

Objective Structured Clinical Examination as A Reliable tool in the Summative Evaluation of Final Year Medical Students at Enugu State University College of Medicine

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ABSTRACT

Objective structured clinical examination (OSCE) is a reliable, objective and reproducible method of summative assessment of clinical competence. The aim of this study is to evaluate the reliability of OSCE for summative evaluation of final year medical students in both Internal Medicine and Surgery. This was a retrospective cross-sectional study of summative assessment of final-year medical students in Internal Medicine and Surgery at College of Medicine, Enugu State University of Science and Technology. The students' clinical competence was tested by OSCE. The OSCE consisted of two parts. The A part (picture OSCE, replacing traditional short cases) in which questions were given to students from slide shows. The B part (clinical OSCE, replacing traditional long case) consisted of clinical OSCE stations to test students' ability and skills in history taking, physical examination, counselling/communication skills, ability to make diagnosis, interpretation of laboratory/radiological results and ability to manage common medical emergencies and conditions. The students' scores in the picture OSCE, clinical OSCE, and final total clinical score scores in both Internal Medicine and Surgery were collated and subjected to analysis with SPSS version 25 (IBM; SPSS, Chicago, IL, USA). Correlation was assessed by Pearson correlation, mean scores compared with paired t-test, reliability assessed by calculating Cronbach's alpha. Statistical significance was considered as $p < 0.05$. A total of 120 students sat for the examinations. There were significant positive correlations between students' score in Surgery clinical OSCE and Internal Medicine clinical OSCE, $r = 0.617$ ($p = 0.000$); students' scores in Surgery picture OSCE and Internal Medicine Picture OSCE, $r = 0.647$ ($p = 0.000$); and students' scores in Surgery clinical examinations and Internal Medicine clinical examinations, $r = 0.750$ ($p = 0.000$). The reliability of Surgery clinical examinations was 0.851 while the reliability of Internal Medicine clinical examinations was 0.816. OSCE is a more reliable tool than traditional method for the summative assessment of final year medical students. OSCE gives a higher correlation coefficient and Cronbach alpha than the traditional method of assessment.

Keywords: Medical students, objective structured clinical examination, reliability, summative assessment.

I. INTRODUCTION

Objective structured clinical examination (OSCE), since its introduction in the mid-seventies by [1], has gained popularity as a reliable, objective, and reproducible method of formative and summative assessment of clinical competence. In the formative stage of training, it does not only help in evaluation of clinical skills while in training but also in teaching relevant clinical skills using standardized patients [2]. All over the world, OSCE is being applied in the training and assessment of health professionals [3]-[5].

Worldwide, the teaching and learning process in higher education has made tremendous progress in recent years [6], [7]. In Medical schools, changes in curricular have occurred with emphasis shifting to problem solving based learning and

active learning strategies. With these changes, it is self-defeating to continue using the traditional method of assessment of medical students' clinical competences with long and short cases [8]. In the past, OSCE was not popular in Nigerian medical schools [9]. Over the past few years, most medical examiners in Nigeria have abandoned the traditional method of evaluation for OSCE in the evaluation of clinical competence both in undergraduate and postgraduate medical training [10]-[12].

Furthermore, in a comparative study by [13] in respective medical schools that use traditional method of clinical examination and OSCE, medical educators in both schools agreed that OSCE is an objective way of evaluating clinical competence of medical students. In a previous study by [14] to compare OSCE and traditional clinical examination in the

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summative evaluation of final year medical students at Enugu State University of Science and Technology (ESUT), OSCE was found to be a more reliable modality of evaluation (Cronbach alpha=0.863) than traditional clinical examination (Cronbach alpha= 0.433). The aim of this current study is to evaluate the reliability of OSCE for summative evaluation of final year medical students in both Internal Medicine and Surgery, as only Surgery department used OSCE in the previous study by [14], while Internal Medicine department used traditional long and short cases.

II. METHODOLOGY

This was a retrospective cross-sectional study of summative assessment of final-year medical students in Internal Medicine and Surgery at College of Medicine, ESUT. The final examinations were held in November, 2021. Both departments of Internal Medicine and Surgery had written examination (to test cognitive ability) consisting of essays and objective structured questions. In addition, the students' clinical competence was tested by OSCE.

The OSCE consisted of two parts. The A part (picture OSCE, replacing traditional short cases) in which questions were given to students from slide shows. These slides contain not only questions and case scenarios but also instruments, images of disease conditions and diagnostic images such as X-rays and computed tomography scans for interpretation. The students had 3 min to answer the question (s) in each slide. In this picture OSCE, the slide automatically transits to the next slide projection after 3 min. The B part (clinical OSCE, replacing traditional long case) consisted of clinical OSCE stations to test students' ability and skills in history taking, physical examination, counselling/ communication skills, ability to make diagnosis, interpretation of laboratory/ radiological results and ability to manage common medical emergencies and conditions. A stopwatch is used for timing the duration students spend in a station and a ring of bell is used to control entrance into and exit from the stations. Students spent 5 minutes at the stations. At the end of 5 minutes, the student occupying a particular station, on the sound of the bell, leaves the station and moves to the next station. Each student performs the same tasks and was marked and assessed according to the same assessment criteria on the examiner's checklist using criterion referenced system of grading [15].

The students' scores in the picture OSCE, clinical OSCE, and final total clinical score scores in both Internal Medicine and Surgery were collated and subjected to analysis with SPSS version 25 (IBM; SPSS, Chicago, IL, USA). Correlation was assessed by Pearson correlation, mean scores compared with paired t-test, reliability assessed by calculating Cronbach's alpha. Statistical significance was considered as $p < 0.05$.

