IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 5, Issue 6 Ver. IV ((Nov. - Dec. 2016), PP 123-144
www.iosrjournals.org

Effect of Blending Objective Structured Clinical Examination with the Simulation on Clinical Exam Achievements of Undergraduate Medical Surgical & Fundamentals Nursing Students

Nagwa Ragab Attia Gad
Assistant Professor , Medical surgical Nursing, Faculty of Nursing, Tanta University, Egypt.

Abstract: *Aims to determine effect of blending OSCE with simulation on clinical achievements of undergraduate nursing students' Objectives 1. Assess nursing students and clinical educators staff perception of OSCE performance and its use as a tool for clinical evaluation from their perspective 2. Evaluate the effect of blending OSCE with simulation on undergraduate medical surgical and fundamentals nursing students clinical exam achievements.*

Materials and method: design : *quasi- experimental design was used to conduct this study.*

Setting: *Medical Surgical Nursing Department Skill Lab and OSCE lab Faculty of Nursing at Tanta University, affiliated to Ministry Of Higher Education Egypt.* ***Subject****s all undergraduate nursing students (n=804) from first and second year as well as their clinical educators(n=9) of Faculty of Nursing at Tanta University* ***.***

Tool development: *two tools was developed.*

Tool one*:* ***Feedback about OSCE questionnaire:*** *it consists of four parts the tool was developed by the researcher but part three was The questionnaire developed by Pierre et al., (2004) and adapted by the researcher in this study.* ***Tool Two: Barriers facing student during implementation of OSCE exam and suggestions to overcome it****. It encompass two parts: part one concerned with barriers facing students and suggestions to overcome and part two concerned with clinical educators perception of barriers facing students and suggestions to overcome . **Method: Ethical considerations:** Approval was granted for this study by the Faculty of Nursing at Tanta University& All students and clinical nursing educators (demonstrators and assistant lecturer)*

Pilot study: *before conduction of the full study ,pilot study was done ,10% of students were invited for each simulation session, with their clinical educators, to test the validity and applicability of tool one and two and required modification was done**.** Students were examined in first exam and for both the first & second year student at the same week and completed a questionnaire.. The first exam was done after 7 weeks of the starting the studying year and the second exam was done after 2 months later post educational session about OSCE and the use of simulation and simulation training and according to curriculum,.*

Data Collection: *The data were collected at the end of august 2012 and to the end of January 2013.*

Results: *In the second year the female respondents were 76.5% in comparison with 62.5 % in the first year. Concerning age, it was ranged between 18-20 years for 1st year nursing students and from 18-23years for 2nd year nursing. The main result was the difference in performance between the two OSCEs for both first and second year nursing students. The improvement in OSCE achievement's score was obtained post implementation of OSCE blending with simulation& providing training sessions for both students and clinical educators in 51.1% and 44.3% of 1st and 2nd year nursing students respectively. There were a statistically significant increase in 2nd OSCE score than first exam for both 1st and 2nd year nursing students respectively. The results of this study indicates that OSCE has been accepted by the majority of nursing students as an evaluation tool for their clinical skills .*

Conclusions & Recommendations: *OSCE blending simulation is helpful, effective and useful method in undergraduate nursing education and evaluation. Adequate training about OSCE blending simulation and strong scenario for students and their clinical educators participated in exam improves student clinical skills and competency ,the teaching , learning and help students to practice in a safe and well controlled environment. It enables students to use thinking rather than memorizing so it must be used* as a method of evaluating clinical practice. *The feedback received regarding this evaluation tool provides evidence that OSCE is an acceptable useful tool and is considered valuable for further development and enhancement of OSCE blending simulation and development of nursing education program**.***

Keywords: Objective Structured Clinical Examination (OSCE), Simulation , role play ,undergraduate nursing student clinical education.

I. Introduction

Worldwide the way students, faculty and staff learn and work is dramatically altered through the development and use of information technology . For education to become a fun and thrill to nursing students it must be converted into a sport and learning process has to great interest, in the students and motivate them to stay back and become good citizens in institution rather than run away from it and become burden and boredom .However in education, teaching methods are traditional means one way teaching with no feedback and nontraditional means innovative teaching methods i.e. multimodal /multimedia learning process) includes multimedia , mind map, teaching with sense of humor, menomoneic words , role playing and scenario analysis introduced to nursing education[(1)].

Evaluation of student clinical competency is paramount and challenge facing clinical nursing educators. Effective and accurate clinical evaluation should be of concern to all nursing faculties and clinical instructors. There is a rationalization for evaluation to be objective, fair, specific, and documented. Also , students need to know, the specific objectives by which they are being evaluated. One type of assessment which meets these criteria is a performance based assessment. An example of a performance-based assessment is OSCE**.** It is a modern type of examination and becomes more prevalent so within health care education used as useful method to assess education required for practice, skills and knowledge**.** It is defined as an assessment of well-defined clinical skills. OSCEs are a valuable strategy to assess 'fitness to practice' at the students' expected level of clinical practice within a nursing context where the importance of accurate patient assessment is paramount. In many instances the OSCE process has been adapted to test trainees from different healthcare related systems as showed by studies [(2-5)].

The Objective Structured Clinical Examination (OSCE) is a form of assessment in, which the student demonstrates clinical skills, and knowledge, usually in simulated conditions**.** It provided an innovative learning experience for students .The OSCE is becoming more prevalent within healthcare education programs &there has been increasing interest and use of this form of assessment in other health professional disciplines, such as nursing and physiotherapy& allied health curricula, because it is regarded as a useful method for assessing, skills, and knowledge required for practice**.** Also It has gained steady and widespread acceptance around the world because of high level of reliability, creditability and objectivity, content validity of the achieved skills, fairness, creating motivation for learning, and instructors‘ and students‘ satisfaction**.** It offers a valid mean to evaluate students clinical performance in a holistic manner added to that, OSCE sessions perceived strengths, weaknesses, and challenges in clinical competence, enhance self-assessment skills, and provide direction for training needs of the programs[(3, 6-16)].

An objective structured clinical examination (OSCE) is designed to test clinical skill performance and competence in skills such as communication, clinical examination, procedures / prescription, exercise prescription, manipulation techniques, radiographic image evaluation and interpretation of results. It is a hands-on, real-world approach to learning that keeps student engaged, allows student to understand the key factors that drive the decision-making process, challenges the professional to be innovative , reveals their errors in case-handling and provides an open space for improved decision making based on evidence based practice for real world responsibilities. An OSCE need each student to perform specific skills and behaviors in a simulated work environment with standardized patient**.** The benefits of assessing discrete skills for novices, and workstation activities such as urine testing, injection technique and resuscitation technique, as well as the skills required for safe practice prior to students' first clinical placement, including hand washing, basic life support and safe manual handling introduced and acknowledged by, Major (2005) [(17)] as well as for second year undergraduates through the use of OSCEs where more complex skills are divided into a series of connected steps taxonomies of learning acknowledged [(9 ,18)].

The pressure of health care delivery system has shaped the forms and frequency of hospitalization and led to a higher percentage of acutely ill patients and shorter inpatient stays& this lead to lower chance for the nursing learner to access a large number of different diseases. In addition in patient care mistakes are not permitted during practical hospital training so simulation-based education was emerging as a solutions to vanish this problem**.** Nowadays, the teaching method that that allows a type of active practice is simulation. The clinical nursing requires the learner's engagement in deliberate practice of expected learning outcomes. According to **Issenberg et al (2002)** [(19)] "Deliberate practice involves (a) repetitive performance of intended cognitive or psychomotor skills in focused domain, added with (b) rigorous skills assessment, that provides learners (c) specific, informative feedback, that results in increasingly (d) better skills performance, in a controlled setting .It has been identified as a method used for fulfilling the gap between theory and practice .

Simulation as a method for assessment is gaining popularity and has been validated as an educational tool within healthcare education,. However, for this to become a meaningful experience for the student, it is important to make the scenario, as realistic as possible, including the environment, equipment and manikins. There were three types of simulator technology was used in education of health care profession students , high

fidelity , intermediate modality and low technology simulators. However the challenge is that it remains difficult to produce an environment in a clinical skills suite that resembles the complexity of a clinical area. Collaboration with practice areas must be sought to keep simulation learning and assessment grounded in the real world. **Finally**, the aim of this study was to evaluate the efficacy of OSCE blending simulation on undergraduate nursing students clinical exam achievements. It is hoped that the competencies demonstrated by students, registered nurses in the OSCE will be manifested daily in the lives of their patients as the nursing profession struggles to maintain skillful, high quality, competent nursing care[(20-23)].

Aims: This study aims to:

1. Assess nursing students and clinical nursing education staff feedback of OSCE performance and its use as a tool for clinical evaluation from their perspective
2. Evaluate effect of OSCE blended with the simulation on clinical exam achievements scores of undergraduate medical surgical and fundamentals nursing students
3. **Research hypothesis**

1. Nursing Students exhibit improvement in overall achievement score of clinical exam using OSCE blended with simulation of both first and second year undergraduate nursing students.
2. Nursing Students perceive OSCE blending with simulation as a useful evaluation tool post preparation of them and clinical education staff

II. Materials and Methods

Research Design: Quasi experimental research design was used in this study

Setting: Medical Surgical Nursing Department labs at Faculty of Nursing Tanta University affiliated to Ministry of Higher Education Egypt.

Subjects

Participation in this study was open to all nursing students in first year attending fundamentals of nursing course and second year attending medical surgical and critical care course in bachelor program in higher education and their number was 804 student of both studying years, group one was 1st year nursing students number were 427 and group two was 2nd year nursing students number were 377student. All Students were invited to attend the sessions of the research in addition to their timetabled classes. Although a relatively large number of students dropped out of the study in post first exam (midterm exam) feedback , the average age and gender distribution of the sample was still representative of the student population and post second exam (final term exam) all students participated to fulfill feedback. Also all (9) clinical educators participating in OSCE all over the term and working in medical surgical department

Power calculation

A software program to estimate the effect sample size was used. The choice of sample size was adequate to meet the principal research objectives.

Tools of data collection: Two tools was developed .Both tools was developed by researcher and each one comprises three parts , part one and three was developed by the researcher and part two was developed by **Pierre et .al**, **(2004**) [(24)] and adapted by the researcher. **Tool one: Feedback about OSCE questionnaire:** it consists of four parts: **part one** student demographic characteristics : **part two** clinical educators demographic characteristics. **part three:** feedback questionnaires which was developed by **Pierre et al; (2004**) [(24)] and modified by the researcher it comprises feedback questionnaires which consists of 32 **&** and only 23 items was used to conduct the aim of this study. The questionnaire was used in this study involves three main items.

First main item : Evaluation of OSCE attributes: This comprises 12 sub- items such as fairness of exam, covered knowledge of area, time of each station and organization and administration .the student responses was rated by them on five point likert scale **Scoring system** :, neutral=3 , agree=4, strongly agree= 5 , disagree=2 and strongly disagree **=1.**

The second main item: Quality of OSCE performance which includes 7 items such as students' awareness of the nature of the exam, tasks of exam, structure of exam and adequacy of time at each station . The student responses was rated by them on three point likert scale **Scoring system** :, not at all=1 , to great extent =2 ,neutral=3.

