

ORIGINAL RESEARCH

Effectiveness of Detailed Operating Room Quality Care on the Quality of Operating Room Care and Patient Satisfaction

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ABSTRACT

Objective • The current study was performed to assess the effectiveness of detailed operating room quality care on the quality of operating room care and patient satisfaction.

Methods • A total of 102 patients who underwent surgery in Union Hospital, Tongji Medical College, Huazhong University of Science and Technology between October 2020 and April 2022 were recruited and assigned to receive either conventional operating room care (conventional group) or detailed operating room quality care (quality group), with 51 cases in each group. Outcome measures for the evaluation of the detailed quality care included quality of operating room care, safe operation, incidence of errors in instrument preparation, loss of parts, incidence of intraoperative adverse reactions, and patient satisfaction.

Results • Patients who received quality care showed higher scores for information acquisition ability, communication ability, standardization of nursing process, and professionalism of nursing service than those who

received conventional care ($P = .021, .032, .003, .043$). Detailed operating room quality care resulted in significantly higher standardization of anesthesia disinfection, promptness of instrument preparation, instrument and equipment management, effectiveness of auxiliary cooperation, and standardization of medical records scores versus conventional care ($P = .004, .022, .036, .004, .002$). Detailed operating room quality care was associated with a lower incidence of instrument preparation errors, lost parts, and intraoperative adverse reactions than conventional care ($P < .05$). Patients were more satisfied with quality care (49/51, 96.1%) than with conventional care (39/51, 76.5%) ($P = .004$).

Conclusion • Detailed operating room quality care can significantly improve patient satisfaction, enhance the quality of operating room care and safe operation, and reduce the risk of instrument preparation errors, lost parts, and intraoperative complications in the operating room. (*Altern Ther Health Med*. [E-pub ahead of print.])

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INTRODUCTION

Surgery is a common treatment modality in clinical practice.¹ Surgery is a source of intense stress that inevitably damages the body of patients and causes physiological and psychological impairment.² The operating room is an important place for surgical operations, and operating room nursing work is characterized by high volume, long duration,

high technical requirements, and high work risks.³ Operating room nursing encompasses a wide range of responsibilities and tasks. Prior to an operation procedure, operating room nurses collaborate with the surgical team to prepare the operating room, ensuring that all necessary equipment, instruments, and supplies are available and properly sterilized. They verify patient information, confirm surgical consent, and assist in positioning the patient for the procedure. During the operation, operating room nurses work alongside surgeons, anesthesiologists, and surgical technologists to provide direct patient care. They assist in maintaining a sterile field, handing instruments and supplies to the surgical team as needed, and anticipating the surgeon's requirements. Operating room nurses closely monitor the patient's vital signs, administer medications as directed, and document the progress of the procedure.⁴

In the intensive care unit, the concept of detailed quality care is applied to develop standardized nursing protocols, enhance communication and collaboration among health

care providers, emphasize the importance of information acquisition and dissemination, and highlight the need for nursing professionalism. This helps improve patient safety, reduce errors and complications, and optimize the recovery and outcomes of critically ill patients.

In the emergency department, detailed quality care concepts are used to optimize the flow of emergency care, improve health care providers' ability to gather and assess information from emergency patients, enhance teamwork and communication, and reinforce the requirements for nursing professionalism. This contributes to rapid assessment and management of emergency patients, reduces errors and delays, and improves the quality and effectiveness of emergency nursing care.

In the inpatient setting, detailed quality care concepts are applied to develop standardized nursing plans and processes, emphasize effective communication and collaboration among health care providers, enhance information acquisition and dissemination, and emphasize the requirements for nursing professionalism. This helps improve patient safety, optimize nursing processes, reduce errors and complications, and enhance patient satisfaction and recovery outcomes.

In long-term care facilities or home care settings, detailed quality care concepts help in developing personalized nursing plans, improving information acquisition and dissemination, emphasizing the requirements for nursing professionalism, and strengthening effective communication and collaboration between nursing staff, patients, and their families. This contributes to improving the quality of life for long-term care patients, reducing complications and hospitalizations and promoting patient autonomy and recovery.

