Comparative study of objective structured clinical examination and traditional practical examination in assessment of nursing students' clinical competencies in south west Nigeria

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Background: Clinical examination is a crucial part of nursing training programmes for assessing nursing student competencies which ultimately lead to the delivery of quality nursing care. Two methods of clinical assessment have been identified: [Traditional Practical Examination (TPE) and Objective Structured Clinical Examination (OSCE)] in nursing and allied professions globally. Nursing and Midwifery Council of Nigeria (N & MCN) previously used TPE for all clinical examinations in nursing. But it adopted the OSCE two decades ago for only midwifery examination while the examination in general nursing still remains TPE. There is dearth of literature on the effectiveness of these two methods hence this study. This will help to determine better method for clinical assessment among nursing students in Nigeria. **Methods:** The study utilised one-group quasi experimental design. Two Hospital-based and two University-based nursing schools randomly selected in South-west Nigeria participated in the study. Purposive sampling technique was used to select 187 nursing students out of which 157 participated in the study. T-test was used to analyze the data. **Results:** There was a significant difference in the effectiveness of OSCE and TPE in testing clinical competency of nursing students, scores for OSCE (M=64.08, SD=7.66) and TPE (M=59.03, SD=5.11); t(156)= 6.936, p = 0.001 at p≤ 0.005. These results suggested that OSCE is more effective than TPE in testing clinical competency of nursing students. **Conclusion:** OSCE effective in assessing student nurses' clinical competencies better than TPE. It is recommended that OSCE should be adopted as method of practical examination for nursing training programmes in Nigeria.

Keywords: Effectiveness, Competencies, Objective, Objective Structured Clinical Examination (OSCE), Traditional Practical Examination (TPE)

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Introduction

The use of Objective Structured Clinical Examination (OSCE) as a tool for formative and summative clinical evaluation in nursing has a relatively short history. This assessment method was first developed in 1979 in Dundee Scotland by Harden and Gleeson, where it was used to assess the clinical performance of medical students [3]. Since then, OSCE has been adopted as an assessment tool for evaluating the clinical performances of both undergraduate and graduate medical students. However, only a small volume of this effort has been reported in the nursing literature. It was reported that assessment of clinical practice has long been recognized as problematic, thus making clinical evaluation in nursing education an important activity [13] Assessment of clinical performance provides data from which to judge the extent to which students have acquired specified learning outcome. Assessment of clinical performance must be done in a way to clearly show whether students can think critically within the clinical setting, interact appropriately with patients, prioritize problems, and have basic knowledge of clinical procedures and complete care-procedures correctly [1]. Both theory and practical examinations form the bulk of the final summative examination in all Schools of Nursing and Midwifery in Nigeria. The oral/practical examination is used for its flexibility and its potential for testing higher order cognitive and psychomotor skills. The face-to-face interaction between the student and the examiner provides a unique opportunity to test interactive skills, which cannot be assessed in any other way. Studies have shown that the majority of question in practical examinations require little more than recall of isolated fragments of information [8].

Furthermore, traditional practical examination guide used presently has been criticised as having some deficiencies in terms of reliability. Marks awarded to candidates by different examiners indicate low reliability between the ratings especially in Schools of Nursing where there are no standardized checklists for rating students for different procedures [11]. It was also stated that with the method currently in use, sometimes, the length of time required to accomplish a certain task the assessor assigned to a candidate to perform may not allow the assessor opportunity to assess the candidateon all the areas that are

Listed on the clinical performance assessment guide [6]. Candidates who are less anxious have been observed to perform better in the oral practical examinations and it is also difficult to establish in any formal way the validity of the said oral practical examination[11]. The method adopted for the general nursing examination gives room for subjectivity that may have detrimental impact on the student, consumers of nursing care and the nursing profession. There is therefore a need for the adoption of OSCE for general nursing examination to make the assessment objective [6].

Evaluation of nursing competency is critical to assuring patient safety and maintaining high professional standards in the practice of nursing [13]. Competencies refer to skills or knowledge that leads to superior performance. These are formed through an individual/ organization's knowledge, skills and abilities and provide a framework for distinguishing between poor performances through to exceptional performance. A competency is a combination of skills, abilities, and knowledge needed to perform a specific task in a given context [4]. Competence should be concerned with the ability to master specific clinical skills and possess necessary personal characteristics to function effectively as a nurse including the capacity for reflection [8].