The third main item: Evaluation of OSCE scoring and objectivity which involves four sub-items about standardization of OSCE Score, usefulness and objectivity. The student responses was rated by them on three point likert scale **Scoring system** :, not at all=1 , to great extent =2 ,neutral=3. barriers

part four Feedback of clinical educators about OSCE. **Tool two: Barriers of OSCE Exam and suggestion to overcome :Part one :barriers facing student during implementation of OSCE exam and suggestions to overcome it**, **Part two: clinical educators perception of barriers facing student during** implementation of OSCE exam and their suggestions to overcome it**. Content validity:** The validity of the simulation scenarios

were assessed by five of experts from clinical and academic backgrounds. The required modification were then made .

Method: Ethical considerations : Approval was granted for this study by the Faculty of Nursing of Tanta University All students and clinical nursing educators (demonstrators and assistant lecturer) involved were informed of the purpose, requirements, duration, and benefits of the study, and were given the option not to participate and just before attending the first and second OSCE session and their accepting to fulfill the feedback questionnaire is considered consent obtained. They were also informed that they could withdraw from fulfilling the feedback of the study at any time without giving any justification and this was shown in feedback of 1st exam since a number of students not welling to participate . Clinical educators and Students who had been participated in this study were invited to attend the simulation training sessions after attending their first OSCE session.

Tool development: Two tools was developed and used by the researcher tool one ,part one and two was developed by the researcher and part three was developed by **Pierre et .al**, **(2004)** [24] and adapted by the researcher while both two parts of tool two was developed by the researcher . **Tool one** : **Feedback about OSCE questionnaire: it comprises four parts. part one :** it was concerned with students demographic characteristics such as age ,sex and academic years . **part two** demographic characteristics of clinical educators such as years of experience academic years ,participation previously in OSCE and trained in OSCE application. **part three**: feedback of undergraduate nursing students about OSCE. **Part four** : Feedback of clinical educators about OSCE. **Tool two** :**Barriers of OSCE Exam and suggestion to overcome** it comprises two parts **:Part one :**barriers facing student during implementation of OSCE exam and suggestions to overcome it, **Part two:** clinical educators perception of barriers facing student during implementation of OSCE exam. **Pilot study:** Prior to the full study was done 10% of students were invited for each simulation session, with their clinical educators, piloted to test the validity and applicability of tool one and tool two and required modification was done. **Data collection**: The researcher started to collect data of this study at the end of august 2012 and to the end of January 2013for six months period. This study was conducted on four phases assessment , planning , implementation and evaluation **Technique of data collection:** The exam is designed to test clinical skill performance and competence in skills such as communication, clinical examination, nursing procedures, exercise prescription, joint mobilization / manipulation techniques, positioning, diagnostic study evaluation and interpretation of results. For first year nursing students the clinical skills assessed was hand washing, vital signs , bed bath and hair shampoo, turning and moving of patient ,body mechanics, vital signs . The areas assessed for second year nursing students included health assessment of cardiovascular, respiratory, burns , orthopedics, urinary and related specific procedures such as I.V infusion , blood transfusion , urinary catheterization , CVP, nasogastric tube , ECG, blood gases analysis, wound care, cast. This assessment format allowed the controlled exposure of students to a wide variety of adult medical surgical and critical care clinical skills within a relatively short time period. Each station was 5 minutes duration with the exception of the 14-minute history-taking station. One minute was given between stations to facilitate change and the reading of instructions. With the inclusion of strategically placed rest stations, to reduce student fatigue, all students completed the circuit over a 1-hour period. This study was conducted on four phases assessment , planning , implementation and evaluation . **I. Assessment phase :** the researcher follow the following tips that was developed by **Harden(1990)** [25] to assess needs of conducting the exam: What is to be assessed?, Duration of station, Number of stations, Use of examiners, Range of approaches, New stations, Organization of the examination, Assigning priority, Resource requirements, Plan of the examination, Change signal and Records **II. Planning phase** : based on the findings of students and clinical educators feedback about OSCE in the assessment phase the researcher plan to use OSCE blinding simulation in the second exam .Organization of OSCE : A) Advance Planning 1) Examiners decided - What is to be examined.- Weightage to different components Minimum standard to pass.2) Briefing the examiners and concerned staff .3) Preparing the skill lab and clinical educator staff .5) Preparation of documentation including checklist, instructions for examiners and questions. B) The Day Before The Examination:1) Final check for preparations & arrangement in skill lab. 2)Final documentation to be given to each examiner. C) The Day Of Examination1.Coordinator -1 hour prior 2. Final check for arrangement. 3.Staff member brief the student. 4. All examiners have arrived and are at their correct station. D) After The Examination: 1)Give feedback to students.

III. Implementation Phase

A. Preparation phase

The researcher follow the principles of Objective Structured Examination (OSCE) which includes Skill to be tested is given in form of a specific question, to be answered in 4-5 minutes ,Each question is a station which made the total examination last 60 minutes. For each question (station) a check list is prepared in advance, Check list prepared by breaking the skill to be tested into its vital components & precautions to be observed.

a. Preparation of students through training in seven session about simulation
b. Preparation of clinical educators through training to construct OSCE and by using simulation session
c. Preparation of materials such a checklists and mark list was done

B. Conducting sessions for
a. First OSCE and First Feedback
b. OSCE Sessions Training For Clinical Educators
c. OSCE blended with Simulation For Clinical Educators session
d. Second OSCE blended with Simulation & Second Feedback

Student rotates round a number of stations – about 20 Spends specified time on each station 5-10 minutes of these five minute to read instructions and questions. Students had 5 minutes per station, with a 1-minute gap to rotate to the next one. The station was two types **Type one: Question Station :** multiple choice questions(MCQs) related to finding ,Interpretation of lab report ,Examine e.g. limb of a patient , arrangement of certain procedure steps, indication of the use of some of instruments, pictures for manifestations of certain disorders and students write comment etc. Also Student asked about patient management (MCQs / True – False type Question used). Each student allocated to two clinical examiners in OSCE lab after finishing the type one OSCE stations. **Type two : Procedure Station** e.g. Taking history of a patient .In the station type one the examiner observes student while in the station type two student answers on the answer sheet. **Station 1** History taking / Examining a patient , Examiner is present, Uses a check list to record the performance of the students as they pass through stations. . A concise set of instructions and marking scales was prepared for the stations in order to make the marking as objective as possible. All OSCE examiners were trained by the principal investigator to ensure consistency in the marking Each o station was supervised by an examiner and required students to use their clinical knowledge, technical ability and communication skills. Those stations were marked at the time of the examination, whereas the theoretical stations were marked later.. **Station 2** : Laboratory and diagnostic study , no examiner, student asked about his findings & interpretation at the next question station., and may be given additional information .

Validity and reliability: In this study, very detailed attention was paid to the design of the OSCE instructions and to the marking and answer sheets. Checklists were used to make sure that assessment was objective. A panel of educators was involved in the validation of the 7 stations for content and accuracy. The design and content of the marking sheets was such that even someone with a very little knowledge of the skill being tested could reliably mark the performance of students. Only assessing students' interaction with equipment and/or mannequins simulated patient. All OSCE assessors were trained to examine particular stations through seven well designed planned educational sessions and remained allocated to that station as much as possible.

First OSCE (Midterm Exam) The initial OSCE was the first exposure to an examination of this kind for the students. This made it a fairly stressful experience because they were being observed and assessed in different skills. **Simulation session**: The objectives of the simulation sessions was to acquire students' knowledge and skills in realistic clinical experience in a safe environment. Students were separated into groups and attended two simulation sessions, each of two hours, focusing on patient care and clinical skills. The first part of the session comprised an introduction and discussion about teamwork and communication in the context of the clinical environment. This was running an informal way to gain students' to help them relax before the scenarios. Students were then introduced to the concept of simulation ' and familiarized with the patient simulator. Before beginning the scenarios, students were clearly briefed about the session. It was explained what was expected from them .During simulation scenarios, students worked in pairs and had the opportunity to be in charge of two distinct simulated situations and to care for the patient simulator as they would do in a real clinical departments setting in hospitals for second year nursing students but for the first year nursing students they worked in pairs and had the opportunity to be in charge of two distinct simulated situations and to care for the patient simulator as they would do in skill lab . They started use the mannequin as a real patient, and communicated with 'it' as well as human patient simulation(student patient simulator). When appropriate, one of the facilitators running the session took the role of a registered nurse . After each scenario the students' performance was discussed, with the participation.

Simulation sessions for second year nursing students Session 1 Introduction to SimMan and awareness /demonstration for clinical educators who participated in the exam.
Session 2 for clinical educators about how to prepare OSCE station type one and session 3,4 about type two OSCE stations.
Session 5 : for clinical educators about how to prepare OSCE station type two and mark list and rubric
Session 6 : for clinical educators about Debriefing and conclusion
Session 7: Scenario with 2nd year nursing students and their examiners& feedback

For first year nursing students
Session 1 Introduction about OSCE and simulation for students
Session 2: introduction of Scenario with first year nursing students
Session 3: demonstration of simulation scenario for the student
Session 4: demonstration of simulation scenario for the student
Session 5: demonstration of simulation scenario for the student
Session 6: student demonstration of simulation scenario with their clinical educator
Session 7: This debriefing was conducted in a non-threatening way and participants were given recommendations on issues that they might have overlooked during the scenarios. The student were given advice and could ask questions related to the scenarios.

Second OSCE (Final Term Exam) Mixed mode types of OSCE with simulation was used to carry out this study. All students were invited to attend a second OSCE to determine their skills and competence level at that time. the second OSCE was conducted at least 5 weeks after their simulation sessions. OSCE stations and the same marking list of first exam was used for the second exam to enable comparison of the results. In addition, for the second OSCE, students were given feedback after the assessment period for each practical station. This type of Objective Structured Clinical Examination is called 'mixed mode' **(Alinier 2003) [26] .** Many students preferred the second OSCE to the first one as they could receive immediate feedback on their performance and strong scenario .The researcher adopted an open-door policy to give them the chance to discuss their performance and see how they had progressed between the two OSCEs.
IV. Evaluation Phase: Immediately after the first and second OSCE, all students completed a questionnaire about the use of OSCE blended with simulation and without simulation in assessment and evaluation of nursing practice . Feedback using tool one and OSCE exam achievements score of 1st and 2nd year nursing students in 1st midterm and summer training and 2nd final first term exam respectively**:** the researcher was used the students achievements score of first exam (midterm & summer course exam) and second exam (final1st term) exams to evaluate the efficacy of OSCE blending simulation achievements scores. The scoring system of achievements was as the following: High score equal to 75% and more allocated score 3 and Good score equal 65% to less than 75% allocated score equal to 2 and Not pass or absents equal to less than 60% allocated score equal to1.
Data analysis
Data analysis was performed using SPSS version 15.0.Statistical significance of the difference in OSCE results was evaluated .
Limitation of study
This was no audio/video link which simultaneously must be used to record the points observed which includes communication, teamwork, situation awareness, decision-making and clinical skills and display the scene on a monitor in an adjacent room.

