had no serious pregnancy complications, indication of cesarean section, or other serious diseases. They agreed to participate in the study and signed the informed consent. This study was approved by the Ethics Committee of our hospital (Approval No. KY2019-136).

Inclusion criteria: (1) Puerperae that delivered in our hospital; (2) Puerperae with single fetus; (3) Puerperae with complete clinical data.

Exclusion criteria: (1) Puerperae complicated with severe hypertension or diabetes; (2) Puerperae with more than one fetus; (3) Puerperae with mental disorders, audio-visual disorders or somatopsychic disturbance.

Methods

The control group received routine nursing in the delivery room, including obstetric examination, health education and psychological comfort [8-10].

The observation group received high-quality nursing in the delivery room. (1) At admission: The nursing staff carefully and in a friendly manner measured the vital signs of puerperae, gave admission evaluation and filled in the admission medical records. Thereafter, the nursing staff introduced themselves, lead the puerperae into their wards, helped the puerperae to be familiar with the ward and the environment as well. They assisted the puerperae to do the routine examination according to the doctor's advice. (2) Before delivery: The puerperae were given emotional comfort, materials on childbirth and informed them about the process of childbirth. The nurses helped the puerperae stay in a good psychological state. Midwives accompanied the puerperae and gave corresponding psychological comfort during the predelivery time. The puerperae were told to be comfortable in thire delivery position, such as lying, walking, kneeling or squatting. The advantages of a free position were told to the puerperae to make them feel comfortable about it, to speed up the progress of childbirth and to reduce the risk of fetal distress. (3) During delivery: With the guidance of midwives, puerperae mastered the delivery skills quickly. The puerperae were taught to maintain a good mental state and physical strength in the first stage of delivery. The puerperae followed the guidance in terms of breathing and giving force during the delivery, and the purpose and significance of the above measures were informed to the puerperae. The husband or other family members were allowed to be in the delivery room to accompany the puerperae, so as to enhance the confidence

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of the puerperae in childbirth. After transferred to the delivery room, the condition of puerperae was assessed. They were fully encouraged and comforted to relieve the pain during childbirth, thereby effectively relieving the nervousness and fear. Constant massage and encouragement were given to the puerperae by the midwives. Music analgesia therapy was performed with soft music, which can reduce the tension and help to ensure the stability of blood pressure and breathing. (4) After delivery: The nurses sought a comprehensive understanding of the physical and mental conditions of the puerperae, telling the puerperae to take full rest and restore their physical strength, helped to relieve the postpartum pain after delivery and took care of the newborns. The puerperae's families were informed to prepare suitable and not greasy food for the puerperae. In addition, medical workers educated the puerperae and their families about neonatal care, as well as postpartum health care and proper ways of feeding (including introducing them to the benefits of breastfeeding). The uterine contraction and bleeding of the puerperae was closely observed 2 hours after delivery. Corresponding psychological care was carried out to help the puerperae get into the postpartum role and avoid postpartum depression as much as possible [11-13].

Outcome measures

The recorded indicators included the levels of blood glucose and blood pressure, scores of Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS), delivery mode, nursing satisfaction and perinatal health status.

Primary outcome measures: (1) Gestational diabetes mellitus related indicators including fasting blood glucose (FBG), 2 h postprandial glucose (2hPG), amniotic fluid and weight gain were measured every day. Basic indicators such as blood sugar and blood pressure were still measured daily after delivery.

(2) SDS and SAS were used to evaluate the mental state one day before nursing and on the last day of nursing. The cut-off value of SAS standard score was 50 points, and an anxiety score ≥ 50 points was seen as having anxiety [14]. SDS contains 20 items reflecting subjective feelings of depression, and each item is divided into four grades according to

the frequency of symptoms [15]. Lower scores indicated less tendency of anxiety or depression.

(3) Perinatal health related indicators. The basic physical indicators (heart rate, blood pressure, blood routine etc.) of the newborns were measured every day. The incidence of neonatal hypoglycemia, hyperbilirubinemia, neonatal asphyxia, neonatal pneumonia and neonatal hypoxic ischemic encephalopathy, etc. was recorded [16].

(4) Blood pressure was measured after the puerperae sat and rested for 15 min using a standard mercury sphygmomanometer at the right brachial artery. After inflation, the air was slowly deflated at a rate of 2 mmHg per second. The systolic blood pressure (SBP) and diastolic blood pressure (DBP) were based on the Korotkoff phase I and the silence phase (Korotkoff phase V), respectively. The measurement was performed twice in a row, with an interval of 1-2 minutes, and the average value was taken. The measurement method was carried out according to the requirements of *Guideline for Prevention and Treatment of Hypertension in China, 2010* [17].

