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Practical Exploration of the "Six-Step" Situational Teaching Method in Operating Room Nursing Education

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Abstract: *Objective*: To explore the application effectiveness of the "Six-Step" Scenario-Based Teaching Method in operating room nursing education. *Methods*: Seventy nursing students undergoing clinical training in the operating room of a certain hospital from January 2024 to June 2025 were selected. They were randomly divided into an observation group (n = 35) and a control group (n = 35) using a random number table. The control group received traditional "mentor-apprentice" on-the-job training, while the observation group underwent the "six-step" scenario-based teaching method. The two groups were compared on final assessment scores, comprehensive competency, surgical nursing emergency response ability, and teaching satisfaction indicators. *Results*: The observation group achieved significantly higher final assessment scores (85.54 ± 5.05) than the control group (78.63 ± 4.75); After instruction, the observation group scored significantly higher than the control group in: mastery of basic duties and procedures (4.22 ± 0.30 vs. 3.98 ± 0.30), understanding of surgical nursing essentials (4.39 ± 0.19 vs. 3.98 ± 0.30), proficiency in surgical assistance (4.11 ± 0.33 vs. 3.98 ± 0.30), aseptic awareness (4.32 ± 0.24 vs. 3.98 ± 0.30), risk awareness (4.22 ± 0.17 vs. 3.98 ± 0.30), and occupational safety awareness (4.01 ± 0.23 vs. 3.98 ± 0.30). (4.01 ± 0.23), which were significantly higher than the control group's scores (3.36 ± 0.28), (3.14 ± 0.27), (3.29 ± 0.24), (3.53 ± 0.36), (3.17 ± 0.25), and (3.51 ± 0.18), respectively. Students in the observation group scored significantly higher than the control group in emergency hands-on skills (24.53 ± 1.85 points), surgical coordination skills (27.65 ± 1.87 points), emergency coordination skills (25.34 ± 1.83 points), and patient condition observation skills (24.34 ± 1.79 points) were significantly higher than those of the control group (20.78 ± 1.74 points, 26.31 ± 1.95 points, 22.92 ± 1.69 points, and 21.58 ± 1.77 points, respectively). The satisfaction rate with operating room nursing education among students in the observation group (97.00%) was significantly higher than that in the control group (77.00%). All differences were statistically significant ($p < 0.05$). *Conclusion*: The "Six-Step" Scenario-Based Teaching Method effectively enhances operating room students' mastery of theoretical knowledge, practical skills, and core comprehensive abilities, while significantly improving their teaching satisfaction. It warrants promotion and application in operating room nursing education.

Keywords: Six-step scenario-based teaching method; Operating room nursing; Nursing education; Practical exploration

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1. Introduction

Operating room nursing education is a critical component in cultivating qualified surgical nursing professionals. Traditional teaching methods primarily rely on "apprenticeship-style" shadowing, where students passively receive knowledge without sufficient opportunities for hands-on practice and scenario-based experiences. This disconnects between theory and practice hinders the flexible application of learned knowledge in real-world settings, particularly during complex surgical situations [1]. Therefore, there is an urgent need to explore an efficient and practical teaching method for operating room nursing to significantly enhance teaching quality and cultivate high-caliber nursing professionals who can meet the demands of operating room work. Situational teaching is a pedagogical approach grounded in constructivist theory. It advocates creating scenarios that closely resemble real-world work environments during the learning process, enabling students to actively construct knowledge and develop competencies while solving authentic problems and completing real tasks [2]. Existing research indicates this method demonstrates significant advantages in emergency and obstetric nursing education. Huang Yumin et al., through observing the application of a scenario-based teaching model using real cases combined with an OSCE evaluation system in emergency nursing clinical teaching, found this approach not only significantly enhances students' theoretical knowledge but also substantially improves their clinical skills and overall professional competence [3]. Yang Chanjuan et al. demonstrated through teaching experiments that applying scenario-oriented nursing teaching models in obstetric education significantly enhances students' foundational theory and nursing practice levels, while promoting improvements in adaptability, problem analysis, teamwork, and communication skills [4]. To investigate the effectiveness of scenario-based teaching in operating room nursing education, this study innovatively designed a six-step scenario-based teaching plan, comprising scenario creation, task-driven learning, role-playing, collaborative inquiry, process guidance, and summary evaluation, based on scenario learning theory and operating room workflow. The findings are reported as follows.

