

Application of Objective Structured Clinical Examination (OSCE) in Intensive Care Curriculum

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Abstract. To explore the application effect of objective structured clinical examination (OSCE) in intensive care course. Methods Two parallel (3+2) classes of nursing in a higher vocational college were selected as the research subjects. The experimental group and control group were randomly determined. The simplified OSCE mode was used for teaching and assessing the experimental group, the conventional teaching method was used for the control group, and used single or group assessment to analyze the experimental and theoretical scores of each group. Pearson correlation analysis was used to analyze the relationship between the student operational test score and the theoretical test score. Using the self-made questionnaire to investigate the evaluation of the OSCE model by the experimental group students. Results The total experimental score and theoretical result of the experimental group were better than the control group.(P<0.01). There was a significant positive correlation between the theoretical scores of the students and the experimental results (P<0.01). Students have a positive attitude towards OSCE . Conclusion The OSCE model can stimulate learning motivation and improve learning outcomes of students. It is recommended topromote the application of OSCE in the further.

Keywords: objective structured clinical examination, nursing, clinical skills.

1. Introduction

The Objective Structured Clinical Examination (OSCE) is proposed by Harden [1] and others in the United Kingdom in which Students complete a series of assessment tasks through multiple established test stations.Standardized patient (SP) is used in OSCE. The student's clinical skills and/or attitudes are evaluated in OSCE ,and it is currently widely used as an assessment model for objectively evaluating the comprehensive ability of medical students [2-4].

A number of studies have shown that objectively structured clinical examination (OSCE) can improve the cognitive status of nursing students on theoretical knowledge, promote the application of nursing procedures, and improve their interviewing skills, critical thinking and problem-solving skills, knowledge, value, beliefs and attitudes [5].It can also guide students to focus on clinical practice, cultivate their ability of humanistic care [6], help them clarify goal of the next stage in work, reduce the blindness in work [7], etc. OSCE is conducive to the improvement of students' comprehensive ability and the training of nursing students' competence [8]. However, at present, there are few related studies on the OSCE model for teaching in intensive care curriculum . In this study, OSCE was used in teaching of intensive care , and the teaching effect was tested to provide reference for the future application and promotion of OSCE. The report is as follows:

2. Objects and Methods

2.1 Research Object

Two parallel (3+2)classes of nursing in a higher vocational college were selected as the research subjects, and the experimental group and the control group were randomly determined, all of which were female, 48 in the experimental group and 50 in the control group. The simplified OSCE mode was used for teaching and assessment of the experimental group , and the conventional teaching method was used for the control group , and single or group assessment was adopted.



2.2 Method

2.2.1 Survey Tools

The "OSCE Teaching Effect Questionnaire" was used to evaluate opinion of students on OSCE teaching effectiveness. The questionnaire was compiled by researchers with reference to the relevant literature [9-10]. The questionnaire was semi-structured with a total of 9 items. The first 8 items were rated at the likert level 5. From "very agree" to "very disagree" are assigned 5 to 1 point respectively. The higher the score, the more positive the attitude.3 points means neutral, more than 3 points means positive attitude, less than 3 points means negative attitude. The last item is an open question. Students were advised to make some suggestions and comments on the OSCE .

2.2.2 Design and Implementation of OSCE

(1) Design of the OSCE site

This OSCE site was designed refer to the composition of the clinical ability of emergency nurses [11]. It includes 3 levels: basic ability, practical ability, and expansion ability; 6 ability: professional attitude, professional practice ability, critical thinking ability, management ability, interpersonal communication ability and professional development ability. The examination team composed of the course group teacher and clinical nursing experts also designed this OSCE on the basis of the characteristics of OSCE and the 2016 edition of the intensive care curriculum standards. This test consists of two test stations, namely, cardiac defibrillation and ECG monitoring technology. Each station focuses on different abilities. The full score is 100 points. Each station has a corresponding rating. The ECG monitoring technique was performed on standardized patients (SP), and a high-simulation intelligent person was used at the cardiac defibrillation site.

