

Effect of Structured Versus Traditional Oral Exam on Critical Care Nursing Students' Performance: A Comparative Study

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Abstract: Traditional oral exam has been commonly used in several nursing universities as one of the assessment method. This method might not be appropriate for the assessment of student's interactive skills and higher cognitive functions and also it might have some biased grading of the students, lack of standardization in time allocated for each student, the examiner might focus on specific topics not all which will lead to students' tension. These difficulties can be solved by using structured oral exam to make it more valid assessment tool. Therefore, the aim of this study was to compare the effect of structured VS traditional oral exam on critical care nursing students' performance. **Methods:** A quasi experimental research design was used in this study in which two tools were used for data collection: "Oral Exam Performance Rubric" and "Students' Satisfaction Questionnaire ". The subjects were comprised of 60 critical care nursing students. **Results:** It was noticed that there were statistical significant differences between study and control groups in the mean scores regarding total score in their oral exam achievement and their satisfaction with the oral exam ($P= 0.002$, $P= 0.001$), respectively. **Conclusion:** Structured oral exam is found to be effective assessment method. It plays an important role in improving nursing students' oral exam performance and it provides the students with more satisfying exam experience. **Recommendations:** An important issue that needs to be considered in future research while applying structured oral exam is the time limitation. Each station should have enough time and enough number of examiners.

Keywords: Evaluation methods- Nursing students- Oral exam- Structures Oral Exam- Nursing Education.

1. INTRODUCTION

Critical care nursing students need to possess theoretical knowledge, advanced skills as well as competencies and capabilities to care for critically ill patients. In the last few decades, nursing education has undergone an immense change, with introduction of modern teaching methodologies and accompanying modification in tools of evaluation. This is to train nursing students to safe and high quality of patient care. For that purpose, nurse educators should assess their students in cognitive, psychomotor and affective domains^[1,2].

Evaluation of students is a vital component of any educational process and it is necessary to assess their performance. It also gets a feedback of teaching process so as to improve the performance of both the teacher and the student. Among these evaluation methods, is the use of oral examinations or viva voce. Oral or viva is one of the essential components of examination practiced in medical and nursing education in all specialties. The oral examination was defined by Joughin G. in 1998 as "assessment in which a student's response to the assessment task is verbal, in the sense of being expressed or conveyed by speech instead of writing"^[3].

Oral examination is also a method of assessment where a set of stimulus questions are constructed to address critical areas of knowledge, or sets of abilities related to competencies. Gordon Joughin (1998) has done a literature study where six scopes of oral assessment have been explored. The first scope is the content type, which describes “what one is looking for, or remarking upon, in the people one is assessing”. It was categorized into knowledge and understanding, applied problem solving ability, interpersonal competence and intrapersonal qualities. The second cope is interaction which refers to "reciprocity between examiner and candidate, with each acting on, responding to and being influenced by the other". Authenticity is the third scope which refers to “the extent to which assessment replicates the context of professional practice or ‘real life’.” The fourth scope, structure which is fundamental scope as Joughin described. It refers to “the extent to which oral assessment is based on a pre-determined, organized body of questions or sequence of events”. The examiners constitute Joughin's fifth dimension. He divides it into self-assessment, peer assessment and authority based assessment, where the last type is the most common. The sixth and last dimension is orality. It refers to the extent to which the assessment is conducted orally, ranging from the purely oral where only the oral medium is used, to the orality as secondary, with oral explanations or defending of the decision^[3].

Oral examination is considered one of the most stressful and as important as the clinical or written exam. Oral exam is totally different from written exams. It required face to face communication with the examiner that helps to get an idea about the way of students' thinking, understanding and communication ability to explain the rational for their answer^[4]. In addition, it is flexible and examines several aspects of clinical competence and ability to rationalize and defend clinical situation that cannot be tested by written exams . However, the current studies have shown that the traditional method of oral examination might not be appropriate for the assessment of student’s interactive skills and higher cognitive functions and also it might have some biased grading of the students, lack of standardization in time allocated for each student, the examiner might focus on specific topics not all which will lead to students' tension. Examiners can also give grades based on 2 or 3 questions. Furthermore, there might be variation in the difficulty of questions between the examiners and this makes it less acceptable by students^[4].

