

## Original Article

# Effect of humanistic nursing in obstetrics on delivery mode and satisfaction of maternal care

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**Abstract:** Objective: This study aimed to explore the effect of humanistic nursing on delivery mode and nursing satisfaction of maternity. Methods: Altogether 89 pregnant women diagnosed in our hospital from January 2018 to January 2019 were analyzed. Among them, 43 pregnant women with conventional nursing were included in group A, and 46 pregnant women with humanistic nursing based on conventional nursing in group B. The labor process, puerperium knowledge, delivery outcome (delivery mode, postpartum 2 h-hemorrhage, uterine recovery time, adverse condition, neonatal Apgar score), bad mood, and quality of life were compared. Results: The first, second and third stage of labor and SAS, SDS levels in group B were significantly lower than those in group A ( $P < 0.001$ ). The puerperal knowledge of group B was significantly better than that of group A ( $P < 0.05$ ). The vaginal delivery rate in group B was significantly higher than that in group A, and the cesarean section rate was significantly lower than group A ( $P < 0.05$ ). The postpartum hemorrhage and uterine recovery time in group B were significantly shorter than those in group A, and the incidence rate of adverse events in group B was significantly lower than that in group A ( $P < 0.001$ ). There was no significant difference in Apgar score between the two groups ( $P > 0.05$ ). The physical health, mental health, material life and social function of group B were significantly higher than those in group A ( $P < 0.001$ ). Conclusion: The humanistic nursing intervention has better effect on improving the mental health and quality of life and reducing the probability of cesarean section, and the acceptance of the relevant parturient is also high, which is worthy of wide clinical promotion.

**Keywords:** Humanistic nursing, obstetrics, delivery mode, nursing satisfaction

## Introduction

Parturient women are prone to anxiety and fear in the process of labor. Some of them will suffer severe pain during delivery and even resist vaginal delivery, requiring caesarean section. Different delivery methods not only affect the physical health of the parturient, but also directly affect the health of the newborn, so obstetric care has certain particularity [1, 2]. The research shows that the parturient should have a correct understanding of the delivery process and attentions, and should be given humanistic care and healthy psychological guidance, which are of great significance to maintain the emotional stability of parturients [3, 4]. Therefore, in order to improve the bad mood of parturients, better psychological intervention based on routine obstetric care is an important measure to improve the compliance of parturients during labor process [5]. Hu-

manized nursing is a new, human-centered and omni-directional nursing model. Research shows that humanized nursing intervention can better assist the safe delivery of parturient and meet aspects of psychological and physiological needs of parturient [6].

With the continuous development of social economy, the concept of nursing has also developed continuously. Relevant medical environment and medical level require continuous improvement of maternal psychology and quality of life [7]. Research shows that different nursing measures are of great significance for improving the quality of life of parturients [8]. Due to the lack of targeted humanistic nursing intervention such as more standardized psychological counseling for parturients, the traditional nursing mode has caused great psychological problems in puerperal period and seriously affected the quality of life [9]. Maternal

treatment process will produce pain and corresponding financial burden, patients will bear tremendous physical and psychological pain, resulting in bad mood. The humanistic nursing intervention on the basis of traditional nursing model and innovative measures have great clinical significance in reducing the pain interference in the process of maternal treatment and improving the quality of life of the patients [10, 11]. This study aimed to compare routine nursing intervention with humanistic nursing intervention, and to explore the influence of humanistic nursing intervention on the delivery mode, nursing satisfaction and quality of life of parturients.

### Methods and materials

#### *General information*

Altogether 89 pregnant women diagnosed and treated in our hospital from January 2018 to January 2019 were prospectively analyzed. Among them, 43 pregnant women who received conventional nursing were included in group A, and 46 pregnant women who received humanistic nursing based on conventional nursing were included in group B. The average age of group A was  $24.10 \pm 5.20$ , while that of group B was  $24.30 \pm 5.40$ . Inclusion and exclusion criteria: All confirmed parturients were in accordance with the clinical full-term pregnancy standard [12]; parturients with immune system diseases, family genetic diseases and other tumors, cancer; parturients with liver or kidney dysfunction, past coagulation disorders; parturients with other complications; parturients with conscious, cognitive and other mental disorders. Before this study was carried out, all parturients and their families were informed in advance, and this study has been approved by the hospital Ethics Committee.

#### *Nursing methods*

Group A parturients were given routine nursing care and adopted routine nursing method. The vital signs, prenatal preparation, prenatal education and perioperative nursing of the parturients were observed by the medical staff and adjusted according to the actual situation of different parturients.

In group B, the human-friendly nursing mode was accepted on the basis of routine nursing: (1) Humanistic hospitalization environment: under the conditions permitted by the hospital,

