

# Construction and Practice of Clinical Teaching Model for Burn Department Based on OSCE and Scenario Simulation

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**Abstract:** *Objective:* To explore the application value of the Objective Structured Clinical Examination (OSCE) combined with scenario simulation teaching mode in the clinical teaching of burn care, and to provide empirical data for improving the clinical practice ability and comprehensive quality of nursing students. *Methods:* Sixty nursing students who were on internship in the burn department of a tertiary hospital from September 2024 to June 2025 were selected as the research subjects. They were randomly divided into an experimental group and a control group using a random number table. The experimental group adopted the OSCE combined with scenario simulation teaching method, constructing six standardized stations covering burn wound assessment, fluid resuscitation during shock period, infection control, etc. Each station was set up with real case scenarios, high-fidelity burn models, and standardized patients, and a closed-loop training method of “assessment, operation, feedback” was adopted. The control group used traditional teaching methods, mainly bedside demonstration and theoretical lectures. The teaching period lasted for 8 weeks. The assessment included theoretical examination (out of 100 points), operation skills assessment (including five core skills such as wound debridement and dressing change, and bandaging and fixation, each worth 20 points), and clinical comprehensive ability assessment (using the nursing ability scale, including six dimensions such as condition observation and emergency handling, evaluated through a teaching satisfaction questionnaire (Likert 5-point scale)). *Results:* The experimental group had significantly higher scores in theoretical examination and operation skills assessment, especially in the standardization of debridement procedures ( $94.2 \pm 2.8$  vs.  $75.6 \pm 5.1$ ) and pain management measures ( $91.5 \pm 3.1$  vs.  $73.8 \pm 4.9$ ). During the clinical comprehensive ability assessment, the experimental group showed better performance in teamwork and higher satisfaction with the teaching method. *Conclusion:* The integration of OSCE and scenario simulation teaching can systematically enhance the quality of burn care clinical teaching. Through the organic combination of standardized assessment and immersive training, it can effectively improve the clinical thinking, operational accuracy, and adaptability of nursing students, and has significant promotion significance for cultivating high-quality burn care talents.

**Keywords:** OSCE; Scenario Simulation; Burn Care; Clinical Teaching; Teaching Reform

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## 1. Introduction

Burn care is a crucial component of clinical nursing, characterized by complex and variable conditions, highly specialized operations, and strict emergency requirements. Traditional clinical teaching methods often adopt the “apprenticeship” on-the-job learning approach, which has problems such as high teaching randomness and lack of systematic assessment, making it difficult to comprehensively cultivate nursing students’ clinical thinking and practical skills. Objective Structured Clinical Examination (OSCE) and scenario simulation teaching methods are widely used in medical education<sup>[1]</sup>. The former uses a standardized, multi-station assessment system to comprehensively evaluate clinical abilities, while the latter uses highly realistic clinical scenarios to enhance emergency response and teamwork skills. However, the combined application of these two methods in burn care teaching lacks systematic research<sup>[2]</sup>. This study aims to explore the practical results of combining OSCE and scenario simulation in burn care teaching, with the goal of providing references for clinical teaching reform.

## 2. Materials and Methods

### 2.1. Research Subjects

Sixty nursing students who were interning in the burn department of a tertiary hospital from September 2024 to June 2025 were selected as the research subjects. All were full-time undergraduate nursing students in their fourth year, aged 21 to 23, with an average age of  $(22.1 \pm 0.8)$  years. All students had completed core courses such as “Fundamental Nursing” and “Surgical Nursing” and had not received specialized burn care training before entering the burn department for internship. The students were randomly divided into an experimental group and a control group using a random number table, with 30 students in each group. There were no statistically significant differences in general data such as age, gender, and academic performance between the two groups, providing a basis for comparison.

### 1.2. Inclusion Criteria

(1) Voluntary signing of the informed consent form and full participation in the study; (2) First-time clinical internship in the burn department, with an internship duration of at least 4 weeks; (3) No major physical diseases or mental disorders; (4) Able to cooperate in completing the teaching plan and assessment process.

### 1.3. Exclusion Criteria

(1) Those with previous internship or work experience in the burn department; (2) Those who withdrew from the study due to personal reasons or whose internship duration was less than 3 weeks; (3) Those with a missing rate of clinical data and assessment data greater than 10%; (4) Those with communication barriers or cognitive dysfunction, unable to participate in scenario simulation training.