To overcome the difficulties in this traditional oral exam (TOE), the structured oral exam (SOE) has been used in several nursing colleges. This modified method of oral examination is considered more better for reducing the bias and subjectivity as well as the luck factor^[3, 5]. In addition, the use of SOE will improve the reliability and validity of the evaluation process and both educators and students had positive perception toward this examination method^[6]. To apply SOE effectively, students should be oriented about the examination process in advance. Examiners should preplan the content to be covered, competencies to be assessed and preparing a blueprint of questions to be asked in the oral exam. Well-structured oral exam rubrics should also be prepared. At the end of the exam, feedback can be given to the student about their strengths and weakness during the exam^[7, 8].

Few studies were conducted in Egypt about the effect of objective structured clinical examination which found to be effective in evaluating the students in clinical. However, no studies have been conducted on modifying the traditional method of oral exam. The SOE is relatively an innovative assessment method and most of the international research studies are conducted on small groups. Therefore, the current study was conducted to examine the effect of structured VS traditional oral exam on critical care nursing students' performance.

2. AIM OF THE STUDY

This study aimed to compare the effect of structured VS traditional oral exam on critical care nursing students' performance.

3. RESEARCH HYPOTHESES

1. Critical Care Nursing students who were examined by SOE exhibit a higher grade in oral exam than those who were assessed by the traditional one.
2. Critical Care Nursing students who were evaluated by SOE exhibit a greater level of satisfaction with oral exam than those who were assessed by the traditional one.

4. MATERIALS AND METHOD

Materials

Research design: A quasi-experimental research design was used to conduct this study

Setting: This study was carried out in Critical Care Nursing Department at the Faculty of Nursing, Alexandria University

Subjects: The study subjects were comprised of 60 nursing students. The nursing students were enrolled in Critical Care Nursing II course. They were randomly assigned into two equal groups the control and study group (30 for each group).

Tools: Two tools were used by the researchers for the purpose of data collection:

Tool I: Oral Exam Performance Rubric

It was developed by the researchers based on the relevant literature to measure students' performance in oral exam. This rubric evaluates and scores student's performance across four levels of ability: (0) poor, (1) satisfactory, (2) good, (3) excellent. There are six criteria to the rubric which are understanding, analysis and interpretation, organization of the content, integration of knowledge, communication skills, and self-confidence. The total score of rubric ranged from 0 to 10 points^[7, 9].

Tool II: Students' Satisfaction Questionnaire (SSQ)

It was developed by the researchers based on the relevant literature to determine the students' satisfaction related to the use of SOE. It consists of 20 statements which include items related to utility of oral exam, oral exam attributes, and scoring system. Responses ranges from strongly disagree (1) to strongly agree (4). The total score of the tool ranged from 20 to 80 grades^[7, 9, 10]. In addition, socio demographic data of students was collected. It includes data about students' age, sex, qualification, and previous academic year achievement.

Method

An official permission to conduct the study was obtained from the head of Critical Care and Emergency Nursing Department and the dean of the Faculty of Nursing, University of Alexandria after explanation of the purpose of the study. Tool I and II were developed by the researchers based on the related literatures. Tools were tested for content validity by experts in Critical Care & Emergency Nursing and Nursing Education. Modifications were done accordingly. Tools were tested for inter-reliability also. They were 8.5, 8.2 respectively. A pilot study was carried out on seven nursing students during mid semester to ensure the clarity and feasibility of the tools. Necessary modifications were done accordingly. In the final oral exam, students were randomly assigned into two equal groups, (30) students in the study group and (30) students in the control group. Study group was assessed using SOE and control group was examined by using TOE. TOE was conducted by asking different questions to examine comprehension and understanding of the course content. The present study was implemented to the study group in three phases (preparation, implementation and evaluation phase)

1. Preparation phase: during this phase, the oral exam case studies and evaluation tools were developed and the examiners were prepared.

a. Case studies

- Ten case studies were developed with questions at different levels of difficulty which represent the curricular intended learning outcomes.
- Each case study was developed to mix more than 3 lectures in the course and the questions were a mix of clinical and theoretical content which were comprehensive to ensure coverage of the course objectives.
- These case studies were revised by three professors in the Critical Care & Emergency Nursing Department.
- A model answer for each case study was prepared by the researchers. Each question had its own marking scheme to ensure a fair scoring to all the students.

International Journal of Novel Research in Healthcare and Nursing

Vol. 6, Issue 2, pp: (343-352), Month: May - August 2019, Available at: www.noveltyjournals.com

b. Oral exam rubric

- An oral exam rubric was developed to ensure a standardized technique of marking.

c. The examiners

- The examiners read all the case studies with the model answer for each. Also, the rubric had been read by the examiners to make it familiar for evaluation.

