

Virtual OSCE Implementation for Remote Family Medicine Clinical Assessment during COVID19: Opportunities and Limitations

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Abstract:

Background: With the continuity of the COVID-19 pandemic and the rapid emergency remote teaching, Assessment was considered problematic. Objective structured clinical examination (OSCE) to assess the core skills required for the family physician is mandatory despite the circumstances. Objectives: This paper is to describe the experience of planning and conducting a virtual OSCE during the COVID-nineteen pandemic. **Methods:** Students enrolled in the professional family medicine diploma were the participants of the study. A suggested set-up of the virtual OSCE exam using the ZOOM meeting application was approved by the diploma council. Pilot Mock was done after orientation and preparation. Exam was conducted on two parallel sets of stations, each set is composed from 4 stations, facilitated by three coordinators and one assistant host in the ZOOM session. Each session included 10 students, 4 examiners. Coordinators (hosts) assigned assessors and role players in the designated (virtual) breakout rooms with the candidate, instructions displayed all through the station on the white board of this room.

Results: Pilot Mock was conducted, and the feedback was improved in the actual exam setting. Nearly eighteen examinee, 8 assessors and 3 moderators and administrate commenced the actual exam. Almost 87.5 % of the assessors were satisfied with the exam. The correlation of the virtual OSCE to written assessment was 0.52 which shows acceptable concurrent validity. **Conclusion:** Virtual OSCE is still an early version of a method for assessing the clinical skills remotely that needs logistics and further study.

Keywords: Competency, E-Learning, E-Assessment, OSCE University, Medical students


Introduction:

With the continuity of the COVID-19 crisis, medical schools had to shift to online teaching. As regards assessment, many of these schools decided to hold an online written exam and to postpone their clinical assessments. Some schools are still trying to find a solution to clinically assess students, especially in their final year. Objective structured clinical examination (OSCE) is a performance-based examination used to assess many of the core skills required of physicians that cannot be assessed with written examinations, such as the ability to complete a history, perform a physical examination or communicate effectively with patients.⁽¹⁾ The Arab Institute of Continuing

Professional Development (AICPD) introduced the professional diploma in family medicine (PDFM) in Egypt from 2011. The one-year PDFM consists of theoretical and practical parts in addition to clinical and field training in family practice.⁽²⁾ The PDFM assessment includes written assessment, objective structured practical examination, and 5-station objective structured clinical examination.

Due to necessities for social distancing during the COVID-19 pandemic to protect students', faculty's', and standardized patients' (SP) health, the family medicine professional diploma Objective Structured Clinical Examination (OSCE) summative exam could

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not safely take place within the primary health care center. Tackling clinical skills assessment with the use of computers have been described.

However, few of these descriptions have been validated or had their development described and using platforms available on the web. ^(3,4,5) Reviewing the blueprint of the course specification in the Professional Diploma reveals that nearly 70-80% of the required skills can be assessed virtually. ⁽⁶⁾ The objective of this study was to describe the virtual OSCE conducted experience for the PDFM candidates during the COVID-19 pandemic.

Methods:

It is an applied research, using a technological computer application for use in the evaluation of clinical skills of the OSCE type.

Participants: Participants in the study were cohort 15 of the students enrolled in the professional family medicine diploma, assessors and moderators of the exam were mainly the scientific council members and an IT administrator.

Study Design: The study was conducted and performed adopting the steps of a valid reliable toolbox for conducting an online OSCE. ⁽⁶⁾

Phase I: Preparation: Exam Stations: A blueprint designed by the exam committee to outline the domains/categories of each station. The scenarios were designed to assess specific objectives within the main domain or category in the blueprint. In each case the examiner

provided information to the candidate on a white board and observe the candidate while interviewing the role player.

Some of the scenarios enhanced reality features (simulation) embedded within them such as included diagnostic imaging studies or clinical information presented on the computer screen by the examiner.