Assessment of competence of practising nurses has been identified as crucially important in maintaining professional standards identifying areas for professional development and educational needs and ensuring that nurse competencies are put to the best possible use in patient care. In view of the holistic definition of competence, there is general agreement that competence assessment in nursing cannot solely be based on demonstration of theoretical content knowledge or technical skills but should also involve some inference about a candidate's attitudes and practice. A core competency is defined as an internal capability that is critical to the success of business. These are organizational competencies that all individuals are expected to possess. These competencies define what the organization values the most in people. The goal of the core competencies is for individuals to be able to perform in a diverse number of positions throughout the organization.

Core Competencies are not seen as being fixed. Core Competencies should change

In response to changes in the company's environment. They are flexible and evolve over time. As a business evolves and adapts to new circumstances and opportunities, so its Core Competencies will have to adapt and change. These distinctive competencies are grouped for each job within the organization. The goal is to optimize performance by having the technical skills to perform a job.

These refer to competencies that are required by people in terms of behaviour. Team working is an example of competency required by an employee working in a typing group in an office where they may be required to cover up for others as the work grows. The characteristics required by a jobholder to perform a job effectively are called threshold competencies. For the position of a typist it is necessary to have primary knowledge about typing, which is a threshold competency.

The characteristics, which differentiate superior performers from average performers, come under this category; such characteristics are not found in average performers [7]. In conventional assessment techniques, the examiner evaluated the psychomotor skills and asked relevant questions. All these exercises were followed by a viva or a question answer session. They are relatively subjective, unstructured, can have errors of bias, ambiguity and obsolesce. It is for this reason that the concept of OSCE was introduced. On the other hand our conventional methods allow for an in-depth analysis of the subject, with more interaction between the examiner and the student. The examiner's professional judgment and experience can make the examination a learning exercise as it provides an instant feedback to the student. These advantages justify their inclusion [12]. The shortcomings of oral examinations and other highly prevalent assessment approaches have also been thoroughly documented. It was in light of this available evidence that we started OSCE which seems to be a reliable method that splits students into a large number of groups in terms of traditional method of examination. According to (Nwonu, 2014) in a paper presented in Nursing and Midwife.

Statement of the Problem: The purpose of practical examination is to ensure that students are objectively assessed without sentiment or bias with the understanding that they can rise up to challenges of clinical practice. Assessment of

Clinical competence of nursing students has constituted a problem to nurse educators. Traditional practical examination assessment scoring sheets have been discovered over time to have some deficiencies in terms of reliability, validity and objectivity. Marks awarded by different examiners to candidates indicate low reliability between the ratings because there are no standardized checklists for rating students and agreement between examiners is often poor [11].

This examination has been unreliable because two examiners may not get the same scores for the same candidate under the same circumstances. This is because questions are not structured along a clearly defined pattern. It is difficult to establish in any formal way how valid an oral practical examination is [2].

The problem that may readily arise from assessors' inability to determine and assign the correct scores to the students during clinical examination is that clinical competency will be difficult to determine. There is possibility of the examiners been stringent, that is examiners may be too strict.

On the part of the students, their scope of preparation is limited as they can guess the procedure they are to be examined on based on the examination timetable. There is an inverse relationship between anxiety and performance in practical examinations as candidates who are less anxious perform better in the oral practical examinations [5].

The above mentioned problems / deficiencies have stirred up the interest of the researcher to look critically into and find out the most effective method of assessing nursing students during practical examination. Although OSCE appears to be a promising method for evaluating the performance of clinical skills, there seem to be limited information on its use for basic/generic nursing programme in the nursing literature that critically examine the use of the OSCE as an instrument for evaluating the performance of clinical skills by nurses in Nigeria *vis a vis* its comparison with the traditional method of practical examination (TPE). This study intends to assess the effectiveness of Objective Structured Practical Examination (OSCE) in the assessment of nursing students' clinical skills in selected Schools of Nursing in South-west Nigeria compared with the use and effectiveness of TPE.

Objective of the Study

General Objective: The broad objective of the study is to compare Objective Structured Clinical Examination (OSCE) and Traditional Practical Examination (TPE) in assessing nursing students' clinical competency in South-west Nigeria in order to identify the more effective of the two methods.

Specific Objectives

01. To compare the nursing students' performances scores in TPE and OSCE in the selected Schools and Departments of Nursing in the study settings.

02. To assess the difference in the effectiveness of OSCE and TPE in testing clinical competency of nursing students.

Research Hypotheses

01. There will be no significant difference in the scores obtained by the students from Objective Structured Practical Examination (OSCE) and Traditional Practical Examination (TPE).

02. There will be no significant difference in the effectiveness of OSCE and TPE in testing nursing students' clinical competency.