2. Materials and methods

2.1. General information

The study included 70 nursing students interning in the operating room of a certain hospital from January 2024 to June 2025. Participants were randomly assigned to an observation group (n = 35) and a control group (n = 35) using a random number table.

2.1.1. Inclusion criteria

(1) Full-time undergraduate or vocational nursing students;
(2) Six-month internship duration;
(3) Voluntary participation in the study

2.1.2. Exclusion criteria

(1) Cumulative leave exceeding one month during internship due to personal reasons;
(2) Prior operating room work experience

2.1.3. Observation group

3 males, 32 females; age 20–24 years, mean (22.3 ± 1.2) years; 22 undergraduate students and 13 vocational

students. The control group comprised 2 males and 33 females; ages ranged from 20 to 23 years, with a mean age of (21.8 ± 1.1) years; 20 undergraduate students and 15 vocational students. Comparisons of general characteristics (gender, age, educational background) between the two groups showed no statistically significant differences ($p > 0.05$), indicating comparability.

2.2. Methods

Both groups used the same textbook for instruction, with identical course hours and assessment criteria.

2.2.1. Control group

Employed a traditional "mentor-apprentice" classroom teaching model. After entering the department, students learned by participating in routine surgical assistance alongside their mentors. The learning process primarily involved observation and imitation. Mentors provided ad hoc explanations and guidance based on the day's surgical procedures, while students performed basic tasks such as instrument passing and inventory checks under mentor supervision.

2.2.2. Observation group

Employed a "six-step" scenario-based teaching method. Theoretical instruction followed three steps: "Project Initiation, Knowledge Construction and Exploration, Deepening and Application". Practical training followed three steps: "Outcome Creation and Revision, Public Presentation and Evaluation, Summary and Reflection".

(1) Step 1: Project initiation

Instructors design typical surgical scenarios based on real clinical cases. They present comprehensive nursing contexts to students through surgical videos and case materials, assigning core learning tasks for the scenario.

(2) Step 2: Knowledge construction and exploration

Students assume roles such as scrub nurse or circulating nurse based on task requirements. Collaboratively researching surgical procedures, instrument diagrams, and nursing essentials, they compile a list of theoretical knowledge and operational workflows needed for surgical assistance, thereby establishing an initial knowledge framework.

(3) Step 3: Deepening and application

Instructors act solely as facilitators, organizing students for preliminary tabletop simulations. Through pre-set critical questions, they guide students to apply previously constructed theoretical knowledge to solve simulated clinical problems, deepening understanding and preparing mindsets for subsequent hands-on training.

(4) Step 4: Outcome creation and revision

Upon entering the simulation operating room, students work in teams to perform role-playing within a high-fidelity scenario, collaborating to complete the entire workflow from preoperative preparation through intraoperative assistance to postoperative management. Throughout this process, team members continuously refine their coordination and techniques, ultimately producing a "practical outcome".

(5) Step 5: Public presentation and evaluation

Following each scenario simulation, teams conduct public presentations. Students first deliver self-reflections and peer evaluations within their groups, explaining procedural rationale and identifying

areas for improvement. Subsequently, instructors provide systematic, structured feedback using the Core Competencies for Nursing (CIRN) framework to assess students' overall competency, highlighting strengths and weaknesses.

(6) Step 6: Summary and reflection

After the training concludes, students write reflection report based on the feedback received. They conduct an in-depth analysis of their gains and shortcomings in knowledge, skills, and attitudes, and formulate subsequent learning plans to achieve knowledge internalization and competency enhancement.

