

Clinical Examination among Medical Students: Assessment and Comparison of the Strengths and Weaknesses of Objective Structured Clinical Examination and Conventional Examination

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ABSTRACT

Background: Traditional clinical examination is perceived to be biased and to overcome this, objective structured clinical examination (OSCE) was introduced.

Aims: The aim was to assess the students' exposure and perception of OSCE as well as its strengths and weaknesses in comparison to conventional clinical examination. **Subjects and Methods** A cross-sectional study of students who had surgical OSCE was conducted from July 2018 to October 2018 in Ahmadu Bello University, Zaria. Using a structured questionnaire, exposure and perception of OSCE as well its strength and weaknesses in comparison to the conventional clinical examination were assessed with dichotomous questions and a 5-point Likert scale. Data were analyzed with SPSS Version 20. **Results:** One hundred and thirty-four students responded, mean aged 24.1 ± 4.3 years, with a male-to-female ratio of 2.5:1. Although 64.7% of them strongly agreed that OSCE is the standard mode of examination, only 36.1% strongly agreed that it was easier to pass. More than half of the students perceived that the content of the OSCE was appropriate, wide-scoped, unbiased, and brought out specific areas of weakness. Some students (38.1%), however, felt that there was a need for improvement in the OSCE process, especially in time allocation, but most of them (89.5%) prefer it and agree that it was superior to conventional clinical examination. **Conclusions:** The perception of the process and structure of OSCE among the medical students was good. Compared to conventional clinical examination, students found OSCE was easier and fairer, had a better examination of structure and level of coordination, and induced lesser anxiety and fatigue. However, the entire process of OSCE can be improved.

KEYWORDS: Knowledge, medical education, objective structured clinical examination, perception

INTRODUCTION

Periodic examination of clinical competencies in medical school is essential in the education process.^[1] Medical training is broad and to assess the competency of the students in clinical skills, a comprehensive examination is required at several stages of the training.^[2] Traditionally, clinical examination involves the presentation and discussion of history, physical findings, investigations, and treatment of the patient.^[3] This mode of examination is characterized by interexaminer variation in marking standards.^[1]

Therefore, it is difficult to adequately and objectively assess clinical skills.^[3] A better method is also needed to assess ethical reasoning, professional judgment, and communication skills of the candidates. Objective structured clinical examination (OSCE), which was introduced in 1975 by Harden in Scotland, uses simulated

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clinical situations to evaluate the clinical skills of the student.^[4] It is not only objective, but also consistent and evaluates the psychomotor, cognitive, and affective domains at the same time. A survey of students' opinion is important to assess the strengths and weaknesses of the system so as to guide system improvement.^[2]

The Department of Surgery of Ahmadu Bello University recently introduced OSCE for the clinical examination of the students. The aim of this study was to assess the students' exposure and perception of OSCE as well as its strengths and weaknesses in comparison to conventional clinical examination.

SUBJECTS AND METHODS

It was a cross-sectional study conducted on all 400- and 600-level clinical students who participated in the Surgery OSCE session at the Ahmadu Bello University Teaching Hospital, Zaria, between July 2018 and October 2018 following approval from the Department of Surgery. The OSCE had 15 stations and 5 rest spots. The station covered wide areas of clinical skills (history taking using trained simulators and physical examination using patients) and other required competence (differential diagnosis, investigations, and treatment; picture tests and instrument discussion). The time allocated per station was 5 min. Candidate assessment was done at each manned stations by two independent assessors using a uniformly structured checklist. Immediately after the examination, consenting candidates were asked to fill a specially designed self-administered questionnaire based on dichotomous answers to assess the knowledge, exposure, and future preference for OSCE and a 5-point Likert scale to assess the perception of its content and process. Increasing levels of examination difficulty, bias, preference, structure, coordination, anxiety induction, and fatigue were also assessed for both OSCE and conventional clinical examination using a 5-point Likert scale (1 = very low level to 5 = very high level). No record of candidates' identity was required while filling the questionnaire.

Data were analyzed using the Statistical Package for the Social Sciences Version 20 and were presented as tables and charts. The categorical variables were summarized as frequency and percentages and the continuous variables were summarized as mean and standard deviation. For the assessment of some specific examination factors,

“strongly agree” and “agree” on the 5-point Likert scale were collapsed as “positive” while “strongly disagree” and “disagree” were collapsed as “negative.” Comparison of the mean score of OSCE with conventional clinical examination factors was done using paired *t*-test with $P < 0.05$ considered statistically significant.