(2) Selection and training of standardized patients (SP)

Recruiting 4 freshmen non-care students across the school to prevent the SP from tending to guide the candidates. Through interviews, assess whether their appearance and performance are consistent with the SP role, communication skills, performance skills, etc. Week 1: Familiarize the role they will play. Week 2: Role-playing.First of all, the teacher explains the imitative points of various diseases and answers questions from SP about the role, asks SP to imitate the symptom according to clinical cases. Then teachers conduct a simulated interview with SP,and further revising the simulation content based on problems in the SP role play.

(3) Implementation of OSCE

In May 2018, OSCE was used to teach, practice, and test students in the experimental group. Explain the specific form and process of the test to the participants before test, and make each student familiar with the exam requirements and specific scoring criteria.

2.2.3 Evaluation Method

(1) Evaluation of experimental assessment results: Standardized patient (SP) sites and non-SP sites were scored on-site by the invigilator according to the scoring standard.

(2) Evaluation of theoretical results: The same test paper was used to simultaneously evaluate two groups of students.

(3) Evaluation of teaching effect: The self-made questionnaire was used, and the students in the experimental group were invited to evaluate the teaching effect of this OSCE.

2.2.4 Method of Questionnaire Collection

In order to prevent possible biases, all information was collected by the research team and was filled out using a uniform instructional language. Before the data collection, explain the purpose, significance and research process of the study to the experimental group. In the process of filling out, explained doubts of the research object about the questionnaire in a unified language. The questionnaires were distributed by the researchers on the spot. The questionnaires were collected on the spot and the integrity and validity of the questionnaires were checked. The recovery efficiency of the questionnaires was 100%.



2.2.5 Statistical Methods

Epidata 3.1 software was used to establish the database and enter the data. SPSS 21.0 software was used for statistical analysis. Student scores were described by mean \pm standard deviation. T test was used to compare the theoretical and experimental scores of the two groups. Pearson correlation analysis was used to test the relationship between theoretical and experimental scores of students.

3. Results

3.1 Comparison of Scores of Two Groups, the Results are Shown in Table 1:

Table 1. Results of the two groups (n=50 in the control group and n=48 in the experimental group)

Item	group	Score($\overline{\chi} \pm S$)	<i>t</i> value	P value
Theoretical score	Control group	66.53±11.55	-3.18	0.002**
	Experimental group	73.44±9.87		0.002
Defibrillation	Control group	82.74±6.26	-3.73	0.000**
	Experimental group	87.29±5.81		0.000
ECG monitoring	Control group	89.80±5.72	-1.29	0.20
	Experimental group	91.25±5.43		0.20
Total experimental results	Control group	86.27±5.03	-3.24	0.002**
	Experimental group	89.27±4.08		0.002

(**P<0.01)

3.2 The Evaluation of OSCE by the Experimental Group Students, See Table 2:

Table 2. Evaluation of OSCE by experimental group students (n=48)					
Item	Rating($\chi \pm S$)	Sequence			
1.OSCE is difficult	3.67±0.72	6			
2.OSCE can reflect professional knowledge and skill level	4.08±0.82	3			
3. OSCE helps to find out their own shortcomings	4.13±0.76	2			
4. OSCE is helpful for improving professionalism	4.13±0.76	2			
5. OSCE is closer to clinical practice than traditional assessment	4.33±0.72	1			
6. OCSE can promote my communication skills	4.02±0.86	4			
7.Satisfied with the design of test site and process	3.88±0.63	5			
8. I agree that OSCE should be popularized	4.13±0.67	2			

3.3 Pearson Correlation Analysis between Theoretical Results and Experimental Results

Table 3. Correlation analysis between theoretical scores and experimental scores (n=98)					
Item	Defibrillation	ECG monitoring	Theoretical score		
Defibrillation	-				
ECG monitoring	0.27**	-			
Total experimental results	0.83**	0.77**	-		
Theoretical score	0.44**	0.32**	0.48**		

(**P<0.01)