Significance of the Study: The measurement of clinical skills performance has been posing challenges for nurse educators. The use of OSCE is a huge success attempt to meet these challenges. Time and experience have however exposed the faults and deficiencies of the traditional instrument especially in the area of testing clinical competencies. Results of the study have:

- Provided comparative data between OSCE and TPE methods of assessing nursing students' clinical competency.

- Identified that OSCE is the most effective methods of assessing the nursing students.

- Contributed to the available literature on OSCE as an approach for evaluating clinical competency in nursing programmes in Nigeria.

- Confirmed that public will enjoy better services from nurses who would have been assessed and certified through the use of more effective practical method.

Methodology

The study utilised one group quasi experimental Design. It assessed the effectiveness of TPE and OSCE by nursing students in assessing clinical competency in South-west Nigeria.

The TPE was conducted as control examination while OSCE was used asexperimental. The two results of nursing students in the two examinations were later compared.

The study was conducted in two Schools of Nursing and two Departments of Nursing in South-western States of Nigeria.

The instruments for data collection were divided into 4 segments as follows:

- **Objective Structured Clinical Examination Instruments (OSCEI).** This was developed to score students during OSCE which is the experimental practical examination. The newly designed OSCE instruments were administered by educators/assessors on the nursing students of four (4) selected nursing programmes during practical examination to assess the students' clinical skills.

- **Traditional Practical Examination Instrument (TPEI).** This is the accepted assessment format by Nursing and Midwifery Council of Nigeria (NMCN) used to assess nursing students during practical examination at all levels. It was adopted in this research during the TPE which was the Control Examination to assess nursing students.

Validity: The validity of the scores obtained from OSCE and TPE during pilot testing were subjected to criterion reference validity test using spearman's correlating coefficient statistical test. The results were as follows: the correlation between mean OSCE scores and the grade point average of 50% (pass mark recognised by Nursing and Midwifery Council of Nigeria) are significant r value = 0.800, P value = 0.006. Similarly for TPE r = 0.911, P = 0.001 indicating that scores obtained using both instruments were statistically valid.

Reliability: The reliability of the instrument was determined by pilot testing. This was done in Ekiti State University Teaching Hospital, School of Nursing. The reliability coefficients of the instrument were determined using Cronbach's Alpha statistical method. The values obtained are as follows:

- Students Demographic Instrument (SDI). 840.

- Traditional Practical Examination Instrument (TPEI). 575.

- Objective Structured Practical Examination Instruments **(OSCEI).**

- Procedure checklist (Urine testing). 785, Procedure checklist (Bed Bath). 840

- Procedure checklist (Vital signs). h729, Question stations. 874

Sampling technique and size: Two Hospital-based and two University-based nursing schools were randomly selected in South-west Nigeria. The four schools participated in OSCE. A purposive sampling technique was used to select 187 nursing students out of which only 157 participated in the study.

Ethical issue: Approval to conduct this study was given from all the selected schools research and ethical committee, students who participated in the study were duly informed about the pain and benefits of the study, and they all consented to participate in the study.

Results

Socio-Demographic Characteristics of Nursing students in the Study.

Table 1: Socio-Demographic Characteristics of nursing students.

Socio-demographiccharacteristics	Variables	FrequencyN=148	%
Sex	Male	38	25.7
	Female	110	74.3
Age on admission	<20	66	44.5
	20 – 25	75	50.6
	25 and above	7	4.7
Level of study	Basic 2nd Year	87	58.7
	Generic 300 level	61	41.3
State of origin	Ondo	32	21.6
	Oyo	25	16.9
	Osun	26	17.6
	Ogun	10	6.8
	Lagos	7	4.7
	Ekiti	23	15.5
	Edo	9	6.1
	Imo	6	4.1
	Kogi	6	4.1
	Anambra	4	2.7
Ethnicity	Yoruba	127	85.8
	Igbo	10	6.8
	Benin	11	7.4
Religion	Christianity	100	67.6
	Islam	48	32.4

The results of research on the comparability of effectiveness of objective structured practical examination and traditional practical examination in assessing nursing students' clinical competency in South-West Nigeria are presented in this chapter. Results are presented in tables

The population distribution of nursing students in the study as presented in Table 1. Shows that 157 students took part in the two practical examinations, that is, OSCE and TPE. Table 1 showed that 148 out of 157 respondents completed and returned the questionnaires thus given 94.2% return rate. One hundred and forty-one respondents (95.1%) were within the age range of 18 to 25 years mean age was 21.5years + 3.8years. Majority 110 (74.3%) respondents were female and more than half 87 (58.7%) were hospital based second year nursing students with the rest 61 (41.3%) being universitybased generic nursing students. Majority of respondents 123 (83.1%) were of Yoruba ethnic group spread across the Yoruba speaking States of south-west Nigeria. The rest were from Edo 9 (6.1%), Imo 6 (4.1%), Kogi 6 (4.1%) and Anambra 4 (2.7%).