Exam. Structure: The online OSCE set consists of 4 manned stations each station lasts for 10 minutes. One parallel set was determined. Three coordinators were needed to use the ZOOM application to manage and rotate the students. Exam Logistics were considered according to the toolbox guide. ⁽⁶⁾

Technical Requirements:

- Zoom software was chosen due to its simplicity, easiness, audio/video quality, familiarity, affordability, and breakout room features (which permits private small-sessions (one-on-one) between host-selected participants).
- To comply with the virtual online oral exam conduction, the computer system requirements include: Desktop computer with an external webcam and a built-in microphone or a laptop computer with a built-in webcam and microphone (not a tablet, Chromebook, or cell phone).
- Built-in or external speakers are required. Headphones or earbuds are NOT allowed.
- All of that was conveyed to the examinee, standardized patients, and assessors.

Phase II: Implementation: Mock Exam: A pre-OSCE run-through was performed with examiners and students. A suggested set-up of the virtual OSCE exam by using the ZOOM meeting application was provided to the diploma council. Students used mobile phones or laptops with connected webcams and microphones while assessors and role players will join from the Diploma Campus with all the social distancing and safety precautions applied. Parallel 2 sets of stations will be facilitated by 3 coordinators and 1 assistant host in the ZOOM session. Each session will include 10 students, 4 examiners and 4 role-players.

Coordinators (hosts) will assign assessors and role players in the designated (virtual) breakout rooms with the candidate, instructions displayed all through the station on the white board of this room. After 10 minutes, the examinees will be received in the (virtual waiting room) to check IDs and compare them with their webcam live pictures. The hosts will then assign students as one student per room. Once 10 minutes ends, the student will be reassigned from the room to the next room.

Real Exam. Implementation: With careful planning, Mocking and feedback from assessors and students, Virtual OSCEs were conducted after adaptations. Adaptations were mainly reduction of the stations numbers and omitting SPs to prevent misunderstanding, time connectivity and duration. and One Zoom link with 11 pre-assigned breakout rooms was

created. There were 2 examiners for each of 8 stations, plus 1 “rest station” (Figure 1).

Within a discipline, 1 examiner was chosen as “A” and the other as “B.” Eighteen students were equally split into 2 sessions; within each session, students were assigned to “A” or “B” group. For standardization, examiner calibration sessions were conducted prior to the exam. The Zoom host positioned examiners in breakout rooms prior to student entry. Examinees were requested to Log in with their full names, leaving cameras and microphones constantly on.

Once all students were logged in in the waiting room, they were placed into their first breakout rooms by the Zoom host. Ten minutes were agreed per station and when the prearranged time had passed, students were moved to the next room/station. One-minute warnings were broadcasted to each room before a move. Examiners graded students on hard copy.

II: Evaluation: Psychometrics were steered afterwards to compare the performance to past face-to-face OSCEs.

1. Student feedback regarding the process, procedure, as well as acceptability and satisfaction using a post Mock pilot and Post real exam survey. The survey consisted of 9 question with Likert scale. (strongly agree 5, agree 4, neutral 3, disagree 2, strongly disagree 1) and a last open-ended question for further comments.

2. Feedback of faculty regarding the process, procedure, as well as acceptability and satisfaction using a survey with 5 Likert scale points. (strongly agree 5, agree 4, neutral 3, disagree 2, strongly disagree 1)
3. Exam validity and reliability reports as compared to similar exams in previous years.

Results:

Out of 19 students; 14 and 11 responses were received on the online forms circulated immediately after the pilot (mock) clinical exam and final clinical exam; respectively.

Eight (73.1%) of student responders did not have any postgraduate studies after their MB, BCH, while 3 (26.9%) have other forms of postgraduate degrees. The range and mean \pm SD age for responders completed both forms was 28:43 and 34.8 \pm 5.3 years respectively. While years of practice ranged from 2 to 12 years with mean \pm SD of 6.1 \pm 3.7 years. On a Self-reported computer skills score of 1 to 5; three (27.2%) of responders reported 5, while equal numbers (4, 36.4%) of responders reported scores of 3 and 4. None of the responders reported computer skills of less than 3. Table 1 shows a summary of responses obtained from students following the pilot (mock) and final clinical exams.

