Students’ Opinions and Attitudes After Performing a Dental OSCE for the First Time: A Jordanian Experience

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Abstract: This study at the Faculty of Dentistry, University of Jordan investigated and evaluated students’ attitudes and opinions after attempting a dental objective structured clinical examination (OSCE) for the first time. The OSCE consisted of sixty-seven stations for fourth-year dental students. After the exam, students were asked to voluntarily complete a questionnaire designed to evaluate their attitudes and opinions about the exam. Of the 134 students who participated in the OSCE, 93.2 percent completed the questionnaire; 43.4 percent said they found the exam difficult and 56.6 percent found it easy (p=0.147). Seventy percent reported that the exam was objective, while 30 percent did not (p<0.001); 65.5 percent indicated that it was a better test than traditional patient-based tests, whereas 34.5 percent did not (p<0.001). Sixty-eight percent stated that there were too many stations, while 30.9 percent stated the number of stations was appropriate and 0.8 percent stated there were too few (p<0.001). Of these respondents, 75.6 percent reported the exam was organized, whereas 21.1 percent said the exam was not very well organized and 3.3 percent said the exam was not organized at all (p<0.001). Overall, the students responded that the OSCE was able to test their clinical judgment and skills and it was a better method for evaluating their clinical skills; most preferred to have such tests in the future. Although the students reported the exam had too many stations, they perceived that it was well organized and that the time allocated for each station was appropriate. These dental students perceived that the OSCE was a suitable method to test operative dentistry clinical judgment and skills.

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Examinations have an important role in assessing students’ learning outcomes and their mastery of a subject. Passing or failing an exam can have strong consequences on students’ careers. The Faculty of Dentistry at the University of Jordan was established in 1989, and since then its Conservative Dentistry Department has adopted the performance of a clinical dental procedure on a patient as a method of evaluating and testing clinical skills of dental students in the final two years of their study. The procedure has usually involved caries removal and placement of a filling in a tooth, and a committee consisting of three tutors has evaluated the students’ performance. This method is not without inherent drawbacks and disadvantages, which include the burden of selecting a patient and ensuring his or her attending the exam, the lack of uniformity in selected cases, stress associated with such clinical exams, and interexaminer differences in evaluation. In addition, it assesses the student’s ability to manage one clinical case, leaving behind a myriad of clinical scenarios the students should be able to tackle in order to be judged as competent and clinically satisfactory. Furthermore, subjectivity and bias may play a role in this method of evaluation.

To enhance assessment and provide a greater degree of objectivity and consistency in clinical assessment, in 1975 Harden et al. developed the objective structured clinical examination (OSCE). After the OSCE format was being used in medical education, it began to be introduced in dental education. It is an important assessment tool in the education of medical and dental predoctoral and postdoctoral students and can be used for basic clinical skills training evaluation. The OSCE requires that examinees rotate through a series of stations in which they are asked to perform a variety of clinical tasks during a prespecified period of time. Among many advantages for the OSCE is its innate objectivity since the aim is to remove patient and examiner variation so that the only variable being examined is the ability of the candidate. Participation in an OSCE
can also improve students’ learning. To minimize subjective bias, all students face the same predefined clinical tasks and the same time limit and are directly observed and scored by examiners. Because a wide range of skills can be tested and evaluated, a reliable overall view of the clinical competence of students can be obtained. Flexibility and versatility made possible by the multiple station design are other advantages. This means that it is possible to examine a range of skills and disciplines and even to incorporate more than one skill or discipline simultaneously in the design of a particular station. In addition, a high degree of interexaminer reliability in an OSCE situation has been found. Overall, it has been found that the OSCE can be a reasonably reliable, valid, and objective method of assessment. Performance on an OSCE was not highly correlated with performance on National Board Dental Examination Parts I and II and multiple-choice question examinations at the Harvard School of Dental Medicine. Nevertheless, OSCE formats are more likely to measure other qualities such as problem-solving ability, critical thinking, and communication skills. Didactic assessment is very important; however, testing for these qualities is fundamental in clinical evaluation. The OSCE can be used as an additional assessment tool to determine the readiness of dental students to function as health care professionals. In addition, a wide variety of skills can be tested for a large number of students. Among the disadvantages are that greater exam preparation time is required, the exam is more demanding in nature for both examiners and patients, and an OSCE is considered more resource-intensive than other assessment methods.

The introduction of an OSCE in a dental school is typically a new experience for both staff and students and usually results in a change in assessment methods. As resistance may arise when changes are introduced into any organization, a strategy for implementation will help minimize opposition and may therefore result in better cooperation among staff members. Since one strategy of change is to conduct a pilot study, when the Conservative Dentistry Department at the Faculty of Dentistry, University of Jordan decided to change the clinical patient-based exam into an OSCE, a pilot study was planned. The aim of this study was to investigate and evaluate students’ attitudes and opinions regarding the implementation of an OSCE instead of the conventional clinical patient-based exam. The results are reported in this article.

