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Research on the Path to Improving Humanistic Literacy of Operating Room Nursing Students–Application and Practice of the ORTCC Model

Feng Ren

Deyang People's Hospital, Deyang 618000, Sichuan, China

Abstract: *Objective*: To explore the application effect of the path for improving humanistic literacy of operating room nursing students based on the ORTCC model, in order to make up for the deficiency of systematic humanistic education in the traditional teaching model. *Methods*: 120 nursing students who practiced in the operating room from June 2023 to June 2024 were randomly divided into the experimental group and the control group, with 60 students in each group. The control group received routine teaching, while the experimental group applied the ORTCC model on the basis of routine and intervened through setting humanistic literacy goals, formulating behavioral norms, conducting diversified training, implementing two-way assessment, and creating departmental culture. The effect of the intervention was evaluated using the Nurse Humanistic Quality Scale, the Clinical Communication Ability Assessment Scale for Operating Room Nursing Students, and a self-made nursing satisfaction questionnaire. *Results*: After the intervention, the total score of humanistic literacy in the experimental group (4 weeks of intervention: 161.43 ± 10.06 points, 12 weeks of intervention: 165.71 ± 9.45 points) was significantly higher than that in the control group (139.38 ± 10.95 points, 143.31 ± 10.52 points) (all $p < 0.001$); The total score of clinical communication ability in the experimental group (109.69 ± 8.05 points for 4 weeks of intervention, 116.90 ± 7.21 points for 12 weeks of intervention) was also significantly better than that in the control group (99.14 ± 9.23 points, 103.03 ± 8.78 points) (all $p < 0.001$); The total score of patient care satisfaction in the experimental group (94.2 ± 4.3) was significantly higher than that in the control group (82.6 ± 5.7) ($p < 0.001$). *Conclusion*: The ORTCC model can systematically enhance the humanistic literacy, clinical communication skills and patient satisfaction of operating room nursing students, providing an effective approach for optimizing clinical teaching in the operating room.

Keywords: ORTCC model; Operating room; Nursing students; Humanistic literacy

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1. Introduction

Intensive care units are important bases for the centralized treatment and care of critically ill patients. They require enclosed treatment Spaces and high-intensity workflows, and impose very high demands on the professional skills and comprehensive qualities of nurses. Nursing students, as reserve talents for nursing staff, are required

not only to have operational skills during their internship in the intensive care unit, but also to have the ability of humanistic care, so as to better relieve the psychological stress of patients during the perioperative period and thereby maintain the nurse-patient relationship. However, in the past teaching process, the instructors only focused on imparting skills and lacked ways to cultivate humanistic abilities, resulting in a widespread phenomenon of "emphasizing professional skills but neglecting humanistic skills" in the humanistic training of nursing students.

The ORTCC model is a perfect management model that includes five factors: objectives, rules, training, assessment, and culture [1]. It is widely used in business management, but has not yet been attempted to be adopted in the cultivation of humanistic qualities of nursing students in operating rooms. This study attempts the effects and methods of using the ORTCC model as a structured way to cultivate humanistic literacy among nursing students.

2. Data and methods

2.1. General information

A total of 120 nurse interns who practiced in the operating room of our hospital from June 2023 to June 2024 were included as the study subjects. The nursing students were randomly divided into the experimental group and the control group by random number table method, with 60 students in each group.

2.1.1. Inclusion criteria

(1) Full-time undergraduate or junior college nursing interns

(2) At least 4 weeks of internship in the operating room

(3) Be aware of the study and participate voluntarily

2.1.2. Exclusion criteria

(1) Nurse interns who have previously interned in the operating room

(2) Those who interrupted their internship for some reason after being included

2.1.3. Experimental group

8 male nursing students, 52 female nursing students; The average age was (21.45 ± 1.12) years; Distribution of educational qualifications: 38 bachelor's degree, 22 associate degree; Control group: 7 male nursing students, 53 female nursing students; Average age (21.38 ± 1.20) years; Education distribution: 36 bachelor's degree, 24 associate degrees. There was no statistically significant difference in general information between the two groups of nursing students ($p > 0.05$), and they were comparable.

2.2. Methods

2.2.1. Teaching methods for the control group

The conventional operating room teaching model was implemented. The content includes introduction to the operating room environment and rules and regulations, recognition of common surgical instruments, aseptic technique operations, job responsibilities of itinerant nurses and instrument nurses, etc. Taught by a designated instructor, with a focus on the mastery of skills and procedures.