The correlation of the virtual OSCE to written assessment was 0.52 which shows acceptable concurrent validity. When the same correlation was calculated for the 2019/2020 batch who had a face-to-face OSCE it was found

to be 0.44 as presented in Table 2. This indicates an acceptable concurrent validity of the virtual OSCE in addition to the acceptable face validity and construct validity reported in feedback from assessors and students.⁽¹⁾

Discussion:

Several challenges emerged during the COVID-19 Pandemic including the OSCE assessments. The online OSCE set of the present study consists of 4 manned stations each station lasts for 10 minutes. One parallel set was determined. Three coordinators were needed to use the ZOOM application to manage and rotate the students in comparison to Khan et al., 2020 who conducted a total of 4 sessions each session consisting of 4 concurrent stations and 4 residents rotating through each station in a timed format⁽⁷⁾ Each station was 10 min long; 2 min to read the case stem, 8 min for the encounter and 2 min to rotate between stations.

Differently, Ryan et al., 2020 delivered one station per day, so two OSCE stations were delivered over two successive days. Each station functioned as a three-way telehealth consultation between the student and a simulated patient; facilitated by an observing examiner.

Before organizing the above mentioned set, mock exam was done as follows; hosts assigned assessors and role players in breakout rooms with the candidate, instructions displayed all through the station on the white board of this room. After 10 minutes, the examinees received

in the (virtual waiting room) to check IDs and compare them with their webcam live pictures. The hosts then assigned students as one student per room. Once 10 minutes ends, the student reassigned from the room to the next room similarly to Khan et al 2020 who did an introduction in the 'main room', residents were sent to the waiting room for 2 min after which they were moved to their respective stations.⁽⁷⁾

The co-host displayed the clinical scenario and task statement on the screen for 2 min, after which the SP was available for the encounter. The faculty instructor for the station assessed and scored the resident performance in real time. The current study included 18 examinee, 8 assessors and 3 moderators and no role-players in contrast to Major et al., 2020 who included nine students, three standardized patients (SPs), three observers, one host and four cohosts⁽⁸⁾ No role-players in the present study as assessors took the student through a patient's scenario while having a standardized checklist to assess their responses. The same process was done by Donn et al., 2020 who did not use SPs due to the fact that the whole process is new and no need to add extra complexity.⁽⁹⁾

The present study revealed that the correlation of the virtual OSCE to written assessment was 0.52 which shows acceptable concurrent validity. When the same correlation was calculated for the 2019/2020 batch that had a face-to-face OSCE it was found to be 0.44 going in hand with Lara et al., 2020 who found

that tele-OSCE is an alternative method of assessment to the face-to-face OSCE. In harmony with Donn et al, 2020 who concluded that the virtual OSCE is a useful method of assessment in hard times and could be used as an alternative to face to face in clinical assessment.

The study indicates an acceptable concurrent validity of the virtual OSCE in addition to the acceptable face validity and constructs validity reported in feedback from assessors and students similarly Kakadia et al., 2020 identified that most students thought the online OSCE was similar to the traditional OSCEs and students were able to express their knowledge.⁽¹⁰⁾ In harmony with Craig et al., 2020 who collected feedback after the online OSCE from participants during in-person debriefing sessions and by questionnaires distributed after the examination.⁽¹¹⁾ The participants' overall feedback was that the online examination could be comparable with that of the in-person OSCE.

Limitations: It should be considered that carrying the study out in a single setting, with a limited number of students were the limitations of the study,

Conclusion: Virtual OSCE is still an early version of a method for assessing the clinical skills remotely, further studies are needed to explore other aspects related to the validity of this method that is applicable in times of lockdown strategies to face pandemics like COVID-19.

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Table (1): Summary of responses for the post pilot (n=14) and post actual exam (n=11) questionnaire on a 1-5 score*

