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Original Article

Applying the Carolina care model to improve nurses' humanistic care abilities

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Abstract: Purpose: To study the application of the Carolina Care Model to improve nurses' humanistic care abilities in the Department of Obstetrics and Gynecology. Methods: From December 2019 to April 2020, 40 nursing staff and 80 patients in the Department of Obstetrics and Gynecology in our hospital were recruited as the study cohort and randomly placed in an intervention group or a control group. The intervention group underwent the Carolina Care Model to complete the clinical nursing work. The control group underwent hospital routines to complete clinical nursing work. Results: After the training, the humanistic care ability scores and the scores of various dimensions in the intervention group were significantly higher than the scores in the control group ($P<0.05$). The patient care perception scores in the intervention group were higher than they were in the control group ($P<0.05$). The patients' nursing satisfaction scores in the intervention group were significantly higher than they were in the control group ($P<0.05$). Conclusion: Carrying out a humanistic care nursing practice based on the Carolina Care Model can improve the humanistic care abilities of the nurses in the Department of Obstetrics and Gynecology, patient care perception and satisfaction, and the quality of the nursing service.

Keywords: Application of Carolina Care Model, nurses, humanistic care abilities

Introduction

With the transformation of medical models and the continuous deepening of high-quality nursing services, Chinese patients' satisfaction with the services has been improved to some extent, but nurses still ignore patients' psychological feelings in clinical nursing work, which may lead to a decrease in the overall humanistic care abilities of Chinese nurses [1]. The "Healthy China 2030" plan issued by the Chinese government specifically pointed out: "Strengthen the humanistic care of medical services and build a harmonious doctor-patient relationship" [2]. At the same time, the Medical Administration and Hospital Authority clearly requires, in the "Notice on Issuing the Guidance Opinions on Promoting the Reform and Development of the Nursing Service Industry", that nursing be "patient-centered", use innovative nursing service models, optimize service processes, and provide patients with high-quality nursing services [3]. Nurses are required to incorporate the elements of humanistic care in their daily nursing work. At present, there are few clinical practice studies on the humanistic care abilities of nurses in our country, and there is no practical model guided by specific theories for reference. This study confirmed that the use of the Carolina Care Model for practical training and nursing practice can improve nurses' humanistic care abilities, the quality of care, and patient satisfaction. The Carolina Care Model is a nursing service model developed by the University of North Carolina Hospital. It is a method of realizing the theory of care and aims to apply Swanson's care theory to practice [4]. To improve nurses' humanistic care abilities and improve patient satisfaction, our department formulated a humanistic care training program based on the Carolina Care Model. Since its implementation, it has

effectively improved the nurses' humanistic care abilities and patient satisfaction. The report is as follows.

Materials and methods

The study cohort

From December 2019 to April 2020, 40 nurses in the Department of Obstetrics and Gynecology in our hospital were recruited as the study cohort. Inclusion criteria: registered nurses with a nurse's license, who had been engaged in nursing for 1 year or more, and who volunteered to participate in this study. Exclusion criteria: nursing trainees or advanced training nurses, nurses expecting to take long-term vacations or studying outside the county, and nurses who refused to participate in the humanistic care ability training. Ultimately, 40 nurses in the Department of Obstetrics and Gynecology were recruited, and all of them were women. They were randomly divided into the intervention group and the control group, each with 20 people. There were 20 people in the intervention group ranging in age from 23 to 38 (26.85±3.50) years old, including 17 with bachelor's degrees and 3 with college degrees, 3 supervisor nurses, 9 primary nurses, and 8 nurses. Their work experience ranged from 1 to 17 years, with an average of (4.60±3.38) years. The levels of the nurses were N0 (0), N1 (12), N2 (5), N3 (3), and N4 (0). There were 20 people in the control group ranging from 24 to 50 (29.05±5.81) years old, including 12 with bachelor's degrees and 8 with college degrees, 1 deputy chief nurse, 1 supervisor nurse, 9 primary nurses, and 9 nurses. Their work experience ranged from 2 to 29 years, with an average of (7.30±5.74) years. The levels of the nurses was N0 (0), N1 (13), N2 (5), N3 (1), and N4 (1). There was no statistically significant difference between the two groups of nurses in terms of their general data, such as age, educational background, working years, or energy level (P>0.05).