2. Implementation phase

- The researchers explained to the SOE group how the oral exam would be performed and discussed with them that they would be evaluated by oral exam rubric explaining the criteria for evaluation.
- Each student exposed to two different case studies and answered all the questions related to each.
- One of the nurse educators in the department was assigned as a time keeper and waiting room was arranged to avoid mixing of the students who have faced the oral examination with those who did not face it.
- Each student in the study group entered the oral exam room and was asked structured questions for the case studies by two different examiners (one internal examiner and one external examiner of the course).
- Each examiner gave a time of 5 minutes to each student to read the case study very well and 5 minutes to answer, so each student was given 20 minutes by both examiners (5 minutes for preparation and 5 minutes for answer to each case study).
- Student performance in the oral exam was assessed by criterion reference for each statement in the oral exam rubric (tool I).
- Each examiner put the scores independently by using the oral exam rubric.

3. Evaluation phase

- After the oral exam had been finished, the oral exam satisfaction questionnaire with the SOE and the TOE was completed by the students in both groups using tool II.

Ethical considerations

- A written informed consent was obtained from all nursing students after explanation of the aim of the study.
- Confidentiality, anonymity and privacy were assured
- Participation was on a voluntary basis and students were assured that those who declined involvement in the survey would not be penalized.

5. STATISTICAL ANALYSIS

The raw data were coded and transformed into coding sheets. The results were checked then the data were entered into SPSS system files (SPSS package version 22) using personal computer. Output drafts were checked against the revised coded data for typing and spelling mistakes. Finally, analysis and interpretation of data were conducted. The following statistical measures were used:

- Descriptive statistics including frequency, distribution were used to describe different characteristics.
- Kolmogorov – Smirnov test was used to examine the normality of data distribution.
- Univariate analyses including Chi-Square test, Fisher's Exact test, Monte Carlo test, Marginal Homogeneity test and McNemar test were used to test for significance among qualitative variables.
- The significance of the results was at the 5% level of significance.

6. RESULTS

The results of the current study will be presented in relation to the following research hypotheses:

- Hypothesis (1): Students who were examined by SOE exhibit higher grades in oral exam than those who pass TOE.
- Hypothesis (2): Students who were tested by SOE exhibit greater satisfaction level than those who attend TOE.

Table I shows the distribution of the study and control groups according to their socio-demographic data. In relation to age, it can be observed that the majority of the students in the study and control groups were aged from 19 to less than 20 years (73.3%, 93.3%) respectively. However, the difference between both groups was statistically significant ($P = 0.038$). Regarding sex, 60% of the students in the study group were males whereas they were 43.3% in the control group and the difference between both groups was not statistically significant ($P = 0.196$). As for previous academic level, the majority of the students in the study group and control groups had general secondary school certificate (83.3%, 73.3%) respectively. The difference between both groups was not statistically significant ($P = 0.347$). Finally, as regards previous academic achievement, GPA of almost half of the study group ranges between (C+ and C), (43.3%, 40% respectively). Few students had GPA of C- (16.7%). However, one third of the students in the control group (33.3%) had a GPA of B-. The difference between both groups was statistically significant ($P = 0.001$).

Table I: Distribution of the study and control groups according to their socio-demographics data

	Study group (n = 30)		Control group (n = 30)		χ^2	P
	No.	%	No.	%		
Age						
19-	22	73.3	28	93.3	4.320*	0.038*
+20	8	26.7	2	6.7		
Sex					1.669	0.196
Male	18	60.0	13	43.3		
Female	12	40.0	17	56.7		
Qualification					0.884	0.347
Secondary School Certificate	25	83.3	22	73.3		
Technical Nursing Institute Certificate	5	16.7	8	26.7		
Previous academic achievement					17.602*	MC p= 0.001*
B-	0	0.0	10	33.3		
C+	13	43.3	9	30.0		
C	12	40.0	6	20.0		
C-	5	16.7	2	6.7		
D+	0	0.0	3	10.0		
D	0	0.0	0	0.0		

χ^2 : Chi square test MC: Monte Carlo P: P value for comparing between the studied groups

*: Statistically significant at $P \leq 0.05$

Table II describes a comparison of oral exam rubric scores between the study and control groups. It was noticed that there were statistical significant differences between study and control groups in the mean scores regarding understanding, analysis & interpretation, organization of the content, self-confidence and total score in their oral exam achievement ($P = <0.001^*$, $P = 0.005$, $P = 0.009^*$, $P = 0.047$, $P = 0.002^*$), respectively.