2.2.2. Experimental group teaching methods

On the basis of regular teaching, implement a systematic humanistic quality improvement path based on the ORTCC model. The specific contents are as follows.

(1) O (Objectives)

Clearly define the overall and sub-objectives for improving the humanistic literacy of operating room nursing students. General Objective: To cultivate outstanding prospective operating room nurses with traits of "benevolence, self-discipline, empathy, and communication"[2]. Sub-objectives: Recognize and master the theoretical knowledge of humanistic care in operating room nursing (cognitive objectives); Behavioral manifestations of humanistic care in preoperative visits, intraoperative care, and postoperative follow-ups (skill objectives).

(2) R (Rules)

Develop a manual of Humanistic behavioral norms for operating room nursing students. The content includes: standardized communication language (SOP) for preoperative visits, specific measures for intraoperative privacy protection (such as standard coverings), skills for non-verbal communication with patients in the anesthesia recovery period, etiquette for collaborating with surgical team members and more. Give human care a set of rules.

(3) T (Training)

First, theoretical education, by organizing 4 hours of medical humanities training, including topics such as introduction to medical humanities, psychological characteristics and needs of surgical patients, nurse-patient communication with surgical patients, medical ethics and law. Next is the practical education, by implementing the scenario teaching method, through simulated situations such as "visiting anxious preoperative patients", "How to deal with conscious intraoperative surgeons", "How to communicate with uneasy surgeons", role-playing, on-site operations, etc.

(4) C (Assessment)

Implement a two-way assessment and feedback mechanism. Firstly, the process assessment, where the instructor records and scores the daily performance of the nursing students based on the Human Behavior Observation Checklist. Then is the final assessment, at the end of the internship, a humanities examination station is designed and an Objective Structured clinical Examination (OSCE) is conducted for the final assessment to evaluate the comprehensive application ability of the nursing students.

(5) C (Culture)

Create a humanistic and caring departmental environment. Play the role of a role model for the teaching staff, such as demonstrating humanistic care behaviors during normal work. Conduct a monthly selection of "Humanistic Care Stars" and give recognition and rewards to nursing students who perform outstandingly during the teaching process each month.

2.3. Evaluation criteria

(1) Humanistic literacy

The Nurse Humanistic Quality Scale, with a Cronbach'sα coefficient of 0.92, consists of three dimensions: humanistic knowledge (15 items), humanistic spirit (10 items), and humanistic behavior (15 items), totaling 40 items, and is scored on a Likert 5-level scale, with a total score of 40 to 200 points. The higher the score, the higher the level of humanistic literacy.

(2) Clinical communication skills

The Operating Room Nursing Student Clinical Communication Skills Assessment Scale, with a Cronbach's α coefficient of 0.89, consists of five dimensions: establishing harmonious relationships, confirming patient needs, effectively communicating information, jointly participating in decision-making, and coping with communication difficulties, totaling 25 items, with a total score of 25–125 points.

(3) Nursing satisfaction

A self-made satisfaction questionnaire was used for the survey at discharge, including four dimensions of service attitude, communication effect, pain management, and health guidance, with a total of 10 items, and a Likert 5-level score of 100 points was used, with higher scores indicating greater satisfaction. The Cronbach's α coefficient of the questionnaire was 0.912.

2.4. Statistical methods

Data analysis was performed using SPSS25.0 software. Measurement data were expressed as ($\bar{x} \pm s$) and independent sample *t*-tests were used for comparisons between groups; Count data were expressed as percentages, and the χ^2 test was used for comparison between groups. A difference was considered statistically significant when $p < 0.05$ [3].

3. Results

3.1. Comparison of humanistic literacy scores of the two groups of nursing students before and after the intervention

As shown in **Table 1**, before the trial intervention, there was no statistically significant difference in the total humanistic quality scores between the two groups of nursing students ($t = 0.179$, $p = 0.858$), and the baseline levels were comparable. After 4 and 12 weeks, the total scores of both groups of nursing students were higher than those before the intervention ($p < 0.05$), and the total scores of the experimental group at 4 and 12 weeks of intervention were significantly higher than those of the control group at the same period, and the differences were statistically significant (all $p < 0.001$).

