

Evaluation of the Experience of Peer-led Mock Objective Structured Practical Examination for First- and Second-year Medical Students

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Background: The objective structured practical examination (OSPE) is used as an assessment tool of laboratory practical sessions. This study described the design and implementation of peer-led mock OSPE for first- and second-year medical students, investigated the perception of the students of the peer-led mock OSPE and the impact of attending the mock OSPE on the performance.

Methods: This is a cross-sectional study. Two mock OSPEs were designed and conducted by third-, fourth- and fifth- year medical students for year one and two. Each mock OSPE involved six stations. Thirty-three medical students facilitated the OSPE. The OSPEs were conducted prior to the summative end of block exams. Following the mock OSPEs, an online survey was sent to the participants to assess their satisfaction, quality and benefits of the mock OSPE. The study also evaluated the impact of the mock OSPE on students' performance.

Results: Out of 313 first-year students, 279 (89.1%) attended the mock OSPE and out of 298 second-year students, 213 (71.5%) attended. A total of 192 (68.8%) first-year medical students and 102 (47.9%) second-year medical students completed the questionnaire. There was no significant difference between attending and non-attending the mock OSPE in the students' performance in the summative OSPE. The majority of students felt more confident, less anxious, and lowered the levels of stress after attending the mock OSPE. More than half of the students felt that attending the mock OSPE helped in easing the steps, better preparation, provided sufficient orientation, well explained the materials and helped them to learn the concept of the final OSPE. The majority of students found the mock OSPE stimulating.

Conclusion: Attending the mock OSPE did not affect the students' performance in the summative OSPE. However, the peer-assessed mock OSPE improved the medical students' confidence and lowered the anxiety associated with OSPE.

Keywords: medical students, OSPE, mock, assessment

Introduction

The objective structured practical examination (OSPE) is used as an assessment tool for laboratory practical teaching sessions in preclinical years in medical college. It was adapted from the objective structured clinical examination (OSCE).^{1,2} In the college of medicine, King Saud University (KSU), the OSPE is system oriented and integrated from basic sciences departments, so that the questions are from anatomy, physiology, and pathology departments. The medical curriculum is composed of five years plus an internship year. The college of medicine at KSU conducts a variety of OSCEs throughout the five-year undergraduate program. The first two years are the preclinical years. The courses are integrated between the basic sciences departments, system oriented with problem-based learning (PBL) components and early clinical practice. There are a variety of teaching methods including lectures, practical sessions in the laboratories, early clinical exposure in the clinical skills and simulation center, problem-based learning sessions and self-directed

learning. As the teaching methods vary, there are variety of examination methods including written exams, OSCEs, OSPEs and PBL sessions evaluation. In traditional medical curriculum, single course exam is conducted from single discipline, which may lead students to memorize the course materials for short-term retention. In the integrated curriculum, the students must learn the materials, integrate the knowledge, and have an overall understanding of the subjects from different disciplines to encourage integration of the knowledge.

The OSPE, as the OSCE, is associated in the literature with high stress and anxiety in medical students as well as health sciences students.⁴⁻⁶ OSCE are well recognized as a method of clinical assessment. This stress may have a negative impact on the performance of the students in the exam.⁷⁻⁹ Studies have shown that medical students, especially in the first years, reported high levels of stress, anxiety and depression.¹⁰ It was also shown that it is important to consider possible interventions on the structural level. Institutional interventions may focus on changes within the medical curriculum or the examination that would help in lowering the academic stressors.¹⁰

Previous studies have shown that the experience with OSCEs may reduce the students' anxiety and therefore improve the performance.¹¹ Medical students that participated in mock OSCEs reported benefits in learning, increasing confidences and lower the stress before entering the final exams.^{12,13} In addition, mock OSCEs improved the performance scores in examination.¹⁴ A mock OSCE replicates the summative OSCE in the timing, format, layout, length, and station content.¹²

Peer-led mock OSCEs have shown to improve the students confidence and reduced the stress and anxiety associated with OSCEs.^{7,15,16} The peer-assisted teaching has proven to be an effective and less stressful experience in medical education.^{13,17} Moreover, peer-assisted teaching has shown to be beneficial in developing professionalism and deep understanding of the subjects.⁴

The present study described the design and implementation of peer-led mock OSPE for first- and second-year medical students. The study also investigated the perception of the students of the peer-led mock OSPE and the impact of attending the mock OSPE on the performance in the exam.

Methods

The study was approved by the Institutional Review Board at The College of Medicine, King Saud University, ref. no. 21/01098/IRB. Written informed consent was obtained before the study. The study is questionnaire based study and adhered to the ethical guidelines of the Declaration of Helsinki.

This is a cross-sectional study. The study also evaluated the impact of the mock OSPE on students' performance by comparing the results of the students who attended the mock OSPE in 2021 by the results of the medical students that did not attend the mock OSPE.

Two mock OSPEs were designed and organized by third-, fourth- and fifth-year medical students: foundation block mock OSPE targeting first-year medical students and neuropsychiatry block mock OSPE targeting second-year medical students. Second-year students were included in the mock OSPE as the OSPE was transformed to written OSPE during the pandemic, when the students were in year one. The two mock OSPEs were conducted two days apart. Thirty-three medical students from years three, four, and five organized the exam.

