Objective Structured Clinical Examination versus Traditional Clinical Examination on the Achievement of Medical Surgical Nursing Students.

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ABSTRACT

Assessment of clinical competence is of great importance when evaluating the expected learning outcomes of nursing education. Therefore it is challenging to have such an objective assessment tool to comprehensively assess students' clinical competencies especially with increased students' number. Using the right method of evaluation plays a considerable role in getting the appropriate result and making the right judgment. **Aim** of this study was to compare between objective structured clinical examination versus traditional clinical examination on the achievement of medical surgical nursing students. *Methods:* quasi-experimental deign was adopted. Implementation of the Objective Structured Clinical Examination (OSCE) was carried out on ١١٤ students enrolled in the academic year ٢٠١٦-٢٠١٧, faculty of nursing, Benha university, **Tools** of this study consists of two tools: The first tool was consisted of the demographic characteristics of studied sample and assessment of their knowledge and practice regarding a selected group of skills including oxygen therapy, advanced cardiopulmonary resuscitation and endotracheal tube suction. The second tool was concerned with assessment of staff and students' perception regarding the OSCE attributes, the quality of OSCE performance, as well as OSCE scoring and objectivity. Results of The current study pointed out that, the comparison between OSCE versus traditional method of evaluation revealed higher mean OSCE scores. The highest rate of satisfaction belonged to OSCE methods of evaluation as reported that OSCE was fair, helped in developing student' confidence, provided opportunity to learn real life scenario, also OSCE highlighted areas of students' weakness in skills and knowledge, provided true measure of essential clinical skills and was objective than the traditional method. *Conclusion*: OSCE can be used most effectively in nursing undergraduate curricula to assess safe practice .Therefore **it is recommended** that OSCE should be adopted as a strategy for examining clinical skills for students in all levels.

Key Words: OSCE, Traditional Method, Students' Achievement**.**

I. Introduction

The nursing profession involves complex clinical situations requiring considerable adaptability. Most employers expect new graduates to be well prepared for a wide range of functions for providing safe care. It has been indicated that nursing graduates are not sufficiently competent to handle the challenges faced in daily practice resulting in disappointed employers, frustrated new graduates and dissatisfied patients. So, it is important for nursing educators to maximize training opportunities to enhance students' clinical competence, to gain confidence for nursing student, to foster professional socialization and minimize the education-service gap. (**Garside and Nhemachena, ٢٠١٣**).

Nursing education involves both theoretical and practical training processes. Clinical education is an essential part of professional nursing education. It provides nursing students with opportunities to acquire professional knowledge, skills, and competencies for patient care as well as thinking and acting like professionals. (**Hellstrom-Hyson, et al., ٢٠١١**). Assessment of clinical skills has a central role in nursing education and the selection of suitable methods has been a matter of permanent concern for clinical educators. An effective educational system has been realized through effective assessment and evaluation methods (**Hatamleh & Abu Sabeeb, ٢٠١٤**).

Since clinical training is a process in which the student acquires clinical experiences with patients and hospital environment, it is very difficult to evaluate and judge clinical skills acquired**. (Yanhun, Watson, ٢٠١١**).In order to respond effectively and actively to rapidly changing public health environments, the nurses should be trained in the latest advances in simulation and must possess excellent skills. However, errors in patient care are not permitted during practical hospital so nursing students tend to lose motivation and confidence if they cannot demonstrate adequate nursing performance activity with patients and are refused access to patients because of their poor skills. Simulation-based education was emerging as alternative solutions to address this problem (**Kim and Kim, ٢٠١٣**).

