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The Application of Scenario Simulation Teaching Method Based on Debriefing-GAS Mode in the Teaching of Clinical Nursing students

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Abstract: *Objective:* To explore the application effect of scenario simulation teaching method based on Debriefing-GAS mode in the teaching of clinical nursing students in neurosurgery and its influence on critical thinking, clinical practice ability and teaching satisfaction. *Methods:* A total of 100 nursing students who were doing their internship in the Department of Neurosurgery at a tertiary hospital in Sichuan Province from July 2024 to June 2025 were selected and divided into a control group and an experimental group, with 50 students in each group, using the historical control grouping method. The control group used the traditional teaching method for scenario simulation, while the experimental group used the Debriefing-GAS model for scenario simulation teaching. The teaching effect was evaluated using the DASH scale, the CIDI-CV scale, the clinical practice ability scale and the self-made teaching satisfaction questionnaire, and statistical analysis was conducted using SPSS 25.0. *Results:* The total DASH score of the experimental group (6.45 ± 0.41) was significantly higher than that of the control group (5.12 ± 0.47, $t = 14.01$, $p < 0.001$); The total score of critical thinking ability (338.6 ± 22.5) was higher than that of the control group (307.8 ± 24.1, $t = 6.55$, $p < 0.001$); The score of clinical practice ability (189.4 ± 15.2) was significantly higher than that of the control group (168.7 ± 14.9, $t = 6.49$, $p < 0$). Teaching satisfaction was 96% in the experimental group and 82% in the control group, statistically significant ($\chi^2 = 4.32$, $p = 0.038$). *Conclusion:* The scenario simulation teaching method based on the Debriefing-GAS model can significantly improve the learning initiative, reflective ability, critical thinking level and clinical practice ability of clinical nursing students, and enhance teaching satisfaction.

Keywords: Debriefing-GAS mode; Situational simulation teaching; Clinical nursing students; Critical thinking; Clinical practice ability

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1. Introduction

The scenario simulation teaching method has been widely applied in nursing education in recent years. It uses highly simulated clinical scenarios to allow students to "learn by doing" and experience the entire process of nursing work in a simulated clinical environment, which can consolidate theoretical knowledge and improve

practical operation and communication skills. This teaching method overcomes the shortcomings of traditional lecture-based teaching, such as students' passive acceptance of knowledge and lack of practical opportunities. It is student-centered and focuses on the cultivation of learners' active participation and clinical thinking ability. However, traditional simulation teaching focuses too much on the cultivation of operational skills during the operation process. Teachers' feedback after teaching is mostly simple summaries, without systematic and structured reflection and guidance of the teaching process. Students' internalization and transfer of the learned knowledge are insufficient, and the maximum benefits of simulation teaching cannot be fully exerted [1].

Debriefing is a key part of situational simulation teaching, the process by which learners review, reflect, and discuss the simulation experience into knowledge and skills. In recent years, the Debriefing GAS model (Gather-Analyze-Summarize) has been widely applied in medical education, focusing on the three stages of "reaction-analysis-summary" to prompt students to reflect on their performance and analyze the gaps in knowledge and skills in a safe and open learning environment. Summarize experiences and areas for improvement. This model emphasizes the combination of emotional guidance and cognitive construction, enabling students to enhance their clinical judgment and communication skills through reflection.

The introduction of the Debriefing-GAS model in nursing teaching is conducive to teachers conducting feedback activities in an organized manner, stimulating students' enthusiasm for learning, and encouraging students to reorganize the knowledge system and achieve deep learning. Especially in high-risk and emergency-intensive clinical departments like neurosurgery, it is particularly important to cultivate critical thinking and clinical adaptability of nursing students. Therefore, this study chose neurosurgical practice nursing students as the research subjects to investigate the effect of the Debriefing-GAS model scenario simulation teaching method in clinical teaching, and to verify its advantages in improving the critical thinking ability, clinical practice ability and teaching satisfaction of nursing students by using the traditional scenario simulation teaching control method To provide practical evidence for the improvement of the nursing teaching model [2].

2. Materials and methods

2.1. General information

This study used convenience sampling to select 100 full-time nursing students who were doing neurosurgery practice at a tertiary general hospital in Sichuan Province from July 2024 to June 2025 as the research subjects. All the subjects had the same pre-internship nursing basic knowledge and skills from the same institution, received the same basic theoretical knowledge and operational skills training, and had roughly the same knowledge base and academic level. Based on the duration of the internship, the historical control group method was used. Fifty nursing students who interned in the department from July 2024 to December 2024 were set as the control group, and the traditional scenario simulation teaching method was adopted; The 50 nursing students who did their internship from January 2025 to June 2025 were assigned to the experimental group, using the Debriefing-GAS model for scenario simulation teaching [3].