III. RESULTS

A total of 120 students sat for the examinations. Sixty-four were males and 56 were females giving a male: female ratio of 1.14:1. While 8 students sat for only Internal Medicine, 112 sat for both Internal Medicine and Surgery. There were

significant positive correlations between students' score in Surgery clinical OSCE and Internal Medicine clinical OSCE, $r=0.617$ ($p=0.000$); students' scores in Surgery picture OSCE and Internal Medicine Picture OSCE, $r=0.647$ ($p=0.000$); and students' scores in Surgery clinical examinations (Surgery clinical OSCE+ Surgery picture OSCE) and Internal Medicine clinical examinations (Internal Medicine clinical OSCE+ Internal Medicine picture OSCE) $r=0.750$ ($p=0.000$). The correlation between students' score in Surgery clinical examinations and Internal Medicine clinical examination is shown in a scatter plot (figure1).

Using paired sample T test to compare means, there was statistical difference between the mean score of surgery clinical OSCE (mean= 61.43, SD= 8.18) and mean score of Internal Medicine clinical OSCE (mean= 57.78, SD= 8.30), $t(111) = 5.356$ ($p= 0.000$). There was also significant difference between the mean scores in Surgery picture OSCE (mean= 26.86, SD =5.83) and mean scores in Internal medicine picture OSCE (mean= 31.42, SD = 7.44), $t(111) = -7.979$ ($p=0.000$). There was no significant difference between the mean score in Surgery clinical examinations (mean= 88.29, SD= 13.27) and mean score in Internal Medicine clinical examinations (mean= 89.20, SD = 14.50), $t(111) = -0.866$ ($p= 0.388$).

The reliability (measured using Cronbach's alpha) of Surgery clinical examinations (comparing individual student's scores in Surgery clinical OSCE versus Surgery picture OSCE) was 0.851 while the reliability (using Cronbach's alpha) of Internal Medicine clinical examinations (comparing individual student's scores in Internal Medicine clinical OSCE versus Internal Medicine picture OSCE) was 0.816.

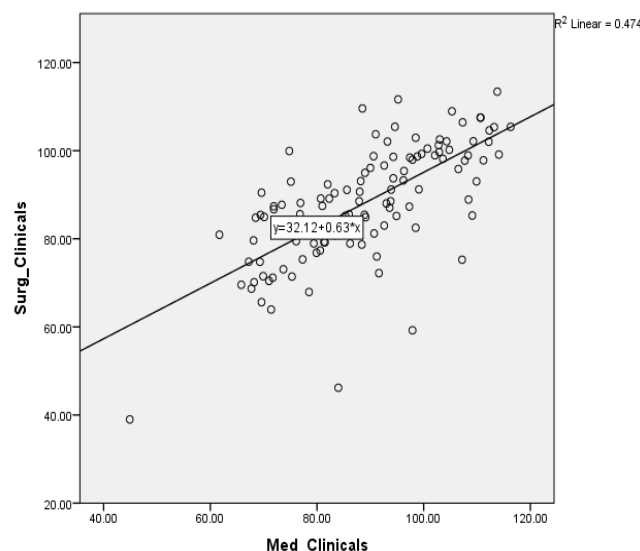


Fig. 1. Scatter plot of correlation between students' scores in Surgery and Internal Medicine clinical examinations.

IV. DISCUSSION

Traditional clinical skills assessment methods have a lot of limitations in holistically evaluating students without bias [16]. OSCE became an answer to decades of dissatisfaction with the use of the traditional long case and short case clinical examination [11]. Even though OSCE consumes a lot of

resources in terms of personnel, time, finances, and facilities required for its execution especially in large groups of students [17], its use in medical education should be encouraged as it effectively measures various degrees of medical clinical skills [16]. It has been found to be a comprehensive, valid and reliable tool for clinical assessment [18], [19].

Reference [20], in a study to evaluate the reliability of a newly developed OSCE for the evaluation of 4th year dental students, found a Cronbach's alpha of 0.68. The Cronbach's alpha of > 0.8 found in the current study is higher than that found by [20]. This can be explained by the fact that we have developed experience in using OSCE for summative assessment of medical students as OSCE has been used in summative assessment in our medical school since June, 2019 [14]. In a study to evaluate the reliability of OSCE among preclinical dental students in Columbia University College of Dental Medicine, [21] found a high Cronbach's alpha of 0.86. This is like a high Cronbach's alpha found in our current study using OSCE in the summative evaluation of medical students.

Between our previous study [14] and the current study, department of Internal Medicine has abandoned the traditional method for summative assessment of final year medical students and have adopted the OSCE. In this current study, the correlation coefficient of Surgery picture OSCE and Internal Medicine picture OSCE ($r=0.647$) was higher than was previously found for Surgery picture OSCE and Internal Medicine short case ($r=0.450$). Also, the correlation coefficient of Surgery clinical OSCE and Internal Medicine clinical OSCE in this current study ($r=0.617$) was higher than was previously found by us between Surgery clinical OSCE and Internal Medicine long case ($r=0.525$). The high Cronbach's reliability test for the two arms of Surgery clinical examinations ($\alpha=0.851$) found in this current study is similar to a high reliability ($\alpha=0.851$) found in our previous study. On the other hand, the Cronbach's reliability found in this study for the two arms of Internal Medicine clinical examinations ($\alpha=0.816$) is higher than what we found in our previous study ($\alpha=0.433$). This means that OSCE is more reliable than traditional clinical examinations in the summative assessment of final medical students in our medical schools. The higher reliability of OSCE has also been found in other studies [11], [13], [20], [21].

V. CONCLUSION

In our medical school (where this current study and previous study were carried out), by comparing the findings in this study and our previous study, OSCE is a more reliable tool than traditional method (long and short cases) for the summative assessment of final year medical students. OSCE gives a higher correlation coefficient and Cronbach alpha than the traditional method of assessment.

CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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