

Research on the Application of the OSCE Model in Vocational Nursing Comprehensive Practical Training

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Abstract: The objective of this study is to examine the application effect of the Objective Structured Clinical Examination (OSCE) model in the comprehensive practical training course for higher vocational nursing. Based on the evaluation dimensions of core nursing competencies, the OSCE framework was constructed with the clinical nursing work process as the main focus and supported by a nursing case database. A questionnaire survey revealed that over 80% of students in the experimental group were satisfied with the application of OSCE in the nursing comprehensive practical training course, and more than 90% believed that OSCE assessment enhanced their theoretical knowledge and practical skills. The OSCE was also considered helpful in transforming learned knowledge and skills into professional competencies.

Keywords: Objective structured clinical examination (OCSE); Higher vocational nursing; Comprehensive practical training

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1. Introduction

There are some deficiencies in the quality of training in vocational colleges and universities, which serve as the main training base for nursing talents. In nursing practical training, traditional teaching methods are often used as the primary approach. However, the training and teaching of comprehensive nursing abilities for vocational nursing students remain insufficient, and there is a significant gap between practical teaching and clinical nursing practice^[1,2]. This gap is mainly reflected in two aspects: First, practical training tends to focus on “technical operations,” with the primary teaching goal being the mastery of specific skills. This often overlooks crucial elements such as communication between nurses and patients, nursing assessments, and the integration of humanistic knowledge, which are inseparable from technical skills^[3]. Second, the teaching methods used in practical training are relatively simplistic. Students lack enthusiasm for learning, teachers struggle to engage fully in their work, and overall teaching effectiveness is poor^[4,5].

2. Materials and methods

2.1. General information

Using classes as the unit, the cluster sampling method randomly selected 128 students from two 2021 classes of the higher vocational nursing major at our university as research participants. One class served as the observation group, consisting of 63 students (19 males and 44 females), aged 18–22, with an average age of 20.58 ± 0.67 years. The other class was used as the control group, consisting of 65 students (22 males and 43 females), aged 18–22, with an average age of 20.82 ± 0.74 years. There were no significant differences in age, gender, or academic performance between the two groups ($P > 0.05$), indicating comparability. In the first three semesters, the students completed basic and some professional courses, along with practical training in specific subject areas. They acquired skills in disease observation, problem-solving, communication, and clinical procedures. Both groups were taught by the same nursing teaching team, and the class schedules were consistent.

2.2. Teaching methods

2.2.1. Writing OSCE cases

In designing the OSCE cases for this study, the research team considered the learning level of vocational nursing students, conducted an in-depth review of relevant domestic and international literature, and combined real clinical cases with the current OSCE framework. They developed standardized nursing cases, standardized patient (SP) scripts, and relevant scoring criteria, including evaluation sheets for admission nursing, vital signs measurement, nurse-patient communication, health education, and teacher assessments. These materials were revised by nursing education experts for training and assessment purposes. A corresponding questionnaire was also developed. A pre-experiment with randomly selected vocational nursing students was conducted to refine the OSCE assessment plan.

2.2.2. Training

Ten students from the experimental group, selected based on academic performance, learning ability, and enthusiasm, were recruited to form two demonstration groups of five members each. These students underwent systematic and standardized training to replicate clinical scenarios in class based on the OSCE case scripts.

2.2.3. Implementation of OSCE teaching

Both classes used the same teaching materials and had the same class hours. The control group followed traditional teaching methods: (1) teacher instruction, (2) student practice, (3) teacher guidance, and (4) lottery-based examination. The observation group used the OSCE model. Inspired by OSCE, the nursing comprehensive practical training course included five major learning tasks and 12 sub-tasks (see **Table 1**).

Table 1. Course learning tasks

Learning tasks	Subtasks
Task 1: Care of admitted and discharged patients	Subtask 1: Hospital inpatient environment management
	Subtask 2: Transporting patients
	Subtask 3: Recumbent position and safe care
	Subtask 4: Specimen collection

Table 1 (Continued)

Learning tasks	Subtasks
Task 2: Operating room care	Subtask 5: Surgical hand disinfection
	Subtask 6: Putting on and taking off surgical gowns
Task 3: Care that meets the patient's physical needs	Subtask 7: Nursing the patient's diet
	Subtask 8: Excretion care
Task 4: Care of common treatment methods	Subtask 9: Care of medication
	Subtask 10: Intravenous fluids and blood transfusions
	Subtask 11: Heat and cold therapy
Task 5: Care of critically ill people	Subtask 12: Care of critically ill patients

Students were divided into groups of 5–6 to participate in cooperative learning activities. The teaching approach emphasized “Student-Centered Protection, Teacher-Led Instruction” , holistic nursing, and quality nursing services. Teaching methods such as flipped classrooms, problem-based learning (PBL), and task-based learning (TBL) were flexibly applied. Each group was required to research relevant materials and watch related instructional videos before class. They also participated in group discussions to assign roles, create scripts, and simulate specific clinical scenarios for standardized patients (played by students). Teachers then provided feedback, and the demonstration group presented the standard procedures .