The traditional clinical examination has been criticized for focusing simply on nursing student's knowledge and their abilities to memorize, while ignoring other important characteristics such as problem solving, critical thinking, and communication skills. **(Bhatnagar, et al., ٢٠١١).** There is a reasonable expectation for evaluation to be objective, fair, specific, and documented. **(Hatamleh & Abu Sabeeb, ٢٠١٤).**

The Objective Structured Clinical Examination (OSCE) is a form of assessment in which the student demonstrates clinical skills, and underpinning knowledge, usually in simulated conditions **(Fidment, ٢٠١٢).** OSCE is becoming more prevalent within healthcare education programs, because it is regarded as a useful method for assessing, skills, and underpinning knowledge required for practice **(Merriman and Westcott, ٢٠١٠).** OSCE is a realistic assessment for the nursing practical courses. It could assess a wide range of learned materials. OSCE scores provide true measure of essential clinical skills to a great extent, OSCE scores are standardized, practical and useful experience, Personality and social relations did not affect OSCE scores. (**Ali, et al., ٢٠١٢**).

The Objective Structured Clinical Examination (OSCE) can be used as an appropriate method in evaluating nursing clinical skills because of various advantages such as improving students' clinical performance, preparing highly qualified and competent graduates, increasing decision making abilities and enhance teaching level. Therefore improving the quality of evaluation as OSCE is a valid and reliable technique uniquely capable of assessing many fundamental clinical skills that are not being assessed in a rigorous way in most undergraduate. OSCE examination offers an attractive option for evaluating practitioner competency. **(Eldarir & Abd el-hamid, ٢٠١٣).**

Aim of the study:

Compare between objective structured clinical examination versus traditional clinical examination on the achievement of medical surgical nursing students.

Methodology:

Research Question

Which one of the objective structured clinical examination or traditional clinical examination is more effective on the achievement of medical surgical nursing students?

Research Design:
Quasi experimental research design was adopted to accomplish the stated aim.

Setting

The study was conducted in medical surgical laboratories (labs.) because of the poor design of OSCE lab. At the faculty of nursing, Benha University affiliated to Ministry Of Higher Education, Egypt. These labs. were divided into three labs. Fundamental –nursing lab., Medical – surgical nursing lab., and Critical care and emergency lab.

Sample
A total sample included ٥٠ % of ٢nd year medical surgical nursing students enrolled in the academic year ٢٠١٦-٢٠١٧, faculty of nursing, Benha University (n. =١١٤). They were chosen by systematic random method. The reasons of selecting such group of students were that those students had been assessed for practical courses of fundamental, medical –surgical and critical nursing skills through traditional methods and so they can give a comprehensive over view regarding clinical evaluation in medical – surgical laboratories.in addition to all available medical surgical staff and clinical instructors (n.=٩).

Tools of Data collection:
After reviewing related literature to fulfill the aims of the study, different tools were modified by the researcher and revised by the consultants, to collect data through:

Tool I: It consisted of three parts:

Part A: Demographic characteristics of the studied samples

Part B: Students' Practice Observational Checklists which were modified by the researcher, revised by the consultants and rated as done completely , need more practice and not done to assess students ' practice regarding oxygen therapy, advanced cardiopulmonary resuscitation(CPR) and endotracheal tube suction. Including demographic characteristics including age, sex, and scientific degree for staff and consists of three parts:

Part B.١: Students' Practice Observational Checklists for Advanced CPR

Part B.٢: Students' Practice Observational Checklists for administering oxygen therapy by face mask.

Part B.٣: Students' Practice Observational Checklists for suctioning for patient with an endotracheal tube (ETT)**.**

Scoring system

A three point Likert scale that indicated degrees of agreement was used to all dimensions in the questionnaire. The scoring system was done by computing the grading system for the answer; zero for not done, one for need more practice, and two for done completely. The score for the total of each subscale and the general total were evaluated as value qualitative percent based on data entry as follows: Less than ٥٠٪ was considered un satisfactory, ٥٠٪-٧٠٪ was considered satisfactory and More than ٧٠٪ was considered very satisfactory.

Part C: **Clinical Scenarios** which were constructed by the researcher after reviewing relevant literature **(Abd Allah, et al., ٢٠١٢)**. The students rotated through a number of five minutes stations, read the instructions and questions presented in the scenario inside each station and answered the questions according to type of each station.