a family-style nursing delivery room was set up to pay attention to the personal privacy of the parturient. Each parturient was provided with a separate space. In combination with the actual situation of the parturient, additional furnishings were added to help the parturient relieve the pain of psychological fear and give birth smoothly. (2) Psychological intervention: relevant nurses communicated with the parturients and their families more, explained the problems encountered in the delivery process and the solutions patiently to the parturients, and informed the parturients of the corresponding prognosis nursing work after delivery. When the parturient had resistance, the nurses patiently and carefully understood the psychological fear and needs of the parturient, and gave different measures according to the specific psychological problems. Suggestive language was used to appease the parturient, and appropriate examples of successful spontaneous labor cases were given to the parturient to enhance the treatment confidence of the parturient, and eliminate the anxiety or depression of the parturient and their ideological burden. (3) Humanistic nursing concept: relevant nurses focused on parturient, understood the actual situation of different parturient, and communicated with the family members of parturient before and after delivery to ensure that the family members of the parturient actively cooperate with the hospital's nursing requirements after parturition, and to better carry out nursing measures. (4) Post-delivery nursing: after all vital signs of the parturients were stable, relevant medical staff told the parturients and their family about newborn nursing knowledge, guided breast feeding, told the parturients to avoid spicy and stimulating foods in diet but more fresh fruits and vegetables, and let the parturients to have more rest. For parturients undergoing caesarean section, the nursing staff provided nursing care to the parturients to avoid infection of surgical wound. All parturients had one-month telephone follow-up after discharge from hospital, and relevant medical staff continued to provide various nursing guidance.

#### *Observation indicators*

The general clinical data, labor process, puerperal knowledge, and maternal delivery outcomes (maternal delivery mode, 2 h postpartum hemorrhage, uterine recovery time, adverse maternal conditions, neonatal Apgar score) of group A and group B were compared

[13]. The mental health status of group A and group B was assessed with self-rating depression scale (SDS) [14] and self-rating anxiety scale (SAS) [15] to evaluate the adverse emotions of parturients in group A and group B. Those with a total score lower than 50 were normal, 50-60 were mild, 61-70 were moderate, and more than 70 were severe. The score was directly proportional to the degree of anxiety and depression. QOL-C30 [16] Comprehensive Quality of Life Scale was used to compare the quality of life (including physical health, mental health, material life and social function) of parturients in group A and group B. The score of each latitude was proportional to the quality of life, and the high score was closely related to the high quality of life. The nursing satisfaction of parturients in group A and group B was compared. Satisfaction = (very satisfied + satisfied + general) divided by the total number and multiplied by 100%. The follow-up time of the parturient was one month.

The general clinical data of parturients in group A and group B were compared. Labor process of parturients and puerperal knowledge between group A and group B were compared.

Delivery outcomes: the delivery outcomes of group A and group B include delivery mode, 2 h postpartum hemorrhage, uterine recovery time, adverse maternal condition, and neonatal Apgar score (including muscular tension, pulse, action of frown, response, appearance, breathing to stimuli) [13].

Mental health status: the mental health status of group A and group B was assessed with self-rating depression scale (SDS) [14] and self-rating anxiety scale (SAS) [15]. Scoring standards were used to assess the adverse emotions of parturients in group A and group B, and those with a total score lower than 50 were normal, 50-60 cases were mild, 61-70 cases were moderate, and more than 70 were severe. The score was positively correlated to the degree of anxiety and depression.

Quality of life: QOL-C30 Scale [16] and Comprehensive Quality of Life Assessment Scale were used to compare the quality of life (including physical health, mental health, material life and social function) of parturients in group A and group B. The score of each latitude was proportional to the quality of life, and the high score was closely related to the high quality of life.

Nursing satisfaction: the nursing satisfaction of group A and group B was compared. The nursing satisfaction = (very satisfied + satisfied + general)/the total number  $\times 100\%$ . The follow-up of the parturient was one month.

### *Statistical methods*

SPSS 19.0 (Asia Analytics Formerly SPSS China) was used for statistical analysis. The counting data was expressed as [n (%)], and  $\chi^2$  test was used for the counting data between the two groups. Measurement data were expressed as (Mean  $\pm$  SD). Paired t test was used for comparison before and after treatment in the group, and independent sample t test was used for comparison between the two groups. When the *P* value is less than 0.05, the difference is statistically significant.

### **Results**

#### *General clinical data of group A and B*

There was no significant difference in age, sex, delivery, BMI, smoking, drinking, household registration, and educational level between the two groups ( $P > 0.05$ ). See **Table 1** for details.

#### *Parturient labor process of group A and group B*

The first stage of labor in group A was  $598.50 \pm 73.80$  min, the second stage was  $99.40 \pm 11.00$  min, the third stage was  $28.60 \pm 2.40$  min. The first stage of labor in group B was  $412.20 \pm 47.82$  min, the second stage was  $63.60 \pm 5.40$  min, the third stage was  $11.60 \pm 2.50$  min. The first, second and third stage of labor in group B was significantly lower than those in group A ( $P < 0.001$ ). See **Figure 1A, 1B**.

#### *Mental health status of group A and B before and after nursing*

*SAS changes before and after nursing care of parturients in group A and group B:* The SDS of group A before and after nursing intervention was  $56.12 \pm 5.20$  and  $42.36 \pm 6.70$  respectively. There was no significant difference in SAS level between the two groups before nursing ( $P > 0.05$ ). The SDS of group B before and after nursing intervention was  $56.31 \pm 4.75$  and  $32.74 \pm 6.63$  respectively. The SDS level of the two groups after nursing was significantly lower than that before nursing ( $P < 0.001$ ). The SDS