A prior study indicated that a high standard of operating room care could effectively alleviate patients' conditions, optimize their treatment experience, reduce the risk of adverse events, and improve the overall safety of the operation.⁵ Detailed operating room quality care is one of the emerging clinical care models,⁶ which is implemented to reduce the incidence of surgical and nursing errors and improve the overall quality of care as well as safety, thereby improving the comfort of surgical treatment and promoting the overall standard of hospital care. Another study showed that the implementation of detailed operating room quality care could effectively enhance nurse-patient trust and patient cooperation, thus ensuring safe procedures.^{7,8} To this end, the present study was performed to assess the effectiveness of detailed operating room quality care on the quality of operating room care and patient satisfaction.

MATERIALS AND METHODS

Participants

A total of 102 patients who underwent surgery in Union Hospital, Tongji Medical College, Huazhong University of Science and Technology between October 2020 and April 2022 were recruited and assigned to receive either conventional operating room care (conventional group) or detailed operating room quality care (quality group), with 51

cases in each group. The study conformed to the requirements of the Declaration of Helsinki and was approved by the ethics committee of Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, and all study participants were informed about the study and signed the relevant consent forms.

Inclusion and exclusion criteria

Inclusion criteria. (1) age 18 years or older; (2) patients received relevant surgical treatment in Union Hospital, Tongji Medical College, Huazhong University of Science and Technology; and (3) normal cognitive function.

Exclusion criteria. (1) intolerance to surgery; (2) endocrine, immune function, or coagulation disorders; (3) malignant tumors; (4) psychiatric disorders, or cognitive behavioral disorders; or (5) inability to cooperate completely with this study.

Treatment methods

Conventional care. The patients in the conventional group received conventional operating room care. Preoperatively, the patients were given health education and instructions on diets, daily living, and examinations. Intraoperatively, the temperature and humidity of the operating room were properly controlled, sterilization and intraoperative warmth maintenance were performed, and the vital signs of patients were closely monitored to ensure an uneventful surgery. The postoperative vital signs of the patients were monitored, and standardized care such as complication prevention, infusion, and drug exchange were carried out.

Detailed operating room quality care. The patients in the quality group received detailed operating room quality care.

Establishment of a detailed quality care team: A detailed quality care team was established. The head nurse of each department served as the team leader and was mainly responsible for the allocation of nursing work, and the nursing staff of each department served as the team members to carry out specific nursing procedures. Training of nursing staff in theory and skills was provided for the nursing staff to improve the level of operating room nursing care.

Standardization of nursing process in the operating room: The nursing process of detailed operating room quality care was managed using a layer-by-layer hierarchical model to ensure the scientific and orderly implementation of clinical nursing work.

Preoperative communication: The nursing staff visited and communicated with patients before surgery, collected relevant information from patients, understood patients' psychological state, and educated the patients about the disease, surgery, and other related knowledge in order to reduce their treatment resistance and negative emotions caused by lack of relevant knowledge. The nursing staff provided psychological counseling to mitigate the negative emotions of patients.

Preoperative preparation: The nursing staff prepared the instruments and equipment needed in the operating room

before surgery and ensured that the instruments and equipment functioned properly without damage. The temperature and humidity of the operating room were properly set before surgery to ensure a comfortable stay for the patient during surgery.

Care of patients during the surgical procedure: The nursing staff introduced the surgical procedure to the patient before the operation to reduce their anxiety, and intraoperative exposure was minimized to avoid psychological discomfort. Adequate intraoperative heat preservation was provided for the patients, such as the use of thermostatic blankets and warmers to warm the delivered fluids and blood to avoid cold stimulation. Nursing staff closely monitored changes in patients' vital signs during the operation and assisted physicians in the access of related instruments for the successful completion of the operation.

