

Original

Dental students Perception toward Objective Structured Clinical Examination in preclinical operative dentistry: Cross-sectional study. Igraa College, Sudan

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Abstract:

Background: The objective structure clinical examination (OSCE) approach has proved to be a useful method in assessing students' psychomotor, cognitive, and attitude skills. OSCE is a clinical exam, but has been used for preclinical in many institutes.

Objectives: The aim was to assess preclinical dental students' perceptions toward OSCE as a method of assessment in preclinical operative dentistry.

Materials and Methods: A descriptive, comparative cross-sectional study among 100 undergraduate dental students from Igraa College – Sudan. Two class years were involved; the first group was composed of 48 senior students in semester 6, and the second group was 52 junior students in semester. The preclinical operative dentistry course was taught for both class years students in a period from May to November 2021 and both were examined at the end of the course. The self-administered questionnaire included questions about their demographic data and their perception toward the OSCE in comparison to the Traditional Practical Examination (TPE). Comparison between different nonparametric data by Chi-Square test with the level of significance set at the P value of <0.05.

Results: The response rate was 53 (53%) where male students were 13 (24.5%) and female students were 40 (75.5%). Senior students were 26 (49.1) and juniors were 27(50.9%). Both groups and both genders considered OSCE as a useful method of assessment; with no statistically significant difference between the two groups ($P > 0.05$). Senior students scored more “agree” 26(49.1%) about their opinion if OSCE is a helpful educational exercise than junior students 24(45.3%), but statistically no significant difference. Students stated that OSCE is more stressful in comparison with written exams and Traditional Practical Examination.

Conclusion: OSCE in preclinical operative dentistry course; transfer knowledge more easily, helpful in education exercise, fair and meaningful when compared to the written and TPE exams.

Keywords: Dental caries, OSCE, tooth preparation, undergraduate students.

Introduction:

Operative dentistry is a field that focuses on the treatment of diseases in dental hard tissue such as dental caries. [1] The objective structure clinical examination (OSCE) is becoming more prevalent in healthcare education programs because it is regarded as a useful method for assessing skills and underpinning the knowledge required for practice. [2] The OSCE was first developed to assess the clinical competency of medical students. Since then it has been used widely as an assessment method for other disciplines such as nursing and dentistry. [3] The OSCE approach has been proven to be a useful method of assessing students' psychomotor, cognitive, and attitude skills. [4,5] The OSCE can be used as an additional assessment tool to determine readiness and a wide variety of skills can be tested. [6,7] It has been also used to assess the transition from preclinical to clinical education in many dental schools. [8]

In Igraa College –Sudan, the preclinical operative dentistry course has been studied in semester 5, but due to the shutdown period during the last ongoing COVID-19 in 2021; the course was shifted to semester 6 and was taken with the successor class year

of those who are in semester 5. Students from both class years were considered as one group to increase the sample size. The method of assessment of the psychomotor skills in preclinical operative dentistry in Igraa follows the Traditional Practical Examination. However, OSCE is a new format for assessing practical competence and this was the first among all subjects. So, exploring student's perceptions of OSCE is of paramount important and in addition, to compare the perception according to student sex and practical experience. The main objective of this study was to assess students' perception toward objective structure clinical examination (OSCE), while specific objectives were to compare the perception toward the (OSCE) between male and female students and between seniors and juniors as a method of assessment in preclinical operative dentistry course.

Materials and methods:

A descriptive cross-sectional study was conducted among (100) undergraduate dental students from Iqraa College-Sudan. The preoperative dentistry course was taught from May 2021 to November 2021 and the exam was held on the last week of November 2021. The course was planned to

be taught to senior students during the lockdown period of ongoing COVID-19. It was moved to semester 6 and was taken with the successor students. Participants from batch 2 (semester 6) were 48 students and batch 3 (semester 5) were 52 students. We included both class years in one sample size to prevent type 1 error if the course was taken for each batch separately; so students from both class years were considered as one sample size of the study. The participation was voluntary and those who were willing to participate were 27 students from semester 5 and 26 from semester 6 and they signed informed written consent. After the students finished the OSCE exam at the end of the course; a self-administered questionnaire with closed-ended questions included demographic data and questions about their perception toward OSCE as a method of assessment in comparison to Traditional Practical Exam TPE. The questionnaire was modified from the study by Jaiswal et al., 2019 [9] and the data was collected through a three-point Likert-type scale. The students were divided in alphabetically into three groups in each batch. The OSCE was composed of 16 stations with 3 minutes duration for each. Interactive questions were three (The patient/operator position, how to manipulate

amalgam filling (carving step), and how to place the matrix system on a plastic tooth mounted in a plastic model). While static questions were different but all related to materials, instruments, equipment, prepared cavities (different G.V. Black classes with intentioned errors), photos of disease, or related to tooth structure. In static questions, students were requested to identify or give advantages/disadvantages, indication/contraindication, and criticism of mishaps in prepared teeth.

The study was approved by the Ethical Committee from the Igraa College, confidentiality was assured and the data were used only for the purpose of the study. Data were analyzed by the SPSS version 21, Chicago, Illinois USA. Comparison between different OSCE perceptions between male and female students was carried out by the Chi-square test with the level of significance set at a P value of <0.05 .