**Table 1.** General clinical data of two groups

Group	A (n=43)	B (n=46)	t/X <sup>2</sup>	P
Age (years)	24.10±5.20	24.30±5.40	0.178	0.859
Delivery experience			0.714	0.398
Multipara	8 (18.60)	12 (26.09)		
Primipara	35 (81.40)	34 (73.91)		
BMI (kg/m <sup>2</sup> )	18.48±2.60	19.10±1.04		
Smoking history			0.000	1.000
Yes	43 (100.00)	46 (100.00)		
No	0 (0.00)	0 (0.00)		
Drinking history			0.000	1.000
Yes	43 (100.00)	46 (100.00)		
No	0 (0.00)	0 (0.00)		
Residence			0.108	0.742
Rural	23 (53.49)	23 (50.00)		
Urban	20 (46.51)	23 (50.00)		
Education degree			3.381	0.337
Middle school	3 (6.98)	0 (0.00)		
High school	5 (11.63)	5 (10.87)		
University	25 (58.14)	29 (63.04)		
Above University	10 (23.26)	12 (26.09)		
Thyroid function examination				
FT3 (pmmol/L)	4.51±0.37	4.48±0.36	0.699	0.388
FT4 (pmmol/L)	11.84±2.57	11.20±2.08	1.295	0.199
TSH (μIU/mL)	1.30±0.49	2.43±0.53	10.420	<0.001

level in group B after nursing was significantly lower than that in group A (P<0.001). See **Figure 2** for details.

*SDS changes of parturients in group A and group B before and after nursing:* The SDS of group A before and after nursing intervention was 58.42±4.73 and 48.14±5.62 respectively. There was no statistical difference in the level of SDS before the two groups (P>0.05). The SDS of group B before and after nursing intervention was 59.14±4.82 and 35.61±5.22 respectively. The SDS level of the two groups after nursing was significantly lower than that before nursing (P<0.001). The SDS level in group B after nursing was significantly lower than that in group A (P<0.001). See **Figure 2B** for details.

*Comparison of puerperal knowledge between group A and group B*

After nursing intervention, the postpartum activity, breast care, postpartum contraception, perineal care, Huang's observation, breast-feeding, umbilical care, and lochia were observed. The puerperal knowledge of group B

was significantly better than that of group A (P<0.05). See **Table 2** for details.

*Comparison of delivery outcomes between group A and B*

*Comparison of delivery modes between group A and group B:* After nursing intervention, the vaginal delivery rate in group B was significantly higher than that in group A, and the cesarean section rate was significantly lower than that in group A (all P<0.05). See **Table 3** for details.

*Postpartum maternity in group A and B:* The amount of postpartum hemorrhage in group A and group B was 171.35±11.45 mL and 109.33±12.26 mL respectively. The recovery time of postpartum uterus in group A and group B were 13.20±1.52 h and 8.01±1.39 h

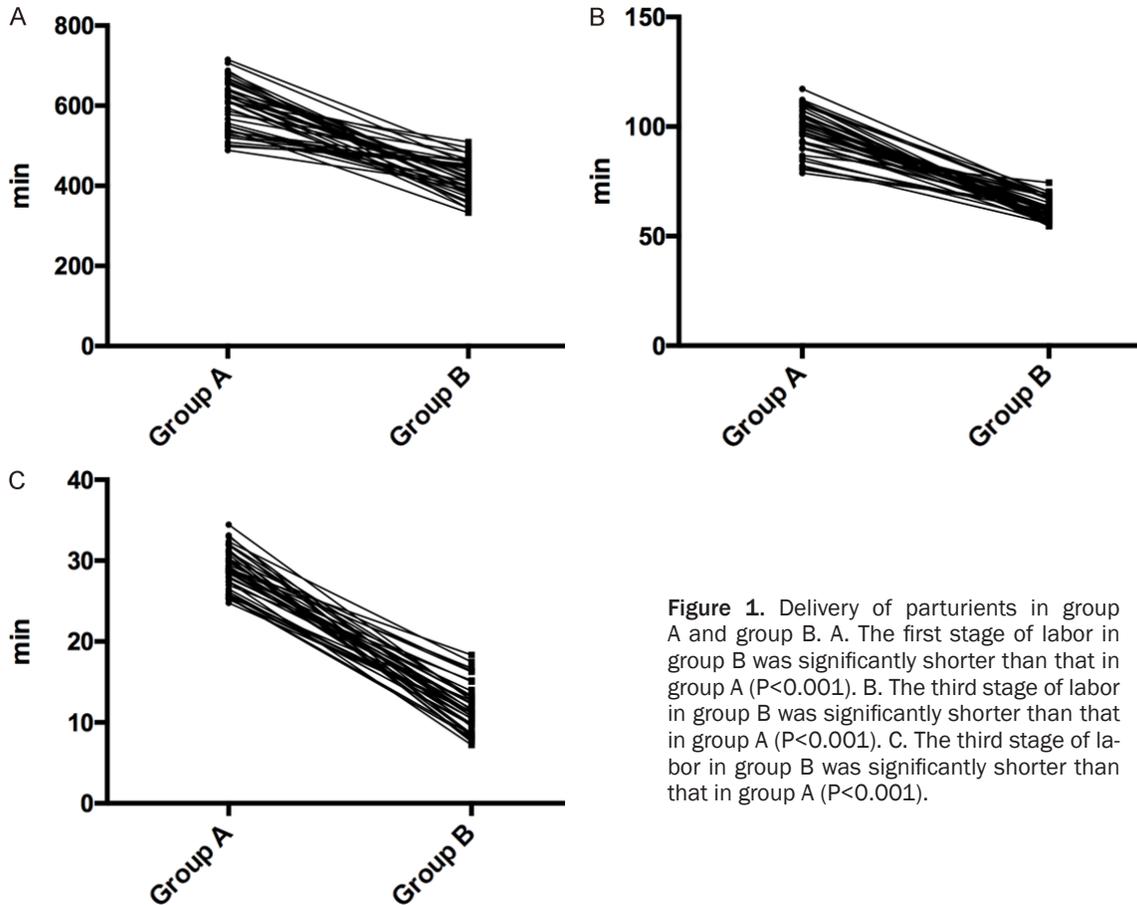
respectively. The incidence of rheumatism, fever, uterine pain, profuse sweating, and postpartum urine retention in group B was significantly lower than that in group A (P<0.001). See **Table 3** (A, B) and **Table 4**.