At the same time, 80 patients in the Department of Obstetrics and Gynecology were selected. The patients in Group A ranged from 18-61 (30.2±7.796) years old, and the patients in group B ranged from 21-63 (32.825± 11.098) years old. In terms of their educational levels, 24 patients had a high school education or below, 8 patients had a technical secondary school degree, 24 patients had a junior college degree, and 21 patients had a bachelor's degree or above. In terms of their disease types, 21 patients were undergoing a cesarean section, 8 patients were having pregnancy complications, 11 patients were being treated for gynecological-related tumors, and the others totaled 40 patients. The 40 patients as in the intervention group were group A, and the 40 patients in the control group were group B. There was no significant difference between the two groups in terms of their ages, educational levels, occupations, etc. (P>0.05). This study was approved by the ethics committee of University Town Hospital Affiliated to Chongqing Medical University (ethics number: 2020-274). All the above patients signed the informed consent forms.

Methods

The control group completed clinical nursing work in accordance with the overall nursing quality requirements of the hospital responsibility system. The nursing staff underwent training on condition observation, treatment nursing, health education, psychological nursing, and other routine tasks while combining the characteristics of their specialties to complete personalized and humanized dynamic demand services. In the intervention group, the nurses were trained in humanistic care abilities according to the Carolina Care Model. The nurses implemented the humanistic care work standards in clinical nursing, and they were evaluated and given feedback promptly. The specific methods were as follows.

Set up a humanistic care team

Choose to work for ≥5 years, and recruit 5 supervisory nurses or above to form a humanistic care training group. The members of the team hold advanced nursing teacher qualification certificates and have good humanistic care qualities. The person in charge of the project will train the team members on the knowledge and methods of humanistic care and the Carolina Care Model, and train the nursing staff of the intervention group after passing the assessment.

Formulation and implementation of the humanistic care intervention plan

Develop a humanistic care intervention plan according to the Carolina Care Model: It mainly reflects the nursing service for the patients

through five core nursing behaviors and achieves nursing behaviors that increase patient satisfaction [5]. Due to cultural differences, this study formulated a humanistic care training program for nurses in the Department of Obstetrics and Gynecology according to the Carolina Care Model (**Tables 1** and **2**).

Implementation of the training program

Before the training, members of the humanistic care training team used Nkongho to compile all the nurses in the Department of Obstetrics and Gynecology. The Chinese version of the Caring Ability Inventory (CAI) translated by Xu Juan conducted a survey on the current status of the selected nurses' humanistic care abilities, and a total of 40 surveys were distributed. All the questionnaires were returned, so the effective recovery rate was 100%. The scale was divided into 3 dimensions of cognition, courage, and patience, with a total of 37 items, and then the results of the questionnaire underwent a statistical analysis. The intervention group was randomly divided into groups according to the desires of the nurses, and the humanistic care training team members were responsible for the training and the nurses participated in the training plan. The training program mainly consisted of the following four parts: 1) Perceived care: To let the nurses experience and feel cared for, the Nursing Warm Month activity was hosted and carried out. The humanistic classic movie "Mind Drops" was recommended. The nurses in the intervention group were divided to participate in training into groups of 5 to simulate the real situations of clinical cases and experience the psychological changes of the body and mind without humane care, etc. Each training was 35-40 min, 2 times a week, over a 2 week period, and was implemented in groups. 2) Theoretical knowledge: The Caring Ability Evaluation Scale was used to conduct a one-to-one survey on the status quo of nurses' humanistic care abilities, and the nurses were informed of the results. Thus, the nurses were aware of the gap between their humanistic care and the overall care, so as to strengthen their own learning care abilities. During the epidemic period, the WeLink conference was used live and online to teach relevant theoretical knowledge. The online discussion and interaction reached a consensus. Offline learning was mainly achieved through role-playing exercises and group competitions. A theme was selected according to the textbook every week and the training took 4 weeks, about 30 minutes each time and 2 times a week. At the end, the nurses completing the theory plus role-playing assessment after reaching the standard will enter the next stage of clinical practice. 3) Clinical practice: Before the nurses started to implement humanistic care, the members of the training team would conduct experiential demonstration training on basic etiquette, working language and methods, such as the experience of cooperating with vaginal examinations during the birth of parturient women and the use of non-verbal communication skills for patients with ovarian malignant tumors during chemotherapy, so as to ensure that the nurses can smoothly implement humanistic care. The training took place for 4 weeks, about 20 minutes each time and 2 times a week and was implemented in groups. 4) Caring experience: Caring experience cases were carried out to the share sessions every month. Moreover, the nurses were allowed to summarize the real problems that they have encountered and participated in the implementation of humanistic care nursing quality inspection standards, which further standardized the nurses' behavior, commended outstanding humanistic care collective groups and individuals, and encouraged more nurses to participate in the humanistic care operations. Each training took about 30 minutes and has held once a month.