There were no statistically significant differences ($p > 0.05$) between the two groups of students in terms of gender, age, educational structure, and pre-internship theoretical performance, and they were comparable. There were 4 male students and 46 female students in the control group, with an average age of (21.6 ± 0.7) years; There were 5 boys and 45 girls in the experimental group, with an average age of (21.7 ± 0.6) years. All subjects were informed of the purpose and process of the study and voluntarily signed written informed consent.

2.1.1. Inclusion criteria

(1) Full-time nursing interns
(2) Good communication and comprehension skills
(3) Be informed and voluntarily participate in this study
(4) Be able to participate in teaching activities and assessments

2.1.2. Exclusion criteria

(1) Those who have previously received situational simulation teaching or Debriefing training
(2) Those who are participating in other teaching research projects
(3) Those who quit or are absent from mock teaching courses for personal reasons [4].

2.2. Methods

2.2.1. Teaching methods for the control group

Use the traditional teaching method, namely the scenario simulation teaching method. The teaching content is designed in accordance with the nursing practice syllabus and the nursing objectives for common neurosurgical diseases. The teaching process consists of five sections: theoretical instruction, scenario design, role assignment, simulation implementation, and teacher summary. In the third week of the internship, the instructor gives lectures on the basic knowledge related to the internship, common disease care, and communication skills; Scenario simulation training in the fourth week. The simulated scenarios are pre-set by the teacher, such as observation after craniocerebral injury or cerebral hemorrhage surgery, care for neurological dysfunction, etc. Students were randomly divided into several groups, and each group took turns playing the roles of nurse, patient, and family member to simulate the operation. After the teacher finished teaching, the students were evaluated collectively. The students evaluated themselves and each other based on the teacher's comments, summarizing their experiences and shortcomings [5].

2.2.2. Teaching methods of the experimental group

Use scenario simulation teaching based on Debriefing-GAS mode. In the teaching preparation stage, in accordance with the internship outline and learning objectives, the instructor formulates detailed lesson plans, identifies key points, difficulties and competency development objectives. Prepare the standardized patient (SP), with trained volunteers playing the role of the patient to ensure the scenario is realistic and communication is natural. The items used for teaching include medical records, models, medical devices and medicines, etc. During the teaching implementation stage, before the teaching begins, the instructor introduces the purpose, content and rules of this scenario simulation, distributes task cards, and clarifies the tasks and roles each student is to undertake. Interns work in groups to determine the sequence of scenarios by drawing lots and perform the simulation operations and role-playing in sequence. Teachers observe students' technical movements, communication styles, teamwork during the simulation and record them. Debriefing-GAS Reflection Session After the scenario simulation is completed, teachers and students enter a quiet learning space together and have a Debriefing discussion chaired by the tutor.

(1) Reaction phase (G)
The teacher guides students to recall the just-ended scenario process, allowing students to express their emotions and intuitive feelings, helping students get out of tension and establish psychological safety.
(2) Analysis stage (A)

Teachers guide students to analyze the nursing process based on teaching objectives and observation records, reflect on their strengths and weaknesses in aspects such as assessment, communication, and emergency handling, analyze the basis of clinical decision-making, and think about ways to improve

(3) Summary stage (S)

Students, under the guidance of teachers, summarize their experiences, reflect on their insights, and form structured knowledge transfer. Teachers provide targeted feedback based on students' performance, reinforce correct behavior, point out deficiencies and offer suggestions for improvement, enabling students to apply the knowledge they have learned to clinical practice [6].

2.3. Observation indicators

(1) Debriefing quality was evaluated using the Debriefing Assessment for Simulation in Healthcare (DASH) scale developed by Harvard University, which included six dimensions such as structural integrity, learning atmosphere, leading discussion, and stimulating reflection. Each dimension was scored on a 7-point scale, with higher scores indicating better quality of Debriefing.

(2) Critical thinking ability

Based on the revised Chinese version of the Critical Thinking Ability Scale (CIDI-CV) by Peng et al., which includes seven dimensions: pursuit of truth, open thinking, analytical ability, systematization ability, critical self-confidence, thirst for knowledge, and cognitive maturity, there are 70 items in total, ranging from 70 to 420 points. The higher the score, the stronger the critical thinking ability.

(3) Clinical practice ability

Using the clinical Practice ability scale for undergraduate nursing students developed by Yao Pingping, which includes seven dimensions of clinical nursing, communication and coordination, health education, scientific research and innovation, emergency cooperation, humanistic care and teaching ability, with a total of 44 items, with a Likert 5-level score ranging from 44 to 220 points, the higher the score, the stronger the practice ability.

(4) Teaching satisfaction was evaluated using a self-made teaching satisfaction questionnaire from five aspects: teaching objectives, teaching content, teaching methods, teaching process, and teaching effect, with a total score of 100, and a score of 80 or above was considered satisfactory.