(5) Blood glucose was measured by collecting blood samples from veins and fingertips. Since there was no calorie intake within 8 h before the fasted blood collection, the fingertip blood may be diluted because of tissue fluid, therefore showing lower blood glucose than that from veins. Two hours after a meal, blood glucose from the fingertip could be slightly higher than that from the veins because of the mix of arterial blood. An error of about 10% is within the allowable range.

Secondary outcome measures: (1) Nursing satisfaction was evaluated by self-made questionnaire, which was mainly aimed at nursing attitude, professional level, degree of concern, diagnosis and treatment environment, diagnosis and treatment skills, etc. There were three criteria: very satisfied, basically satisfied and dissatisfied. Nursing satisfaction rate = (satisfied + basically satisfied) cases/total number of cases *100%.

(2) Apgar score, also known as neonatal score, was evaluated. In this study, the main criteria were skin color (for evaluating the pulmonary

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Table 1. Comparison of general information ($\bar{x} \pm sd$)

| Item | Control group (n=50) | Observation group (n=50) | t/ χ^2 | P |
|--------------------------------------|----------------------|--------------------------|-------------|-------|
| Age (years old) | 28.50±3.10 | 29.61±3.21 | 1.746 | 0.084 |
| Body mass index (kg/m ²) | 27.52±2.81 | 28.30±3.11 | 1.354 | 0.179 |
| Number of births | | | | |
| 1 | 28 (56.00) | 27 (54.00) | 0.192 | 0.661 |
| 2 | 20 (40.00) | 20 (40.00) | <0.001 | 1.000 |
| 3 | 2 (4.00) | 3 (6.00) | 0.467 | 0.495 |
| Nutritional status (scores) | 7.18±0.79 | 7.20±0.81 | 0.125 | 0.901 |
| Gestational weeks | 39.6±1.94 | 39.8±1.01 | 0.125 | 0.581 |
| Height (cm) | 159.54±20.49 | 159.48±20.44 | 0.015 | 0.988 |

blood oxygen exchange of the newborn, 0-2 points), heart rate (for evaluating the strength and rhythm of heart beating, 0-2 points), respiratory assessment (for evaluating the maturity of the central nervous system and lung, 0-2 points), muscle tension and movement (for evaluating the central reflex and muscle strength of the newborn, 0-2 points) and reflex (for evaluating the response ability of newborns to external stimuli, 0-2 points). An Apgar score of 10 points was seen as normal. A score of 7-9 points indicated a good prognosis. Neonates with a score of less than 7 points were considered to have mild asphyxia.

Statistical analysis

All data were analyzed using SPSS 22.0 statistical software. Excel was used for data recording. The measurement data were tested for normality, and those following a normal distribution were represented as mean \pm standard deviation ($\bar{x} \pm sd$). Independent sample t-test was used for inter-group comparison, and paired t-test was used for intra-group before-after comparison. GraphPad Prism 8 software was used to plot bar charts and deviation charts when comparing SAS and SDS scores of the two groups before and after nursing. Count data were expressed as the number of cases/percentage (n/%) and tested by the chi-square test. $P < 0.05$ indicated a statistically significant difference.

Results

Comparison of general information

There was no difference in the general information between both groups. See **Table 1**.

Comparisons of blood glucose and blood pressure levels

After nursing, the levels of blood glucose and blood pressure of the two groups were lower than those before nursing (both $P < 0.05$). The FBG, 2hPG, SBP and DBP of the observation group were lower than those of the control group (all $P < 0.05$). See **Table 2**.

Comparison of change of amniotic fluid index

The change of amniotic fluid index before and after intervention in the two groups was determined. In the observation group, the amniotic fluid index was significantly increased after intervention, and the difference was statistically significant ($P < 0.001$). There was no significant difference in amniotic fluid index before and after treatment in the control group ($P > 0.05$). There was no significant difference in the amniotic fluid index between the two groups before intervention ($P > 0.05$), while after intervention, the index in the observation group was significantly higher than that of the control group ($P < 0.001$). See **Table 3**.

Comparison of nursing satisfaction

The total nursing satisfaction rate of the observation group was higher than that of the control group, with significant difference ($t = 14.324$, $P < 0.001$). See **Table 4**.