**Methods and Materials**

The study sample was the fourth-year dental class at the School of Dentistry, University of Jordan. The Conservative Dentistry Department formed an OSCE committee to investigate and formulate the best method to implement the exam. In addition, the committee had the task of educating staff members and students regarding the nature of the exam and its various aspects.

The OSCE was to be carried out as the final exam of the summer clinical course. The course included restorative and endodontic procedures. All department members were asked to participate in the formulation and design of questions and/or development of OSCE stations. They were specifically asked to formulate clinically oriented questions that would objectively measure or evaluate students’ clinical competence or judgment. The OSCE committee reviewed all collected questions, verified their clinical orientation and appropriateness, and ensured that questions could be answered in the allotted time. Forty stations (twenty-five restorative and fifteen endodontic) were selected for the final exam. Most stations included props such as dental models, standardized actors, photos, or radiographs. The committee held meetings with the students to explain the nature and format of the exam. Students had participated in similar exams while studying some medical modules in their second year. A short PowerPoint presentation was provided, and sample stations/questions were introduced.

The main clinic area of the dental school comprised of fifty-four dental units and a nearby conservative dentistry laboratory was deemed suitable for the examination area. A total of 134 fourth-year dental students participated in this pilot OSCE. For the OSCE purposes, students were divided into two groups, and sixty-seven stations (forty testing stations and twenty-seven rest stations) were set up. As it was summer and hot, rest stations included two water rests and one with a snack. The exam area was divided into seven sub-areas, each consisting of approximately ten stations. Two staff members were allocated to each sub-area. Their duties included monitoring to prevent tampering with exam items, to ensure a smooth flow of students, and to answer any questions that may arise during the exam. They also collected examination booklets at the conclusion of the exercise.
Among those responding, 111 students indicated their gender (90.2 percent). There were eighty-eight (79.3 percent) females and twenty-three (20.7 percent) males. Regarding items related to the format of the OSCE, only one of the 123 respondents did not respond to the exam difficulty question; 4.9 percent reported that the exam was very difficult, 38.5 percent difficult, 54.1 percent not difficult, and 2.5 percent easy (Table 1). By combining extremely difficult and difficult into one category and combining not difficult and easy into another, we can conclude that 43.4 percent of the students found the OSCE difficult and 56.6 percent found it easy. This difference was not statistically significant (p=0.147).

Regarding objectivity of the OSCE, 120 of the students responded to this question. Seventy percent reported finding the exam objective compared to 30 percent who did not. The difference was statistically significant (p<0.001). Regarding testing of clinical judgment and skills, of the 120 students who responded to this question, 65.8 percent stated that the OSCE was able to test their clinical judgment and skills, whereas 34.2 percent stated that it did not. The difference was statistically significant (p<0.001) (Table 1).

On the subject of the OSCE being a better test of clinical skills than patient-based exams, seven respondents did not answer this question; of those who did, 65.5 percent stated that the OSCE was a better test, whereas 34.5 percent did not.

The collected data were imported into SPSS software (SPSS Inc. 18, Chicago, IL, USA) and were statistically analyzed for significance using chi-square tests. Statistical analysis was carried to the 0.05 level of significance.

### Results

The overall number of respondents to the questionnaire was 123 out of 132 students (93.2 percent).
who did, 65.5 percent indicated that it was a better test, whereas 34.5 percent did not. The difference was statistically significant (p=0.001). Regarding preference for OSCEs in their fifth year, four students did not respond to this question, but 72.3 percent of the students reported preferring an OSCE in contrast to 27.7 percent who did not. The difference was statistically significant (p<0.001) (Table 1).

Concerning logistics of the OSCE, all 123 students answered the question regarding the number of stations: 68.3 percent indicated there were too many, while 30.9 percent indicated the number was appropriate and 0.8 percent indicated there were too few. All these differences were statistically significant (p<0.001) (Table 2). Regarding the organization of the OSCE, all 123 respondents answered this question: 75.6 percent indicated the exam was organized, whereas 21.1 percent indicated the exam was not very well organized, and 3.3 percent indicated the exam was not organized at all. All these differences were statistically significant (p<0.001). With respect to station time, two students did not respond to this question; of those who did, 4.1 percent considered the time as too much, whereas 80.2 percent considered the time as appropriate and 15.7 percent considered the time as too little. All these differences were statistically significant (p<0.001).

The students’ scores ranged between 17 and 32.5 out of 40 with a mean of 25.07. The mean of male scores was 24.6 with the least being 19 and the highest being 30, whereas that for females was 25.1 with the least being 17 and the highest being 32. There was no statistically significant difference between the genders.