RESULTS

A total of 134 students responded to the questionnaire. The mean age of the students was 24.1 ± 4.3 years. Ninety-four (71.8%) were male, while 37 (28.2%) were female. Majority of the respondents (130 [98.5%]) had no previous degree. Analysis of the level of posting showed that 99 (76.7%) were 4th-year students, while 30 (23.3%) were 6th-year students. Majority of the candidates, 128 (95.5%) had prior exposure to OSCE in other clinical departments. However, only 75 (58.1%) said that they had adequate knowledge to participate in it [Figure 1]. While 86 (64.7%) strongly agreed that OSCE is standardized, only 48 (36.1%) strongly agreed that it was easier to pass [Table 1].

Regarding the assessment of the perception of the content of OSCE, 51.5%, 53.0%, and 54.9% of the candidates, respectively, strongly agreed that it addressed bias in physical examination, covered wide areas of clinical competence, and brought out specific areas of weakness [Figure 2]. Although just over two-fifths (41.0%) of the candidates strongly agreed that the OSCE process felt like a real-life scenario and allowed the candidates compensate in areas of strength (43.6%), just over a quarter of them (27.6%)

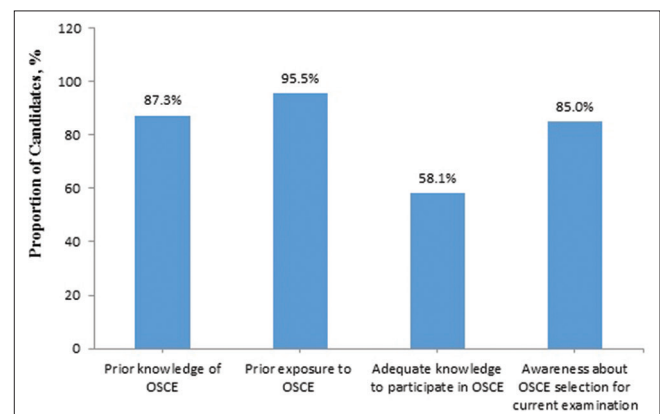


Figure 1: Assessment of the knowledge and exposure of the candidates to objective structured clinical examination

Table 1: Assessment of general perception of objective structured clinical examination

General perception	Number of candidates, <i>n</i> (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
OSCE is easier to pass	48 (36.1)	46 (34.6)	35 (26.3)	2 (1.5)	2 (1.5)
OSCE is standardized	86 (64.7)	36 (27.1)	10 (7.5)	1 (0.8)	0

OSCE=Objective structured clinical examination

Table 2: Assessment of the strengths and weaknesses of objective structured clinical examination and conventional clinical examination

Examination factors	Number of candidates, <i>n</i> (%)		
	Positive	Neutral	Negative
Level of ease			
OSCE	41 (48.8)	34 (40.5)	9 (10.7)
Conventional examination	12 (14.6)	31 (37.8)	39 (47.6)
Degree of bias			
OSCE	0 (0.0)	4 (4.8)	80 (95.2)
Conventional examination	35 (42.2)	30 (36.1)	18 (21.7)
Examination preference			
OSCE	75 (89.3)	8 (9.5)	1 (1.2)
Conventional examination	11 (13.6)	34 (42.0)	36 (44.4)
Examination structure			
OSCE	74 (89.2)	8 (9.6)	1 (1.2)
Conventional examination	25 (31.6)	37 (46.8)	17 (21.5)
Examination coordination			
OSCE	75 (89.3)	7 (8.3)	2 (2.4)
Conventional examination	34 (41.5)	33 (40.2)	15 (18.3)
Anxiety induction			
OSCE	52 (61.9)	16 (19.0)	16 (19.0)
Conventional examination	75 (90.4)	6 (7.2)	2 (2.4)
Examination fatigue			
OSCE	51 (61.4)	16 (19.3)	16 (19.3)
Conventional examination	66 (80.5)	7 (8.5)	9 (11.0)