IV. Results

The study was conducted on 804 female and male first and second year nursing students of these 614 only responses in the first assessment pre implementation of training for clinical education staff of these 1st year nursing students were 318 and 2nd year nursing students were 296. In the second year the female respondents were 76.5% in comparison with 62.5 % in the first year. After implementation of training session for clinical educators all the student engaged in the second exam from first and second year responded to evaluate the OSCE from their point of view. Also male students were more than one third in the1st year nursing students while less than quarter 23.3% in the second year .Concerning age, it was ranged between 18-20 years for 1st year nursing students and from 18-23years for 2nd year nursing.

Also the study was carried out on nine (9) clinical education staff working in the department of Medical-Surgical nursing at faculty of nursing at Tanta University and their years of experience were ranged from 1-10 years with Mean±SD 5.00±2.49 and Academic degree in majority of them 86.7. % was demonstrators while minority13.3 was assistant lecturer and more than half 60% of clinical education staff does not engaged in the OSCE previously and more than quarter 26 % of the clinical education staff engaged in OSCE from five to six times but all works in exams under faculty staff supervision who are working in the departments.

Table 1 shows Perception of the respondents study nursing students about OSCE. It was found that majority 93.1%, 91.5%, 88.1%, and 86.2%, of 1st year study nursing students & 82.3%, 80.1%, 72.6%,75% 2nd year study nursing students indicated that OSCE is a beneficial session for the students, OSCE , helps the students developing their confidence, and OSCE should be part of the nursing curriculum, Rating the OSCE session Useful &Very useful with statistical significant difference $\chi 2$ =24.031, P= 0.0001, $\chi 2$ =39.344, P= 0.0001, $\chi 2$ =6.524 P= 0.038, $\chi 2$ = 47.172, P=0.0001, $\chi 2$ = 17.558, P=0.0001 respectively.

In relation to Barriers of OSCE application as reported by undergraduate nursing students it was found that there was no statistical significant difference about barriers reported by 1st and 2nd years nursing students

$\chi 2$=7.875 at P=0.247. As for Suggestions to avoid the barriers and disadvantages of OSCE reported by undergraduate nursing students it was 22.0%, 17.6%, 13.8%, 3.5%, 1.3%, 0.6 ,% 25.7% ,14.5%,18.2%,10.1%,1.4%,0.3% avoid unuseful information, Making the practical book more simplified to, More facilities in OSCE lab, More cooperation with students during explanation, Commitment of the staff and students with the exam time, More training of the staff for good performance of OSCE-,Delegation of experts in OSCE till training of more staff while No suggestions41.2% and 29.7 % of 1st and 2nd year respectively with statistical significant difference $\chi 2$19.792=at P=0.003*.

Benefits and advantages of OSCE reported by 1st year undergraduate nursing students it was 41.2%, 22.0%, 17.6%, 13.8%, 3.5%, 1.3% and 0.6% and 2nd year undergraduate nursing students26.4%,21.3% , 18.9%, 16.6%, 10.5%, 4.4%, 1.7%, 0.3%, 0% increase experience generally in life, Develop the skills of the nurse Increase self-confidence More opportunities for learning Help self-dependence More understanding of clinical procedures Protect from exposure to infection Increase the sense of responsibility towards work and deal with patient More communication with teachers of 1st and 2nd year respectively with statistical significant difference $\chi 2$ 17.694=at P=0.039*respectively .

Figure (1): Reported barriers for OSCE without simulation by the respondents study nursing students (n=614). it can be noticed approximately quarter and near quarter 27%, 20% , 23%, 21%, of 1st 14%,20%,of 2nd and 1st year nursing students the reported that barriers were large number of students time of exam is short insufficient facilities , insufficient sitting places making students stand long time in OSCE lab, and Deficient capacity of the staff in conducting OSCE respectively while no barriers were reported by approximately one third 30%,28% of 1st and 2nd year nursing students respectively**.**

Figure (2): Agreement of the Respondents from study nursing students about the conducted session of OSCE with significant difference between first and second academic years (n=614). It was found that half 50%, 50 %, and one third 33%, 39% of 1st and 2nd year nursing students agreed that the exam covered wide area and intimidate students aware of level of information needed as well as 39% ,51%minimize the chance of failing and 39%,48% allow students to compensate respectively.

Table (2): illustrates perception of the respondents study nursing students about the conducted session of OSCE without simulation (n=614). It was found that statistical significant difference between academic years and their perception about conducted session of OSCE in the following items , wide area was covered, exam well administered, exam minimize chance of failing, OSCE less stressful than other exam, allow students to compensate in some areas, highlight area of weakness and intimidate students aware of level of information needed at P= 0.0001, 0.001, 0. 007,0.007, 0.013, 0.001,and 0.007 respectively.

Table (3): Evaluation of the respondents of study nursing students of the quality of OSCE performance (n=614). It was found that statistical significant difference between study nursing students of 1st and 2nd year concerned with evaluation of quality of OSCE performance in the following sub items the student fully aware of nature of exam and tasks reflected those taught at P= 0.003and 0.007 respectively.

Also this table presents that The respondents from Nursing students perceive to great extent that OSCE practical and useful experience and scores provide true measure of essential clinical skills, in two third 64.2% and more than half 56.1%, near two third 61.0 % and near half 43.6% of 1st and 2nd year nursing students with statistical significant difference $\chi 2$= 4.169 at P =0.041* and $\chi 2$= 18.970 at P = 0.0001 respectively.

Table (4): illustrates Perception of the study clinical nursing educators about OSCE. It can be noticed that all 100%, 100%, 100%, 100%, 100% and majority 88.9%, 77.8%, 77.8 %, 77.8 %, 77.8 %, 77.8% of the study clinical nursing educators perceived that OSCE should be part of the nursing curriculum, is a beneficial session for the students, like the students to be able to take part to those sessions more regularly, Students should get more practical skills training sessions at the University , and can be considered as a practical skills training session helps the students developing their confidence, Insufficient equipment's and sitting places for students was barriers to OSCE application, Most of students don't be ready for exam as being overloaded by clinical & theoretical lectures and of suggestions to relive barriers was More equipment in OSCE lab.

Also this table shows Opinion of the study clinical nursing educators bout OSCE. It was found that all 100%, and majority 88.9% of the study clinical nursing teachers agreed and strongly agreed, that needed more time at stations and OSCE allowed student to compensate in some areas respectively. Also it was found that more than two third 66.7 %, 66.7 ,66.6%, 66.6% agreed and stated natural that exam was fair exams ,well administered **,**highlighted areas of weakness, and Exam minimized chance of failing, respectively.

Also it was noticed that more than half 55.6**%**%, 55.5 of the study clinical educators were agree and strongly agree that**,** Exams well structured & sequenced , and Exam intimidating student aware of level of information needed respectively. Moreover majority77.8% and one third, 33.3 % of the study clinical teachers were agree and strongly agree that Exams very stressful but OSCE less stressful than other exams.

This table(5) illustrates that evaluation of the study clinical nursing teachers of the quality of OSCE performance. It was found that majority 88.9%, 77.8%, more than two third 66.7%, 66.7% and more than half 55.6 % of clinical nursing teachers pointed out that OSCE was natural in the statements of, Time at each station

was adequate, Instructions were clear & unambiguous, fully aware of the nature of the exam, Tasks asked to perform were fair and Sequence of stations logical & appropriate respectively. Also it can be seen that more than half 55.6% of teachers of clinical nursing reported that exam provided opportunities to learn to a great extent.

Moreover this table reveals that perception of the study clinical nursing teachers' staff (nursing demonstrators& assistant lecturers) about OSCE scoring and objectivity. It was noted that majority77.7% , more than two third and more than half 66.7%, 66.7%, 55.6% of clinical teacher reported that the OSCE scoring and objectivity neutral in four items statement Personality and social relations will not affect OSCE scores ,provide true measure of essential clinical skills, practical and useful experience and OSCE scores are standardized respectively **.**

This table 6 presents that students' evaluation for performance of OSCE with simulation after staff training sessions. It was found that perception of OSCE with simulation as very good to excellent was reported by majority 86% of 1st year nursing students and more than half 52% of 2nd year nursing student. Also it was found that none 0% and minority of 14% 1st year and 2nd year nursing student perceive OSCE with simulation as weak exam. After students& staff preparation using educational sessions, Students' evaluation for OSCE with simulation performance as the following , Second year students 86 % rating OSCE from pass to excellent with 26% as an excellent exam while only 14% rating OSCE is weak . Also the second year nursing student improvements from midterm 1st exam to final term 2nd exam is 30% while the improvement of 1st year nursing students was 45%.

Moreover this table presents that all students 100% and 100%1st year and 2nd year nursing student reported that the advantages of the second exam is Strong scenario , stations with simulation and questions lead to majority students to use thinking more than memorizing plus all mentioned advantages in the first exam while none 0% and 14% of 1st year and 2nd year reported that disadvantages of 2nd exam is dividing students into small groups because they are large number and on different days lead to students feel this is unfair.

This table 7 shows that Achievements' score of OSCE with and without simulation for the study first and second year nursing students' before & after educational training sessions for both students clinical education' staff. Regarding the total success rate it was 96.1% and 97.2 % per year for both 1st and 2nd year undergraduates nursing students respectively. Also this table illustrates the difference between 1st OSCE without simulation and 2nd OSCE blending simulation for both 1st and 2nd year nursing students .it was found that the achievement score tends to be increased 55.1% and 44.3% as well as no changes in achievement score 21.1% and 20.3 % among 1st and 2nd year nursing students respectively.

Figure (3) illustrates that there was changes toward improvement in the students' OSCE blending simulation achievements' score in second exam than first exam for both 1st year 51.1 % and 2nd year 44.3 % from low level score to high level of study undergraduate students and this is indicates that OSCE measures what intended to measure. Also it can be seen that there was changes by decrease in achievement score in 28.1% and 22% 2nd exam than 1st exam in both 1st and 2nd year nursing students respectively and this is mean that the students who depends on surface approach of learning achieve lower score although they obtained high score in exam because this OSCE need critical thinking rather than memorizing and good performance ability.

Table (1): Perception of the respondents study nursing students about OSCE (n=614).