Table 1. Comparison of humanistic literacy scores of the two groups of nursing students before and after intervention ($\bar{x} \pm s$, points)

Group	Number of cases	Before intervention	4 weeks after the intervention	After 12 weeks of intervention
Experimental group	60	130.35 ± 12.45	161.43 ± 10.06 * #	165.71 ± 9.45 * #
Control group	60	129.95 ± 11.88	139.38 ± 10.95*	143.31 ± 10.52*
t value		0.179	11.267	12.845
p value		0.858	< 0.001	< 0.001

Note: Compared with the group before intervention, $p < 0.05$; Compared with the control group at the same period, $\#p < 0.05$*

3.2. Comparison of clinical communication ability scores between the two groups of nursing students after intervention

There was no significant difference in the total score of clinical communication ability between the two groups of

nursing students before the intervention ($t = 0.235$, $p = 0.815$). After different teaching modes, as shown in **Table 2**, the total communication ability scores of the experimental group were significantly higher than those of the control group after 4 weeks and 12 weeks of intervention, and the differences were statistically significant (all $p < 0.001$).

Table 2. Comparison of clinical communication ability Scores of the two groups of nursing students after intervention ($\bar{x} \pm s$, points)

Group	Number of cases	Before intervention	4 weeks after the intervention	After 12 weeks of intervention
Experimental group	60	89.58 ± 10.02	109.69 ± 8.05 * #	116.90 ± 7.21 * #
Control group	60	89.14 ± 10.47	99.14 ± 9.23*	103.03 ± 8.78*
t value		0.235	6.445	9.128
p value		0.815	< 0.001	< 0.001

Note: Compared with the group before intervention, $p < 0.05$; Compared with the control group at the same period, $\#p < 0.05$*

3.3. Comparison of student satisfaction between the two groups

The scores of the experimental group in each dimension of service attitude, communication effect, pain management, health guidance and the total score were significantly higher than those of the control group, and the difference was statistically significant ($p < 0.01$). See **Table 3**.

Table 3. Comparison of satisfaction scores between two groups of nursing students ($\bar{x} \pm s$, points)

Group	Service attitude	Communication effect	Pain management	Health Guidance	Total score
Experimental Group	23.8 ± 2.1	24.1 ± 1.8	23.5 ± 2.0	22.8 ± 1.9	94.2 ± 4.3
Control Group	20.5 ± 2.5	20.8 ± 2.7	20.9 ± 2.4	20.4 ± 2.6	82.6 ± 5.7
t value	10.842	10.125	8.934	7.856	16.327
p value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

4. Discussion

This study innovatively applies the ORTCC model in enterprise management to the cultivation of humanistic literacy among operating room nursing students. The results show that the model can build a closed-loop management system from goal orientation to cultural edification, significantly improving the humanistic literacy level, clinical communication ability and patient satisfaction of nursing students.

The ORTCC model provides a systematic management procedure for humanistic education in operating rooms, transforming intangible humanism into tangible management. The model is goal-oriented and regulates learning purposes; Rules refine management behavior; Training uses situational simulation for internalization; Assess the use of immediate feedback for behavioral correction. Culture uses the spiritual atmosphere to internalize the spirit.

The model can also achieve consistency between humanistic knowledge and humanistic practice of nursing students. Nursing students use humanistic knowledge to solve problems in simulated scenarios and complete the transformation from “knowledge” to “action”. Feedback from the process assessment can also further enhance

their ability to practice clinical humanities. In addition, the implementation of the model also promotes the emphasis on teaching and learning, and drives the reform of the department's humanistic culture. The teaching staff also gained and improved during the teaching and assessment process, and the creation of a humanistic atmosphere further enhanced the team's value recognition and ultimately formed a harmonious and mutually supportive operating room culture, from which patients also benefited.

5. Conclusion

In summary, the pathway program for improving humanistic literacy of operating room nursing students in the context of the ORTCC model is a targeted and feasible intervention procedure that compensates for the deficiencies of conventional teaching methods, promotes the development of humanistic literacy and the improvement of clinical practice ability of nursing students, enhances the quality of medical services, and can be promoted and applied in clinical teaching. This study is a single-center study, and its long-term utility still needs to be further explored. In the future, more multi-center, large-sample and longer-term studies will be needed to confirm its value in the long term.

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Disclosure statement

The author declares no conflict of interest.

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