Table II: The comparison of oral exam rubric scores between the study and control groups

	Study group (n = 30)	Control group (n = 30)	t	P
	Mean ±SD	Mean ±SD		
Understanding	0.63 ± 0.25	0.97 ± 0.13	6.471*	<0.001*
Analysis & interpretation	1.20 ± 0.59	1.62 ± 0.52	2.895*	0.005*
Organization of the content	0.93 ± 0.28	1.17 ± 0.38	2.719*	0.009*
Integration of knowledge	1.11 ± 0.45	1.29 ± 0.49	1.509	0.137
Communication skills	1.52 ± 0.50	1.67 ± 0.36	1.340	0.186
Self confidence	1.34 ± 0.52	1.58 ± 0.40	2.028*	0.047*
Total oral exam achievement	6.73 ± 2.14	8.36 ± 1.65	3.296*	0.002*

t: Student t-test

P: P value for comparing between the studied groups

*: Statistically significant at $P \leq 0.05$

Table III illustrates comparison between the study and control groups regarding their satisfaction with the oral exams. It was found that students' satisfaction scores in the study group is higher than the control group regarding utility of the oral exam, evaluation of the oral exam attributes, oral exam scoring system ($P < 0.001^*$, $P < 0.001^*$, $P < 0.001^*$) respectively. However, the total mean score of satisfaction in the study group is statistically higher than the control group ($P < 0.001$).

Table III: Comparison between the study and control groups regarding their satisfaction with the oral exams

	Study group (n = 30)	Control group (n = 30)	t	P
	X±SD	X±SD		
The utility of oral exam	11.90 ± 0.40	7.77 ± 2.70	8.278*	<0.001*
Evaluation of the oral exam attributes	51.85 ± 2.54	36.03 ± 6.72	12.054*	<0.001*
Oral exam scoring system	13.17 ± 1.26	10.50 ± 2.62	5.018*	<0.001*
Total overall	76.92 ± 2.66	54.31 ± 10.96	10.985*	<0.001*

t: Student t-test

P: P value for comparing between the studied group

*: Statistically significant at $P \leq 0.05$

Table IV shows the relationship between students' socio demographic data and oral exam scores for the study group. There were no statistical significant differences between the students' scores and age groups, sex, previous academic level, previous GPA ($P = 0.822$, $P = 0.721$, $P = 0.149$, $P = 0.375$), respectively.

Table IV: The relationship between students' socio demographic data and oral exam scores in the study group

	Study group (n =40)	Test of sig.	P
	Mean ±SD		
Age			
19-	76.95 ± 2.72	t=0.227	0.822
+20	76.50 ± 2.12		

Sex			
Male	77.12 ± 1.98	t=0.360	0.721
Female	76.76 ± 3.13		
Qualification			
Secondary School Certificate	77.35 ± 2.17	t=1.483	0.149
Technical Nursing Institute Certificate	75.75 ± 3.62		
Previous academic achievement			
B-	77.60 ± 2.27	F=1.106	0.375
C+	77.18 ± 2.58		
C	76.83 ± 1.47		
C-	77.0 ± 1.41		
D+	74.0 ± 5.57		
D	76.92 ± 2.66		

F: F for ANOVA test t: Student t-test

P: P value for comparing between the studied groups

Table V shows the relationship between students' socio demographic data and oral exam scores in the control group. There were no statistical significant differences between the students' scores and age groups, sex, previous academic level, previous GPA ($P= 0.257$, $P= 0.457$, $P= 0.712$, $P= 0.409$), respectively.

Table V: The relationship between students' socio demographic data and oral exam scores in the control group

	Control group (n = 30)	Test of sig.	P
	Mean ±SD		
Age			
19-	52.92 ± 11.70	t=1.158	0.257
+20	58.13 ± 8.01		
Sex			
Male	53.07 ± 12.04	t=0.753	0.457
Female	56.17 ± 9.28		
Qualification			
Secondary School Certificate	53.97 ± 10.22	t=0.373	0.712
Technical Nursing Institute Certificate	56.0 ± 15.46		
Previous academic achievement			
B-	-	F=0.925	0.409
C+	11.06 ± 3.07		
C	53.83 ± 10.27		
C-	49.0 ± 12.57		
D+	-		
D	-		