Tool II Perception sheet: which was modified by the researcher after reviewing the related literatures as **piere et al., ٢٠٠٤; EL-Nemer & Kandeel, ٢٠٠٩ and Abdalla, et al., ٢٠١٢** to assess staff and students'

perception regarding the OSCE attributes, quality of OSCE performance, as well as OSCE scoring and objectivity.

scoring system : The students were asked to rate their responses on a three point scale ranging: agree ٣, neutral ٢ and disagree ١.The response for each item will be separately evaluated to reveal positive perception when level ٣ was recorded or negative perception when levels ٢ Or ١ were recorded.

III. Procedure
In this study, Data collection was done twice: firstly through the traditional method during second semester in the academic year ٢٠١٦-٢٠١٧from February to May. Secondly, through OSCE at the end of second semester in the academic year ٢٠١٦-٢٠١٧ which has been done in eight steps during the planning and implementation phases as following: Identification of competencies to be assessed (drawn from the curriculum as oxygen therapy. Endotracheal suction and advanced CPR), Development of case scenarios based on identified competences. (procedure stations and written station), Identification / modification / development of evaluation tools (checklist, rating scales etc.), Identification of assessment sites as medical surgical and critical skills laboratory), Planning for resources (human, simulator/models, supplies…etc.), Orientation of standardized patients SPs (graduate students and/or support staff), Mock OSCE, and finally Implementation (actual conduction of OSCE).

٢) Implementation Process
Objective Structured Clinical Examination was performed as follows; after determining the number and kind of station based on the trained techniques and available facilities, the researcher divided medical surgical laboratory into two sessions. Each session included ٥٧ students and consisted of two practical five minute stations regarding oxygen therapy and endotracheal tube suctioning in addition to five written stations one minute each. The exam ' registration started at ٩:٠٠ am till ٩:٣٠ am then the exam started and stations were implemented from ٩:٣٠ am till ٣:٠٠ pm. Each station tested a particular clinical competence. The student's instructions and checklist of each station were provided. All the students had done the techniques equally at the same time (١٥ minute per first round) and had been assessed by the examiners on the basis of the

checklist. Then all the students had gone through the second round in the critical skill laboratory that consisted of ten minute interactive station regarding advanced cardiopulmonary resuscitation. After students had completed the first and second round, they completed the written feedback regarding OSCE and signed out at ٤:٠٠ pm.

٣) Evaluation Phase
After the conduction of the examination, staff and student's perspectives tool were distributed to be fulfilled and written feedback had been obtained.

- Statistical Design

Data were analyzed using statistical package for the social science (SPSS), version ٢٠.٠. Numerical data were expressed as mean and standard deviation (SD).Qualitative data were expressed as frequency and percentage, Chi-square test was used to examine the difference between groups regarding qualitative variables.

IV. Results

Part I: Distribution of the studied samples according to their demographic characteristics:

Table ١: Distribution of the studied staff and clinical instructors according to their demographic characteristics (n. = ٩).

Demographic Characteristics	No.	%
Age / year		
< ٢٥	٥	٥٥.٦
٢٥_٣٥	٢	٢٢.٢
>٣٥	٢	٢٢.٢
Mean ±SD	٢٩.١١±٧.٨٢	
Sex		
Female	٩	١٠٠.٠
Scientific degree		
Demonstrator	٥	٥٥.٦
Assistant lecturer	١	١١.١
Lecturer	٣	٣٣.٣

Table ١ indicates that, the mean age of the studied staff and clinical instructors was ٢٩.١١±٧.٨٢   and all of them were females. Regarding Scientific degree, ٥٥.٦٪ of them were demonstrator while ٣٣.٣٪ of them were lecturer.

Table ٢: Distribution of the studied nursing students according to their demographic characteristics (n. =١١٤).

Demographic Characteristics	No.	%
Age / year		
< ٢٠	٩٠	٧٨.٩
≥٢٠	٢٤	٢١.١
Mean ±SD	١٩.٢١± ٠.٤١	
Sex		
Male	٣١	٢٧.٢
Female	٨٣	٧٢.٨

Table ٢ shows that, ٧٨.٩٪ of the studied Students were aged less than twenty years with the mean age ١٩.٢١± ٠.٤١ and ٧٢.٨٪ of them were female.