Questions about OSCE	Respondents from Nursing students(n=614)					
	1st academic year (n=318)		2nd academic year (n=296)		χ2	P
	N	%	n	%		
1-OSCE should be part of the nursing curriculum						
Yes	280	88.1	241	82.3	6.524	0.038*
No	17	5.3	32	10.9		
No answer	21	6.6	20	6.8		
2-OSCE is a beneficial session for the students						
Yes	296	93.1	237	80.1	24.031	0.0001*
No	14	4.4	46	15.5		
No answer	8	2.5	13	4.4		
3-OSCE helps the students developing their confidence						
Yes	291	91.5	215	72.6	39.344	0.0001*
No	20	6.3	70	23.6		
No answer	7	2.2	11	3.7		
4- Would you like the students to be able to take part to those sessions more regularly?						
Yes	241	75.8	178	60.1	17.558	0.0001*
No	69	21.7	103	34.8		
No answer	8	2.5	15	5.1		
5-How many times per year would it be useful to repeat the OSCE?						
No time	40	12.6	45	15.2	6.770	0.149
1-3	167	52.5	174	58.8		
4-6	101	31.8	73	24.7		
7-9	2	0.6	1	0.3		
10-12	8	2.5	3	1.0		
6-Rating the OSCE session						
Useful	156	49.1	179	60.5	47.172	0.0001*
Very useful	118	37.1	43	14.5		
Don't know	34	10.7	44	14.9		
Unuseful	6	1.9	16	5.4		
Not useful al all	4	1.3	14	4.7		
7-Barriers of OSCE application:						
-No barriers	95	29.9	83	28.0	7.875	0.247
-Insufficient facilities	63	19.8	42	14.2		
-Large number of students	63	19.8	79	26.7		
-Time of exam. is short	67	21.1	67	22.6		
-No commitment from the staff with the exam time	22	6.9	21	7.1		
-Insufficient sitting places making students stand long time in OSCE lab.	7	2.2	4	1.4		
-Deficient capacity of the staff in conducting OSCE	1	0.3	0	0		

Table (1): Perception of the respondents study nursing students about OSCE (n=614) Continued.

Questions about OSCE	Respondents from Nursing students(n=614)					
	1st academic year(n=318)		2nd academic year(n=296)		χ2	P
	n	%	N	%		
8-Benefits and advantages of OSCE:						
-Increase self-confidence	75	23.6	56	18.9	17.694	0.039*
-increase experience generally in life	38	11.9	49	16.6		
-Develop the skills of the nurse	61	19.2	78	26.4		
-More opportunities for learning	63	19.8	63	21.3		
-Help self-dependence	44	13.8	31	10.5		
-More understanding of clinical procedures	22	6.9	13	4.4		
-Protect from exposure to infection	10	3.1	5	1.7		
-Increase the sense of responsibility towards work and deal with patient	2	0.6	1	0.3		
-More communication with clinical teachers	3	0.9	0	0		
9-Disadvantages of OSCE:						
-No disadvantages	129	40.6	72	24.3	30.813	0.0001*
-No sufficient chance for each student	66	20.8	44	14.9		
-Increase tension and fear of the student	56	17.6	80	27.0		
-It is very stressful	41	12.9	58	19.6		
-It needs more words than clinical performance	19	6.0	32	10.8		
-It depends on the capacity of the staff regarding its application	7	2.2	10	3.4		
10-Suggestions to avoid the barriers and disadvantages of OSCE:						
-No suggestions	131	41.2	88	29.7	19.792	0.003*
-Making the practical book more simplified to avoid unuseful	56	17.6	43	14.5		

information						
-More facilities in OSCE lab.	70	22.0	76	25.7		
-More cooperation with students during explanation	44	13.8	54	18.2		
-Commitment of the staff and students with the exam time	11	3.5	30	10.1		
-More training of the staff for good performance of OSCE	4	1.3	4	1.4		
-Delegation of experts in OSCE till training of more staff	2	0.6	1	0.3		

***Significant (P<0.05)**
≠ Notice the total number of study nursing student's equal 804
≠The student who responses was equal 614
≠The student with no responses was equal 190
≠ First year non respondents equal 109
≠ Second year non respondents were 81students

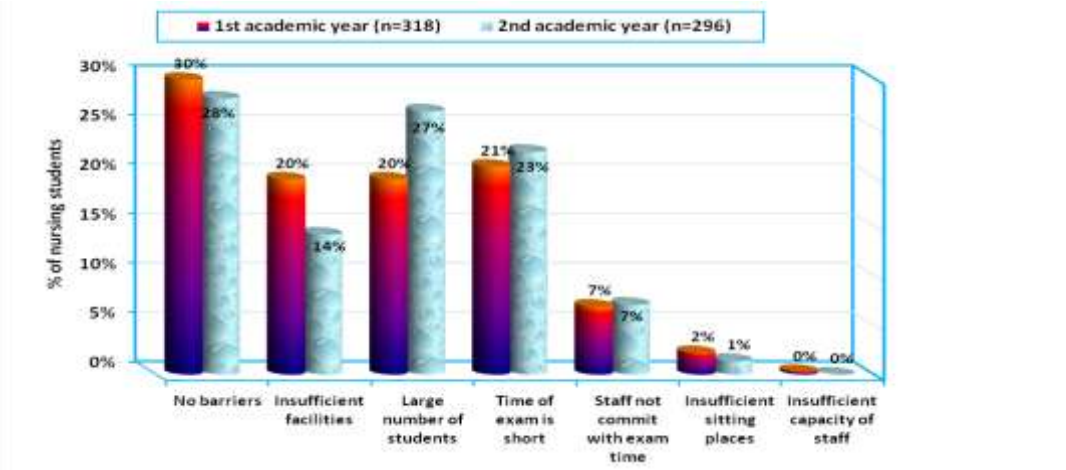


Figure (1): Reported barriers for OSCE without simulation by the respondents study nursing students (n=614).

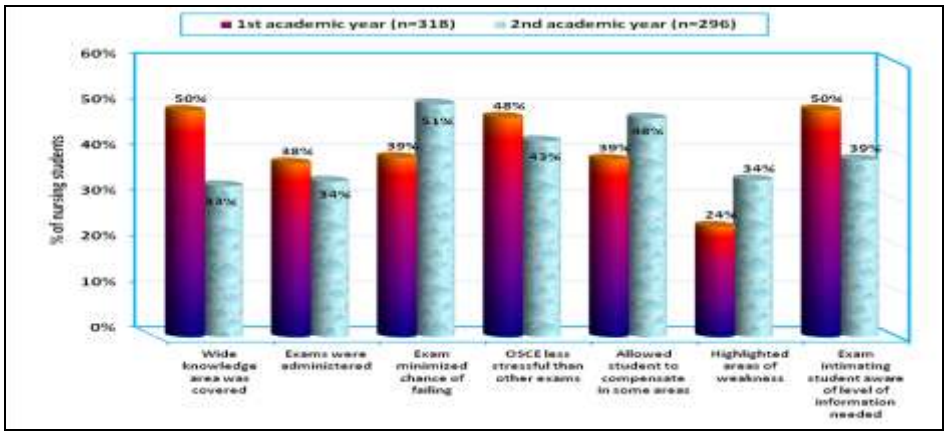


Figure (2): Agreement of the Respondents from study nursing students about the conducted session of OSCE with significant difference between first and second academic years (n=614).

Table (2): Perception of the respondents study nursing students about the conducted session of OSCE (n=614).

Items about conducted OSCE	**Respondents from Nursing students(n=614)**					
	1st academic year (n=318)		**2nd academic year (n=296)**		**χ2**	**P**
	N	**%**	**n**	**%**		
1-Exam. was fair						
No comment	67	21.1	63	21.3	4.436	0.489

Neutral	62	19.5	69	23.3		
Agree	123	38.7	95	32.1		
Strongly agree	22	6.9	21	7.1		
Disagree	35	11.0	34	11.5		
Strongly disagree	9	2.8	14	4.7		
2-Wide knowledge area was covered						
No comment	63	19.8	60	20.3	40.426	0.0001*
Neutral	64	20.1	62	20.9		
Agree	127	39.9	92	31.1		
Strongly agree	31	9.7	6	2.0		
Disagree	31	9.7	65	22.0		
Strongly disagree	2	0.6	11	3.7		
3-Needed more time at stations						
No comment	36	11.3	35	11.8	7.757	0.170
Neutral	17	5.3	29	9.8		
Agree	124	39.0	127	42.9		
Strongly agree	86	27.0	66	22.3		
Disagree	38	11.9	27	9.1		
Strongly disagree	17	5.3	12	4.1		
4- Exams well administered						
No comment	103	32.4	63	21.3	21.690	0.001*
Neutral	47	14.8	71	24.0		
Agree	96	30.2	88	29.7		
Strongly agree	25	7.9	13	4.4		
Disagree	43	13.5	50	16.9		
Strongly disagree	4	1.3	11	3.7		
5-Exams very stressful						
No comment	56	17.6	45	15.2	8.773	0.133
Neutral	47	14.8	47	15.9		
Agree	83	26.1	100	33.8		
Strongly agree	61	19.2	56	18.9		
Disagree	50	15.7	28	9.5		
Strongly disagree	21	6.6	20	6.8		
6-Exams well structured & sequenced						
No comment	103	32.4	89	30.1	9.582	0.088
Neutral	45	14.2	48	16.2		
Agree	90	28.3	74	25.0		
Strongly agree	34	10.7	28	9.5		
Disagree	28	8.8	47	15.9		
Strongly disagree	18	5.7	10	3.4		

Table (2): Perception of the respondents study nursing students about the conducted session of OSCE (n=614). Continue.

Items about conducted OSCE	**Respondents from Nursing students (n=614)**				**χ^2**	**P**
	1st academic year (n=318)		**2nd academic year (n=296)**			
	n	**%**	**N**	**%**		
7-Exam minimized chance of failing						
No comment	95	29.9	62	20.9	15.963	0.007*
Neutral	23	7.2	32	10.8		
Agree	90	28.3	99	33.4		
Strongly agree	35	11.0	52	17.6		
Disagree	50	15.7	34	11.5		
Strongly disagree	25	7.9	17	5.7		
8-OSCE less stressful than other exams						
No comment	60	18.9	35	11.8	15.928	0.007*
Neutral	31	9.7	39	13.2		
Agree	93	29.2	92	31.1		
Strongly agree	60	18.9	35	11.8		
Disagree	55	17.3	70	23.6		
Strongly disagree	19	6.0	25	8.4		
9-Allowed student to compensate in some areas						
No comment	128	40.3	78	26.4	14.357	0.013*
Neutral	31	9.7	34	11.5		
Agree	94	29.5	107	36.1		
Strongly agree	30	9.4	35	11.8		
Disagree	16	5.0	24	8.1		
Strongly disagree	19	6.0	18	6.1		
10-Highlighted areas of weakness						

No comment	109	34.3	90	30.4	21.246	0.001*
Neutral	34	10.7	50	16.9		
Agree	60	18.9	80	27.0		
Strongly agree	17	5.3	22	7.4		
Disagree	63	19.8	39	13.2		
Strongly disagree	35	11.0	15	5.1		
11-Exam intimidating student aware of level of information needed						
No comment	84	26.4	81	27.4	15.989	0.007*
Neutral	45	14.2	48	16.2		
Agree	111	34.9	93	31.4		
Strongly agree	47	14.8	22	7.4		
Disagree	12	3.8	25	8.4		
Strongly disagree	19	6.0	27	9.1		

***Significant (P<0.05)**

Table (3): Evaluation of the respondents of study nursing students of the quality of OSCE performance, scoring and objectivity (n=614).