Operating room psychological care: After entering the operating room and before anesthesia, nursing staff provided encouragement and comfort to the patient. Nursing staff closely observed the changes in patients' expressions during the surgery and communicated with patients to divert their attention and reduce patients' tension, anxiety, and other negative emotions, thereby avoiding intraoperative stress reactions.

Postoperative care: After surgery, the nursing staff promptly inventoried the surgical instruments, drugs, and apparatus; used warm saline to wipe the disinfectant and blood stains on the patient's body; and fixed drains and infusion tubes, so as to avoid adverse events such as catheter dislodgement. The nursing staff transferred the patient to the postanesthesia care unit and then to the general ward after the patient was awake. The transfer was smooth and avoided bumps and other behaviors that could cause discomfort to the patient. The nursing staff closely monitored the changes in vital signs and condition of the patients after the operation, and the doctor was timely informed of any adverse conditions.

Outcome measures

Quality of nursing care in the operating room: The quality of nursing care in the operating room was evaluated using a self-designed scale with reference to the *Standards of nursing practice: operating room*,⁹ including 4 aspects: information acquisition ability, communication ability, standardization of the nursing process, and professionalism of nursing service. Each aspect was scored from 0 to 100, and higher scores indicated better quality of operating room care.

Safe operation of the operating room: The safe operation of the operating room was assessed using a self-developed scale with reference to the *Operating Procedures and Standards for Nursing Techniques*,¹⁰ which included 5 aspects: standardization of anesthesia disinfection, promptness of instrument preparation, instrument and equipment management, effectiveness of auxiliary cooperation, and standardization of medical records. The score of each aspect was 0 to 100, and the higher the score, the better the safe operation of the operating room.

Incidence of instrument preparation errors, incidence of lost parts, and incidence of intraoperative adverse

reactions: The incidence of instrument preparation errors, incidence of lost parts, and incidence of intraoperative adverse reactions were recorded by the relevant medical and nursing staff in both groups of patients in this study.

Patient satisfaction: The hospital's self-made Satisfaction Survey Scale was used to score patient satisfaction—it contains 20 questions worth 5 points each. A total score of less than 70 is dissatisfied, 70 to 89 is satisfied, and 90 or higher is highly satisfied. Total satisfaction (%) = (highly satisfied + satisfied)/total number of cases × 100%.

Statistical analysis

GraphPad Prism version 8 (GraphPad Software) was used as the graphing software, and SPSS version 26.0 (IBM Corp) was used for data analyses. Measurement data were expressed as mean (SD) and analyzed using *t* tests. Count data were expressed as number (%) and analyzed using the chi-square test. Statistical significance was indicated by *P* less than .05.

RESULTS

Patient characteristics

In the conventional group, there were 27 males and 24 females, aged 22 to 56 years with a mean (SD) age of 42.4 (3.9) years. There were 16 cases of general surgery, 18 cases of orthopedics, 3 cases of ophthalmology, 10 cases of urology, and 4 cases of gynecology.

In the quality group, there were 25 males and 26 females, aged 21 to 57 years with a mean (SD) age of 42.6 (4.0) years. There were 13 cases of general surgery, 16 cases of orthopedics, 4 cases of ophthalmology, 12 cases of urology, and 6 cases of gynecology. The two arms were well balanced in terms of patient characteristics (all *P* > .05) (Table 1).

Quality of care

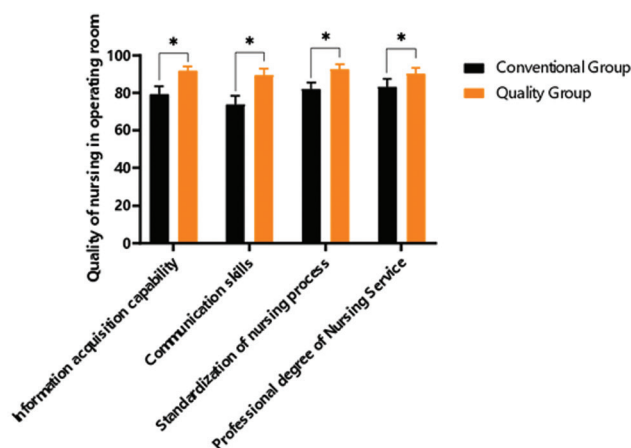
In the conventional group, the mean (SD) scores were 79.24 (4.45) for information acquisition ability, 73.82 (4.65) for communication ability, 82.15 (3.48) for standardization of the nursing process, and 83.28 (4.35) for professionalism of nursing service.