OSCE=Objective structured clinical examination

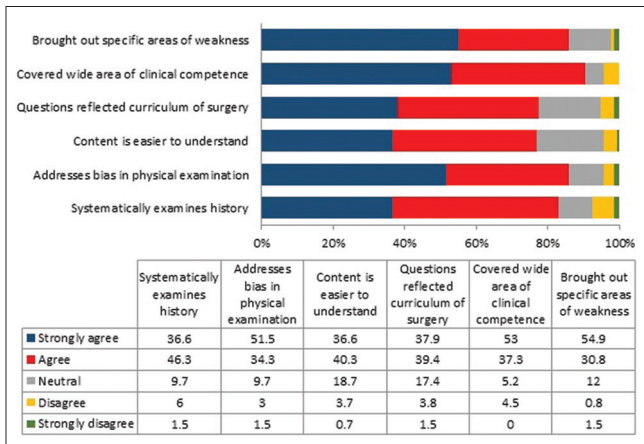


Figure 2: Assessment of the perception of the content of objective structured clinical examination

strongly agreed that the time allocated per station was adequate. About two in five candidates (39.1%) agreed that the guidelines were unambiguous, while 33.3% agreed that chaperones were available (to give adequate guidance and support). However, about half (48.5%) of the candidates agreed that the patients/simulators were available [Figure 3].

Eighty-nine percent of the candidates preferred OSCE and were positive about its examination

Table 3: Comparison of objective structured clinical examination to conventional clinical examination

Examination factors	Mean±SD		<i>P</i>
	OSCE	Conventional exam	
Difficulty	2.5±0.8	3.4±0.9	0.001
Bias	1.5±0.6	3.4±1.0	0.001
Preference	4.4±0.7	2.5±1.1	0.001
Structure	4.3±0.7	3.1±0.8	0.001
Coordination	4.4±0.8	3.3±1.0	0.001
Anxiety induction	3.7±1.2	4.4±0.8	0.001
Fatigue	3.6±1.0	4.1±1.0	0.004

P (paired samples *t*-test) <0.05 is significant. Increasing degree of factors represents a higher whole number integer on the 5-point Likert scale. OSCE=Objective structured clinical examination, SD=Standard deviation

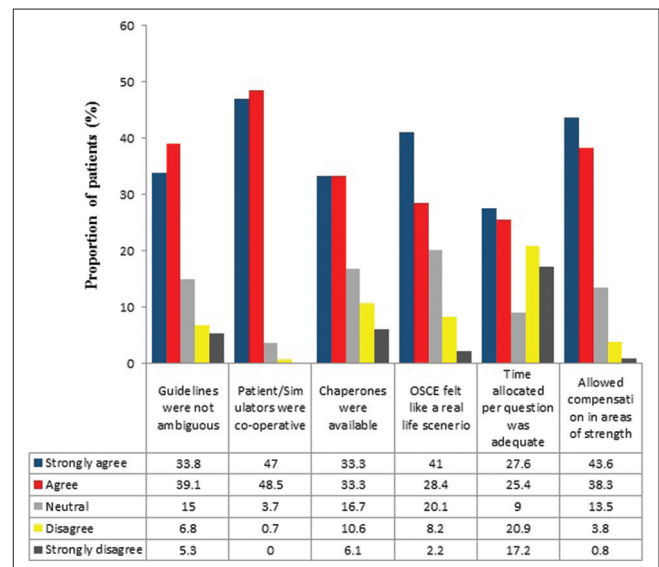


Figure 3: Assessment of the perception of the process of objective structured clinical examination

structure (89.2%) and examination coordination (89.3%) in comparison to the proportion who were positive about the conventional examination (13.6%, 31.6%, and 41.5%, respectively). Even though some of the candidates (42.2%) said that conventional clinical examination was biased, none of them noted that OSCE had any form of bias. While 10.7% stated that OSCE was difficult, 47.6% noted that conventional examination was not easy. Majority of the candidates were also positive that conventional clinical examination induces more anxiety (90.4%) and examination fatigue (80.5%) in comparison to OSCE (61.9% and 61.4%, respectively) [Table 2]. There was a significantly better perception of the above factors in OSCE compared to the conventional examination [Table 3]. A high percentage of candidates (89.0%) highlighted the merits of OSCE in ethics and communication skills, self-learning (92.2%), and reduction in chances of failure (89.1%). Nearly,