In the OSPE, the student goes into six stations, spending three minutes at each. The stations were integrated stations from different disciplines and system oriented. Student's performance in OSPE is strongly correlated with their performance in the written examination.¹ The preparation of the OSPE requires a lot of effort, time and manpower from teachers and laboratory staff.³ But in contrast the OSPE tests much wider subjects and abilities.

First- and second-year medical students gathered in the waiting rooms, and were given exam instructions. They were then accompanied by their senior peers into the examination laboratory. The exam was conducted in three tracks simultaneously, each consisting of six stations. The time allocated for each station was three minutes. Attendance to the mock OSPEs was open to all first- and second-year medical students, as a list containing the names of all students with their allotted time was distributed through the medical students' council's database. Both mock OSPEs were conducted one week before the summative end of block exams. Following the block OSPEs, an online survey was distributed to all participants to assess their satisfaction, quality, and benefits of the mock OSPE. The questionnaire consisted of 18 closed-ended questions that assessed students' satisfaction, quality and benefits of the mock OSPE.

Table 1 Demographic Data

Variables	First-year Medical Students n (%)	Second-year Medical Students n (%)
Sex		
Male	197	172
Female	116	126
Number of students who participated in the mock	279 (89.1)	213 (71.5)
Number of students who completed the questionnaire	192 (68.8)	102 (47.9)
Total 611	313	Total 298

Statistical Analysis

Data collected from the survey was analyzed using Microsoft Excel software (version 2013). Data was presented as average percentage. Normal descriptive test was used for comparison of the OSPE results.

Results

Table 1 shows that out of 313 first-year medical students, 279 (89.1%) attended the peer-led mock OSPE and out of 298 second-year students, 213 (71.5%) attended. One hundred and ninety-two (68.8%) first-year medical student and 102 (47.9%) second-year medical students completed the questionnaire.

Tables 2 and **3** showed that the majority of first-year students (n=137, 72%) and second-year students (n=65, 64%) felt more confident, less anxious (first-year students n= 144, 75%, second year students n=65, 64%) and lowered the levels of stress after attending the mock OSPE (first-year students n=135, 70%, second-year students n=61, 60%). More than half of the students (first-year students n=150, 78%, second-year students n=68, 67%) felt that attending the mock OSPE helped in easing the steps, better preparation (first-year students n=148, 77%, second-year students n=621, 61%), provided sufficient orientation (first-year students n=151, 79%, second-year students n=67, 66%), well explained the materials (first-year students n=142, 74%, second year students n=64, 63%) and helped them to learn the concept of the final OSPE (first-year students n=145, 76%, second-year students n=74, 63%). The majority of students found the mock OSPE stimulating (first-year students n=151, 79%, second-year students n=66, 65%). **Table 4** showed that there was no significant difference between attending and non-attending the mock OSPE in the students' performance in the summative OSPE. First-year scores, 2019 non-mock OSPE participants (n=294) scored 18.14 ± 1.28 out of 20 vs 2021 mock OSPE participants (n=304) scored 17.75 ± 1.49 ($p < 0.001$). Second-year scores, 2019 non-mock OSPE participants (n=263) scored 18.08 ± 1.14 out of 20 vs 2021 mock OSPE participants (n=292) scored 18.47 ± 1.15 ($p < 0.001$).

Discussion

The results of the present study also showed no significant difference in OSPE results of the participants of the peer-led mock OSPE for first- and second-year medical students compared to the previous year who did not attend mock OSPE. Although there may be other factors influencing the results (ie, types of question, the overall average academic performance of the cohort, etc).

The results support the similar results on the benefit of mock OSCEs in lowering the stress levels of the students and improving the performance.^{13,14} Medical students felt more confident while taking the actual examination after the mock OSPE. The results showed that OSPE is an effective way of lowering the stress and anxiety, in consistent with the previous results of the similar situation in mock OSCE.^{12,14} The benefits of mock OSCE are already well documented. However, the experience of peer-led mock OSPE was not evaluated previously.

Table 2 First-year Medical Students' Satisfaction Following Attending Peer-led Mock OSPE