Comparison of perinatal health status

Compared with the control group, the incidence of neonatal hypoglycemia, hyperbilirubinemia, neonatal asphyxia, neonatal pneumonia and neonatal ischemia was lower in the observation group ($\chi^2 = 4.762$, $P = 0.029$). The compari-

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Table 2. Comparisons of blood glucose and blood pressure levels (score, $\bar{x} \pm sd$)

| Indicator | Observation group (n=50) | Control group (n=50) | t | P |
|------------------------|--------------------------|----------------------|--------|--------|
| Blood glucose (mmol/L) | | | | |
| FBG | | | | |
| Before nursing | 7.18±0.79 | 7.20±0.81 | 0.125 | 0.901 |
| After nursing | 4.66±0.69 | 6.41±0.75 | 12.142 | <0.001 |
| t | 16.988 | 5.060 | | |
| P | <0.001 | <0.001 | | |
| 2hPG | | | | |
| Before nursing | 11.67±1.57 | 11.57±1.49 | 0.327 | 0.745 |
| After nursing | 6.99±0.75 | 8.62±0.81 | 10.441 | <0.001 |
| t | 19.019 | 12.300 | | |
| P | <0.001 | <0.001 | | |
| Blood pressure (mmHg) | | | | |
| SBP | | | | |
| Before nursing | 98.47±14.58 | 99.01±14.75 | 0.184 | 0.854 |
| After nursing | 89.34±12.06 | 101.48±12.66 | 4.331 | 0.040 |
| t | 3.412 | 2.376 | | |
| P | 0.001 | 0.019 | | |
| DBP | | | | |
| Before nursing | 159.54±20.49 | 159.48±20.44 | 0.015 | 0.988 |
| After nursing | 135.78±19.45 | 143.65±19.57 | 2.017 | 0.046 |
| t | 5.947 | 3.956 | | |
| P | <0.001 | <0.001 | | |

Note: FBG: fasting blood glucose; 2hPG: 2 h postprandial glucose; SBP: systolic blood pressure; DBP: diastolic blood pressure.

Table 3. Comparison of changes of amniotic fluid index (cm, $\bar{x} \pm sd$)

| Group | Before intervention | After intervention | t | P |
|--------------------------|---------------------|--------------------|--------|--------|
| Control group (n=50) | 16.22±1.42 | 15.97±2.33 | 0.657 | 0.513 |
| Observation group (n=50) | 16.23±1.40 | 18.94±2.44 | -6.814 | <0.001 |
| t | 0.027 | 6.239 | | |
| P | 0.979 | <0.001 | | |

Table 4. Comparison of nursing satisfaction (n, %)

| Group | Very satisfied | Basically satisfied | Dissatisfied | Nursing satisfaction rate |
|--------------------------|----------------|---------------------|--------------|---------------------------|
| Control group (n=50) | 25 (50.00) | 14 (28.00) | 13 (26.00) | 39 (78.00) |
| Observation group (n=50) | 32 (64.00) | 16 (32.00) | 2 (4.00) | 48 (96.00) |
| t | | | | 14.324 |
| P | | | | <0.001 |

Table 5. Comparison of perinatal health status (n, %)

| Group | Neonatal hypoglycemia | Hyperbilirubinemia | Neonatal pneumonia | Neonatal asphyxia | Neonatal ischemia | Incidence | Apgar score |
|--------------------------|-----------------------|--------------------|--------------------|-------------------|-------------------|------------|-------------|
| Control group (n=50) | 1 (2.00) | 3 (6.00) | 2 (4.00) | 2 (4.00) | 4 (8.00) | 12 (24.00) | 6.03±2.09 |
| Observation group (n=50) | 0 (0.00) | 1 (2.00) | 1 (2.00) | 1 (2.00) | 1 (2.00) | 4 (8.00) | 8.38±4.52 |
| χ^2 | | | | | | 4.762 | 1.559 |
| P | | | | | | 0.029 | 0.013 |

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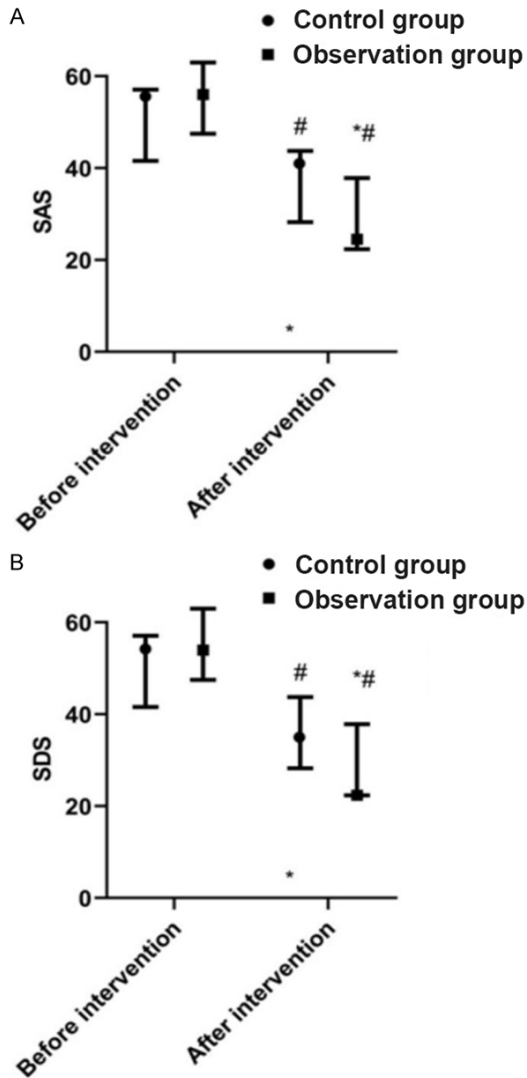