Results:

The response rate was 53 (53%), male students were 13 (24.5%), while female students were 40 (75.5%). table (1) displayed different responses as “Agree” was scored by 39(73.6%) female students when the question asked; if OSCE is helpful educational exercise, while male students 11

(20.8%). The question regarding if OSCE in Operative dentistry for dental students is fair and meaningful compared with traditional practical exam (TPE); male showed less disagreement when compared to females. Also if OSCE covered a wide range of knowledge compared with written exam for dental students; females that disagreed were 4 (7.5%), with no statistical significant difference $P>0.05$. Answering by agree for question “if OSCE is easier to pass compared to written exam” was 19 (35.8%) by girls and 5 (9.4%) by boys. No males agreed that OSCE is more stressful compared with written exam for dental student while few females 3 (5.7%) disagree with it. Both sex agreed that OSCE is very useful and relevant to study and the type of work the students will be doing during

preclinical dental works. Very few boys 2 (3.8%); thought that OSCE should be implemented as a method of assessment in operative dentistry, while girls 11 (20.8%) agreed, but the difference was not statistically significant $P>0.05$. Table (2) revealed that 26(49.1%) of senior students scored “agree” about their thinking “if OSCE is helpful educational exercise than 24(45.3%) of junior students, but with no statistical significant difference. Also 23(43.4%) of junior students showed more “agree” about their thinking “if OSCE in Operative dentistry for dental students is fair and meaningful compared with traditional practical exam (TPE)” than 20(37.7%) of senior students but the difference was not statistically significant $P>0.05$.

Table 1: Comparison between male and female students perception towards OSCE in the preclinical operative dentistry.

Question	Sex	Agree	Disagree	Neither agree nor disagree	Total	P. value
Do you think an OSCE is helpful educational exercise	Female	39 (73.6%)	0 (0.0%)	1 (1.9%)	40 (75.5%)	0.1
	Male	11 (20.8%)	1 (1.9%)	1 (1.9%)	13 (24.5%)	
Do you think OSCE in Operative dentistry for dental students is fair and meaningful compared with traditional practical exam (TPE)	Female	34 (64.2%)	2 (3.8%)	4 (7.5%)	40 (75.5%)	0.4
	Male	9 (17.0%)	1 (1.9%)	3 (5.7%)	13 (24.5%)	
In OSCE Covered a wide range of knowledge compared with written exam for dental students	Female	32 (60.4%)	4 (7.5%)	4 (7.5%)	40 (75.5%)	0.4
	Male	9 (17.0%)	1 (1.9%)	3 (5.7%)	13 (24.5%)	
OSCE is easier to pass compared with written for dental students	Female	19 (35.8%)	9 (17.0%)	12 (22.6%)	40 (75.5%)	0.8
	Male	5 (9.4%)	3 (5.7%)	5 (9.4%)	13 (24.5%)	
OSCE may be exhausting and lengthy with increased number of stations	Female	23 (43.4%)	10 (18.9%)	7 (13.2%)	40 (75.5%)	0.5
	Male	7 (13.2%)	2 (3.8%)	4 (7.5%)	13 (24.5%)	
Is more stressful compared with written exam for dental student	Female	34 (64.2%)	3 (5.7%)	3 (5.7%)	40 (75.5%)	0.5
	Male	12 (22.6%)	0 (0.0%)	1 (1.9%)	13 (24.5%)	
OSCE is very useful and relevant to study and type of work the students will be doing during preclinical dental works	Female	39 (73.6%)	1 (1.9%)	0 (0.0%)	40 (75.5%)	0.02
	Male	10 (18.9%)	1 (1.9%)	2 (3.8%)	13 (24.5%)	
Do you think the OSCE should be followed as the method of assessment in operative dentistry for dental students	Female	23 (43.4%)	6 (11.3%)	11 (20.8%)	40 (75.5%)	0.4
	Male	10 (18.9%)	1 (1.9%)	2 (3.8%)	13 (24.5%)	
Attitude of the examiners during OSCE was better compared to the practical	Female	32 (60.4%)	4 (7.5%)	4 (7.5%)	40 (75.5%)	0.1
	Male	8 (15.1%)	1 (1.9%)	4 (7.5%)	13 (24.5%)	
OSCE improve preclinical skills and knowledge of Operative dentistry for dental students	Female	37 (69.8%)	1 (1.9%)	2 (3.8%)	40 (75.5%)	0.6
	Male	11 (20.8%)	1 (1.9%)	1 (1.9%)	13 (24.5%)	

Table 2: The perception towards OSCE exam in preclinical operative dentistry according to the student's class year's.