Statements	**Nursing students (n=614)**					
	1st academic year (n=318)		**2nd academic year (n=296)**		**χ2**	**P**
	n	**%**	**n**	**%**		
I. The quality of OSCE performance 1-Fully aware of the nature of the exam.						
Neutral	224	70.4	174	58.8	9.134	0.003*
To a great extent	94	29.6	122	41.2		
2-Tasks reflected those taught						
Neutral	148	46.5	170	57.4	7.284	0.007*
To a great extent	170	53.5	126	42.6		
3-Time at each station was adequate						
Neutral	201	63.2	176	59.5	0.909	0.340
To a great extent	117	36.8	120	40.5		
4-Instructions were clear & unambiguous						
Neutral	174	54.7	149	50.3	1.179	0.278
To a great extent	144	45.3	147	49.7		
5-Tasks asked to perform were fair						
Neutral	163	51.3	165	55.7	1.239	0.266
To a great extent	155	48.7	131	44.3		
6-Sequence of stations logical & appropriate						
Neutral	173	54.4	150	50.7	0.854	0.355
To a great extent	145	45.6	146	49.3		
7-Exam provided opportunities to learn						
Neutral	137	43.1	136	45.9	0.509	0.475
To a great extent	181	56.9	160	54.1		

Table (3): Evaluation of the respondents of study nursing students of the quality of OSCE performance, scoring and objectivity (n=614)(continue).

Statements	**The respondents from Nursing students (n=614)**					
	1st academic year (n=318)		**2nd academic year (n=296)**		**χ2**	**P**
	n	**%**	**n**	**%**		
II.OSCE scoring and objectivity 1-OSCE scores provide true measure of essential clinical skills						
Neutral	124	39.0	167	56.4	18.970	0.0001*
To a great extent	194	61.0	129	43.6		
2-OSCE scores are standardized						
Neutral	167	52.5	164	55.4	0.515	0.473
To a great extent	151	47.5	132	44.6		
3-OSCE practical and useful experience						
Neutral	114	35.8	130	43.9	4.169	0.041*
To a great extent	204	64.2	166	56.1		
4-Personality and social relations will not affect OSCE scores						
Neutral	207	65.1	178	60.1	1.612	0.204
To a great extent	111	34.9	118	39.9		

***Significant (P<0.05**

Table (4): Perception of the study clinical nursing educators about OSCE (n=9).

Questions about OSCE	**The study nursing demonstrators (n=9)**	
	n	**%**
1-OSCE should be part of the nursing curriculum	9	100
2-OSCE is a beneficial session for the students	9	100
3-OSCE helps the students developing their confidence	7	77.8
4- OSCE could be considered as a practical session for the students	8	88.9
5-Would you like the students to be able to take part to those sessions more regularly?	9	100
6-Students should get more practical skills training sessions at the University	9	100
7-OSCE can be considered as a practical skills training session	9	100
8-How many times per year would it be useful to repeat the OSCE?		
2	4	44.4
4	2	22.2
6	3	33.3
9-Rating the OSCE session		
Useful	1	11.1
Very useful	6	66.7
Don't know	2	22.2
10-Barriers of OSCE application:		
-Insufficient equipment's and sitting places for students	7	77.8
-It depends only on theoretical not practical skills	4	44.4
-Not enough time for students	3	33.3
8-Benefits and advantages of OSCE:		
-Increase self-confidence of the students	7	77.8
-Fairness and objectivity of evaluation of all students	5	55.5
-improve practical skills and competence of the students		
-Develop the skills of the nurse	2	22.2
-Provide more opportunities for students to perform the procedures with their own (depend on themselves)	4	44.4
-More understanding of clinical procedures	2	22.2
-Decrease the overload to learn the students in hospitals	4	44.4
9-Disadvantages of OSCE:		
-Most of students don't be ready for exam as being overloaded by clinical & theoretical lectures	7	77.8
-It is lack in clinical performance	4	44.4
10-Suggestions to avoid the barriers and disadvantages of OSCE:		
-Every demonstrator is responsible for one procedure in OSCE	5	55.5
-More organization and planning for OSCE sessions	3	33.3
-More equipment in OSCE lab.	7	77.8
-Decrease number of student groups in the day for exam	6	66.7
-More supervision and follow up using cameras during exam	3	33.3
-Increase the number of stations	2	22.2

Table (4): Perception of the study clinical nursing educators about OSCE (n=9).(continue.)

Items about conducted OSCE	**The study nursing demonstrators (n=9)**	
	n	**%**
1-Exam. was fair		
Neutral	2	22.2
Agree	6	66.7
Strongly agree	1	11.1
2-Wide knowledge area was covered		
Agree	5	55.5
Strongly agree	3	33.3
Disagree	1	11.1
3-Needed more time at stations		
Agree	1	11.1
Strongly agree	8	88.9
4- Exams well administered		
Neutral	6	66.7
Agree	3	33.3
5-Exams very stressful		
Neutral	2	22.2
Agree	5	55.6
Strongly agree	2	22.2
6-Exams well structured & sequenced		
Neutral	4	44.4

Agree	5	55.6
7-Exam minimized chance of failing		
Neutral	3	33.3
Agree	4	44.4
Strongly agree	2	22.2
8-OSCE less stressful than other exams		
No comment	1	11.1
Neutral	2	22.2
Agree	2	22.2
Strongly agree	1	11.1
Disagree	3	33.3
9-Allowed student to compensate in some areas		
No comment	1	11.1
Agree	7	77.8
Strongly agree	1	11.1
10-Highlighted areas of weakness		
Neutral	4	44.4
Agree	4	44.4
Disagree	1	11.1
11-Exam intimidating student aware of level of information needed		
No comment	1	11.1
Neutral	2	22.2
Agree	4	44.4
Strongly agree	2	22.2

Table (5): Evaluation of the study clinical nursing educators of the quality of OSCE performance, scoring and objectivity (n=9).).

Statements		
	The study nursing demonstrators (n=9)	
	n	**%**
1-Fully aware of the nature of the exam.		
Neutral	6	66.7
To a great extent	3	33.3
2-Tasks reflected those taught		
Neutral	4	44.4
To a great extent	5	55.6
3-Time at each station was adequate		
Neutral	8	88.9
To a great extent	1	11.1
4-Instructions were clear & unambiguous		
Neutral	7	77.8
To a great extent	2	22.2
5-Tasks asked to perform were fair		
Neutral	6	66.7
To a great extent	3	33.3
6-Sequence of stations logical & appropriate		
Neutral	5	55.6
To a great extent	4	44.4
7-Exam provided opportunities to learn		
Neutral	4	44.4
To a great extent	5	55.6

Table (5): Perception of the study clinical nursing education staff (nursing demonstrators& assistant lecturers) about OSCE quality of performance ,scoring and objectivity (n=9). (continue.)

Statements		
	The study nursing demonstrators (n=9)	
	n	**%**
1-OSCE scores provide true measure of essential clinical skills		
Neutral	6	66.7
To a great extent	3	33.3
2-OSCE scores are standardized		
Neutral	5	55.6
To a great extent	4	44.4
3-OSCE practical and useful experience		
Neutral	6	66.7

To a great extent	3	33.3
4-Personality and social relations will not affect OSCE scores		
Neutral	7	77.8
To a great extent	2	22.2

Table 6: Students' evaluation for performance of OSCE blended with simulation (n=804)

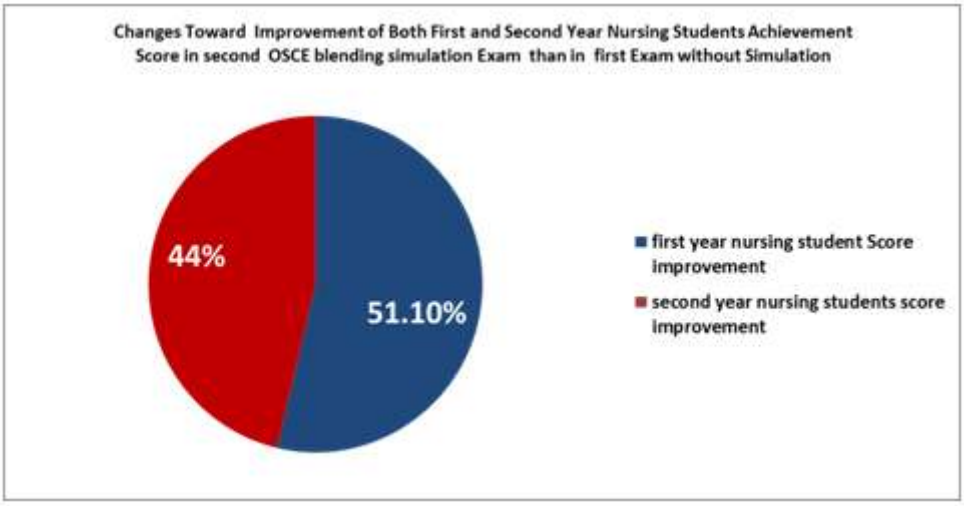
Rating score of OSCE as perceived by the nursing students	**First year nursing students n= 429**		**Second year nursing students n=377**	
	No	**%**	**No**	**%**
Excellent	**128**	**30**	**98**	**26**
Very good	**240**	**56**	**98**	**26**
Good	**25**	**6.0**	**59**	**16**
Pass	**32**	**8.0**	**67**	**18**
Weak	**0**	**0.0**	**52**	**14**
Advantages				
In addition to previously mentioned advantages : Strong scenario , stations with simulation and questions lead to majority students to use thinking more than memorizing	**429**	**100**	**377**	**100**
Disadvantages				
• Dividing students because they are large number on numbers on different days lead to students feel this is unfair	**0**	**0.0**	**52**	**14**

≠. All the students 804 enrolled in second term final exam in the first and second year were responds' after training sessions of the clinical education staff and there was zero non response post training session of clinical education staff

Table 7: changes in Achievements' score of OSCE with and without simulation for the study first and second year nursing students' before & after educational training sessions (804).

I. Achievement Score of OSCE	**First year nursing students Fundamentals of nursing subject N=427**				**Second year nursing students Medical Surgical Nursing subject N=377**			
	First exam without the use of simulation(midterm Exam) N=427		**Second exam After education sessions & with the use of simulation N=427**		**First exam without the use of simulation N=377**		**Second exam After education sessions & with the use of simulation N=377**	
	No	**%**	**No**	**%**	**No**	**%**	**No**	**%**
Total success	**398**	**93.2**	**402**	**94.1**	**366**	**97.0**	**367**	**98.5**
Total not pass	**7**	**0.016**	**11**	**0.03**	**2**	**1.0**	**2**	**0.01**
Absent	**19**	**0.4**	**6**	**0.014**	**9**	**0.2**	**14**	**0. 03**
Total	**427**	**100**	**427**	**100**	**377**	**100**	**377**	**100**
Total success/per year in both exams	**96.1%**				**97.2 %**			
Total not pass/ year in both exams	**3.5%**				**2. 6 %**			

≠. All the students 804 enrolled in second term final exam in the first and second year were responds' after training sessions of the clinical teachers' staff and there was zero non response post training session of clinical teachers' staff.