Figure 1. SAS and SDS scores of the two groups before and after intervention. A: Score of SAS; B: Score of SDS. Compared with the same group before intervention, [#] $P < 0.05$; compared with the control group after nursing, ^{*} $P < 0.05$. SAS: Self-Rating Anxiety Scale. SDS: Self-Rating Depression Scale.

son of perinatal health showed that the Apgar score of the observation group was significantly higher than that of the control group, and the difference was statistically significant ($P = 0.013$). The specific results are shown in **Table 5**.

Comparisons of SAS and SDS scores

After nursing, SAS and SDS scores in the two groups were lower than those before nursing (all $P < 0.05$). The scores in the observation group were lower than those in the control group (both $P < 0.05$). See **Figure 1**.

Discussion

High-quality nursing service provides psychological support and balance for puerperae based on a guarantee of their daily needs being met, nursing safety and body comfort. Through positive and effective nursing work, high-quality nursing tries to improve the overall coordination and support provide from the family members and society, which is a further improvement of the connotation of holistic nursing care. To carry out high-quality nursing service in the delivery room nurses are required to have rich professional knowledge and skills, positive service attitude and behaviors, so as to give timely care for and communication with puerperae. After intervention, blood glucose and blood pressure levels in the observation group were better than those in the control group. It can be seen that the application of high-quality nursing in the delivery room for neonatal care has many advantages, and it can help the maternal recovery of physiological function, as well as help in the establishment of maternal breastfeeding [18, 19].

The purpose of high-quality nursing service in the delivery room is to comprehensively improve the level of nursing service [20]. Therefore, nurses are required to carry out puerperae and newborn oriented nursing work, constantly strengthening basic nursing, fully implement a nursing responsibility in the delivery room, and improve the quality of nursing service and satisfaction [21]. Moreover, the optimal nursing regimen was developed according to the actual needs of puerperae and newborns, in order to achieve the nursing service goals. The formulation, implementation and quality evaluation of high-quality nursing service requires nurses to continuously learn relevant knowledge, be proficient in relevant professional operation skills, strengthen their service ability, and earnestly fulfill their duties. The nursing meets the physical and mental needs of the puerperae to the greatest extent, ensuring a safe and smooth delivery process, obtains a high satisfaction rate from the puerperae and their families, and avoids medical disputes [22, 23]. In this study, the total nursing satisfaction rate of the observation group was higher than that of the control group, with significant difference.

In the current era, clinical unified nursing methods cannot meet the needs of newborns and

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puerperae, and this may seriously affect the physical health of newborns. This has a certain negative impact on the physical health and development of newborns, so it is necessary to conduct in-depth research in this field [24].

Compared with traditional nursing, high-quality nursing requires nurses to comprehensively perform their duties, focusing on detailed basic care and specialized care. Nurses not only need to carry out the procedures according to doctors, but also need to think from the perspective of puerperae. Through carrying out high-quality nursing, the psychological state of parturient women was well improved, which is of great significance for the delivery and other nursing work. The results of this study showed that SAS and SDS scores of parturient women in the observation group were significantly lower than those in the control group.

Another study also compared the health status of newborns before and after nursing. However, they grouped the subjects according to the delivery time, then nursing effects were evaluated by vaginal delivery rate, incidence of neonatal distress, SAS score and SDS score, which also illustrated that nursing service in the delivery room is significant to newborns' health [25].

However, this study also has some limitations. This is a single-center study with a small sample size, and the application value of high-quality nursing is still not deeply discussed. Therefore, it is necessary to cooperate with multiple centers and further expand the sample size in the future research.

To sum up, the application of high-quality nursing intervention for puerperae in the delivery room can improve their negative psychological emotions, as well as showing better health status in newborns, so it is worthy of widespread application and promotion.

Disclosure of conflict of interest

None.

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