Evaluation method

(1) Before the training and at 3 months after the training, the Chinese version of the Caring Competence Evaluation Scale was used to evaluate the nurses' humanistic caring capacity [6]. The Nurses' Humanistic Care Ability Scale had 3 dimensions, including cognition (14 items), courage (13 items), and patience (10 items). There were 37 items in 3 dimensions. Each item ranged from "strongly agree" to "Completely opposed" had 7 levels, each with 1-7 points, and the total CAI score was 37-259 points. The higher the score, the stronger the caring ability. A total score <203.1 was considered low humanistic care ability, a score from 203.1-220.3 was considered medium humanistic care ability, and a score >220.3 was

Table 1. Humanistic care training program for nurses in the Department of Obstetrics and Gynecology based on the Carolina Care Model

Subject section	Training method	Training content	Training objectives	Time
Emotional care	Group participation	Nurse Warm Month Activity 1. Watching the classic humanities movie "Mind Drops" 2. Scenario simulation and role-playing: ask nurses to experiencing the psychological changes without humane care	Stimulating nurses' perceptual knowledge and understanding of humanistic care	1 week
Theoretical knowledge	Group teaching (online and offline)	1. "Caring Nursing: Application of Watson's Humanistic Care Theory in Nursing" edited by Huang Xingzhi 2. Shi Ruifen, Liu Yilan, editor of "Nurse Humanity Cultivation" 3. Cheng Weiwei, editor of "Gynecology and Obstetrics Medical Behavior and Humanistic Care" 4. Cheng Peng, Zhang Kexin, editor of "Nursing Psychology" 5. Carolina Care Model and Connotation	1. Nurses mastered knowledge of humanistic care theory 2. Nurses understood the quality of humanistic care 3. Nurses could take care of themselves 4. Nurses mastered the Carolina Care Model and its connotation	4 week
Clinical practice	Group implementation	According to the Carolina Care Model of nursing behavior combined with the internal responsibility system of overall care, a workflow suitable for the Department of Obstetrics and Gynecology were formulated: the core behaviors of a Carolina Care Model were introduced every month into daily nursing work, throughout the patient's admission, surgery, recovery and discharge. And during the implementation process, we promptly effected the evaluation, provided timely feedback and continued improvement	Let nurses believe in their own abilities and consciously implement core nursing behaviors in accordance with the humanistic care training program	Practicing in the first 2 weeks of each month and maintaining in the next 2 weeks
Skills practice	Group implementation	1. The assessment of nursing operation incorporated the concept of humanistic care 2. Humanistic care and nursing rounds combined with ROUNDS structure 3. Developing ISBAR handover template for patient bedside handover	1. Nurses mastered humanistic care and communication skills 2. Improving nurses' practical ability of humanistic care	4 week
Caring experience	group discussion	1. Case experience sharing session: sharing the actual problems encountered by nurses in the implementation of humanistic care, and helping them to make better suggestions and plans based on the specific situation 2. Humanistic care experience sharing: please share their experience with outstanding nurses who won the "Humanistic Care Star" award	Enhancing nurses' maintenance of good humanistic care behavior, improving self-efficacy, and enhancing professional humanistic quality	2 week

Table 2. The core nursing behaviors of the Carolina Care Model

Caring Behavior in the Carolina Care Model	Specific implementation content
Multi-level rounds	Follow the ROUNDS structure to carry out humanistic nursing rounds during daily rounds.
Working language and method	A standardized scripting language was developed for the recurring and common nursing work scenarios and the operating procedures in the Department of Obstetrics and Gynecology. In addition, personalized language was used to communicate with the patients according to their individual conditions.
Caring moment	The responsible nurse spent 3 to 5 minutes every day talking with the patients in charge of him, which could be chatting or therapeutic communication, giving the patients care or encouragement.
No area of transmit information	Although the responsible nurses had their own patients in charge, as long as a patient pressed the call bell, they dealt with it promptly instead of waiting to pass the task to the responsible nurse of the patient.
Patient handover	The on-duty and succession nurses were handed over at the bedside, combined with ISBAR handover, reviewed the nursing points of this shift, formulated the nursing plan for the next shift, and put forward predictive measures and suggestions according to the handover and evaluation content.

considered high humanistic care ability [7]. The Cronbach's a coefficient of this scale was 0.904 [8].