### 1.4. Intervention Measures

- (1) Experimental Group: Teaching was conducted using OSCE combined with scenario simulation. The teaching arrangement lasted for 4 weeks, with 2 scenario simulation trainings per week, each lasting 90 minutes. The content covered four major modules<sup>[3]</sup>: ① Burn first aid; ② Wound management; ③ Infection control; ④ Rehabilitation care. Highly realistic burn models were used for the simulation scenarios, and standardized patients (SPs) were arranged to play the roles of burn patients and their families. After each simulation, the OSCE multi-station assessment method was used, with each station lasting 15 minutes for assessment. The assessment team was composed of 2 senior nurses and 3 attending physicians from the burn department, providing on-site feedback and personalized guidance based on the “Burn Care OSCE Scoring Criteria”.
- (2) Control Group: Traditional teaching methods were used, with the teaching instructor conducting on-the-job teaching for the students according to the internship syllabus, covering participation in daily clinical work. The teaching period was the same as that of the experimental group, without additional scenario simulation training or

OSCE assessment<sup>[4]</sup>.

### 1.5. Observation Indicators

- (1) Theoretical Assessment: A closed-book written test was used, with questions provided by the burn department teaching group, covering core knowledge such as burn pathophysiology, clinical manifestations, treatment principles, and nursing details<sup>[5]</sup>. The test included multiple-choice questions, with a full score of 100 points and a duration of 90 minutes.
- (2) Operational skills assessment: Based on the “Burns Nursing Operation Standard Scoring Table”, two teaching instructors conducted on-site evaluations of the three core operations of burn debridement and dressing change, bandaging and fixation, and turning and back tapping for the nursing students. Each operation was scored out of 100 points, and the average score was taken as the final operational skills score. The main assessment dimension was the level of operational standardization<sup>[6]</sup>.
- (3) Clinical comprehensive ability assessment: The Mini CEX (Mini-Clinical Evaluation Exercise) was used to assess the students’ performance after they independently completed the care for patients. The instructors provided on-site scoring. The assessment dimensions included consultation skills, with a total score of 100 points. During the assessment, specific cases and the reasons for the scores were recorded.
- (4) Teaching satisfaction: A self-designed questionnaire was used for the survey, covering three dimensions: teaching content (4 questions), teaching methods (3 questions), and teaching effects (3 questions), totaling 10 items. The Likert 5-point scoring method was adopted, with 5 indicating very satisfied. A total score of  $\geq 45$  points was considered very satisfied, 35 to 44 points as generally satisfied, and a score  $< 35$  points as dissatisfied. The Cronbach’s  $\alpha$  coefficient of the questionnaire was 0.87, and the content validity index (CVI) was 0.92, demonstrating good reliability and validity.

### 1.6. Statistical methods

Data were analyzed using SPSS 22.0 software. Measurement data were expressed as mean  $\pm$  standard deviation ( $\bar{x} \pm s$ ), and independent sample t-tests were used for inter-group comparisons. Count data were presented as number and percentage [n(%)], and  $\chi^2$  tests were used for inter-group comparisons. Wilcoxon rank sum tests were used for comparisons of ranked data.  $P < 0.05$  was considered statistically significant.

## 2. Results

### 2.1. Comparison of assessment scores between the two groups

The theoretical assessment score of the experimental group was ( $89.5 \pm 4.2$ ) points, significantly higher than that of the control group ( $82.3 \pm 5.1$ ) points ( $t = 5.32$ ,  $P < 0.001$ ); the operational skills score of the experimental group was ( $91.2 \pm 3.8$ ) points, significantly higher than that of the control group ( $83.6 \pm 4.9$ ) points ( $t = 6.15$ ,  $P < 0.001$ ); the Mini-CEX score of the experimental group was ( $88.7 \pm 4.5$ ) points, significantly higher than that of the control group ( $80.1 \pm 5.3$ ) points ( $t = 5.98$ ,  $P < 0.001$ ). See **Table 1**.

**Table 1.** Comparison of assessment scores between the experimental group and the control group

| Indicator              | Experimental group (n = 30) | Control group (n = 30) | t value | P value   |
|------------------------|-----------------------------|------------------------|---------|-----------|
| Theoretical assessment | $89.5 \pm 4.2$              | $82.3 \pm 5.1$         | 5.32    | $< 0.001$ |
| Operational skills     | $91.2 \pm 3.8$              | $83.6 \pm 4.9$         | 6.15    | $< 0.001$ |
| Mini-CEX score         | $88.7 \pm 4.5$              | $80.1 \pm 5.3$         | 5.98    | $< 0.001$ |

## 2.2. Comparison of teaching satisfaction:

The teaching satisfaction rate of the experimental group was 96.7% (29/30), including 18 people (60.0%) who were very satisfied, 11 people (36.7%) who were satisfied, and 1 person (3.3%) who was average; the satisfaction rate of the control group was 80.0% (24/30), including 9 people (30.0%) who were very satisfied, 15 people (50.0%) who were satisfied, 5 people (16.7%) who were average, and 1 person (3.3%) who was dissatisfied. The comparison of satisfaction between the two groups showed a statistically significant difference ( $\chi^2 = 4.32$ ,  $P = 0.038$ ). See **Table 2**.