2.3. Evaluation of teaching effect

Before and after the course, the two groups were assessed on their critical thinking abilities. After the study, the students took practical training tests, theoretical exams, and OSCE assessments. Following the assessments, they completed a questionnaire .

2.4. Statistical analysis

SPSS 22.0 statistical software was used for analysis. Categorical data were described by frequency and percentage, with results represented as [*n* (%)], and the χ^2 test was used for group comparisons. Measurement data were first tested for normality. Data that followed a normal distribution were described as mean \pm standard deviation (SD), and comparisons between groups were made using the independent sample *t*-test. The significance level was $\alpha = 0.05$, with $P < 0.05$ considered statistically significant.

3. Results

3.1. Comparison of theoretical and operational test results between experimental and control groups

The 63 students in the experimental group received practical teaching training according to the objective structured training mode based on OSCE, while the 65 students in the control group received practical teaching training based on the conventional method. The results in the experimental group were as follows: medical nursing theory scored 83.63 ± 3.64 points, surgical nursing theory scored 85.23 ± 4.12 , operational assessment scored 87.82 ± 2.88 , while in the control group, medical nursing theory scored 78.62 ± 5.99 , surgical nursing

theory scored 79.27 ± 6.59 , and operational assessment scored 82.64 ± 4.51 . There were statistically significant differences in both theoretical and operational scores between the two groups ($P < 0.05$). Specific results are shown in **Table 2**.

Table 2. Comparison of students' scores between the two groups (mean \pm SD)

Groups	<i>n</i>	Operational assessment	Medical nursing theory	Surgical nursing theory
Experimental group	63	87.82 \pm 2.88	83.63 \pm 3.64	85.23 \pm 4.12
Control group	65	82.64 \pm 4.51	78.62 \pm 5.99	79.27 \pm 6.59
<i>t</i> value		2.51	2.43	3.34
<i>P</i> value		< 0.05	< 0.05	< 0.05

3.2. Comparison of students' satisfaction with practical teaching and training methods between experimental and control groups

The 63 students in the experimental group received practical teaching training using the objective structured training mode based on the OSCE model. They filled out a student satisfaction questionnaire regarding practical teaching, resulting in 59 effective responses, with a recovery rate of 93.7%. A score of ≥ 40 points indicated satisfaction, with 48 students expressing satisfaction, yielding a satisfaction rate of 81.4%.

In the control group, 65 students received practical teaching training through the conventional method and filled out the same questionnaire. A total of 63 effective responses were received, with a recovery rate of 97.0%. Of these, 45 students expressed satisfaction, resulting in a satisfaction rate of 71.4%.

While there was no statistical significance in the lost questionnaire data, the difference in satisfaction rates between the two groups was statistically significant ($P < 0.05$). Specific results are shown in **Table 3**.

Table 3. Comparison of students' satisfaction with practical teaching and training methods between the two groups [*n* (%)]

Group	<i>n</i>	Dissatisfaction	Satisfaction
Experimental group	63	11 (18.6)	48 (81.4)
Control group	65	18 (28.6)	45 (71.4)
χ^2			3.91
<i>P</i>			0.048

3.3. Analysis of students' satisfaction with practical teaching training in the experimental group

Both the experimental and control groups participated in the OSCE assessment and completed an OSCE assessment satisfaction survey afterward. Specific results are shown in **Table 4**.

Table 4. Students' evaluation of OSCE model (*n* = 128)

Survey content	Yes [<i>n</i> (%)]	Neutral [<i>n</i> (%)]	No [<i>n</i> (%)]
Do you think there is a need to promote OSCE teaching?	96 (75)	21 (16.6)	11 (8.5)
Were you nervous during the OSCE assessment?	13 (10.2)	112 (87.5)	3 (2.3)

Table 4 (Continued)

Survey content	Yes [<i>n</i> (%)]	Neutral [<i>n</i> (%)]	No [<i>n</i> (%)]
With an OSCE assessment duration of 25 minutes, did you feel fatigued?	17 (13.3)	100 (78.2)	11 (8.5)
Does OSCE help improve your ability to learn theoretical knowledge?	101 (79)	20 (15.6)	7 (5.4)
Does OSCE help improve your mastery of nursing operational skills?	87 (68)	27 (21)	14 (11)
Does OSCE help you translate the knowledge and skills you have acquired into vocational skills?	89 (69.5)	18 (14.1)	21 (16.4)

3.4. Comparison of critical thinking ability scores between experimental and control groups before and after training

3.4.1. Pre-training comparison of critical thinking ability scores

A total of 128 students participated in the pre-training evaluation of critical thinking ability in both groups. In the end, 63 students in the experimental group returned 60 effective critical thinking ability scale questionnaires, with an effective recovery rate of 95.2%, while 65 students in the control group returned 63 effective questionnaires, with an effective recovery rate of 96.9%. The results showed no statistically significant difference in critical thinking ability scores between the two groups ($P > 0.05$). The specific results are shown in **Table 5**.