(2) Patient Care Perception Questionnaire Score (CPCS). The CPCS scale was designed by McDaniel [9] in the United States in 1990 and translated into Chinese by Xingzhi Huang [10]. It aims to measure the response of patients to nurses' caring behavior. The scale has 10 items and is a self-rating scale for patients. The scoring method is a Likert scale. From "strongly disagree" to "strongly agree", 1 to 6 points were counted. The total score ranged from 10 to 60 points. The higher the score, the more caring the patient could perceive. The internal consensus reliability of CPCS in this study was 0.81 [11].

(3) Patient satisfaction score. The scale was the "Chinese Hospital Inpatient Experience and Satisfaction Monitoring Scale" (CHPESMS) developed by domestic scholars Zhang Tuohong, Feng Hao, Cui Tao, etc., which is suitable for domestic hospitals [12]. The total number of items on the scale is 33, including 31 closed items (mainly around each link of the patient's medical treatment process) and 2 open items (respectively praise, criticism, and suggestions). The scale used the Likert 5-level scoring method, in which the option corresponding to the item was set to "strongly disagree" corresponds to 1 point and "strongly agree" corresponds to 5 points. In addition, the option "uncertain" corresponded to 3 points, and the overall Cronbach's a coefficient was 0.956 [13]. The higher the score, the more satisfied the patient.

Statistical analysis

The statistical analysis was performed using SPSS 24.0 software, the measurement data was expressed as $\bar{x} \pm s$, and t tests were performed, and the test level was $\alpha=0.05$.

Results

*Comparison of the two groups of nurses' humanistic care ability scores (**Figure 1**)*

This study found that in the cognition scores ($P<0.05$, **Figure 1A**), courage ($P<0.05$, **Figure 1B**), and patience ($P<0.05$, **Figure 1C**) as well as the total score of the three dimensions ($P<0.05$, **Figure 1D**), the intervention group's humanistic care abilities had significant differences from the control group, suggesting that, based on the Carolina Care Model, the nurses were trained in humanistic care knowledge and skills, which enhanced the nurses' cognitive clinical care abilities.

Comparison of caring perception scores between the two groups

Through the implementation of the unified, standardized, and standardized nursing behaviors of the Carolina Care Model, the nurses' cognitive concepts had been consolidated and strengthened in practice. The results are shown in **Table 3**. The humanistic care perception scores of the intervention group of group A was significantly higher than the scores in control group B ($P<0.05$, $P<0.01$), and the scores of the 6 items were significantly different, suggested that the training based on the Carolina Care Model was recognized by the patients.

Comparison of the patient satisfaction scores between the two groups

To improve the interaction between the patients and the nurses, and to allow the patients to obtain greater satisfaction and improve their quality of care, the Carolina Care Model was used to train the nurses. **Table 4** shows that, after the training based on the Carolina Care Model, the satisfaction of the patients in group A was significantly higher than it was in group B ($P<0.05$).

Discussion

Humanistic care training for nurses according to the Carolina Care Model improved the humanistic care abilities of the nurses in the Department of Obstetrics and Gynecology

This study found that the total scores of the intervention group's humanistic care ability and the three dimensions of cognition, courage, and patience were significantly different ($P<0.05$, **Figure 1**), suggesting that based on the Carolina Care Model, the nurses were trained in humanistic care knowledge and skills, which enhanced the nurses' cognitive ability of clinical care. It was consistent with the research results of Aviles Gonzalez [14]. Through the care education and training of this model, the nurse intervention group had a significant statistical difference in the *P* value of