Figure(4) : changes of OSCE blinding simulation achievements score among the study first and second year nursing students before & after educational sessions for clinical nursing educators' staff and students (n= 804).

V. Discussion

To fit the demands of the student learner there is a need to change teaching methods **Medley and Horn (2005)** [27]. Over the past two decades simulation in health care professional education use has increased rapidly . Simulation aims to replicate real anatomical sites , clinical settings or to mirror real life . simulation provides a safe environment to practice clinical skills in staged progression of increasing difficulty , appropriate to the learners. Practicing skills on real patient can be difficult , costly, time consuming and potentially dangerous and unethical so health professional educators have increasing adopted simulation based assessment as a viable means of evaluation of health professionals . A unique tool of simulation is increasingly adopted by health professional educators is virtual reality. To create a realistic environment and immersive learning and assessment the health care professionals uses human patient simulators. Simulation is a teaching and learning strategy that is increasingly used in nursing education to prepare students for the clinical work place **Ryall et .al; (2016)** [28]

Evaluation of the study clinical nursing educators and study nursing students in 1st and 2nd years of the **quality of OSCE performanc**e in the current study . It was found that majority ,more than two third and more than half of clinical nursing teachers pointed out that OSCE was neutral in the statements of, Time at each station was adequate, Instructions were clear & unambiguous, fully aware of the nature of the exam, Tasks asked to perform were fair and Sequence of stations logical & appropriate respectively. Also it can be seen that more than half of teachers of clinical nursing reported that exam provided opportunities to learn to a great extent.

A study results was done by **El- Nemer and Kandeel (2009)** [29] indicated that nursing students' evaluation of the quality of OSCE performance, the majority of students reported that they were fully aware of the nature of the exam and that OSCE provided them with more learning opportunities.

Regarding perception of the respondents study nursing students about OSCE evaluation in the current study **.** It was found that majority of 1st year study nursing students &2nd year study nursing students indicated that OSCE is a beneficial session for the students, helps the students developing their confidence, and should be part of the nursing curriculum, Rating the OSCE session Useful &Very useful with statistical significant difference. Also in the current study it can be noticed that all and majority of the study clinical nursing educators perceived that OSCE should be part of the nursing curriculum, is a beneficial session for the students, like the students to be able to take part to those sessions more regularly, Students should get more practical skills training sessions at the University , and can be considered as a practical skills training session helps the students developing their confidence, Insufficient equipment's and sitting places for students was barriers to OSCE application, Most of students don't be ready for exam as being overloaded by clinical & theoretical lectures and of suggestions to relive barriers was more equipment in OSCE lab. This is congruent with a study was done by **Rasoulian et. al; (2007)** [30] who reported that OSCE was seen as a positive and a useful practical experience by most students and staff .

Perception of the study clinical nursing educators staff (nursing demonstrators& assistant lecturers) **nursing students' perception of OSCE scoring and objectivity**. Most nursing students believed that OSCE scores provided true measures of essential clinical skills and were standardized. They also felt that OSCE was a useful practical experience for them. It was noted that majority, more than two third and more than half of clinical educators reported that the OSCE scoring and objectivity neutral in four items statement Personality

and social relations will not affect OSCE scores ,provide true measure of essential clinical skills, practical and useful experience and OSCE scores are standardized respectively.

The current results supported by several research study results in parts of feedback from nursing students suggests that OSCE is an objective tool for evaluating clinical skills. Students perceived OSCE scores as a true measure for essential clinical skills being evaluated, standardized, and not affected by student's personality or social relations. Also objectivity of OSCE was mentioned by **Bartfay et .al** , **(2004)** [9]**.**The evaluation of OSCE by nursing students underlines some areas that need to be fostered and fulfilled in future, such as the inadequate time of some of the stations, and the insufficient equipment's needed for OSCE. The insufficient time and equipment's at OSCE stations was one of students' reported barriers for implementation of OSCE in some of the studies which analyzed students 'feedback about OSCE **Monaghan et .al ,(2000)** [31]**, Pierre et al, (2004)** [24] **.**

Benefits and advantages of OSCE reported by 1st year &2nd year study **undergraduate nursing students it was** increase experience generally in life, Develop the skills of the nurse, Increase self-confidence, More opportunities for learning ,Help self-dependence , More understanding of clinical procedures Protect from exposure to infection ,Increase the sense of responsibility towards work and deal with patient and more communication with teachers of 1st and 2nd year respectively with statistical significant difference. This is in line with a study findings was done by **Khattab and Rawings (2001)** [32] since students and examiners were perceived educational benefits of OSCE as formative and summative assessment. Also positive feedback was obtained from study was done by **Alinier** et.al, **(2003)** [26] about nursing students and lecturers perspective of OSCE which denoted that OSCE session were generally appreciated by students and lecturers .

The current study findings also approved by several studies [7,9 ,17, 21,27 and33]which declared that OSCEs possesses a number of advantages, of these advantages , it gave the students a sense of achievement, lecturers involved in the administration of the OSCE felt that the planning had contributed to a good learning experience for the students, standardized procedures ensure objectivity and maximize reliability in assessment**,** because in a simulated work environment each student is required to demonstrate specific behaviors, reflecting real-life professional tasks as well as flexibility of the individual components of the stations, which can take the form of small scenarios, simulations, case studies, MCQ or short theoretical questions**.** Also**,** OSCE provided a learning opportunity for the nursing students, lecturers, and the institution. Learning in the clinical environment provides the real world context for nursing students to develop the knowledge, skills, attitudes, and values of a registered nurse.

Moreover, importance of the feedback from nursing students and faculty is it has been useful in effecting improvements to the process and greater emphasis has been placed on the teaching and evaluation of history taking, communication, and technical competencies. It is also sending a clear message to students that the achievement of overall competence is imperative to clinical practice in the current environment **Imani and Tabatabaie, (2005)** [34].

In the current study the respondents from Nursing students perceive to great extent that OSCE practical and useful experience and scores provide true measure of essential clinical skills, in two third & more than half, near two third& near half of 1st and 2nd year nursing students respectively with statistical significant difference .The results indicate that while students acknowledge the OSCE was stressful, they felt they were well prepared and appreciated the efficacy and relevance of this assessment method. Several studies explained the stressful nature & unpredictability of the OSCE as an indication of validity. **Of these studies , a study was done by Bartfay et. al;(2004)** [9] who pointed out that performing in stressful circumstances increases the validity of OSCE, since equipping the student to perform competently in stressful clinical situations. **In the same line Barry et .al; (2012**) [35] and **Cioffi (2001)** [36] declared that preparation for OSCE was considered central to the process as practicing with peers enable confidence and help student to acquire skill in non-threatening safe environment without fear of making mistakes that compromise patient safety.Also in a study was done by **El- Nemer (2009)** [29] it was found that although the majority of students from both groups reported that OSCE was less stressful than other exams , still a considerable percentage of students felt that the exam was very stressful and intimidating.

It is essential to evaluate critically how effective is the use of simulation in undergraduate nursing education. So when a patient's life is at stake in a clinical setting to teach students it is preferable for students to experience stressful clinical events in a simulation lab. In the current study it was found that all and majority of the study clinical nursing educators agreed and strongly agreed, that needed more time at stations and OSCE allowed student to compensate in some areas respectively. Also it was found that more than two third agreed and stated neutral that exam was fair , exams well administered ,highlighted areas of weakness, and Exam minimized chance of failing, respectively. Also it was noticed that more than half of the study clinical educators were agree and strongly agree that, Exams well structured & sequenced , and Exam intimidating student aware of level of information needed respectively. Moreover majority and one third, of the study clinical teachers were agree and strongly agree that Exams very stressful but OSCE less stressful than other exams.

This in the same vain with a study was done by **El- Nemer and Kandeel (2009) [2 9]** which revealed that the majority of students provided positive feedback about the OSCE attributes. They agreed that the OSCE was fair covered a wide range of knowledge and was well administered. Most students felt that OSCE stations were well structured and sequenced. Concerning the outcome of the exam, most students from the two groups reported that the nature of OSCE minimized the chance of failing and highlighted areas of weaknesses and minority of students felt that the time at each station was inadequate. **Barry et. al; (2012) [35]**mentioned that some of the participants acknowledged that the level of stress experienced interfered with their performance, but they felt that it prepared them for the realities of practice and providing benefits for students' overall performance in clinical settings.

This in consistent with **several research studies results [35-39]** which reported that most students provided positive feedback about the quality of OSCE performance in terms of the clarity of the instructions of the exam, the sequence of OSCE stations, the reflection of the tasks taught and the time at each station, OSCE was seen as a positive and a useful practical experience by most students and should be repeated regularly.

In relation to barriers of OSCE application as reported by clinical educators and nursing students pre teaching sessions was Insufficient facilities, Large number of students, Time of exam is short, No commitment from the staff with the exam time, Insufficient sitting places making students stand long time in OSCE lab, and Deficient capacity of the staff in conducting OSCE while No barriers reported by near one third of 1st and 2nd year respectively with no statistical significant difference. This is congruent with study results was done by **Bayomi and Yousri (2012) [37]** who reported that twenty six students wanted that time should be increased .

Reasons elicited for time management which it is short by some educators and students are multiple it explained by **Bensenor (2004) [38]** study it may be due student embarrassment by presence of examiner who analyze a clinical situation inside the room verifying he or she doing the correct thing and expression of student were stressed. This study results was supported by a study results was done by **Troncon (2004) [39]** who found that difficulties in part of students in managing time during OSCE and could not be ascribed to excessively short length of time at stations and might be related to various factors , such as immaturity and lack of specific training in time management techniques and explained that by it might be due to local culture factors as students tend to perceive tests as something aiming only at rewarding a few students and punishing others. This is in agreement with **Awaisu et.al; (2007) [40]** who found that near half dissatisfied with allocated time per station and explained that it was difficult to allocate different time limits at different stations during OSCE.

Suggestions to avoid & overcoming the barriers and disadvantages of OSCE as reported by undergraduate nursing students of OSCE were more facilities in lab , more cooperation with students during explanation, commitment of the staff and students with exam time, more training of staff for good performance and delegation of experts in OSCE till training more staff & supervisors suitable for students numbers while no suggestions by near half and near one third of 1st and 2nd year respectively with statistical significant difference in the current study results.

The current study findings of students suggestions' in line with the findings of the study was done by **EL Darir and Abd El Hamied (2013) [41]** which pointed out that more than half of students unsatisfactory perceived preparation of OSCE and OSCE in part of needed equipment and simulators availability and suitable for students numbers. Also The current study results of suggestion in the same vain of a study results was done by **Bayomy and Yousri (2012) [37]** which reported that assessors be more cooperative, friendly more and be more respectful with students , equipment was old , should allowed more practice session and time of each station should be increased.

