

FATIGUE LEVEL OF EXAMINERS DURING OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

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ABSTRACT

Objectives: To assess the examiners' level of fatigue and ability to concentrate over the course of OSCE.

Material and methods: This observational study was conducted on six examiners who were involved in a direct encounter with final year medical students of Khyber Medical College, Pakistan. The examiners rated their fatigability and decline in concentration on a scale of 1-10, at the end of each day of the seven days' long OSCE conducted in the year 2017. A score of 1 meant a minimum degree of fatigue or decline in concentration and vice versa. The data was analyzed using SPSS version 16.

Results: The results showed statistically significant increase in mean fatigability level over time, $F(6) = 25.76$, $P < 0.001$, Eta squared = 0.82. Similarly, there was a statistically significant decline in concentration amongst examiners with the passage of time, $F(6) = 7.67$, $P < 0.001$, Eta squared = 0.57.

Conclusion: Examiners have a tendency to get tired over time in a long OSCE leading to a decline in their ability to concentrate.

Key words: Objective, structured, clinical, examination, fatigability, concentration, validity, reliability

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INTRODUCTION

To prevent many of the pitfalls of the traditional clinical examination, Harden et al introduced the objective structured clinical examination (OSCE) in 1975¹. These days; objective structured clinical examinations (OSCEs) are increasingly used as a means of assessing a variety of clinical skills at both undergraduate and postgraduate level. Basically, OSCE is a circuit of assessment stations, each lasting 5-10 minutes, where a range of practical clinical skills are evaluated by an examiners using a previously determined, objective marking scheme². In a typical OSCE, examinees complete all the stations by rotating through the circuit. In this way, all candidates take the same stations. OSCE has been considered as an improvement over traditional examination methods because the stations can be standardized³.

However, despite its prominence, there are criticisms that the OSCE stations can never be truly standardized and objective in the same way as a theoretical exam⁴. Amongst the different limitations in the conduct of OSCE like a need for an exhaustive human resource, supervision and equipment, examiners' fatigue and decline in concentration over time is of paramount importance. Tiredness over the course of an examining session may introduce systematic error in the conduct of an OSCE. This may influence the final results of the candidates^{4,5}. This study was conducted to evaluate the degree of examiners' fatigue and decline in concentration over time in the conduct of a seven days long OSCE. This was done through a structured questionnaire distributed among the examiners at the end of each OSCE.

MATERIAL AND METHODS

This cross-sectional study included 6 examiners who examined 250 students of final year MBBS in the subject of General Medicine. This was a 7 days long OSCE, conducted by Khyber Medical University (KMU) in the department of medicine of the Khyber Teaching Hospital (KTH) Peshawar in April 2017. The study was approved by the Ethics Committee of KMC/KTH and an

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informed written consent was obtained from every participant. All the 250 participating students were divided into seven groups A-G. Group-A was examined on the 1st and group-G on the 7th day of OSCE. The first six groups (A-F) comprised of 36 students each while the last group (group-G) had 34 candidates.

For convenience, each candidate group was split into two equal subgroups and examined separately but in the same OSCE circuit each day. Each OSCE circuit comprised 18 stations designed as follows: 2 rest stations, 4 short cases, 2 interactive stations for counseling and communication skills, 2 data interpretation stations, and two stations each for clinical scenario, CT scan, Chest X-ray, and ECG interpretations.

On the day of OSCE, an orientation class was arranged for each group of candidates before the conduct of OSCE. Six out of a total of 18 stations had direct encounter of examiners with the students. The stations where examinees were assessed in the presence of an examiner included; 4 short cases (one for neurology, gastroenterology, pulmonology and cardiology each), one counselling skill assessment station and one combined station for communication skills, ethics and professionalism, respectively. Senior faculty members of the department of medicine of KMC/KTH decided the content of each OSCE station according to the syllabus of KMU for the final year MBBS students. A key was available for each individual station.

The six examiners involved in the OSCE were bound to mark the patient against a set of predetermined objectives and skills. By using a group of six house officers as simulated examinees, all the six OSCE examiners were pilot tested two days before the OSCE. This pilot study was done to ensure examiners orientation, detect flaws in the content of OSCE and to ensure adequate time allocation for individual OSCE stations. Furthermore, all the examiners were re-briefed about their responsibilities on the first day of OSCE. A similar orientation was arranged for every group of the participating final year students, half an hour in advance of their respective OSCE day.

Each OSCE station was 5 minutes long. Two bells were rung, one at the start and one just 30 seconds before the closure of each individual station, to alert the examinees to wrap up their remaining tasks. The students were moved in an anticlockwise fashion in the OSCE circuit. At the completion of one circuit, the candidates were separated to avoid crossover and leaking of the materials to the yet unexamined subgroup of the examinees.