F: F for ANOVA test t: Student t-test

P: P value for comparing between the studied groups

7. DISCUSSION

Oral exam formats enable the instructors to test the students on all six cognitive domains of Bloom's taxonomy i.e. knowledge, comprehension, application, analysis, synthesis and evaluation^[11]. In nursing education, they are being used in combination with written exams^[8]. Preplanning and structuring of the oral exam makes it more objective and unbiased. In the current study, it can be seen that the study group had significant higher performance on the oral exam than the control group based on the oral exam rubric sub-scores and the total score. This is expected as in the structured type of questions; the questions are varied and with different levels of difficulty compared to the TOE. This finding was supported by Patidar and Chaturvedi (2019) who found that SOE had significantly higher marks as compared to TOE^[12]. Moreover, a study conducted by Ochsner et al. in 2013 enforces that the positive effects for oral examinations can be achieved through training the examiners^[13]. In that study, they found that SOE acts as an additional method of assessing students' knowledge and skills using patient based case studies hence the average performance of students was 90 % using SOE. Moreover, they found no correlation between students' performance of oral exam and written exam. However, Khilnani et al (2015) found that SOE had significant lower marks as compared with unstructured oral exam^[6].

Regarding students' satisfaction of the oral exam either the SOE or the TOE. It was found that both groups were significantly different as the mean scores of satisfaction were significant regarding the utility of the oral exam, evaluation of the oral exam attributes and the oral exam scoring system. This is hopeful as it reflects that students feel comfortable, not feeling biased, and feeling organized while they answer. This finding was supported by the fact that the SOE is considered as a useful assessment method, since 1970s to overcome the difficulties addressed by the TOE^[14]. This is in line with a study done by Patidar and Chaturvedi in 2019, which found that the students have good perception regarding the SOE rather than the traditional one. In that study, most of the pharmacology students stated that SOE is less stressful, better attitude of the teacher during oral exam and it may impact their learning pattern. Moreover, most of them agreed that SOE should be used as an evaluation method in future examinations^[12]. Hashim et al. (2015) also stated that almost all of the undergraduate medical students were satisfied after being assessed by SOE. ⁽⁵⁾ Chandak et al. (2017) showed that the majority of the students agreed and strongly agreed of the nature of the SOE and they stated that it had logical sequence of the questions being asked^[15]. Moreover, in a study conducted by Shenwai and Patil (2013) as well as Vancudre et al. (2016) concluded that students were generally satisfied about SOE and felt comfortable than the TOE. It was even better for the faculty members as it reduced their bias and they reported that it is a fair method for assessing students^[7, 16]. In line with that, a study conducted by Shah and Mostghare in 2013 was found that 87% of the students preferred being examined by SOE against the conventional method^[17]. Singel et al. study in 2014 concluded that SOE was applied in a small group. Main question in addition to leading questions were asked to reduce students' anxiety. They recommended also proper orientation and preparation to the examiners^[18]. Moreover, Dangre-Mudey et al. study in 2013 concluded that the response statements of students which indicate positive perception are more than the negative perception statements. The students stated that it is well organized, covers most of the topics. On the other side, teachers reported that it needs intensive group work, training of teachers and orientation to the students as mentioned in previous studies. The teachers preferred it than the traditional one^[19].

Our study contradicts a study done by Alam and Begum (2015) in which SOE was not performed perfectly and they recommended in that study also that the teachers should be motivated and adequately trained to achieve the objectives of that kind of oral exam as it is a valid and reliable method of assessment^[20]. In addition, the study conducted by Sharma et al. (2018) found the majority of students do not appreciate the structuring of the oral exam for the purpose of covering a wide range of content so makes it difficult to the student but the faculty members reported that it is more better than the traditional one as it reduces the bias and the luck factor which is in line with what have been reported by many authors^[21].

8. CONCLUSION

Structured oral exam is an effective assessment method for nursing students. It plays an important role in improving students' oral exam performance. It also provides students with more satisfying exam experience and better achievement based on the oral exam scores.

9. RECOMMENDATIONS

Based on the current study results, the following recommendations are offered:

- Educational workshops should be conducted to all nurse educators to increase their competencies in applying SOE
- Nurse educators should integrate the SOE in the evaluation system of nursing education
- Each exam station should have enough time and enough number of examiners during applying SOE for future research.

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Vol. 6, Issue 2, pp: (343-352), Month: May - August 2019, Available at: www.noveltyjournals.com

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