This study results supported by **Ziv et al.(2000) [42]**who reported that Students' experience acquired by practice has been diminished for patient safety and ethical reasons. Because of individual students' involvement with patient care and opportunities to deal with practice situations have reduced as well as the increased need for clinical areas and lack in numbers of practice supervisors so, there has been a need to reproduce that experience by some other means such as simulation training **Cioffi (2001) [36] .**

On the other hand the suggestions pertaining by clinical educators to overcome OSCE barriers and disadvantages were every clinical educator is responsible for one procedure , more planning and organization of OSCE session, more equipment in lab , decrease number of students per group in day of exam, more supervision and follow up using camera and increase number of stations. This congruent with a study**[35]** results which reported that more assessors , evaluators should be informed prior exam to be able to come up with consistent and some basis of evaluating performance, orientation of assessors , flows of stations and assessors criteria for evaluating students but the current study contradicted with part, a number of stations since instructors suggests decrease the number of stations while in the current study clinical educators suggests increased number of stations .

Achievements' score of OSCE with and without simulation for the study 1st & 2nd year nursing students' before & after educational training sessions for students and clinical teachers' staff. Regarding the total

success rate it was ninety seven point three percent and ninety eight point four percent for both 1st and 2nd year undergraduates nursing students respectively. After staff preparation using educational sessions, Students' evaluation for OSCE with simulation performance were as the following , majority of 2nd year nursing student 's eighty six percent rating OSCE from pass to excellent with twenty six percent as an excellent exam while only fourteen percent rating OSCE as weak . Also the 2nd year nursing student improvements from midterm 1st exam to final term 2nd exam is in near half of them while the improvement of 1st year nursing students was half percent. Moreover all students in the 1st year and 2nd year nursing student reported that the advantages of the second exam is Strong scenario , stations with simulation and questions lead to majority of students to use thinking more than memorizing plus all mentioned advantages in the first exam while none and minority of 1st year and 2nd year reported that disadvantages of 2nd exam is dividing students into small groups and on different days lead to students feel this is unfair. The researcher explain that the dividing of students into small groups was due to they are large number. Also in the current study post staff and nursing students training sessions, students' evaluation for performance of OSCE with simulation was that OSCE with simulation very good to excellent was reported by all 1st year nursing students and majority of 2nd year nursing student.

Students' evaluation **for performance of OSCE with simulation after clinical educators staff and nursing students training sessions**. It was found that perception of OSCE with simulation as very good to excellent was reported by majority of 1st year nursing students and more than half of 2nd year nursing student and all clinical educator staff. Also it was found that none and minority of 1st year and 2nd year nursing student perceive OSCE with simulation as weak exam.

After staff preparation using educational sessions, **Students' evaluation for OSCE with simulation performance** as the following , majority of Second year students rating OSCE from pass to excellent with more than quarter as an excellent exam while only minority rating OSCE as weak . This is in the same line with **Selim et al;(2012) [14]** who indicated that OSCE is valid assessment tools used in evaluating students and total grade which more correlated to OSCE than oral exam and clinical evaluation.

Achievements' score of OSCE with and without simulation for the study 1st and 2nd year nursing students' before & after educational training sessions for clinical educators' staff and nursing students. Regarding the total success rate it was found that majority per year for both 1st and 2nd year undergraduates nursing students succeeded respectively. Changes toward improvement in the students' OSCE with simulation score of achievements' between first exam and second exam for both 1st year more than half (fifty one point 1 percent) and 2nd year near half (forty four percent) from low level score to high level of study undergraduate students and this is indicates that OSCE measures what intended to measure. Also it can be seen that there was changes by decrease in achievement score in twenty three percent and twenty two percent 2nd exam than 1st exam in both 1st and 2nd year nursing students respectively and this is mean that the students who depends on surface approach of learning achieve lower score although they obtained high score in first exam because this OSCE need critical thinking and good performance ability rather than memorizing and that is means that the students who may be depends on surface approach of learning achieve lower score although they obtained high score in previous exam.

Also the current study in line with a research study about simulators use during training in different specialties in which Skill deficiencies were able to be determined when low to high fidelity simulators were used , the subsequent training to be targeted to individuals ' needs is the findings of **two studies[43,44]** that is used low , medium and high fidelity human patient simulators during the assessment of trainees ' resuscitation skills and intensive care . The current study results approved by **Edgecombe et .al ;(2013) [45]** who mentioned that Simulation does not replace the need for learning in clinical practice skills but allows the student to develop their assessment, critical thinking and decision making skill in a safe and supportive evaluation .

Benner (1984) [46] stated that providing nursing care involves risks for both nurse and patient and skilled nursing requires well planned education programs. Patient simulation is only as effective as the faculty who are using it. The creativity , clinical knowledge , teaching expertise and technological abilities of the faculty are highly influential in the effective use of patient simulation . This is also approved the current study results since post teaching session of clinical educators the student achievements changed toward improvement. Also **Brosnan et al. (2006) [47]** pointed out that mature students claimed that more practice effort was required but also felt more prepared for placements and achieved higher OSCE scores.

Internationally nursing professional boards has been endorsed simulation **(Nursing council of New Zealand2010[48], National League for Nursing 2003[49])**.The finding of the current study reveals that OSCE blending simulation help majority of students of both 1st and 2nd year developing self -confidence was increased post second exam .Also the students reported that the advantages of OSCE blending simulation are they thinking rather than memorizing , have more opportunity to learn , increase their experience generally , protect them from infection , increase sense of responsibility towards work and deal with patient and it focused on performance than the use of more words with statistical significant difference. The current study in agreement with research studies[45,50,51] findings which indicates that simulation allows for assessment and

evaluation of the student performance , whereby if the students demonstrates a mistakes in accurate patient assessment or slow clinical decision making patient health not affect and the student has the opportunity to learn from the experience.

The findings by **Howard et. al; (2010) [52]** indicated that the students in human patient simulation (HPs) group agreed more significantly than the interactive case study group that the teaching method assisted their critical thinking and was valuable learning experience and recommended that to utilize HPs as a teaching and learning strategy , citing its effectiveness in enhancing student learning outcomes.

Patient simulation is a learner centered instructional strategy where faculty act as primarily as facilitators. The role varies somewhat depending on whether the patient simulation is utilized for student learning or as a mean of evaluating student performance. In the current study simulation was used for learning students and blending OSCE as an evaluation of the student performance so the simulation in the current study was used as a learner centered instructional strategy. **Smith and Rochers (2009) [53]** found that students were satisfied with teaching method using simulation and were confident in their ability to care for patient and significance of the simulation had an effect on the students perception of their learning.

Cordeau (2010) [54] mentioned that overall student found the simulation to be a positive experience. & determine a number of implications for teaching and learning strategies to be considered : the student preparation for clinical simulation , the design, implementation and evaluation of the simulation affect the student's perception of their learning and their experience linking to learning objectives and transference of knowledge to clinical practice. Moreover the findings of the current study in congruent with a finding of a study was done by **Street and Hamilton (2010) [55]** which indicated that adequate preparation and sufficient practice not only the key to passing OSCE but also an important part of their ongoing development skilled knowledgeable practitioners. **Finally** for the development of nursing programs , it should consider the following criteria when determining the amount of simulation that can substitute for traditional clinical hours: overall number of clinical hours required, student pass rates, availability of clinical sites, turnover of faculty and program directors, student complaints, and retention rates .The findings that hypothesis one accepted suggested that nursing students exhibit improvement in overall achievement score of clinical exam using OSCE blended with simulation of both first and second year undergraduate nursing students. Fundamentals and medical surgical undergraduate nursing students achieve higher score in the second exam than first in half of them than in 1st exam and their overall succeeding rate was excellent. Also hypothesis two accepted because Nursing Students perceive OSCE blending with simulation as a useful evaluation tool post preparation of them and clinical education staff .OSCE blended with simulation is considered an attractive and active valid methods in teaching &evaluation of student and it will become more valuable if the clinical educators take into account its use when construct nursing curriculum.

VI. Conclusion

Based on the findings of the present study results, it can be concluded that with better planning in performing OSCE and increase of the students awareness with the stations and overcoming its barriers, OSCE can be used as valuable tool in evaluation of nursing clinical skills Simulation is an interactive and innovative teaching and learning strategy that has opportunity to provide effective clinical knowledge and skills into nursing practice. OSCE blending simulation is helpful ,effective and useful method in undergraduate nursing education and offers an attractive option for evaluating practitioner competency. Adequate training about OSCE blending simulation and strong scenario for students and their clinical educators participated in exam improves student clinical skills and competency ,the teaching , learning and help students to practice in a safe and well controlled environment. It enables students to use thinking rather than memorizing so it must be used. The feedback received regarding this evaluation tool provides evidence that OSCE is an acceptable useful tool and is considered valuable for further development and enhancement of OSCE blending simulation and development of nursing education program**.**

Recommendations

Based on findings of the current study, it is recommended that:

1. OSCE blending with simulation should be used as a method of evaluating clinical practice
2. OSCE must be used as an integral part of the nursing curriculums and clinical evaluation system / students' assessment at the under graduate.
3. It can be suggested that OSCE blending with simulation has the potential to make a very effective and meaningful contribution to fitness for practice.
4. The current results support the use of simulation in undergraduate nursing education.

Recommendation for Future researches

1. What is the impact had OSCE on improving care of our patients? How do we measure commitment integrity and dedication?

2. The transfer of knowledge to actual practice is not well documented because there remains a need to capture simulations impact on nurses knowledge and clinical judgment on actual patient outcomes

Acknowledgments

I gratefully acknowledge the contributions of the student participant, and would like to are thankful to colleagues and the students in Faculty of Nursing Tanta University who participated in this study for their great cooperation to carry out this work. Thanks also to the statistician for her support with the statistical analysis.