4. Discussion

4.1 OSCE can Enhance Learning Motivation and Improve Learning Effect

According to the teaching experience over the years, the content of the intensive care course is difficulty. Most students think that the course content is difficult, the operation process is complicated, and the theoretical content is profound. In order to solve these problems, the research team has tried a variety of teaching methods. The purpose of applying OSCE is to help students improve their clinical practice skills and promote them to learn relevant theoretical knowledge. The results of the study showed: defibrillation scores [r(96) = 0.44, P = 0.000], ECG monitoring results [r(96) = 0.32, P = 0.32](0.001], total experimental results [r (96) = 0.48, P = 0.000] are significantly positively correlated with theoretical results. This is consistent with the results of Dan Tang et al [12], and the experimental group's theoretical and experimental scores are higher than that of the control group (P < 0.01). The reason may be that OSCE is closer to the clinical practice than traditional teaching method. The comprehensiveness of the assessment has been increased, and the motivation of the students has been stimulated. In order to meet the assessment requirements, students must study relevant theoretical knowledge and practice their operational skills continuously. In addition, the survey results also show that "OSCE makes teaching content closer to clinical practice" has the highest score (4.33 ± 0.72). In-depth analysis shows that OSCE can make teaching close to clinical practice, and it is easy for students to understand and learn, and enhance learning confidence and motivation of students. However, in the operation assessment, the operation scores of ECG monitoring in the two groups were not statistically significant. The reason for the analysis may be that the systemic evaluation criteria of ECG monitoring are not perfect enough to fully reflect the superiority of OSCE. But teachers found that the communication performance of the experimental group was significantly better than that of the control group. In the follow-up teaching and research, the scoring standard will be improved ,and the systemicity of OSCE will be enhanced.

4.2 Students have a Positive Attitude Towards the Teaching Effect of OSCE

Students have a positive attitude towards OSCE teaching, and each item scores are greater than the median of 3 points. Most students have a positive attitude towards the teaching effect of OSCE. Among the items, the highest score is "OSCE can make the teaching content close to clinical practice". and the lowest score is "OSCE is difficult". The content of the intensive care curriculum focuses on the care of clinical critically ill patients. The main contents include the use of simple breathing sacs and ventilators for artificial respiration, ECG monitoring, shock defibrillation, invasive hemodynamic monitoring, and respiratory monitoring. The main focus is on cultivating clinical comprehensive ability of students. In view of the limitations of teaching conditions, ECG monitoring and shock defibrillation were first selected to use OSCE mode. In the teaching process, Standardized patients (SP) was used as object of teaching operation demonstrations, student operation exercises, and student operation assessments. SP plays different conditions according to different cases that have been set up, so that the teaching situation is close to the clinical reality. Students agree that "OSCE can make the teaching content closer to clinical practice than traditional teaching method", which is consistent with the findings of Junhong Ma et al [13-14]. It is believed that OSCE teaching can reflect their own professional knowledge and skills, help to identify their own deficiencies, help improve professionalism, and improve their communication skills. Most of the students expressed satisfaction with the OSCE teaching venue and design of process. They persisted that the OSCE teaching method should be popularized.

The survey results of open questions show that some students suggested "improving the OSCE assessment criteria". Some students said that "to carry out such projects more is helpful to improve professional quality". Some students said that "OSCE should be used more in class to combine theory with practice." Some said "OSCE should be widely used in teaching". Some said "hope to have a little more opportunities to be tested in OSCE". They also said "I hope that the school could promote the use of it which can enable students to improve their professional knowledge and combine knowledge with clinical practice." This is consistent with the research results of Yuling Hao [10]. However, most



students also indicated that OSCE is difficult. This may be related to the fact that students have less exposure to OSCE, and the standardized patient (SP) plays a flexible case, which increases the difficulty of assessment. It is recommended to further promote the application of OSCE, increase the frequency of OSCE in course, increase the flexibility of cases, optimize the evaluation plan, enhance its operability, increase the objectivity, authenticity and standardization of assessment. In the end, learning adaptability of students can be improved.

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