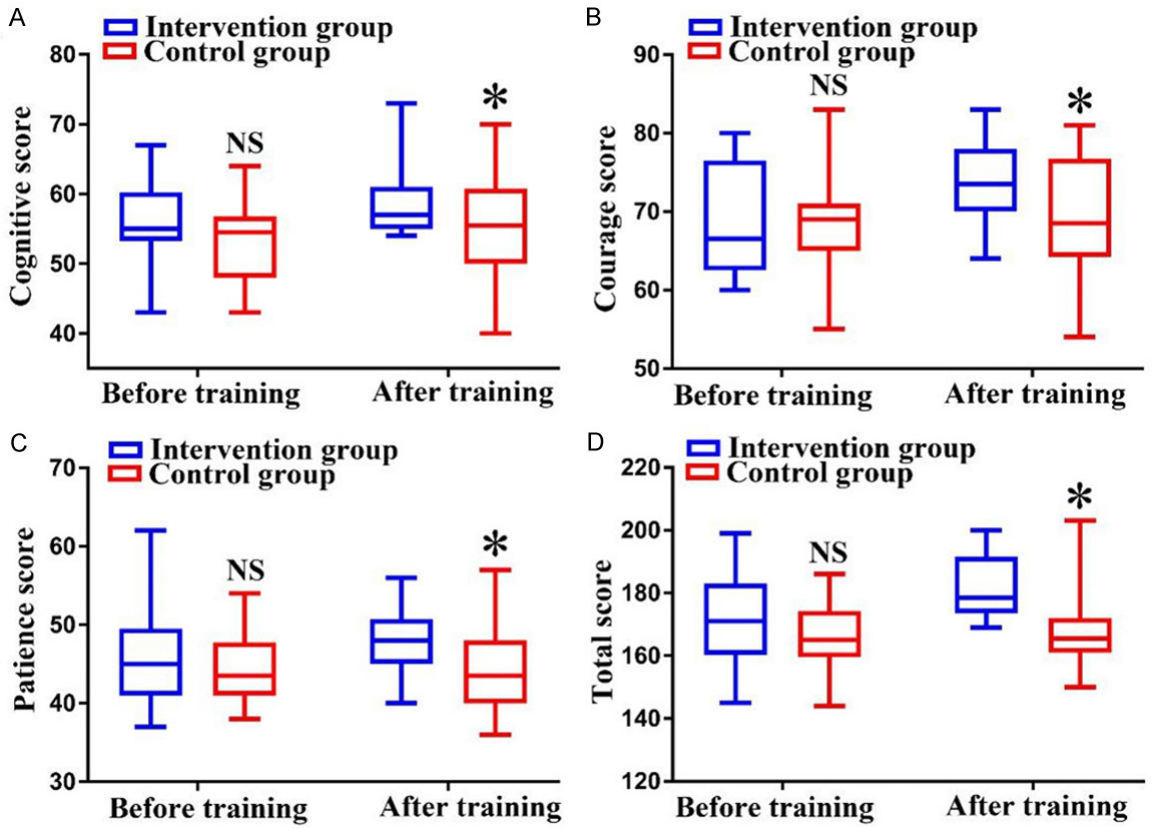

Figure 1. Comparison of the scores of the nurses' humanistic care abilities between the two groups. The cognition (A), courage (B), and patience (C) scores for the intervention and control groups were calculated. (D) The total scores of the three dimensions (cognition, courage, and patience) for the intervention and control groups were calculated. $^{ns}P>0.05$; $^{*}P<0.05$.

Table 3. Comparison of the caring perception scores between the two groups

Item	score ($\bar{x} \pm s$)			
	Group A (Intervention Group)		Group B (control group)	
	Before training	After training	Before training	After training
I feel this nurse is really listening to me	5.63±0.49	5.88±0.33**	5.50±0.87	5.40±0.67
The nurse's care restores my confidence	5.53±0.66	5.68±0.53**	5.50±0.68	5.57±0.50
I feel this nurse respects me	5.60±0.55	5.80±0.41	5.65±0.48	5.55±0.63
I can talk to this nurse freely about the things I care about	5.40±0.50	5.81±0.41**	5.45±0.64	5.35±0.66
I think this nurse cares more about her job than about my needs	3.48±1.72	2.15±1.64**	3.85±1.75	3.95±1.78
When something bothers me, I think I can talk to this nurse	5.08±0.89	5.63±0.63**	5.15±1.05	5.42±0.81
I feel at ease when this nurse takes care of me	5.33±0.61	5.63±0.54*	5.43±0.81	5.32±0.72
The attitude of this nurse makes me feel depressed	5.23±0.77	1.72±0.85**	4.35±1.85	4.42±1.48
I feel this nurse really cares about me	5.20±0.76	5.55±0.68*	5.20±0.97	5.37±0.83
I think this nurse wants me to feel comfortable	5.40±0.55	5.72±0.45	5.38±0.84	5.52±0.92

Note: *P<0.05, **P<0.01.

cognition and courage, which indicated that the nurses' cognition, self-confidence and the nurses' patience to treat patients in the process of nursing patients had been improved, thereby improving the self-efficacy of the nurses' care. In the control group, under the conventional nursing model, the scores of the three dimensions also increased slightly, but the results were not statistically significant. The reason may be that, with the increase in