References

[1] Damodharan V. S, and Rengarajan.V .Innovative Methods of Teaching. available at : :http://math.arizona.edu/~atpmena/conference/proceedings/Damodharan_Innovative_Methods.pdf
[2] Ahmed, C, Ahmed, N & Abu Baker , R , (2009) . Assessing nursing clinical skills performance using objective structured clinical examination (OSCE) for open distance learning students in open university Malaysia international conference on information ' Kuala Lumpur , 12 – 13 August**.**
[3] Fidment, S. (2012) ;The Objective Structured Clinical Exam (OSCE): A Qualitative Study exploring the Healthcare Student's Experience. Student Engagement and Experience Journal, 1 (1): 1-11. Available at: http://dx.doi.org/10.7190/seej.v1i1.37 .
[4] Alinier, G. (2003); Nursing students and lecturers perspectives of objective structured clinical examination incorporating simulation. Nurse Education Today, 23 (6): 419-26.
[5] Ward H, Willis A (2006). Assessing advanced clinical practice skills: Helen Ward and Annaliese Willis show how the development of an Objective structured clinical assessment (OSCA) has enabled assessment of nurse practitioner advanced practice clinical skills at Masters Level. *Primary Health Care 16(3), 22-24.*
[6] Alinier G . Nursing student's and lecturer's perspectives of objective structured clinical examination incorporating simulations. Nurse Education Today, 2009; 23 (6): 419- 426
[7] Merriman ,C and Westcott, L., (2010) Succeed in OSCEs and Practical Exams: An Essential Guide For Nurses . 1st ed. Milton Keynes, Open University Press.
[8] Walters, J. and Adams, J. (2002): A child health nursing Objective Structured Clinical Examination (OSCE). Nurse Education in Practice; 2: 224-29.
[9] Wessel J., Welliam, R. Finch, E., Gemus, M. (2003); Reliability and Validity of an Objective Structured Clinical Examination For Physical Therapy Students. J of Allied Health.32(4):266-271**.**
[10] Bartfay, W.J., Rombough, R., Howse, E. and LeBlanc, R. The OSCE approach in nursing education: Objective structured clinical examinations can be effective vehicles for nursing education and practice by promoting the mastery of clinical skills and decision-making in controlled and safe learning environments. The Canadian Nurse, 2004; 100(3): 18-25.
[11] Chehrzad MM, Shafie Pour SZ, Mirzaei M, Kazem Nejad E. (2004) Comparison between two methods: Objective structured clinical evaluation (OSCE) and traditional on nursing students' satisfaction. Journal of Medical Faculty Guilan University of Medical Sciences. Summer; 13(50):8-13[Last accessed on 2010 Dec];J Gilan Med Fac. 2006 13:8–13. Available from: http://www.iranmedex.com/issues.asp?journalID=57
[12] Furlong E , Fox P , Lavin M and Collins R (2005) Oncology nursing students views of a modified OSCE. Euro .j of oncology. Nursing.,(9):351-359.
[13] Rushforth, H.,. Objective structured clinical examination (OSCE): review of
[14] literature and implications for nursing education. Nurse Educ. Today 2007; 27, 481–490.
[15] Walsh, M ., Bailey, PH and Koren ,I. (2009). Objective Structured Clinical Evaluation of clinical competence: An integrative review. J of adv.nurg.65(8):1584-1595.
[16] Selim A A, Ramadan F H. , El-Gueneidy MM.. Maha G M. (2012).Using Objective Structured Clinical Examination (OSCE) in undergraduate psychiatric nursing education: Is it reliable and valid? Nurse Education Today ;(32): 283–288, Available at : www.elsevier.com/nedt
[17] Rentschler D ,Eaton J , Cappiello S . McNally And P Mc Welliam (2007). Evaluation of undergraduate 's students using objective structured clinical evaluation . research brief 46(3): 135-139.
[18] Pierre, R.B., Wierenga, A. and Barton, M. et al. Student self-assessment in a pediatric objective structured clinical examination. West Indian med. J. 54 (2), (2005, 144-8.
[19] Major D (2005),OSCE s – Seven years on bandwagon the progress of an objective structured clinical evaluation programme. Nurse Education Today ,25:442-54.
[20] Ward, H & Barratt, J. (2005) Assessment of nurse practitioner advanced clinical skills using objective structured clinical examination (OSCE): Helen Ward& Julian Barratt examine how OSCE can be developed to ensure a robust assessment of clinical competence . Primary Health Care . 15(10):37-41.
[21] Issenberg SB, McGaghie WC, Gordon DL, Symes S, Petrusa ER, Hart IR, et al. Effectiveness of a Cardiology Review Course for Internal Medicine Using Simulation Technology and Deliberate Practice. Teach Learn Med. 2002;14:223–8.
[22] McGaghie W. (2010); A critical review of a simulation based medical education research . Medical Education , 44,50-63.
[23] Bradshow MJ, Lowenstein AJ.(2011). Innovative Teaching Strategies In Nursing And Related Health Professions . 5th ed; Jones & Bartlet, Boston , 173,206-209.
[24] Taras M (2005) Assessment – Summative And Formative – Some Theoretical Reflections University of Sunderland British Journal of Educational Studies, ISSN 0007-1005 © Blackwell Publishing Ltd. and SES.53.(4),: 466–478.
[25] Alinier, G., Hunt, B., Gordon, R., & Harwood, C. (2006) Effectiveness of intermediate-fidelity simulation training technology in undergraduate nursing education Journal of Advanced Nursing.54(3), 359-369.
[26] Pierre, R.B., Wierenga, A, and Barton, M. et al.,(2004);Student evaluation of an OSCE in pediatric at the University of the West Indies, Jamaica, BMC Medical Education. 4 (22): 1-7.
[27] Harden RM. (1990) Twelve tips for organizing an Objective Structured Clinical Examination (OSCE). Med Teach;12(3-4):259-264.
[28] Alinier, G. (2003); Nursing students and lecturers perspectives of objective structured clinical examination incorporating simulation. Nurse Education Today, 23 (6): 419-26.
[29] Medley, C., & Horne, C. (2005). Using simulation technology for undergraduate nursing education. Journal of Nursing Education, 44(1), 31-34.
[30] Ryall T , Judd BK , and Gordon C J (2016)Simulation-based assessments in health professional education: a systematic review Multidiscip Healthc. 2016; 9: 69–82. doi: 10.2147/JMDH.S92695https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4768888/

[31] El-Nemer, A. and Kandeel, N. Using OSCE as an Assessment Tool for Clinical Skills: Nursing Students' Feedback. Australian Journal of Basic and Applied Sciences, 2009; 3(3):2465-72.

[32] Rasoulian, M. ,· Taghva A · Ghalebandi Md (2007) A Qualitative Study of Psychiatrists' View About a Pilot Objective Structured Clinical Examination (OSCE) in Iran .Iranian Jof Psychiat. and Behav.Scien.1(1):27-29. Available PDF at https://www.researchgate.net/publication/228511964.

[33] Monaghan ,MP, Turner, R. Vanderbus and A Grady. (2000) Traditional student, non-traditional student and pharmacy practitioner attitudes toward the use of standardized patients in the assessment of clinical skills. American J of Pharmaceutical Education . 64:27-32.

[34] Khattab AD & Rawings B. (2001); Assessing nurse practitioner students using a modified objective structured clinical examination (OSCE). Nurse Educ. Today 21:541-50.

[35] Levett-Jones, T. and Lathlean, J. (2007). Belongingness: A prerequisite for nursing Students' clinical learning, Nurse Education in Practice, 8: 103–11.

[36] Imani and Tabatabaie, H. (2005) ; Is OSCE successful in pediatrics ? Journal of medical education 5(2): 153-58.

[37] Barry, M., Noonan, M., Bradshaw, C. and Murphy-Tighe, S (2012);. An exploration of student midwives' experiences of the Objective Structured Clinical Examination assessment process. Nurse Education Today, 32(6):690-694.

[38] Cioffi J. (2001) Clinical simulations: development and validation. Nurse Education Today 21, 477–486.

[39]] Bayoumy H.M. M. and Yousri(2012), Objective Structured Clinical Examination (OSCE) - Based Assessment in Nursing: Students' and Clinical Instructors' Perception Journal of American Science, 2012; 8(9):523 – 540. Available at: http://www.americanscience.org.

[40] Benseñor, E.M. How to evaluate the acquisition of clinical skills at medical school: A tough question. Sao Paulo Medical Journal, 2004; 122(1):12-17.

[41] Troncon LE.(2004);Clinical Skills assessment imitations to the introduction of an OSCE(Objective Structured Clinical Examination) in a traditional Brazilian medical school. Sao Paulo Medical j 122(1):12-17.

[42] Awaisu, A., Mohamed, M.H. and Al-E fan, Q.A.. Perception of pharmacy students in Malaysia on the use of objective structured clinical examinations to evaluate competence. Am J of Pharma. Edu., 2007; 71(6): 1-8.

[43] Eldarir, S A and Abd el Hamid, N A. (2013), Objective Structured Clinical Evaluation (OSCE) versus Traditional Clinical Students Achievement at I OSR J of Dental and Medic. Scei . (IOSR-JDMS). (4):63-68. Available at www.iosrjournals.org

[44] Ziv A, Small SD, Wolpe PR. (2000) Patient safety and simulation-based medical education .Medical Teach. 22(5):489–95.

[45] Nunnink L, Venkatesh B, Krishnan A, Vidhani K, Udy A. A prospective comparison between written examination and either simulation-based or oral viva examination of intensive care trainees' procedural skills. Anaesth Intensive Care. 2010;38(5):876–882.

[46] Lammers RL, Byrwa MJ, Fales WD, Hale RA. (2009);Simulation-based assessment of paramedic pediatric resuscitation skills. Prehosp Emerg Care. 13(3):345–356.

[47] Edgecombe K, Seaton P, Monahan K, Meyer S, Le Page S and Erlam G. (2013) Guide clinical simulation in nursing : Literature Review And Guideline For Practice. Ako Aotearoa, National Centre for Tertiary Teaching Excellence June ISBN: 978-1-927202-52-http://akoaotearoa.ac.nz/communities/collaboration-clinical-simulation-leading-way This work is published under the *Creative Commons 3.0 New Zealand Attribution Non-commercial*

[48] Benner P. From novice to expert . Menlo Park, CA: Addison Wesley; 1984.

[49] Brosnan, M., Evans, W., Brosnan, E., and Brown, G. (2006);Implementing objective structured clinical skills evaluation (OSCE) in nurse registration programs in a Centre in Ireland: A utilization focused evaluation. Nurse Education Today, 26: 115-122.

[50] Nursing Council of New Zealand (2010). Education programme standards for the registered nurse scope of practice. Retrieved from http://www.nursingcouncil.org.nz/download/204/ed prog-stds-rn-sop-sept10.pdf

[51] National League for Nursing. (2003). Executive report 2002-2003. Retrieved from http://www.nln.org/aboutnln/2002_2003execrprt.pdf

[52] Hawkins R, Gaglione MM, LaDuca T, et al(2004). Assessment of patient management skills and clinical skills of practicing doctors using computer-based case simulations and standardized patients. Med Educ. 38(9):958–968.

[53] Kaplan, B., & Ura, D. (2010). Use of multiple patient simulators to enhance prioritizing and delegating skills for senior nursing students. *J of Nursing Education, 49*(7), 371-377.

[54] Howard, V., Ross, C., Mitchell, A., Nelson, G. (2010). Human patient simulators and interactive case studies: A comparative analysis of learning outcomes and student perceptions. Computers, Informatics, Nursing, 28(1), 42-48.

[55] Smith, S., & Roehrs, C. (2009). High-fidelity simulation: Factors correlated with nursing student satisfaction and self-confidence. Nursing Education Perspectives, 30(2), 74-78.

[56] Cordeau, M. (2010). The lived experience of clinical simulation of novice nursing students. International Journal for Human Caring, 14(2), 9-15.

[57] Street P. and Hamilton L . (2010) Preparing To Take Objective Structured Clinical Examinations. Nursing Standards J. 24(34):35-39.