In the quality group, the mean (SD) scores were 91.78 (2.23) for information acquisition ability, 89.44 (3.67) for communication ability, 92.74 (2.56) for standardization of the nursing process, and 90.19 (3.23) for professionalism of nursing service.

Table 1. Patient Characteristics

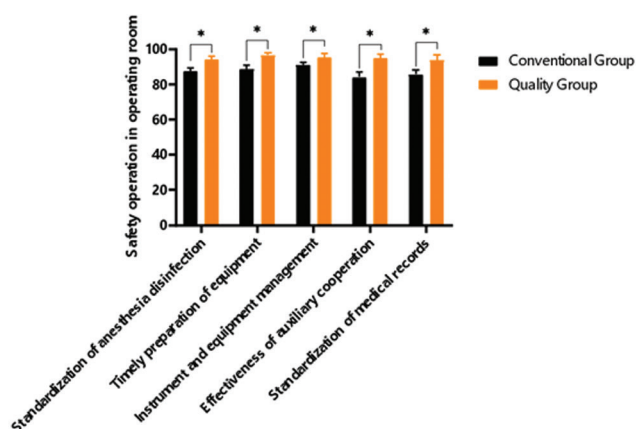
	Conventional group (n = 51)	Quality group (n = 51)	<i>t</i> or χ^2	<i>P</i> value
Sex			0.157	.69
Male	27	25		
Female	24	26		
Age, range, y	22-56	21-57		
Age, mean (SD), y	42.4 (3.9)	42.6 (4.0)	-0.207	.84
Surgical types				
General surgery	16	13	0.434	.51
Orthopedics	18	16	0.176	.67
Ophthalmology	3	4	0.153	.70
Urology	10	12	0.232	.63
Gynecology	4	6	0.443	.505

Figure 1. Quality of Care



^a $P < .05$, conventional group vs quality group.

Figure 2. Operation Safety in Operating Room



^a $P < .05$, conventional group vs quality group.

Table 2. Incidence of Instrument Preparation Errors, Lost Parts, and Intraoperative Adverse Reactions

Group	Incidence of instrument preparation errors, No. (%)	Incidence of lost parts, No. (%)	Incidence of intraoperative adverse reactions, No. (%)
Conventional group (n=51)	8 (15.7)	6 (11.8)	9 (17.6)
Quality group (n=51)	1 (2.0)	0 (0.00)	1 (2.0)
χ^2	6.0	6.4	7.1
P value	.02	.01	.008

Table 3. Patient Satisfaction

Groups	Highly satisfied	Satisfied	Dissatisfied	Total satisfaction, No. (%)
Conventional group (n=51)	10	29	12	39 (76.5)
Quality group (n=51)	23	26	2	49 (96.1)
χ^2	NA	NA	NA	8.3
P value	NA	NA	NA	.004

Abbreviation: NA, not applicable.

Patients who received quality care had higher scores of information acquisition ability, communication ability, standardization of the nursing process, and professionalism of nursing service than those who received conventional care ($P < .05$) (Figure 1).

Operation safety in the operating room

In the conventional group, the mean (SD) scores were 87.43 (1.95) for standardization of anesthesia disinfection, 88.74 (2.35) for promptness of instrument preparation, 90.92 (1.79) for instrument and equipment management, 84.24 (2.87) for effectiveness of auxiliary cooperation, and 85.83 (2.41) for standardization of medical records.