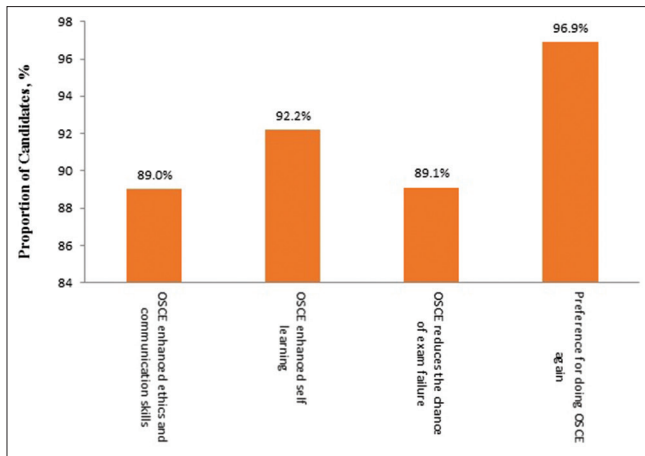


Figure 4: Assessment of future preference for examination

all the respondents (96.9%) would like to do OSCE again [Figure 4].

DISCUSSION

Examination of knowledge and core skills is an important aspect of medical education. There has been an increasing shift in the pattern of assessment of medical students over the years.^[5] This was attested to by the fact that majority of the respondents in this study have had earlier exposure to OSCE in other clinical in other clinical departments of their training. Despite this significant proportion, just over half of them felt that they had adequate knowledge to participate in the examination. This method of the examination is known to assess not just clinical skills but also counseling, data interpretation, and communication ability which are important for the quality performance of medical professionals on the field.^[6] Elfaki and Al-Humayed in Saudi Arabia and Jawaid *et al.* in Pakistan observed that 54.0% and 58.7% of their students were aware of the scope of information needed in preparation for the examination.^[1,7] It is thus possible that students' perception of their inadequacies might especially relate to a low level of awareness regarding the information required to prepare for the examination.

Considering the novelty in the introduction of OSCE in the study location, an audit of the general perception, the structure, and the process of the test was carried out. In terms of the general perception, a large proportion of the students believed that the exam was standardized even though only about 7 in 10 students believed that it was easier to pass. This could mean that creating objectivity in the examination does not necessarily translate to a high pass rate but rather creates a uniform criterion for a fair assessment. It is therefore not surprising that majority of the students in the study by

Maurya in India thought that it was a valid and reliable method of examination.^[4] Regarding the perception of the content of OSCE, it was clear that more than four-fifths of the respondents rate it high in the coverage of clinical competence, systematic assessment of history and physical examination, and in the identification of specific areas of weakness. This finding is similar to the result of Khan *et al.* in Pakistan who observed that over 90% of their candidates have positive views regarding the above criteria for assessing the content of OSCE.^[8] However, nearly half of the candidates in the present study either outrightly criticized or were equivocal about the time allocated per question for the examination. Ameh *et al.* in Nigeria also noted this similar concern in the process of the examination.^[5] Therefore, it is particularly instructive that simulation and drills should be done before the examination in order to objectively manage time allocation per OSCE station to achieve a good balance.

The study also investigated the strengths and weaknesses of OSCE and conventional clinical examination to provide an evidence base to guide the future choice of examination and system improvement. A higher proportion of candidates agreed that OSCE was fairer, better coordinated and well structured. Nasir *et al.* in Nigeria also corroborated that OSCE was fairer in comparison to the traditional clinical examination.^[2] Despite the fact that most of the students agreed that OSCE induced less anxiety and caused less stress in comparison to the traditional examination, about 6 in every 10 learners, however, noted that it was associated with nervousness and fatigue.

Majority of the respondents reported other merits of OSCE as the enhancement of ethics and communication skills, enhancement of self-learning, and reduction in the chances of examination failure. Similar findings were reported by Khan *et al.* and Ameh *et al.* in their studies.^[5,8] All these strengths and the relatively limited weaknesses of OSCE could have been responsible for the higher rate of preference of the respondents for this examination in comparison to the traditional clinical examination. However, OSCE requires continuous improvement in the process of the examination to overcome its shortcomings.

CONCLUSION

OSCE has greater strengths than the traditional long and short cases. However, it requires continuous improvement in the process of the examination.

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Conflicts of interest

There are no conflicts of interest.

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