Discussion

Clinical restorative skills in dentistry cannot be validly assessed using unrealistic phantom head scenarios.6 Clinical restorative exams carried out on patients also have disadvantages, so it is deemed important that other testing methods such as the OSCE be considered. A clear advantage of the OSCE is that it is easily standardized and reasonably objective.6 A recent study found that the OSCE is reliable and valid in the context of preclinical dentistry.8 Although expectations to succeed in an OSCE are usually higher than in other exam types, it has been found that the OSCE is a more anxiety-provoking assessment method and that students prepared more for the OSCE than other conventional types of examinations.1

The OSCE has been used as a tool for evaluating graduate curricula.4,9,18 One study found the OSCE provided a useful outcome measure for evaluating graduate proficiency levels in students’ clinical dental skills and for revising the curriculum.18 In that study, problematic dental skills were identified and appeared to respond to curriculum revision and innovation by using the OSCE instrument for diagnosis and follow-up evaluation. Another study found that postgraduate courses designed with an OSCE were helpful in evaluating students’ clinical knowledge and that the unique multidisciplinary style fulfilled its objective in promoting thoughts regarding future study.4

In our study, the questionnaire was completed anonymously by students immediately after the OSCE sessions. This procedure was in agreement with three previous studies5,15,13 and in disagreement with another study that conducted the survey during the OSCE.1 For our study, it was deemed most appropriate to administer the questionnaire immediately after the test, as the survey contained eight items and would be somewhat time-consuming.

The number of female respondents was higher than their male counterparts. This was because the number of female students in that academic year was greater than males. Regarding the format of the exam, results show that the students considered the OSCE to be equally both difficult and not difficult. They also perceived that it was an objective exam and was able to test clinical judgment and skills. Moreover, the students found it to be a better method for evaluating their clinical skills than other means of assessment; as a group, they tended to prefer this type of testing in the future.
When comparing the items according to gender, we found no statistically significant differences between males and females. Similarly, there were no statistically significant gender differences in the OSCE scores. This was in agreement with a previous study that reported no significant gender effects on students’ anxiety, level of preparation, expectation to pass the examination, or scores on the OSCE, whereas female students typically scored significantly higher than male students on written examinations.1

When comparing the previous items according to degree of difficulty, we found that about 77 percent of the students who reported the exam as being not difficult or easy, found the exam to be difficult or extremely difficult. Similarly, 60 percent of the students who reported the exam as not being a suitable tool to test their clinical judgment and skills also found the exam to be difficult or extremely difficult. Of those who reported that the OSCE was not a better test than other forms of assessment, a higher proportion (56.4 percent) found the exam to be difficult or extremely difficult. On the other hand, 65.8 percent of those who found the OSCE to be a better assessment tool reported it to be not difficult or, in other words, an easier exam. In addition, while the majority of students who did not prefer this format reported it to be difficult or extremely difficult (68.8 percent), the majority of those who would prefer this form of exam reported it to be not difficult or an easy exam (66.3 percent).

Regarding the logistics of the exam, results showed that although students perceived the exam had too many stations, they reported that it was organized and that the time allocated for each station was appropriate. There were no statistically significant gender differences in these items. Also, when comparing the previous logistic items according to degree of difficulty, we found that the majority of those who reported the exam to be difficult or extremely difficult reported that it had too many stations (71.7 percent). Coincidentally, there was agreement between those who found the exam extremely difficult or difficult and those who found it to be not difficult or easy, with the majority of both groups (69.2 percent and 89.7 percent, respectively) reporting the time allocated for each station as appropriate.

In patient-based testing, students’ scores ranged between 20 and 33 out of 40, with a mean of 25.7. The mean of male scores was 25.9 with the least being 22 and the highest being 31, whereas that for females was 25.6 with the least being 20 and the highest being 33. Although the OSCE scores were almost similar to patient-based testing method scores, the students showed a favorable attitude towards the OSCE.

While these results should be carefully interpreted, it could be speculated that the degree of difficulty of the OSCE is a key factor and an influence on students’ opinions and attitudes towards it. However, further study may be warranted to test that speculation. In addition, the relationship between OSCE scores and class rank was investigated. The OSCE scores were correlated with scores obtained from a patient-based clinical exam performed by the same students, and a weak correlation was found. In the open remarks, some students expressed that the OSCE was a more fair and unbiased method of testing than the conventional patient-based method for both students and tutors. Nevertheless, some students expressed their fear that the OSCE did not effectively measure their clinical skills and was just another theoretical test.

The OSCE did not assess some patient-related factors such as soft tissue management and moisture control. These factors are usually assessed throughout the year as students perform specific dental procedures and are evaluated at that time. In addition, to date no method of clinical assessment that is able to evaluate all factors related to clinical procedures is available. Taking into consideration some shortcomings of the conducted OSCE and modifications that should be made in the future, this study found that the OSCE was a suitable alternative to test the restorative dentistry clinical judgment and skills of dental students at the Faculty of Dentistry, University of Jordan.

REFERENCES