Part II: section I: table ٣: Total score of the studied nursing students' performance by both methods (n. =١١٤).

Procedure	Total performance scale	OSCE		Traditional		Test of significance	
		No.	%	No.	%	X^2	P- value
Endotracheal suction	**Done completely**	٩٥	٨٣.٣	٢	١.٨	١٥٧.٤١٣	٠.٠٠٠**
	Need more practice	١٩	١٦.٧	٩٠	٧٨.٩		
	Not done	٠	٠.٠	٢٢	١٩.٣		
Oxygen therapy	**Done completely**	٧٠	٦١.٤	٠	٠.٠	١٢٥.٧٥٨	٠.٠٠٠**
	Need more practice	٤٢	٣٦.٨	٥٤	٤٧.٤		
	Not done	٢	١.٨	٦٠	٥٢.٦		
Advanced CPR	**Done completely**	٦٦	٥٧.٩	٢	١.٨	٩٧.٣٩٢	٠.٠٠٠**
	Need more practice	٤٧	٤١.٢	٨١	٧١.١		
	Not done	١	٠.٩	٣١	٢٧.٢		

**a highly statistically significant at P < ٠.٠٠١

Table ٣ shows that, there is a highly statistically significant difference between the studied students' traditional and OSCE total performance scores regarding suction, oxygen and advanced CPR procedure at $P < ٠.٠٠١$.

Part II: section II: Table ٤: Knowledge of the studied Students regarding oxygen therapy and suction inside written station (n. = ١١٤).

ITEMS	Done completely		Done incompletely		Not done	
	No.	%	No.	%	No.	%
oxygen written station's questions						
Advantages of nasal cannula	٦٧	٥٨.٨	٣٢	٢٨.١	١٥	١٣.٢
contraindications of nasal cannula	٤٤	٣٨.٦	٥٢	٤٥.٦	١٨	١٥.٨
Name of ١st device (nasal cannula)	٧٧	٦٧.٥	٠	٠.٠	٣٧	٣٢.٥
Name of ٢nd device (flow meter)	٧٨	٦٨.٤	٠	٠.٠	٣٦	٣١.٦
Name of ٣rd device (nasal catheter)	٨٠	٧٠.٢	٠	٠.٠	٣٤	٢٩.٨
Name of ٤th device (oxygen tent)	٧٦	٦٦.٧	٠	٠.٠	٣٨	٣٣.٣
Rational of Putting sterile water into the flow meter…	٦٨	٥٩.٦	٣٠	٢٦.٣	١٦	١٤.٠
Rational of using gauze pads at ear beneath tubing …	٤٩	٤٣.٠	٤٥	٣٩.٥	٢٠	١٧.٥
Overall average	**٦٧.٤**	**٥٩.١**	**١٩.٩**	**١٧.٤**	**٢٦.٨**	**٢٣.٥**
suction written station's questions						
Name of part one (patient end of tube)	٦٩	٦٠.٥	٠	٠.٠	٤٥	٣٩.٥
Name of part two (inflation line)	٧٨	٦٨.٤	٠	٠.٠	٣٦	٣١.٦
Name of part three (inflation balloon)	٩٢	٨٠.٧	٠	٠.٠	٢٢	١٩.٣
Name of device (cuff pressure manometer)	٧٨	٦٨.٤	٠	٠.٠	٣٦	٣١.٦
Normal value of cuff pressure	٨١	٧١.١	٠	٠.٠	٣٣	٢٨.٩
Overall average	**٧٩.٦**	**٦٩.٨**	**٠**	**٠.٠**	**٣٤.٤**	**٣٠.٢**

Table ٤ shows that, the overall average of the studied Students who answer questions completely is represented by ٥٩.١ % of them for oxygen therapy and ٦٩.٨ % of them for suction, while ٢٣.٥ % of them didn't answer oxygen related questions. and ٣٠.٢ % of them didn't answer suction related questions.