In the quality group, the mean (SD) scores were 94.12 (1.78) for standardization of anesthesia disinfection, 96.67 (1.21) for promptness of instrument preparation, 95.48 (2.26) for instrument and equipment management, 94.83 (2.52) for effectiveness of auxiliary cooperation, and 93.89 (2.96) for standardization of medical records.

Detailed operating room quality care resulted in significantly higher standardization of anesthesia disinfection, promptness of instrument preparation, instrument and equipment management, effectiveness of auxiliary cooperation, and standardization of medical records scores versus conventional care ($P < .05$) (Figure 2).

Incidence of instrument preparation errors, lost parts, and intraoperative adverse reactions

Detailed operating room quality care was associated with a lower incidence of instrument preparation errors, lost parts, and intraoperative adverse reactions than conventional care ($P < .05$) (Table 2).

Patient satisfaction

Patients were more satisfied with detailed quality care (96.1%) than with conventional care (76.5%) as quantified by the total satisfaction percentage ($P < .05$) (Table 3).

DISCUSSION

Surgical interventions are effective for the relief and treatment of patients' medical conditions. Patients admitted to the operating room are mostly critically ill and in highly unstable conditions, which predisposes them to a high risk of complications or other adverse events.⁹ The operating room is a key place for resuscitation and treatment but is also the most affected area for medical disputes.¹⁰ The quality of operating room care and the safety of nursing staff procedures are closely related to the success of surgery.¹¹

Conventional operating room care normally focuses on communication with physicians to complete intraoperative care, which lacks patient care and guidance, leading to a poor understanding of intraoperative conditions of patients and compromised surgical safety.¹² Detailed operating room quality care is a new surgical care model optimized on the basis of conventional operating room care.¹³ Detailed operating room quality care provides patients with meticulous, standardized, and perfect care centered on the actual needs of patients, which is crucial for ensuring surgical safety, facilitating smooth surgery, and helping postoperative recovery.¹⁴ Bai et al¹⁵ showed that detailed operating room quality care had statistically significantly better levels of all studied indicators (responsibility, resilience and

responsiveness, cooperation, and operational standardization) than conventional care. Their results were consistent with our current research findings and suggest that detailed quality care in the operating room could significantly improve the quality of care. The reason may be that detailed quality care in the operating room is centered on patient benefits to reduce the risk of surgical errors and improve the quality of care.

In the operating room, factors that affect patient safety include adverse operating room reactions (such as excessive bleeding or infection), device injuries, and delayed surgery.^{16,17} It has been stated that clinical safety management in the operating room should be further standardized and refined due to its relevance to the safety of patients and health care workers.¹⁸ Previous research suggests that issues with care, operative techniques, and equipment during surgery easily interfere with the surgical process and treatment outcome.¹⁹ Here, detailed operating room quality care resulted in statistically significantly higher standardization of anesthesia disinfection, promptness of instrument preparation, instrument and equipment management, effectiveness of auxiliary cooperation, and standardization of medical records scores versus conventional care. Detailed operating room quality care was associated with a statistically significantly lower incidence of instrument preparation errors, lost parts, and intraoperative adverse reactions than conventional care.

The results of present study and others confirm that the implementation of detailed operating room quality care could effectively improve safety and reduce the risk of various adverse events in the operating room. The possible reason may be that detailed quality care in the operating room resulted in more procedural and standardized operating room care operations, which effectively ensures the smooth implementation of the surgery. Moreover, patients were more satisfied with the detailed quality care than with conventional care in the current research, which was in line with previous research.²⁰ Detailed operating room quality care was associated with enhanced patient satisfaction, which may be ascribed to the improved surgery safety and nursing quality produced by detailed operating room quality care.

CONCLUSION

Detailed operating room quality care can significantly improve patient satisfaction, enhance the quality of operating room care and safe operation, and reduce the risk of instrument preparation errors, lost parts, and intraoperative complications in the operating room.

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Tingting Li and Heyu Wu served as co-first authors and contributed equally to the work.

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