Objective 1: To compare the nursing students' performance scores in Traditional and Objective Structured Clinical Examinations in the selected Schools and Departments of Nursing in the study setting.

Hypothesis 1: There will be no significant difference in the scores obtained in Traditional Practical Examination (TPE) and Objective Structured Clinical Examination (OSCE) in the selected Schools and Departments of Nursing in the study setting.

Table 2: Comparison of nursing students' scores in TPE and OSCE.

Paired Samples Test								T	Df	Sig. (2-tailed)
		Paired Differences								
		Mean	Std. Deviation	Std.Error Mean	95% ConfidenceInterval of theDifference					
					Lower	Upper				
Pair 1	OSCE	64.59	5.15	0.72	3.72	5.56		3.29	157	.002
	TPE.	59.31	2.92							

In order to test this hypothesis a paired sample t-test was conducted to compare the performance in TPE and OSCE at P=0.05 confidential interval. There was a significant difference in the scores in TPE and

OSCE. TPE mean 59.31+2.92, OSCE mean 64.59+5.15, t= 3.29, P = 0.002. The null hypothesis is therefore rejected. The results suggested that there was a significant difference in the scores of TPE in the selected Schools and Departments of Nursing, and OSCE in the selected Schools and Departments of Nursing in the study setting.

Objective 2: To assess the difference in the effectiveness of OSCE and TPE in testing clinical competency of nursing students.

Hypothesis 2: There will be no significant difference in the effectiveness of OSCE and TPE in testing clinical competency of nursing students.

Table 3: Clinical Competency of Nursing students during OSCE and TPE

Variables	TPE		OSCE	
	Freq	%	Freq	%
Not Competent (below 40% – 49%)	1	0.64	5	3.2
Fairly competent (50% - 59%)	87	55.4	30	42.4
Competent (60% - 69%)	65	41.4	91	58
Very competent (70% and above)	4	2.5	31	19.7
	157		157	

Table-4: Difference in the Effectiveness of OSCE and TPE in testing Clinical Competencies of Nursing Students.

		Paired Differences						t	df	Sig. (2-tailed)
		Mean	Std.	Mean Diff.	Std. Deviation Diff.	>Std. Error Mean	95% Confidence Interval of the Difference			
							Lower	Upper			
Pair 1	OSCE	64.59	7.66	5.05	9.11	.73	3.61	6.48	6.94	156	.001
	TPE.	59.03	5.12								

In table 3 results revealed that nine (5) students scored below 50% in OSCE while one scored below 50% in TPE (not competent); 30 students scored between 50% and 59% in OSCE while 87 students scored the range of marks in TPE (fairly competent); 91 students scored between 60% and 69% in OSCE while 65 students recorded the same scores in TPE (competent); for very competent group; 31 students scored 70% and above in OSCE while four (4) students scored within the same range of scores in TPE.

In table 4 A paired-samples t-test was conducted to compare the difference in the effectiveness of OSCE and TPE in testing clinical competency of nursing students. There was a significant difference

In the effectiveness of OSCE and TPE in testing clinical competency of nursing students, scores for OSCE (M=64.08, SD=7.66) and TPE (M=59.03, SD=5.11) with conditions; t (156) = 6.936, p = 0.001 at p≤ 0.005. Therefore, the null hypothesis is hereby rejected. These results suggested that OSCE is more effective than TPE in testing clinical competency of nursing students.

Discussion

A total number of 157 students participated in the study. They took part in the two practical examinations, that is, OSCE and TPE. Only 148 out of 157 respondents completed and returned the questionnaires thus giving 94.2% return rate. The respondents' characteristics of age range and mean age of 21.5+3.8 years is consistent with Nursing and Midwifery Council of Nigeria age limit for would-be nursing students at any level of entry into the training program which stipulates that the nursing students must not be less than 17 years by the time of their indexing, usually six months after admission. The gross gender imbalance of 74.3% female and 25.7% male supports the general observation and believe that describe nursing as a predominantly female profession in Nigeria.