2.3. Observation indicators

(1) Final assessment scores

Upon completion of instruction, both student groups undergo unified evaluations in nursing theory, basic procedural skills, and specialty procedural skills. The total score is 100 points, with 30 points allocated to each section: nursing theory, basic procedural skills, and specialty procedural skills.

(2) Comprehensive competencies

Quantitatively assess students' mastery of fundamental job responsibilities and procedures, surgical nursing essentials, proficiency in surgical assistance, aseptic concepts, risk awareness, and occupational safety consciousness. Each competency is scored out of 5 points.

(3) Surgical emergency response capability

Compare emergency response capabilities during operating room practice between groups, encompassing emergency intervention, surgical coordination, emergency collaboration, and patient condition monitoring. Ten items are evaluated, each scored 1–3 points, totaling 30 points.

(4) Nursing satisfaction

A self-designed teaching satisfaction survey was used to assess satisfaction with teaching methods across groups. Options included "Very satisfied," "Satisfied," and "Dissatisfied". Students selected based on genuine feelings. Overall satisfaction rate = (Number of "very satisfied" + Number of "satisfied") / Total number of respondents × 100%.

2.4. Statistical methods

Data analysis was performed using SPSS 22.0 statistical software. Quantitative data were expressed as mean ± standard deviation ($\overline{x} \pm s$). Intergroup comparisons were conducted using *t*-tests. Qualitative data are expressed as rates (%). Intergroup comparisons were conducted using chi-square χ^2 tests. A p value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of course assessment scores between groups

Students in the observation group demonstrated significantly higher scores than the control group in nursing theory knowledge, basic procedural skills, specialized procedural skills, and overall assessment scores ($p < 0.05$), as shown in **Table 1**.

Table 1. Comparison of final assessment scores between groups ($\overline{x}$ ± s, points)

Group	Nursing theory	Basic operational skills	Specialized skills	Total score
Control group (n = 35)	22.25 ± 1.07	23.32 ± 1.14	33.06 ± 2.54	78.63 ± 4.75
Observation group (n = 35)	25.42 ± 1.19	24.75 ± 1.68	35.37 ± 2.18	85.54 ± 5.05
t	11.719	4.167	4.083	5.897
p	< 0.001	< 0.001	< 0.001	< 0.001

3.2. Comparison of comprehensive competency scores between the two groups

After the training, the observation group scored significantly higher than the control group in all dimensions, including mastery of basic job responsibilities and procedures, understanding of key surgical nursing points, proficiency in surgical assistance, aseptic concepts, risk awareness, and occupational protection awareness. The differences were statistically significant ($p < 0.05$), as shown in **Table 2**.

Table 2. Comparison of comprehensive competency scores between groups ($\overline{x}$ ± s, points)

Group	Mastery of basic job responsibilities and procedures	Mastery of key surgical nursing points	Proficiency in surgical procedure coordination	Sterility concept	Risk awareness	Occupational safety awareness
Control group (n = 35)	3.36 ± 0.28	3.14 ± 0.27	3.29 ± 0.24	3.53 ± 0.36	3.17 ± 0.25	3.51 ± 0.18
Observation group (n = 35)	4.22 ± 0.30	4.39 ± 0.19	4.11 ± 0.33	4.32 ± 0.24	4.22 ± 0.17	4.01 ± 0.23
t	12.398	22.399	11.889	10.802	20.547	10.128
p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

3.3. Comparison of surgical nursing emergency response capabilities between the two groups

After instruction, the observation group demonstrated significantly higher scores than the control group in emergency hands-on skills, surgical coordination ability, emergency coordination skills, and patient condition observation skills were significantly higher than those of the control group ($p < 0.05$), as shown in **Table 3**.