	Post pilot exam				Post actual exam			
	Score 2	Score 3	Score 4	Score 5	Score 2	Score 3	Score 4	Score 5
I was clearly informed about the rules, regulations and instructions of online clinical exams	0 (0.0%)	1 (7.1%)	1 (7.1%)	12 (85.7%)	0 (0.0%)	0 (0.0%)	2 (18.2%)	9 (81.9%)
The mock online clinical exams prepared me on what to expect in the real exams	0 (0.0%)	0 (0%)	2 (14.3%)	12 (85.7%)	1 (9.1%)	1 (9.1%)	5 (45.5%)	4 (36.4%)
The communication process with institute and students before and during the exam was efficient	0 (0.0%)	2 (14.3%)	4 (28.6%)	8 (57.1%)	0 (0.0%)	1 (9.1%)	5 (45.5%)	5 (45.5%)
The transition between pre-test, exam rooms and post-test room was smooth and quick	0 (0.0%)	1 (7.1%)	4 (28.6%)	9 (64.2%)	0 (0.0%)	0 (0%)	4 (36.4%)	7 (63.6%)
Duration of the sessions and format of the online exams matched my expectation	1 (7.1%)	3 (21.4%)	2 (14.3%)	8 (57.1%)	1 (9.1%)	2 (18.2%)	7 (63.6%)	1 (9.1%)
Examiners and invigilators handled the exam professionally	1 (7.1%)	2 (14.3%)	2 (14.3%)	9 (64.2%)	0 (0.0%)	1 (9.1%)	4 (36.4%)	6 (54.5%)
The exam material shown during online clinical exam (images/ case scenarios/ role players) was appropriate	0 (0.0%)	2 (14.3%)	3 (21.4%)	9 (64.2%)	1 (9.1%)	2 (18.2%)	5 (45.5%)	3 (27.2%)
Except for physical examination skills, the online exam was a suitable method to assess my clinical skills	1 (7.1%)	1 (7.1%)	5 (35.7%)	7 (50.0%)	2 (18.2%)	4 (36.4%)	3 (27.2%)	2 (18.2%)
I am satisfied with the overall organization and implementation of the online clinical exams	0 (0.0%)	2 (14.3%)	0 (0.0%)	12 (85.7%)	0 (0.0%)	0 (0.0%)	5 (45.5%)	6 (54.5%)

* Score one was omitted from table as it wasn't selected in any response

Table (2): Correlation Between OSCE And Written Assessment in Virtual OSCE Compared to Face-To-Face

	Virtual OSCE (2020)	Face-to-face OSCE (2019)
Correlation	0.52	0.44

Table (3): Assessors Feedback Post Exam

Item	Neutral		Agree		Strongly agree.	
	N.	%	N.	%	N.	%
▪ I was clearly informed about the rules, regulations clinical exam and instructions of online clinical exams:	0	0%	1	13%	7	88%
▪ Mock online clinical exams prepared me sufficiently for the real exam	0	0%	0	0%	8	100%
▪ I am satisfied with the communication process with PDFM staff and administration before and during the exam	0	0%	1	13%	7	88%
▪ Briefing done before the exam was helpful	1	13%	1	13%	6	75%
▪ The technical support personnel at the exam rooms was adequate.	1	13%	2	25%	5	63%
▪ Physical distance principles were respected at the exam rooms	1	13%	1	13%	6	75%
▪ Duration of the whole exam was suitable	0	0%	1	13%	7	88%
▪ The exam material shown during online clinical exam (images/ case scenarios/ role players) was appropriate	0	0%	1	13%	7	88%
▪ The exam reflects real practice	0	0%	4	50%	4	50%
▪ The exam samples the curriculum well	1	13%	3	38%	4	50%
▪ This type of exam can assess clinical competence of students (except for physical examination)	0	0%	3	38%	5	63%
▪ Statement Evaluation form is well-structured and easy to use	0	0%	4	50%	4	50%
▪ I am satisfied with the overall organization and implementation of the PDFM online clinical exam.	0	0%	2	25%	6	75%

* Score for disagree and strongly disagree were omitted from table, as it was not selected in any response.