*Postpartum neonates in group A and B:* The Apgar scores of newborns in group A and group B were 9.49±0.43 and 9.18±0.36, respectively. There was no significant difference in the Apgar scores between the two groups (P>0.05). See **Figure 3C**.

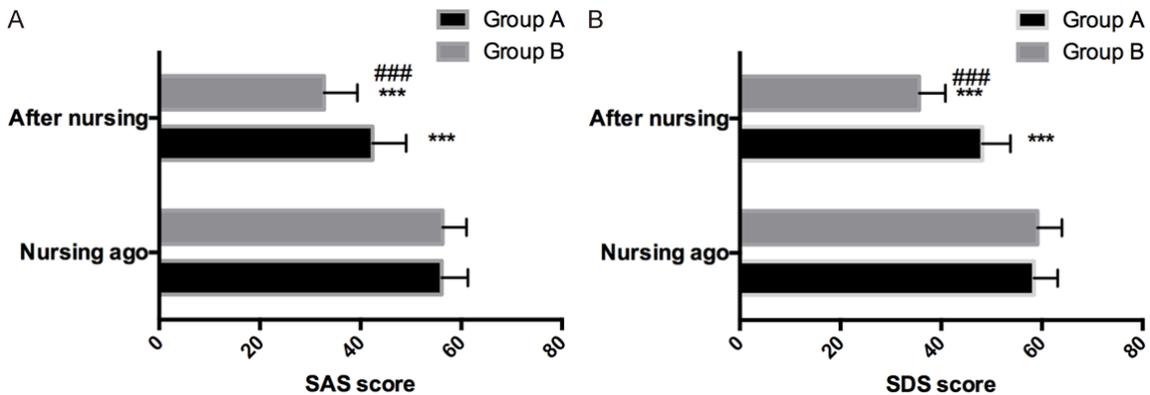
*Comparison of quality of life of parturients in group A and group B*

The QOL-C30 scale scores of maternal physical health, mental health, material life and social function in group A were 69.20±7.92, 65.19±7.34, 64.38±6.90, and 61.23±5.71 respectively, those in group B were 79.76±6.42, 79.22±6.61, 77.24±5.38, and 75.32±5.84, respectively. The scores of physical health, mental health, material life and social function in group B were significantly higher than those in group A (P<0.001). See **Figure 4A, 4B** for details.

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**Figure 1.** Delivery of parturients in group A and group B. A. The first stage of labor in group B was significantly shorter than that in group A ( $P<0.001$ ). B. The third stage of labor in group B was significantly shorter than that in group A ( $P<0.001$ ). C. The third stage of labor in group B was significantly shorter than that in group A ( $P<0.001$ ).



**Figure 2.** Changes of SAS and SDS before and after nursing in group A and group B. A. SAS changes before and after nursing care of parturients in group A and group B. The SAS level of the two groups after nursing was significantly lower than that before nursing ( $P<0.001$ ). The SAS level in group B after nursing was significantly lower than that in group A ( $P<0.001$ ). Note: \*\*\*, ### indicates  $P<0.001$ . B. SDS changes before and after nursing in group A and group B. The SDS level of the two groups after nursing was significantly lower than that before nursing ( $P<0.001$ ). The SDS level in group B after nursing was significantly lower than that in group A ( $P<0.001$ ). Note: \*\*\*, ### indicates  $P<0.001$ .

### Nursing satisfaction in group A and B

The total nursing satisfaction of parturients in group B was significantly higher than that in group A ( $P<0.05$ ). See **Table 5** for details.

### Discussion

At present, with the continuous development of new concepts and modes of obstetric care, the humanistic nursing mode based on the princi-

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**Table 2.** Comparison of puerperal knowledge between group A and group B

Group	A (n=43)	B (n=46)	X <sup>2</sup>	P
Postpartum activity	23 (53.49)	44 (95.65)	21.230	<0.001
Breast nursing	24 (55.81)	43 (93.48)	16.940	<0.001
Postpartum contraception	25 (58.14)	44 (95.65)	17.950	<0.001
Perineal nursing	30 (69.77)	45 (97.83)	3.633	<0.001
Jaundice observation	30 (69.77)	46 (100.00)	16.290	<0.001
Breast feeding	31 (72.09)	46 (100.00)	14.840	<0.001
Umbilical nursing	28 (65.12)	42 (91.30)	9.078	0.003
Lochia observation	29 (67.44)	41 (89.13)	6.226	0.013

**Table 3.** Comparison of delivery outcomes between group A and B

Group	A (n=43)	B (n=46)	X <sup>2</sup>	P
Transvaginal natural labour	30 (69.77)	41 (89.13)	5.165	0.023
Transvaginal delivery	1 (2.33)	1 (2.17)	1.701	0.192
Cesarean section	12 (27.91)	4 (8.70)	5.563	0.018