Table 5. Pre-training comparison of critical thinking ability scores between the two groups (mean \pm SD)

Items	Groups	<i>n</i>	Score	<i>t</i>	<i>P</i>
Open-mindedness	Control group	63	33.49 \pm 5.23	1.487	0.138
	Experimental group	60	32.48 \pm 4.22		
Search for truth	Control group	63	34.28 \pm 4.39	0.625	0.533
	Experimental group	60	33.79 \pm 5.37		
Analytical ability	Control group	63	34.73 \pm 5.6	0.646	0.519
	Experimental group	60	34.27 \pm 5.99		
Systematization ability	Control group	63	35.23 \pm 5.45	1.912	0.057
	Experimental group	60	36.55 \pm 6.54		
Self-confidence	Control group	63	36.33 \pm 6.85	1.951	0.052
	Experimental group	60	34.39 \pm 8.12		
Intellectual curiosity	Control group	63	38.24 \pm 5.52	0.451	0.652
	Experimental group	60	37.89 \pm 6.24		
Cognitive maturity	Control group	63	31.82 \pm 5.59	0.425	0.672
	Experimental group	60	31.73 \pm 4.95		
Total points	Control group	63	243.98 \pm 37.97	0.535	0.593
	Experimental group	60	241.18 \pm 41.47		

3.4.2. Post-training comparison of critical thinking ability scores

A statistical analysis of the critical thinking ability scores of nursing students after comprehensive intensive

training showed that the total score of the experimental group was higher than that of the control group ($P < 0.001$). According to the $\alpha = 0.05$ significance level, this difference was statistically significant. The specific results are shown in **Table 6**.

Table 6. Post-training comparison of critical thinking ability scores between the two groups (mean \pm SD)

Items	Groups	<i>n</i>	Score	<i>t</i>	<i>P</i>
Open-mindedness	Control group	63	35.63 \pm 5.18	4.464	< 0.001
	Experimental group	60	38.67 \pm 4.42		
Search for truth	Control group	63	35.74 \pm 5.45	2.945	0.004
	Experimental group	60	38.25 \pm 6.42		
Analytical ability	Control group	63	38.66 \pm 5.38	4.179	< 0.001
	Experimental group	60	41.73 \pm 5.56		
Systematization ability	Control group	63	37.11 \pm 5.02	6.349	< 0.001
	Experimental group	60	41.86 \pm 6.32		
Self-confidence	Control group	63	39.43 \pm 6.32	3.667	< 0.001
	Experimental group	60	42.78 \pm 7.72		
Intellectual curiosity	Control group	63	40.12 \pm 4.85	4.231	< 0.001
	Experimental group	60	42.88 \pm 5.06		
Cognitive maturity	Control group	63	33.42 \pm 4.64	8.339	< 0.001
	Experimental group	60	38.83 \pm 5.15		
Total points	Control group	63	260.40 \pm 37.66	4.728	< 0.001
	Experimental group	60	284.98 \pm 41.08		

4. Discussion

4.1. OSCE mode assessment is comprehensive

When designing the OSCE model, the research team integrated the nursing concept of “patient-centered care” according to the clinical nursing workflow—nursing procedures^[6]. The OSCE design focuses on cultivating and evaluating students’ clinical nursing practice abilities. Drawing from OSCE assessment experiences in nursing and aligning with the teaching syllabus and nursing training objectives of our school, the OSCE curriculum reform content was established. This reform covers the assessment of disease observation, information collection, clinical decision-making, nursing operation skills, patient communication, humanistic care, and knowledge application^[7].

4.2. Analysis of learning effect in practical teaching and training with OSCE mode

The core goal of nursing education is to enhance students’ clinical nursing skills. The essential competencies for nursing students include critical thinking, communication skills, operational abilities, and a professional attitude, all of which are cultivated through study and practice. These abilities encompass elements such as critical thinking, communication, and practical operation^[8].

The results of this study indicate that the experimental group using the OSCE mode outperformed the

control group in theoretical assessments, practical assessments, and critical thinking. This demonstrates that structured training with the OSCE model in comprehensive practical nursing education helps improve students' theoretical knowledge and practical skills^[9]. Through structured OSCE training, students enhanced their hands-on skills in simulated clinical scenarios and applied classroom theoretical knowledge to practice, deepening their understanding. The diversity and flexibility of OSCE assessment methods, such as the use of standardized patients (SPs) to simulate real situations, overcome the limitations of traditional assessment methods, ensure consistency in assessment standards, and make practical teaching more realistic and objective^[10].

In summary, the OSCE-based structured training mode has positively impacted nursing practice teaching, improving students' assessment scores and significantly enhancing teaching effectiveness. Future nursing education should incorporate this model more frequently, encouraging teachers to innovate their methods and better manage the classroom environment.

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The author declares no conflict of interest.

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