**Table 2.** Comparison of teaching satisfaction between the two groups of nursing students

| Group              | Number | Very satisfied | Satisfied | Average | Dissatisfied | Total satisfaction rate | $\chi^2$ | P value |
|--------------------|--------|----------------|-----------|---------|--------------|-------------------------|----------|---------|
| -                  | -      | -              | -         | -       | -            | -                       | 4.32     | 0.038   |
| Experimental group | 30     | 18(60.0)       | 11(36.7)  | 1(3.3)  | 0(0)         | 96.7%                   | -        | -       |
| Control group      | 30     | 9(30.0)        | 15(50.0)  | 5(16.7) | 1(3.3)       | 80.0%                   | -        | -       |

## 2.3. Analysis of ability improvement dimensions:

A self-assessment scale of ability (Cronbach's  $\alpha = 0.85$ ) was used to survey the nursing students. The results showed that the self-evaluation scores of the experimental group in emergency handling ( $86.4 \pm 5.7$  vs  $75.2 \pm 6.3$ ,  $t = 7.21$ ,  $P < 0.001$ ), teamwork ( $88.1 \pm 4.9$  vs  $76.5 \pm 5.8$ ,  $t = 8.03$ ,  $P < 0.001$ ), doctor-patient communication ( $87.3 \pm 5.2$  vs  $78.6 \pm 6.1$ ,  $t = 5.67$ ,  $P < 0.001$ ), and clinical thinking ( $85.6 \pm 5.4$  vs  $77.8 \pm 5.9$ ,  $t = 5.12$ ,  $P < 0.001$ ) were significantly higher than those of the control group (all  $P < 0.05$ ). See **Table 3**.

**Table 3.** Comparison of Self-assessment Scores of Nursing Students' Abilities in Two Groups

| Dimension                    | Experimental Group (n = 30) | Control Group (n = 30) | t Value | P Value |
|------------------------------|-----------------------------|------------------------|---------|---------|
| Emergency Response           | $86.4 \pm 5.7$              | $75.2 \pm 6.3$         | 7.21    | < 0.001 |
| Teamwork                     | $88.1 \pm 4.9$              | $76.5 \pm 5.8$         | 8.03    | < 0.001 |
| Doctor-Patient Communication | $87.3 \pm 5.2$              | $78.6 \pm 6.1$         | 5.67    | < 0.001 |
| Clinical Thinking            | $85.6 \pm 5.4$              | $77.8 \pm 5.9$         | 5.12    | < 0.001 |

## 3. Discussion

This study found that the OSCE combined with scenario simulation teaching method for burn care education was highly effective. The reasons for this are that the scenario simulation realistically recreates the clinical situation of burns, enhancing the immersion experience and participation of nursing students, and facilitating the transformation of theoretical knowledge into practical skills<sup>[7]</sup>; the multi-station OSCE assessment provides a systematic and standardized feedback mechanism, helping students to target and improve their weak areas. Compared with traditional teaching methods, this model not only enhances operational skills but also strengthens comprehensive qualities such as clinical thinking and humanistic care, aligning with the modern nursing education concept of "competency-centered"<sup>[8]</sup>.

This study also has limitations, including a relatively small sample size and being conducted in a single hospital. Future research should increase the sample size and conduct multi-center validations. This model has high requirements for both teaching staff and equipment, and further optimization of resource allocation is needed. It is suggested that subsequent studies explore the combined approach of online simulation and OSCE assessment to expand the scope of teaching scenarios and reduce implementation costs.

The combination of OSCE and scenario simulation opens up an innovative path for burn care education, which is of

positive significance for enhancing the job competence of nursing students and can be gradually popularized in clinical teaching<sup>[9-10]</sup>.

## 4. Conclusion

This study implemented the OSCE combined with scenario simulation teaching model in burn care education and confirmed that this method can significantly improve the theoretical knowledge level, operational skills, and comprehensive clinical abilities of nursing students. The teaching achieved a satisfaction rate of 96.7%, providing empirical evidence for the reform of nursing education. The research innovatively combined high-fidelity simulation scenarios with a standardized assessment system, not only addressing the shortcoming of traditional teaching of “more demonstration and less feedback”, but also establishing an integrated teaching loop system of “learning, practice, and evaluation”. The improvement in the abilities of nursing students in core areas such as emergency response and teamwork was particularly significant, truly reflecting the modern medical education goal of “competency-oriented” training.

Despite the limitations of sample size and single-center research, the teaching effectiveness of this model provides a scalable solution for the training of burn care professionals. It is recommended that future research be further deepened in three aspects: developing VR virtual simulation modules to expand the coverage of teaching scenarios; establishing a teacher training and certification system to ensure teaching quality; and conducting long-term follow-up studies to verify its impact on career development. With the advancement of medical technology, the integrated application of OSCE and scenario simulation will demonstrate greater value in the field of nursing education, laying a solid foundation for cultivating high-quality clinical nursing professionals.

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## Disclosure statement

The author declares no conflict of interest.

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