Questions	Strongly Agree 1n (%)	Agree 2n (%)	Neutral 3n (%)	Disagree 4n (%)	Strongly Disagree 5n (%)
I felt confident going into the final OSPE.	84 (44)	53 (28)	20 (10)	10 (5)	25 (13)
I was less anxious going into the final OSPE because of my experience in the mock OSPE.	105 (55)	39 (20)	13 (7)	6 (3)	29 (15)
The mock OSPE helped in easing the steps of the final OSPE examination.	119 (62)	31 (16)	11 (6)	5 (3)	26 (14)
The mock OSPE helped me to prepare for the final OSPE.	109 (57)	39 (20)	14 (7)	3 (2)	27 (14)
The steps of conduction of the OSPE were well explained.	118 (61)	34 (18)	10 (5)	6 (3)	24 (13)
The mock OSPE provided sufficient orientation to the OSPE examination.	121 (63)	30 (16)	10 (5)	5 (3)	26 (14)
I learned and understood the concept of OSPE.	130 (68)	29 (15)	4 (2)	4 (2)	25 (13)
I found the mock OSPE stimulating.	107 (56)	44 (23)	11 (6)	6 (3)	24 (13)
The mock OSPE helped in introducing me to the concept of OSPE.	130 (68)	23 (12)	9 (5)	4 (2)	26 (14)
The mock OSPE helped in lowering the level of the stress before the OSPE examination.	99 (52)	35 (18)	25 (13)	9 (5)	24 (13)
The OSPE materials were well explained.	109 (57)	33 (17)	18 (9)	7 (4)	25 (13)
Are you satisfied with the quality of the pictures and illustrations in the mock OSPE?	117 (61)	31 (16)	12 (6)	5 (3)	27 (14)
Overall, I was satisfied with the mock OSPE.	127 (66)	26 (14)	10 (5)	3 (2)	26 (14)
The OSPE materials were well explained.	115 (60)	30 (16)	14 (7)	8 (4)	25 (13)

The present study showed that the design and implementation of mock OSPE is an effective and successful experience. This experience is recommended to be part of the curricular activity despite the efforts for preparation and the large demand of resources. This study showed the evidence for the benefits of the mock OSPE on both medical students and peer tutors in improving their knowledge, lowering the level of stress and anxiety and improving their teaching skills.

Although introduction of mock OSPE did not result in a significant change in the overall pass rate of the summative OSPE, the perception of students indicated a positive learning experience in lowering the levels of stress and improve the overall performance in the summative OSPE. The results of the present study showed no significant difference in OSPE results for first- and second-year medical students who attended the mock OSPE compared to the previous year who did not attend the mock OSPE. Increased satisfaction and involvement of the student and faculty in the OSPE, allowed this type of testing to become an integral component of the evaluation system of the preclinical years blocks.¹²

Limitations of the study: the results of this study are from a single institution and may not be transferable to other institutions for medical education. Further studies are needed in this field.

Conclusions

Although attending the mock OSPE did not affect the students' performance in the summative OSPE, the peer-led mock OSPE proved to be a successful and beneficial experience in lowering the levels of stress and anxiety. The peer-led mock OSPE assessed mock OSPE improved the medical students' confidence and lowered the anxiety associated with OSPE.

Table 3 Second-year Medical Students' Satisfaction Following Attending Peer-led Mock OSPE

Questions	Strongly Agree 1n (%)	Agree 2n (%)	Neutral 3n (%)	Disagree 4n (%)	Strongly Disagree 5n (%)
I felt confident going into the final OSPE.	43 (42)	22 (22)	7 (7)	10 (10)	20 (20)
I was less anxious going into the final OSPE because of my experience in the mock OSPE.	43 (42)	22 (22)	9 (9)	6 (6)	22 (22)
The mock OSPE helped in easing the steps of the final OSPE examination.	61 (60)	7 (7)	1 (1)	6 (6)	27 (26)
The mock OSPE helped me to prepare for the final OSPE.	50 (49)	12 (12)	6 (6)	7 (7)	27 (26)
The steps of conduction of the OSPE were well explained.	54 (53)	12 (12)	2 (2)	8 (8)	26 (25)
The mock OSPE provided sufficient orientation to the OSPE examination.	54 (53)	13 (13)	2 (2)	7 (7)	25 (26)
I learned and understood the concept of OSPE.	62 (61)	7 (7)	1 (1)	5 (5)	27 (26)
I found the mock OSPE stimulating.	54 (53)	12 (12)	3 (3)	9 (9)	24 (24)
The mock OSPE helped in introducing me to the concept of OSPE.	54 (53)	12 (12)	4 (4)	5 (5)	27 (26)
The mock OSPE helped in lowering the level of the stress before the OSPE examination.	50 (49)	11 (11)	9 (9)	11 (11)	21 (21)
The OSPE materials were well explained.	52 (51)	12 (12)	7 (7)	6 (6)	25 (25)
Are you satisfied with the quality of the pictures and illustrations in the mock OSPE?	55 (54)	11 (11)	3 (3)	6 (6)	27 (26)
The OSPE materials were well explained.	54 (53)	12 (12)	4 (4)	6 (6)	26 (25)
Overall, I was satisfied with the mock OSPE.	60 (59)	8 (8)	3 (3)	5 (5)	26 (25)

Table 4 Comparison of Baseline First- and Second-year OSPE Scores Between Peer-led Mock OSPE Participants and Non-participants

Variable	Mean OSPE Score $\pm$ SD	p-value
First-year scores		
2019 non-mock OSPE participants (n=294)	18.14 $\pm$ 1.28	<0.001
2021 mock OSPE participants (n=304)	17.75 $\pm$ 1.49	
Second-year scores		
2019 non-mock OSPE participants (n=263)	18.08 $\pm$ 1.14	<0.001
2021 mock OSPE participants (n=292)	18.47 $\pm$ 1.15	

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Disclosure

The authors report no conflicts of interest in this work.

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