All the respondents are either in their second year for basic students or 300 level for generic students meaning that the respondents are familiar with the use of TPE as a form of practical examination but had their first major experience with the OSCE in this study. It was also discovered that the students came from various States of the Federation and of various ethnic groups with majority being Yoruba. This may be because the study was carried out in the south-western part of Nigeria which is predominantly a Yoruba speaking area.

The results in the four schools revealed a higher mean score in OSCE than TPE. This could be a reflection of the highly structured nature of OSCE and its scoring method which was designed to erase any form of bias. It could also be a reflection of the fact that the students prepared very well for the OSCE being a new method of practical examination. This result is contrary to the findings of a similar study where it was reported that the average scores obtained by the students in the two methods of practical examinations were nearly equal, that is, 61.2 in OSCE and 61.5 in CPE [7].

Result is also contrary to the findings of result that OSCE and CPE are in agreement because analysis of scores obtained from both practical examination shows that 96% of the values fell within the limits of the mean of ±1.96 SD [10]. However, this finding is in support of similar study of physiology practical examination from four medical colleges combined which showed a significant higher mean score in OSCE when compared to TPE [4].

Result shows that OSCE and TPE have different ability to test clinical competency of students. Findings show that OSCE was able to test clinical competency among nursing students better than TPE. This could be as a result of the highly structured nature of OSCE and its wider coverage of curriculum. OSCE was further shown to be more capable in discriminating between lower and higher achiever, that is, poor and very good students. Findings show that OSCE was able to test clinical competency among nursing students better than TPE. Results shows that more students were grouped as not competent (5) in OSCE as against five (1) in TPE while more students were also grouped as very competent (31) in OSCE as against (4) in TPE. This result is congruent to the findings of a similar study conducted where it was reported that OSCE splits the students into a large number of groups in terms of measured competence or discriminates between different levels of competence better than the traditional method of examination [9].

Implications of Results to Nursing Education: Results from this study revealed that OSCE is more effective in assessing nursing students' clinical competency in nursing training programmes. Nursing students actually performed significantly better in OSCE than TPE, the implication of this discovery is that Nursing and Midwifery Council of Nigeria and other relevant stakeholders in nursing education should critically review the continuous use of TPE in Nursing training programmes with the aim of either replacing it outright with OSCE or remodelling it to correct the notable faults to reflect current realities in Nursing training and nursing education. OSCE is more effective in testing student clinical competencies than TPE. What this implies is that OSCE can successfully replace TPE without the fear of losing credibility, quality or standard of practical examination. Findings on the preference for the two methods of practical examination show that students significantly

Prefer OSCE to TPE indicating that if OSCE is introduced into the nursing curriculum, the move will be positively embraced by students and nursing can successfully join other health profession such as midwifery, medicine, pharmacy and physiotherapy that are already implementing OSCE as the mode of practical examination in their training programmes.

Implications for further study: This study should be replicated in other Nursing training institutions in other parts of the country using schools' real examinations to validate the findings.

Recommendations: Objective structured practical examination is a new development in the assessment of clinical competency of nursing students. On the strength of the findings of this research, the followings are recommended:

- The Nursing and Midwifery Council of Nigeria, that is, the body that regulates nursing education and the nurse educator, who prepares students for professional practice, should adopt the OSCE for the general nursing practical examination. This will help to produce nurses that are clinically competent to render quality care to patients and to achieve this lofty idea and goal, OSCE should be fully adopted at all levels of nursing training.

- Schools and departments of nursing demonstration laboratories in Nigeria should be equipped with necessary manikins and body parts so as to enhance the valuable learning and assessment opportunities inherent in the clinical education component of our nursing programs.

- There is a need to create competency-based curriculum for nursing education with OSCE process being inculcated into general/generic nursing program curriculums in Nigeria.

Summary and Conclusion

This study was carried out to assess the effectiveness of objective structured practical examination and traditional practical examination in assessing clinical competency of nursing students in selected nursing training institutions in south-west Nigeria. The study utilised quasi experimental design. TPE which is control and OSCE which is experimental are both forms of practical examination for assessing nursing students in this

Study. Four schools (two departments of Nursing and two schools of Nursing) were randomly selected for the study. These schools were used as both control and experimental groups. A total of ten (10) OSCE stations were used viz: three (3) observed stations, two (2) skill description stations and five (5) question stations. A total of one hundred and fifty seven students were trained and participated in the study.

Evidence from findings revealed that students performed significantly better in OSCE than TPE in the final analysis. Findings showed that OSCE was able to test clinical competency among nursing students better than TPE. It is therefore concluded from the results of this study that OSCE method of practical examination is more effective in assessing nursing students' clinical competency than TPE.

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