**Table 4.** Comparison of adverse conditions between group A and B

Group	A (n=43)	B (n=46)	X <sup>2</sup>	P
Rheumatism	5 (11.63)	1 (2.17)	-	-
Fever	4 (9.30)	2 (4.35)	-	-
Hysteralgia	6 (13.95)	1 (2.17)	-	-
Profuse sweating	12 (27.91)	4 (8.70)	-	-
Postpartum urinary retention	9 (20.00)	2 (4.35)	-	-
Total adverse incidence	36 (83.72)	10 (21.73)	34.190	<0.001

ple of people-oriented is gradually implemented in parturients [17]. In recent years, studies have shown that the introduction of humanistic nursing mode in obstetrical nursing can not only improve the quality of obstetric nursing service, but also form a good doctor-patient relationship and to a certain extent increase the satisfaction degree of maternal nursing, which has great influence on improving the development of obstetric medical services [18].

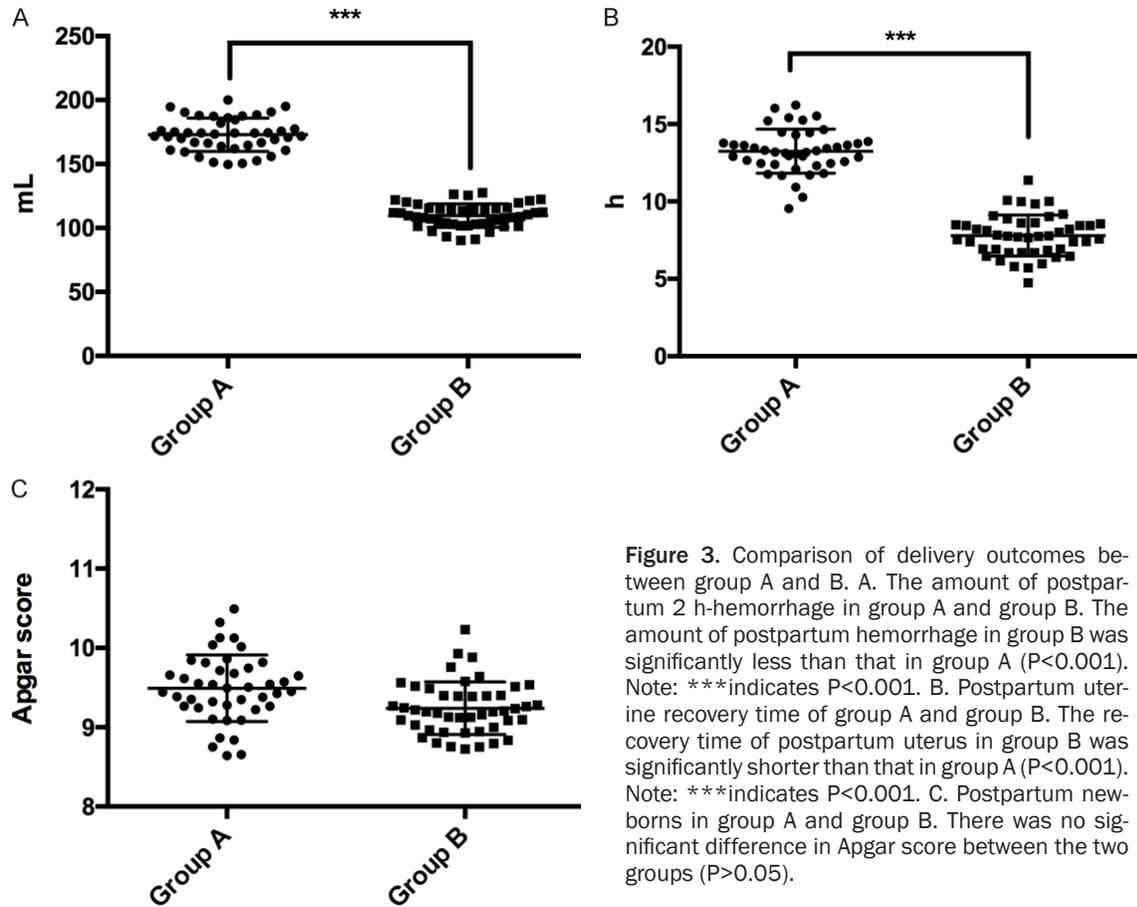
Maternal and infant health is closely related to the obstetric care mode. In the past, the conventional obstetric care mode lacked the puerperal knowledge and the whole process was operated by the relevant nursing staff, which could not mobilize the subjective initiative of the pregnant and maternal women, resulting in strong fear, anxiety, depression and other negative emotions of natural childbirth, leading to

the occurrence of adverse prognosis of pregnant and lying-in women. Due to the lack of knowledge and bad emotions, some parturients choose cesarean section for delivery [19, 20]. Cesarean section has adverse effects on the health of both mother and infant [21]. This study shows that, after nursing intervention, the puerperal knowledge of pregnant women who received humanized nursing intervention is significantly better than that of pregnant women who received conventional obstetric care. The SAS and SDS levels of all parturients after nursing were significantly lower than those before nursing, and the levels of the parturient after humanistic nursing were significantly lower than those of the parturient after routine nursing. Therefore, we believe that the implementation of humanistic intervention nursing mode for pregnant and maternal women is better than that of routine nursing in regulating the unhealthy mood. Anxiety and depression, as a kind of emotional disorder, are commonly found in adverse complications

after delivery [22]. A large number of clinical studies have shown that anxiety and depression have a great influence on the physical recovery rate of parturients. Proper obstetric care can improve the anxiety and depression of parturients [23, 24]. All these prove the importance of the research results in this paper. Research on humanistic nursing proves that the improvement of anxiety, uneasiness and other bad emotions is better when humanistic nursing is adopted on the basis of routine nursing.