Part II: section II: table ٥: Total score of the studied Students knowledge regarding oxygen and suction written stations (n=١١٤).

Total performance scale	oxygen		suction		X^2	P-value
	No.	%	No.	%		
Done completely	١٧	١٤.٩	٥١	٤٤.٧	٠.٧٩٤	٠.٦٧٢
Done incompletely	٧٤	٦٤.٩	٦٣	٥٥.٣		
Not done	٢٣	٢٠.٢	٠	٠.٠		

Table ٥ shows that, there is no statistically significant difference between total score of the studied Students 'knowledge regarding oxygen therapy and suction procedure at $P \geq ٠.٠٥$.

Part III: section I: table ٦: Comparison between the studied staff and students' total satisfaction regarding the objective structured clinical examination

[ns] No statistically Significance at $P \geq ٠.٠٥$ * statistically Significance at P <

Items	Medical Surgical Nursing Staff(n=٩)		Medical Surgical Nursing Students(n=١١٤)		X^2	P- value
	No.	%	No.	%		
OSCE attributes						
Agree	٧	٧٧.٨	١٠٦	٩٣.٠	٢.٥٨٢	*٠.٠١٠٨
Neutral	٢	٢٢.٢	٨	٧.٠		
Disagree	٠	٠.٠	٠	٠.٠		
The Quality of OSCE Performance						
Agree	٨	٨٨.٩	١٠٠	٨٧.٧	٠.٠١١	٠.٩١٨ [ns]
Neutral	١	١١.١	١٤	١٢.٣		
Disagree	٠	٠.٠	٠	٠.٠		
The OSCE Scoring and Objectivity						
Agree	٤	٤٤.٤	٥٥	٤٨.٢	٠.٠٤٨	٠.٨٢٦ [ns]
Neutral	٥	٥٥.٦	٩٥	٥١.٨		
Disagree	٠	٠.٠	٠	٠.٠		

٠.٠٥

Table ٩ shows that, there is no statistically significant difference between the studied staff and students' total satisfaction regarding quality of OSCE performance, OSCE scoring and objectivity at $P \geq ٠.٠٥$.while there is a statistically significant difference regarding OSCE attributes at $p<٠.٠٥$.

V. Discussion

Sample of the present study included two subjects: all the available staff of medical surgical nursing department (n. = ٩) **&** ٥٠ % of the ٢nd year medical surgical nursing students (n. =١١٤). Who were studying in the academic year ٢٠١٦-٢٠١٧, faculty of nursing, Benha, University.

Regarding demographic characteristics of staff, the study results indicated that the mean age of the studied staff and clinical instructors was ٢٩.١١±٧.٨٢ and all of them were females. Regarding Scientific degree, more than half of them were demonstrator and only one third of them were lecturer. Regarding demographic characteristics of studied nursing students, the study results indicated that three quarter of the studied Students were aged less than twenty years with the mean age ١٩.٢١± ٠.٤١.This finding supported by **Abd Allah, et al., ٢٠١٦** who conducted the study entitled the effect of educational program for cardiopulmonary resuscitation using Sim Man versus traditional manikin & reported that the majority of the studied samples were with age ranged between ١٩-٢٠ years.

Regarding to gender, the study results indicated that majority of the studied nursing students were females. This could be due to that in the Egyptian culture: females were commonly working in nursing field than males. This finding supported by **Kipsang and Bruce, ٢٠١٣** who conducted the study entitled comparison of cardiopulmonary resuscitation competence between two groups of advanced practice student nurses at a medical training & reported that the majority of the studied sample were females.

The current study pointed out that, the comparison between OSCE versus traditional method of evaluation revealed higher mean OSCE scores. This could reflect the positive effect of OSCE on students' performance as students were provided with opportunities to watch video recorded simulated OSCE about required skills which provide a demonstration of the procedures that can be repeated several times to help students observing them before the final checklist. In addition, students were also provided with printed clinical scenarios which were attractive; stimulate critical thinking and easier in learning skills.