Table 3. Comparison of surgical nursing emergency response scores between groups ($\overline{x}$ ± s , points)

Group	Emergency hands-on skills	Surgical cooperation	Emergency coordination	Clinical observation
Control group (n = 35)	20.78 ± 1.74	26.31 ± 1.95	22.92 ± 1.69	21.58 ± 1.77
Observation group (n = 35)	24.53 ± 1.85	27.65 ± 1.87	25.34 ± 1.83	24.34 ± 1.79
t-value	8.735	2.934	5.748	6.486
p-value	< 0.001	0.004	< 0.001	< 0.001

3.4. Comparison of teaching satisfaction between groups

Students in the observation group demonstrated significantly higher satisfaction with operating room nursing education than those in the control group, with statistically significant differences ($p < 0.05$), as shown in **Table 4**.

Table 4. Comparison of teaching satisfaction between groups [n (%)]

Group	Very satisfied	Satisfied	Dissatisfied	Overall satisfaction
Control group (n = 35)	9 (26.00)	18 (51.00)	8 (23.00)	27 (77.00)
Observation group (n = 35)	15 (43.00)	19 (54.00)	1 (3.00)	34 (97.00)
χ^2				4.590
p				0.032

4. Discussion

Operating room nursing practice imposes exceptionally high standards on nurses' professional competence due to its stringent aseptic techniques, complex surgical care procedures, and demanding requirements for teamwork [5]. The quality of operating room nursing education is crucial in determining whether students can become qualified operating room nurses in the future. Therefore, during this period, it is essential to actively adopt scientific and effective teaching methods to ensure the effectiveness of clinical training, thereby effectively enhancing their theoretical knowledge, nursing skills, comprehensive competence, and emergency response capabilities in surgical care [6]. While the traditional "apprenticeship-style" shadowing model can transmit basic experience, its passive, fragmented, and observation-focused nature struggles to systematically cultivate the comprehensive competencies students need to handle complex surgical scenarios [7].

The "Six-Step" Scenario-Based Teaching Method is a structured instructional approach developed under constructivist theory guidance [8]. The "Six-Step" teaching method implemented in this pedagogical research study perfectly embodies this theoretical core through six interlinked steps: "Project Initiation, Knowledge Construction and Inquiry, Deepening and Application, Product Creation and Revision, Public Presentation and Evaluation, and Summary and Reflection". The study findings indicate that students in the observation group significantly outperformed the control group in all three major domains: nursing theory, basic procedures, and specialized procedures ($p < 0.001$). Scores for observation group students were significantly higher than those for the control group across all dimensions, including mastery of fundamental job responsibilities, surgical essentials, coordination proficiency, aseptic concepts, risk awareness, and occupational protection consciousness ($p < 0.001$). The improvement in emergency response skills, emergency coordination, and patient observation abilities among the observation group was significantly greater than that of the control group ($p < 0.001$). The observation group also demonstrated significantly higher satisfaction with operating room nursing education compared to the control group ($p < 0.05$).

Analysis attributes these outcomes primarily to the significant application advantages of the "Six-Step" Scenario-Based Teaching Method in operating room nursing education:

(1) Through the "Knowledge Construction and Exploration" and "Deepening and Application" steps, the method effectively promoted students' deep understanding and retention of theoretical knowledge. The "Outcome Creation and Revision" step further transformed theoretical knowledge into stable, standardized operational skills, achieving an organic integration of theory and practice [9].

(2) Role-playing and task-driven "collaborative inquiry" enabled students to personally experience the severe consequences of improper aseptic techniques, clearly understanding their responsibilities. This not only reinforced aseptic awareness but also further enhanced their mastery of operating room nursing

procedures and risk awareness [10].

(3) The "Six-Step" scenario-based teaching method, through pre-set critical questions and high-fidelity simulations, creates opportunities for students to repeatedly hone emergency decision-making and hands-on skills in a "protective" environment. This approach stimulates intrinsic learning motivation, ultimately yielding high teaching satisfaction.

5. Conclusion

In summary, the "Six-Step" Scenario-Based Teaching Method is a proven effective surgical nursing teaching approach that significantly enhances students' theoretical knowledge, operational skills, comprehensive competence, and emergency response capabilities, while achieving exceptionally high teaching satisfaction.

Disclosure statement

The authors declare no conflict of interest.

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