The emotions of pregnant and lying-in women directly affect the mode of physical delivery, adverse reactions and pregnancy outcomes. Humanistic whole-course nursing, through the integration of psychology and environment, enables the pregnant women to establish self-confidence in natural delivery. At the same

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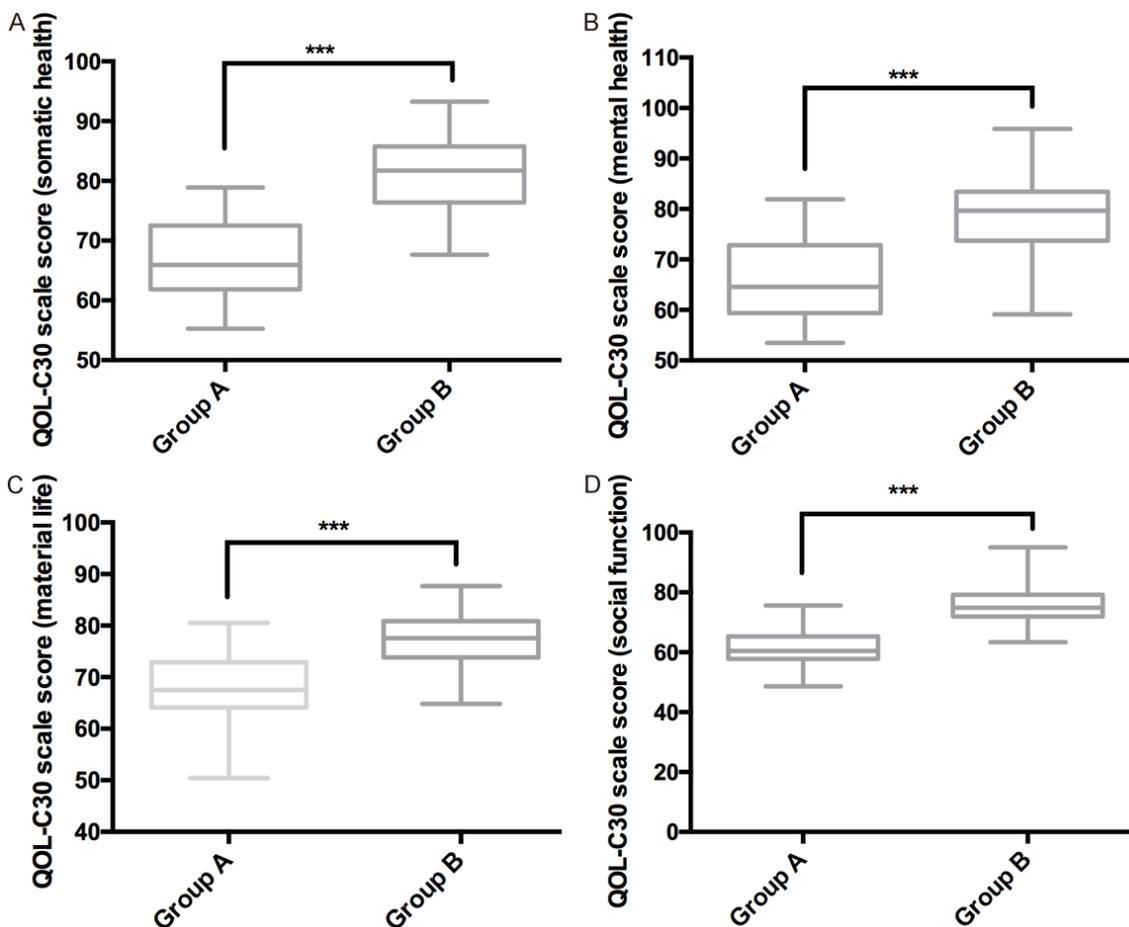


**Figure 3.** Comparison of delivery outcomes between group A and B. A. The amount of postpartum 2 h-hemorrhage in group A and group B. The amount of postpartum hemorrhage in group B was significantly less than that in group A ( $P < 0.001$ ). Note: \*\*\*indicates  $P < 0.001$ . B. Postpartum uterine recovery time of group A and group B. The recovery time of postpartum uterus in group B was significantly shorter than that in group A ( $P < 0.001$ ). Note: \*\*\*indicates  $P < 0.001$ . C. Postpartum newborns in group A and group B. There was no significant difference in Apgar score between the two groups ( $P > 0.05$ ).

time, it improves the maternal compliance with medical staff in the delivery process, greatly improves the natural delivery rate, reduces the adverse symptoms of postpartum, and improves the quality of life of parturients and newborns [25]. In this study, the stages of labor, delivery outcomes and quality of life after one month were compared. The results showed that the probability of spontaneous delivery, postpartum 2 h-hemorrhage, uterine recovery, adverse conditions and neonatal Apgar score of humanistic nursing intervention were better than those of conventional obstetric nursing. The QOL-C30 scale results show that the quality of life scores of humanistic nursing intervention on maternal physical health, mental health, material life and social function are significantly higher than those of routine nursing. Physical health and mental health are both important aspects that reflect the prognosis of parturients and are indispensable. Good mental state also promotes the physical health of parturients. Parturients who are expected to give birth need to bear the combined effects of

pain, fear of death and great economic pressure [26]. Similar studies have confirmed that the relevant medical and nursing staff, while continuously improving the quality of nursing services, carry out reasonable psychological education for the lying-in women to improve the unhealthy psychology, which have a positive impact on the physical health and social functions [27]. Therefore, we believe that humanistic nursing intervention has better effect and greater value in improving maternal quality of life than conventional nursing.