These findings are in convenience with **Mondal et al., ٢٠١٢** who found that the comparison of the two examination styles showed that students fared better in objective structured clinical examination than in conventional examination with respect to mean total score as well as mean percentage score. These findings are in convenience with **Smith et al., ٢٠١٢** who compared different methods of assessing midwifery students ' clinical skills, the results indicated that none of the assessment methods of clinical skills can provide complete information about the student ' skills but OSCE method can be used as a very valuable method for assessing clinical competency of students because of appropriate reliability in comparison to methods such as worksheet, clinical observance, and etc.

Concerning the studied nursing students' knowledge regarding suction using OSCE methods, the study results indicated that the overall average of the studied Students who answer suction related questions completely is represented by about two third of them, while only one third of them didn't answer the questions. The mean score of the studied students' total knowledge was ٢.٤٤٧٤ ± ٠.٤٩٩٤٢. Concerning the studied nursing students' knowledge regarding oxygen therapy using OSCE methods, the study results indicated that the overall average of the studied Students who answer oxygen therapy related questions completely is represented by two third of them, while only one third of them didn't answer the questions The mean score of the studied students' total knowledge was ١.٩٤٧٤± ٠.٥٩٢٦١.

Interestingly **schlaret and Pollock, ٢٠١٠** provided evidence that simulation is effective in learning knowledge and skills in fundamental nursing than traditional learning methods. This referred to the use of technology to assist instructors in facilitating nursing skills, and students becoming intrinsically motivated to learn, which helped improve students' performance. This finding is in agreement with **Piscotty et al., ٢٠١١** who stated that traditional teaching methods provided a content in learning, whereas simulation may provide the context of learning, combining traditional learning with simulation can be more powerful than if used separately. There is no statistically significant difference between the studied staff and students' total satisfaction regarding quality of OSCE performance, OSCE scoring and objectivity while there is a statistically significant difference regarding OSCE attributes.

At the end, the findings of the study revealed that OSCE has been considered as an acceptable method for assessment for clinical skills in nursing. Similar assertions were made by **Huang et al., ٢٠٠٧ who** studied students 'satisfaction with OSCE method and showed that the majority of students were satisfied and expressed that its effect on improving clinical skills was pleasing. However, **Mitchell et al., ٢٠٠٩** mentioned that in contrast with various positive specifications of OSCE, for better usage of this method in assessing clinical skills of nursing students, it is essential that this method is used besides other methods of assessment so that more accurate and favorable results will be found for judgment.

VI. Conclusion
Based on results of the present study, it can be concluded that:

Objective Structured Clinical Examination (OSCE) was viewed as an accepted tool for clinical evaluation. This appeared in staff & students' feedback which confirmed their acceptance of OSCE, so as to fairness and easiest to cover a wide range of knowledge, proving as an excellent tool for assessment. The OSCE therefore remains a more objective

method of assessment than the traditional method that was previously used. OSCE can be used most effectively in nursing undergraduate curricula to assess safe practice in terms of performance of psychomotor skills, this type of exam provided true measure of clinical skill competencies; therefore OSCE should be adopted as a strategy for examining clinical skills for students in all levels.

Recommendations:

Based on the study findings and conclusion, the following recommendations are suggested:

Recommendations for nursing education:
- OSCE has the potential to make a very effective and meaningful contribution to fitness for practice.
- OSCE/OSPE demonstration workshops for nurse educators are advocated for competence in structuring valid and reliable blueprint for Clinical evaluation in general nursing.
- OSCE checklists are strongly suggested as reliable and valid assessment of the growing number of nursing students.

Recommendations for future studies:

- In future studies, it is suggested to establish more widely applied standard OSCE protocols, such as <15 checklist items per station and rules for awarding and deducting points for answers.

- Further studies should go through studying validity and reliability of other competencies in the Medical-Surgical Nursing field. Revise and modify the unreliable checklists and retest its reliability.

- Further studies should be carried out to assess factors which hinder application of Objective Structured Clinical Examination.

- Replication of this study on a larger probability sample and different settings is recommended to generalize tis study results.

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