2.4. Statistical processing

Analysis was performed using SPSS 25.0. Measurement data were expressed as mean ± standard deviation ($\bar{x} \pm s$), and independent sample *t*-tests were used for comparisons between groups; Count data were analyzed using the χ^2 test, and a *p*-value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of debriefing quality between the two groups of nursing students

The quality of Debriefing for the two groups of nursing students was evaluated using the DASH scoring scale. The results showed that the experimental group scored higher than the control group in six dimensions including teaching structure orderliness, learning atmosphere, promotion of reflection and communication feedback, and the differences were statistically significant ($p < 0.01$). See **Table 1**.

Table 1. Comparison of debriefing quality between the two groups of nursing students ($\bar{x} \pm s$, points)

Items	Teaching structure orderliness	Learning atmosphere	Stimulate discussion and reflection	Point out gaps and feedback	Maintain good performance	Total score
Control group (n = 50)	5.18 ± 0.64	5.06 ± 0.59	4.95 ± 0.71	5.10 ± 0.67	5.08 ± 0.65	5.12 ± 0.47
Experimental group (n = 50)	6.42 ± 0.52	6.38 ± 0.47	6.40 ± 0.44	6.36 ± 0.48	6.33 ± 0.50	6.45 ± 0.41
t-value	10.31	11.39	12.02	10.44	10.08	14.01
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

3.2. Comparison of critical thinking ability between two groups of nursing students

The critical thinking ability of the two groups of nursing students was evaluated using the CIDI-CV scale. The results showed that the experimental group scored significantly higher than the control group in the dimensions of truth pursuit, analytical ability, systematization ability and cognitive maturity, and the differences were statistically significant ($p < 0.01$). See **Table 2**.

Table 2. Comparison of critical thinking ability between the two groups of nursing students ($\bar{x} \pm s$, points)

Items	Pursuit of truth	Open mind	Analytical skills	Systematic ability	Critical confidence	Thirst for knowledge	Cognitive maturity
Control group (n = 50	42.8 ± 4.6	44.5 ± 4.9	43.2 ± 4.4	46.0 ± 4.7	44.1 ± 4.8	45.3 ± 5.1	42.0 ± 5.0
Experimental group (n = 50)	48.2 ± 4.1	49.7 ± 4.3	49.5 ± 4.5	51.6 ± 4.2	48.6 ± 4.6	49.8 ± 4.7	48.7 ± 4.8
t-value	6.12	5.29	6.73	5.87	4.43	4.35	6.76
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

3.3. Comparison of clinical practice ability between the two groups of nursing students

The two groups of students were evaluated using the Clinical Practice Ability Scale for Undergraduate nursing students. The results showed that the experimental group scored higher than the control group in clinical nursing, communication and coordination, health education, humanistic care and scientific research innovation, and the differences were statistically significant ($p < 0.01$). See **Table 3**.

Table 3. Comparison of clinical practice ability between the two groups of nursing students ($\bar{x} \pm s$, points)

Item	Clinical care	Communication and coordination	Health education	Research and innovation	Emergency coordination	Humanistic care	Clinical teaching	Total score
Control group (n = 50)	36.8 ± 3.9	22.5 ± 2.8	18.3 ± 2.4	24.9 ± 3.1	19.4 ± 2.3	27.5 ± 3.0	19.3 ± 2.1	168.7 ± 14.9
Experimental group (n = 50)	41.3 ± 3.6	26.4 ± 2.3	21.6 ± 2.0	28.0 ± 2.5	22.0 ± 2.2	31.2 ± 2.8	22.0 ± 1.9	189.4 ± 15.2
t-value	6.08	7.12	6.88	5.19	5.57	6.28	6.78	6.49
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

4. Conclusion

Through research, it is found that the scenario simulation teaching adopting the Debriefing-GAS mode can

significantly improve the critical thinking ability, clinical practice ability and teaching satisfaction of nursing students. It can also stimulate students to learn and reflect actively more than the traditional teaching methods. The Debriefing-GAS model uses three stages of reaction, analysis, and summary to allow learners to express their true feelings in a safe learning atmosphere, analyze the strengths and weaknesses of nursing in the nursing process, thereby achieving the purpose of internalizing experience and transferring knowledge. The DASH score of the experimental group in this study was higher than that of the control group, indicating that the teaching feedback of this model is highly structured and inspiring, and can guide students to conduct in-depth reflection.

At the same time, the experimental group had higher scores for critical thinking and clinical practice ability, indicating that systematic reflection is conducive to the cultivation of students' logical analysis and clinical decision-making abilities, and to the transformation of theoretical knowledge into practical skills. The improvement in students' satisfaction with teaching indicates that they have gained positive learning experiences and a sense of achievement in the activities. In summary, the Debriefing-GAS model has effectively improved the quality of nursing teaching by improving the teaching structure and strengthening feedback and reflection, and has a positive effect on improving the comprehensive quality and practical ability of clinical nursing students, which is worthy of promotion in nursing education.

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Disclosure statement

The author declares no conflict of interest.

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