Finally, we counted the nursing satisfaction of group A and group B. The results showed that the total nursing satisfaction of group B was significantly higher than that of group A, and the difference was statistically significant. Therefore, we believe that the acceptance and approval of humanistic nursing intervention on the basis of routine nursing are far higher than those of routine nursing intervention. In recent years, relevant clinical studies have also confirmed that the satisfaction of puerpera or their



**Figure 4.** Comparison of quality of life between group A and group B after intervention. A. QOL-C30 Scale Score (Mental Health). The scores of maternal physical health and quality of life in group B were significantly higher than those in group A ( $P < 0.001$ ). Note: \*\*\*indicates  $P < 0.001$ . B. QOL-C30 Scale Score (Mental Health). The mental health and quality of life scores of parturients in group B were significantly higher than those in group A ( $P < 0.001$ ). Note: \*\*\*indicates  $P < 0.001$ . C. QOL-C30 Scale Score (Material Life). The material quality of life scores of parturients in group B were significantly higher than those in group A ( $P < 0.001$ ). Note: \*\*\*indicates  $P < 0.001$ . D. QOL-C30 Scale Score (Social Function). The material quality of life scores of parturients in group B were significantly higher than those in group A ( $P < 0.001$ ). Note: \*\*\*indicates  $P < 0.001$ .

**Table 5.** Nursing satisfaction in group A and B

Group	A (n=43)	B (n=46)	$\chi^2$	P
Very satisfied	25 (58.14)	35 (76.09)	-	-
Satisfied	5 (11.63)	7 (15.22)	-	-
General	5 (11.63)	3 (6.52)	-	-
Dissatisfied	8 (18.60)	1 (2.17)	-	-
Total satisfaction	35 (81.40)	45 (97.83)	6.601	0.010

families with humanistic nursing intervention is higher than that of routine obstetric nursing intervention [28].

In this study, there are still some deficiencies, such as not showing the biochemical indexes of parturients. The nursing plan formulated this

time was also affected by the local medical level and may differ from other regions. The follow-up time was too short. In view of these defects, we will continue to pay attention to the latest relevant research results in the later period and regularly review the prognosis of pregnant women, so as to continuously improve the research.

To sum up, the implementation of humanistic nursing intervention has a better effect on improving the mental health and quality of life of the parturient, reduces the probability of cesarean section to a certain extent, and has a higher acceptance of the relevant parturient, which is worthy of wide clinical promotion.

## Disclosure of conflict of interest

None.