Question	Batch	Agree	Disagree	Neither agree nor disagree	Total	Count	P. value
Do you think an OSCE is helpful educational exercise	Semester5	24(45.3%)	1(1.9%)	2(3.8%)	(50.9%)	27	0.1
	Semester 6	26(49.1%)	0(0.0%)	0(0.0%)	(49.1%)	26	
Do you think OSCE in Operative dentistry for dental students is fair and meaningful compared with traditional practical exam (TPE)	Semester5	23(43.4%)	2(1.9%)	2(5.7%)	(50.9%)	27	0.7
	Semester 6	20(37.7%)	2(3.8%)	4(7.5%)	(49.1%)	26	
OSCE Covered a wide range of knowledge compared with written exam for dental students	Semester5	19(35.8%)	3(7.5%)	5(7.5%)	(50.9%)	27	0.3
	Semester 6	21(41.5%)	2(1.9%)	3(5.7%)	(49.1%)	26	
OSCE is easier to pass compared with written for dental students	Semester5	12(26.4%)	6(5.7%)	9(18.9%)	(50.9%)	27	0.1
	Semester 6	11(18.9%)	8(17.0%)	7(13.2%)	(49.1%)	26	
OSCE may be exhausting and lengthy with increased number of stations	Semester5	15(24.5%)	6(15.1%)	6(11.3%)	(50.9%)	27	0.3
	Semester 6	16(32.1%)	5(7.5%)	5(9.4%)	(49.1%)	26	
Is more stressful compared with written exam for dental student	Semester5	24(47.2%)	0(0.0%)	3(3.8%)	(50.9%)	27	0.1
	Semester 6	20(39.6%)	3(5.7%)	3(3.8%)	(49.1%)	26	
OSCE is very useful and relevant to study and type of work the students will be doing during preclinical dental works	Semester5	24(45.3%)	2(3.8%)	1(1.9%)	(50.9%)	27	0.2
	Semester 6	23(47.2%)	2(0.0%)	1(1.9%)	(49.1%)	26	
Do you think the OSCE should be followed as the method of assessment in operative dentistry for dental students	Semester5	17(28.3%)	3(7.5%)	7(15.1%)	(50.9%)	27	0.5
	Semester 6	17(34.0%)	3(5.7%)	6(9.4%)	(49.1%)	26	
Attitude of the examiners during OSCE was better compared to the practical	Semester5	20(39.6%)	2(1.9%)	5(9.4%)	(50.9%)	27	0.1
	Semester 6	21(35.8%)	3(7.5%)	2(5.7%)	(49.1%)	26	
OSCE improve preclinical skills and knowledge of Operative dentistry for dental students	Semester5	24(45.3%)	1(1.9%)	2(3.8%)	(50.9%)	27	0.8
	Semester 6	23(45.3%)	2(1.9%)	1(1.9%)	(49.1%)	26	

Discussion:

It is crucial to use reliable and objective assessment methods in education in order to properly assess students' performance. [10] Most of dental researches exclude student's experience of their assessment methods and curriculum development, yet it is only through studying students' experience; it could be reliable to inform change or include different assessment methods. [11] The advantage of the pre-clinical training in operative dentistry is to provide the real-time feedback for students and to improve their clinical skills and practical ability. [12,13]

As participation was voluntary the response rate was low as almost half of the students agreed to participate; similar study by Tseng et al., 2023 analyzed different variables with less sample size than ours. [14] Other recommended involvement of large sample size for more comprehensive result, [15] and more than one institute to be included, so as to enable generalization of the results for all undergraduate preclinical students.

The results of this study indicate positive feedback from students about the OSCE assessment in preclinical operative clinical skills. More than half of our participants

agreed that the OSCE was fair, which was in accordance with the result obtained by others. [16] In agreement with the result of Zayyan., 2011 study; students revealed that OSCE presents flexible and wide range of fairness, repeatable and is simple to remember, [17] and majority stated that OSCE cover wide range of knowledge similar to Khan et al., 2018. [18] This is because of the inclusion of the three learning domains (psychomotor, cognitive and attitude). A high percentage of the students felt that the OSCE induce higher levels of stress compared to TPE, as stated by the results of others. [7,19] the stress during OSCE exam may be due to the limited time duration for each station and also unpredictable stations questions, which could be read at the begging of the written exam or in case of TPE; you can know the task before you start the exam procedures requested.

When comparing senior and junior students perceptions toward OSCE exam and their responsiveness for participation; our result disagree with the result of Jaiswal., 2019 as we concluded that junior students are more interactive when collecting data by their high response rate, [9] and another study by Moorthy., 2006; where there are considerable variations within both senior

and junior trainees for technical and surgical skills in the course of surgical crisis management. [20] Perception toward OSCE has no association with student sex as similar results obtained by another study. [14]

Conclusions: OSCE is an appropriate method of assessment in dentistry. Students expressed positive feedback perceptions toward OSCE exam in preclinical operative dentistry course with no significance different male and female. Experience according to student class year has no significant difference with positive perception.

Declarations:

Ethics approval: The study was approved by the Ethical Committee from the Igraa College of Sciences and Technology, Gizera State. All procedures performed in the study were conducted in accordance with the ethical standards given in 1964 Declaration of Helsinki, as revised in 2013.

Consent for participation: All the participants provided written informed consent for the participation in the study.

Availability of data and materials: Data available upon request from the correspondence author EMA.

Competing interests: All authors declare no competing of interest.

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