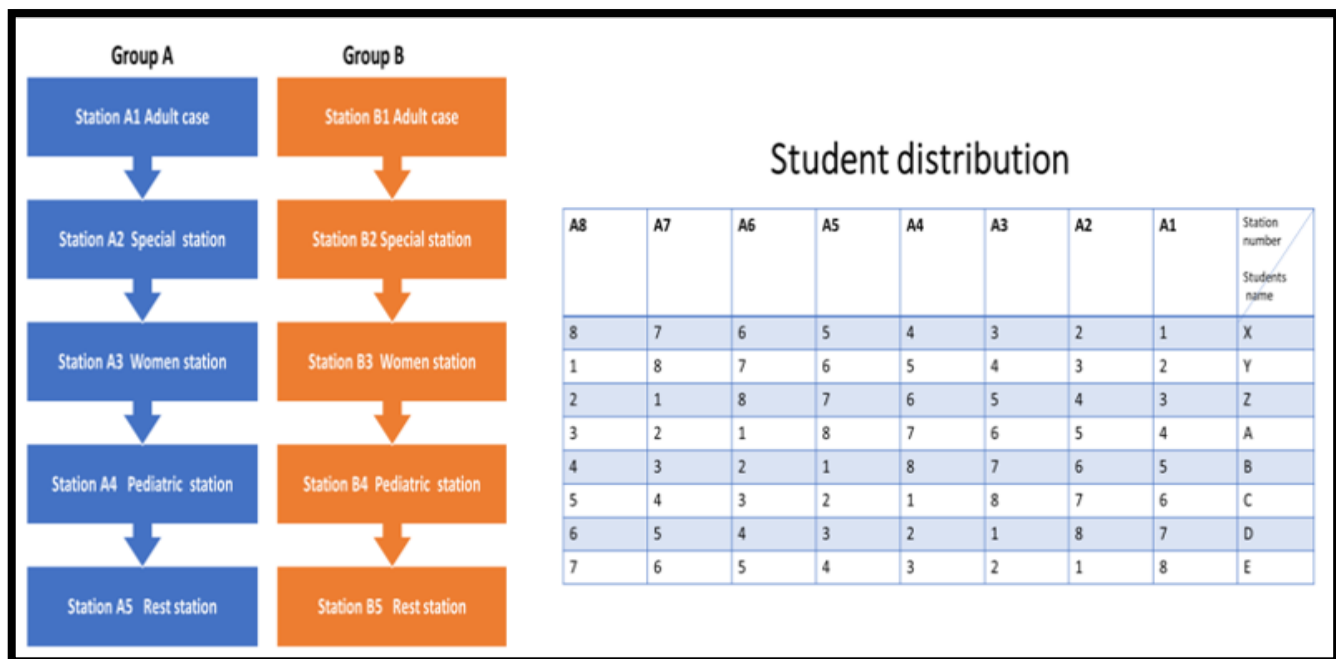


Figure (1): Exam Construction

الملخص العربي

تنفيذ الامتحان السريري الموضوعي المنظم لتقييم المهارات السريرية للطب العائلي عن بعد: الفرص المتاحة والقيود

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الخلفية: لوباء كورونا تأثير كبير على تعليم وتدريب المهن الصحية في جميع أنحاء العالم. وحيث ان التدريب السريري يشكل تحديًا خصوصًا في الكليات محدودة الموارد ، فقد اصبح من الضرورة ابتكار طرق جديدة للتدريب. ويعتبر التدريب المعزز بالتكنولوجيا واحد من الطرق المبتكرة حيث يساعد في تطوير المهارات السريرية والمهنية المطلوبة. **الهدف:** تقييم رضا المدربين والمتدربين على التجربة الجديدة للتدريب السريري المعزز بالتكنولوجيا في طب الأسرة. **الطريقة:** تم التدريب السريري المعزز بالتكنولوجيا باستخدام تطبيق زووم مع خاصية الغرف الفرعية. يتكون التدريب من محاكاة المدرب عبر الإنترنت متبوعة بمناقشة الحالة والتغذية الراجعة. تم استخدام استبيانات بمقاييس ليكرت ومقاييس رقمية بأسئلة مفتوحة. **النتائج:** فيما يتعلق بملاحظات المتدربين على التدريب السريري المعزز بالتكنولوجيا ، اعتقد 85% من المتدربين أنها كانت طريقة مفيدة للتدريب وأوصى حوالي 75% منهم بتكراره للمتدربين المستقبليين. أعرب أكثر من 80% من المدربين عن رضاهم عن تجربة التدريب السريري المعزز بالتكنولوجيا واعتقد أكثر من 75% منهم أن هذه التجربة كانت مفيدة للمتدربين المشاركين. على الرغم من أن ثلثي المدربين رأوا أن مقدار العمل بالتدريب ليس بالقليل ، إلا أن أكثر من 80% كانوا راضين عن هذه التجربة وحوالي ثلاثة أرباعهم يفضلونه عن التدريب وجهاً لوجه. واقترحوا زيادة وقت الجلسة للسماح بمزيد من المناقشات. **الخلاصة:** التدريب السريري المعزز بالتكنولوجيا هو طريقة مفيدة للتدريب على المهارات السريرية في طب الأسرة مثل مهارات الاتصال ، والنهج الذي يركز على المريض، والتفكير السريري، وبناء خطة العلاج.