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## References

- [1] Stoll K, Swift EM, Fairbrother N, Nethery E and Janssen P. A systematic review of nonpharmacological prenatal interventions for pregnancy-specific anxiety and fear of childbirth. *Birth* 2018; 45: 7-18.
- [2] Moghimi-Hanjani S, Mehdizadeh-Tourzani Z and Shoghi M. The effect of foot reflexology on anxiety, pain, and outcomes of the labor in primigravida women. *Acta Med Iran* 2015; 53: 507-511.
- [3] Wilkinson EL, O'Mahen HA, Fearon P, Halligan S, King DX, Greenfield G, Dunkley-Bent J, Erickson J, Milgrom J and Ramchandani PG. Adapting and testing a brief intervention to reduce maternal anxiety during pregnancy (ACORN): study protocol for a randomised controlled trial. *Trials* 2016; 17: 156.
- [4] Galland BC, Sayers RM, Cameron SL, Gray AR, Heath AM, Lawrence JA, Newlands A, Taylor BJ and Taylor RW. Anticipatory guidance to prevent infant sleep problems within a randomised controlled trial: infant, maternal and partner outcomes at 6 months of age. *BMJ Open* 2017; 7: e014908.
- [5] Rotheram-Fuller EJ, Tomlinson M, Scheffler A, Weichle TW, Hayati Rezvan P, Comulada WS and Rotheram-Borus MJ. Maternal patterns of antenatal and postnatal depressed mood and the impact on child health at 3-years postpartum. *J Consult Clin Psychol* 2018; 86: 218-230.
- [6] Haakstad LA, Torset B and Bø K. What is the effect of regular group exercise on maternal psychological outcomes and common pregnancy complaints? An assessor blinded RCT. *Midwifery* 2016; 32: 81-86.
- [7] Sawyer AC, Lynch J, Bowering K, Jeffs D, Clark J, Mpundu-Kaambwa C and Sawyer MG. An equivalence evaluation of a nurse-moderated group-based internet support program for new mothers versus standard care: a pragmatic preference randomised controlled trial. *BMC Pediatr* 2014; 14: 119.
- [8] Bobo WV, Wollan P, Lewis G, Bertram S, Kurland MJ, Vore K and Yawn BP. Depressive symptoms and access to mental health care in women screened for postpartum depression who lose health insurance coverage after delivery: findings from the Translating Research into Practice for Postpartum Depression (TRIP-PD) effectiveness study. *Mayo Clin Proc* 2014; 89: 1220-1228.
- [9] Caldwell BA and Redeker NS. Maternal stress and psychological status and sleep in minority preschool children. *Public Health Nurs* 2015; 32: 101-111.
- [10] Saing S, Parkinson B, Church J and Goodall S. Cost effectiveness of a community-delivered consultation to improve infant sleep problems and maternal well-being. *Value Health Reg Issues* 2018; 15: 91-98.
- [11] Boatman AA, Wylie B, Goldfarb I, Azevedo R, Pittel E, Ng C and Haberer J. Wireless fetal heart rate monitoring in inpatient full-term pregnant women: testing functionality and acceptability. *PLoS One* 2015; 10: e0117043.
- [12] Moran LJ, McNaughton SA, Sui Z, Cramp C, Dussen AR, Grivell RM and Dodd JM. The characterisation of overweight and obese women who are under reporting energy intake during pregnancy. *BMC Pregnancy Childbirth* 2018; 18: 204.
- [13] Dowdall D, Flatley C and Kumar S. Birth weight centiles, risk of intrapartum compromise, and adverse perinatal outcomes in term infants. *J Matern Fetal Neonatal Med* 2017; 30: 2126-2132.
- [14] Pu D, Luo J, Wang Y, Ju B, Lv X, Fan P and He L. Prevalence of depression and anxiety in rheumatoid arthritis patients and their associations with serum vitamin D level. *Clin Rheumatol* 2018; 37: 179-184.
- [15] Emons WH, Sijtsma K and Pedersen SS. Dimensionality of the hospital anxiety and depression scale (HADS) in cardiac patients: comparison of Mokken scale analysis and factor analysis. *Assessment* 2012; 19: 337-353.
- [16] Piwek L, Petrini K and Pollick F. A dyadic stimulus set of audiovisual affective displays for the study of multisensory, emotional, social interactions. *Behav Res Methods* 2016; 48: 1285-1295.
- [17] Medeiros RM, Teixeira RC, Nicolini AB, Alvares AS, Corrêa AC and Martins DP. Humanized care: insertion of obstetric nurses in a teaching hospital. *Rev Bras Enferm* 2016; 69: 1091-1098.
- [18] Vázquez Lara JM, Rodríguez Díaz L, Ramírez Rodrigo J, Villaverde Gutiérrez C, Torres Luque G and Gómez-Salgado J. Quality of life related to health in a population of healthy pregnant women after a program of physical activity in the aquatic environment. *Rev Esp Salud Pública* 2017; 91.
- [19] Koblinsky M, Moyer CA, Calvert C, Campbell J, Campbell OM, Feigl AB, Graham WJ, Hatt L,

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- Hodgins S, Matthews Z, McDougall L, Moran AC, Nandakumar AK and Langer A. Quality maternity care for every woman, everywhere: a call to action. *Lancet* 2016; 388: 2307-2320.
- [20] Castral TC, Warnock F, Dos Santos CB, Daré MF, Moreira AC, Antonini SR and Scochi CG. Maternal mood and concordant maternal and infant salivary cortisol during heel lance while in kangaroo care. *Eur J Pain* 2015; 19: 429-438.
- [21] Blustein J and Liu J. Time to consider the risks of caesarean delivery for long term child health. *BMJ* 2015; 350: h2410.
- [22] Salari AA, Fatehi-Gharehlar L, Motayaghani N and Homberg JR. Fluoxetine normalizes the effects of prenatal maternal stress on depression- and anxiety-like behaviors in mouse dams and male offspring. *Behav Brain Res* 2016; 311: 354-367.
- [23] Reck C, Tietz A, Muller M, Seibold K and Tronick E. The impact of maternal anxiety disorder on mother-infant interaction in the postpartum period. *PLoS One* 2018; 13: e0194763.
- [24] Winter C, Van Acker F, Bonduelle M, Van Berkel K, Belva F, Liebaers I and Nekkebroeck J. Depression, pregnancy-related anxiety and parental-antenatal attachment in couples using preimplantation genetic diagnosis. *Hum Reprod* 2016; 31: 1288-1299.
- [25] Xu J, Wang J, Xuan S, Fang G, Tian J and Teng Y. The effects of childbirth age on maternal and infant outcomes in pregnant women. *Iran J Public Health* 2018; 47: 788-793.
- [26] Cooklin AR, Amir LH, Nguyen CD, Buck ML, Cullinane M, Fisher JRW and Donath SM; CASTLE Study Team. Physical health, breastfeeding problems and maternal mood in the early postpartum: a prospective cohort study. *Arch Womens Ment Health* 2018; 21: 365-374.
- [27] Conesa Ferrer MB, Canteras Jordana M, Ballasteros Meseguer C, Carrillo García C and Martínez Roche ME. Comparative study analysing women's childbirth satisfaction and obstetric outcomes across two different models of maternity care. *BMJ Open* 2016; 6: e011362.
- [28] Inagaki AD, Cardoso NP, Lopes RJ, Alves JA, Mesquita JR, de Araújo KC and Katagiri S. Spatial distribution of anti-toxoplasma antibodies in pregnant women from Aracaju, Sergipe, Brazil. *Rev Bras Ginecol Obstet* 2014; 36: 535-540.