Table 4. Comparison of the satisfaction scores between the two groups

	Group	Cases	Accessibility Index	General hospital services	Treatment service	Complaints and opinions	Environment and logistics services	Discharged guide	Overall satisfaction evaluation
Before training	Group A	40	13.43±1.81	8.95±1.33	63.83±7.77	26.48±3.54	12.55±2.50	12.55±2.21	138.45±16.57
	Group B	40	13.73±2.21	9.18±1.13	63.90±6.98	26.17±3.71	13.60±1.69	12.65±2.65	139.23±14.95
After training	Group A	40	14.38±1.05	9.42±10.3	66.95±3.96	28.70±2.32	14.20±1.20	14.20±1.66	147.85±7.18
	Group B	40	14.05±1.64	9.20±1.20	64.70±6.54	25.60±3.71	13.20±1.82	12.88±2.77	139.63±11.98
	t (Group A)		-2.87	-1.775	-2.265	-3.32	-2.75	-3.47	-3.29
	P value (group A)		0.005	0.08	0.026	0.001	0.007	0.001	0.001
	t (Group B)		-0.74	-0.096	-0.529	0.694	1.016	-0.371	-0.132
	P value (group B)		0.46	0.92	0.56	0.49	0.31	0.71	0.89

working years and the accumulation of work experience, the nurses were more experienced in cognition and courage than when they first started working. It can be seen that the targeted training of the nurses meant that through the humanistic care training based on the Carolina Care Model, the nurses could truly understand the essence and connotation of nursing during the learning process of humanistic care theory and practice, and deepen their knowledge and understanding of humanistic care. This transformed the perception of humanistic care into internal concepts and nursing behaviors, and ultimately enabled the nurses to effectively improve their humanistic care abilities, which is consistent with the research view of Deng [15].

Training according to the Carolina Care Model improved patient care perception and satisfaction

Through the implementation of the unified, standardized, and standardized nursing behaviors of the Carolina Care Model, the nurses' cognitive concepts were consolidated and strengthened in practice. The results are shown in **Table 3**. The humanistic care perception score of the intervention group of group A was significantly higher than it was in control group B ($P<0.05$, $P<0.01$), and the scores of the 6 items were significantly different, suggesting that training based on the Carolina's care model was recognized by patients. It is consistent with Lewallen's [16] research point of view. In this study, the intervention group used the training program scenario simulation to let the nurses play the roles of patients and family members, so that they could experience the physical and mental changes in comparison between humanistic care and no humanistic care, and to let them feel the true meaning of humane care. Only through the nurse's personal perception, could the nurses learn to think about empathy and pass the humanistic care concept to the patient through their nursing behavior, so that the patient truly felt being cared for, thereby increasing the patient's trust in the nurses, the harmonious nurse-patient relationship, and improving the patient's satisfaction [17]. This is consistent with the results of Kippenbrock's [18] study. Providing relevant care services to patients can improve the interaction between the patients and providers, allowing the patients to obtain greater satisfaction, thereby improving the quality of care. Yanli Yang, et al. [19] believe that caring ability training is an important way to build a harmonious nurse-patient relationship, and that patients' satisfaction with the nursing services largely depends on the degree of humanistic care. **Table 4** shows that after training based on the Carolina Care Model, the satisfaction of the patients in group A was significantly higher than it was in group B ($P<0.05$), which is consistent with the results of Qiuping Gan and Liuxia Lu [20]. It can be seen that training based on the Carolina Care Model can improve nurses' humanistic care abilities, patient care satisfaction, and patient care perception, so that the patients' inner needs can be cared for and satisfied, and the sense of security, gain and happiness can be enhanced. Therefore, the quality of nursing service is improved while ensuring the quality of the nursing service.

Finally, a caring nursing practice is the central aspect of implementing service quality. The improvement of nurses' caring and nursing abilities is particularly important, so that they can be aware of their nursing effects and improve their strategies [14]. Humanistic care training based on the Carolina Care Model can enhance the humanistic care abilities of the nurses in the Department of Obstetrics and Gynecology, improve the nurses' sense of self-efficacy, enhance their patient care perception and satisfaction, and ultimately improve the quality of the nursing services. Since this study was first implemented in the Department of Obstetrics and Gynecology, the sample size was small. Later studies could further increase the sample size to verify the conclusions of this study. In the later period, according to my country's national conditions, the sample size of nurses would be expanded to choose a multi-center system combining internal medicine and surgery in our hospital to further improve the behavior evaluation standards of this model, which observed the effect and conducted promotion for the hospital.

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Disclosure of conflict of interest

None.

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