At the end of each day, a questionnaire was distributed to each of the six examiners. They marked their level of fatigue, and decline in concentration, using a scale of 1-10, a score of 1 meant minimum fatigue or decline in concentration, where as a score of 10 indicated maximum fatigability, and decline in ability to concentrate. Data was obtained from every examiner

at the end of each day, so that a total of seven sets of questionnaires were obtained in this 7 days long OSCE. In order to avoid a bias, all the examiners remained unchanged throughout this OSCE. Similarly, the stations they examined remained the same. However, to avoid the repetition of the same materials; the tasks for students kept changing. As all the examiners filled in the data each day, the response rate was 100%.

STATISTICAL ANALYSIS

All the data were analyzed using SPSS version 16. One-way ANOVA was used to compare mean fatigue level and decline in concentration of different OSCE days and a P value of less than 0.05 was considered as criterion standard. Frequencies and percentages were calculated for qualitative variables like gender and previous exam training. Skewness and Kurtosis were used to check the assumption of normality. The assumption of homogeneity of variance was analyzed by using Levene's test.

RESULTS

Of the six examiners, 5 were males. Furthermore, only 4 of them had been trained formally in the conduct of OSCE previously. Other examiners' related characteristics are given below (Table 1), In order to compare the means of fatigability level of the examiners, and their ability to concentrate over the course of this 7 days long OSCE, one-way ANOVA was applied. Skewness and Kurtosis were used to check the assumption of normality (Table 2).

Similarly, the assumption of homogeneity of variance was analyzed by using Levene's test and found tenable (Table 3). The results showed numerically significant increase in the level of fatigue of the examiners by each passing day. A similar trend was also seen in their ability to concentrate over time. However, it must be noted that in contrast to a progressive increase in their fatigability score over time, the ability to concentrate remained constant between day 2 & 3 and day 4 & 5 respectively (Table 4).

The results showed statistically significant increase in mean fatigability level over time, $F(6) = 25.76$, $P < 0.001$, $\text{Eta squared} = 0.82$. Post Hoc analysis with Turkey HSD showed that fatigability score on day 3-7 was significantly different than on day 1-2, $P < 0.01$. Moreover, there was no statistically significant difference between two consecutive days i.e. day-1 and day-2, day-2 and day-3, day-4 and day-5 and so forth, $P = > 0.05$ each. Similarly, there was a statistically significant decline in concentration amongst examiners with the passage of time, $F(6) = 7.67$, $P < 0.001$, $\text{Eta squared} = 0.57$. In terms of Post Hoc analysis, day-6 and 7 were statistically different than day1-5, $P < 0.05$; however, rest of the days were not significantly different, $P < 0.05$.

Table 1: OSCE examiner related characteristics (level of fatigue and ability to concentrate over time were recorded on a scale of 1-10 with 1 meaning minimum and 10 the maximum value).

Examiner's characteristic	Mean	Standard Deviation
Age	48.67 (years)	1.75
Previous exam experience	8 (years)	1.41
Level of fatigue over time	3.64	1.10
Decline in concentration over time	3.14	0.75

Table 2: Tests for the assumption of normality of the two study variables.

Variable				
	Statistic	Std. Error	Statistic	Std. Error
Level of fatigue over time	-0.04	0.36	-0.89	0.72
Decline in concentration over time	0.12	0.36	-0.39	0.72

Table 3: Levene's test for the assumption of homogeneity of variance.

Variable	Levene's Statistic	Pvalue
Level of fatigue over time	0.69	0.66
Decline in concentration over time	0.17	0.98

DISCUSSION

Conventional examination methods including, long and short cases, essays writing, multiple choice questions (MCQs), instruments and specimen based oral interviews, and so forth have been the most popular forms of clinical competence assessment in Pakistan for years. It is worth mentioning that the validity and reliability of such assessment methods have been questioned, not only in Pakistan, but abroad as well. The postgraduate medical body, the College of Physicians and Surgeons of Pakistan (CPSP), initiated OSCE as a method of clinical assessment in the 1990s. This was later adopted by the Pakistan Medical and Dental Council (PMDC) at the undergraduate level. Khyber Medical University took another step forward, by replacing the traditional examination methods with OSCE in 2010. As per this initiative, all the medical and dental schools in

Khyber Pakhthunkhwa (KP) province of Pakistan adopted OSCE as a part of the final year medical examination for assessing clinical competencies of the students⁵.

These days, OSCE has become a very renowned format of clinical assessment in Medicine. In a recent study, the introduction of OSCE as a form of assessment into a geriatric medicine teaching program and student evaluation was found to be feasible⁶. This finding is consistent with our experience. OSCE improves problem based learning (PBL) in the candidates and is thus, very crucial in promoting problem solving skills and deep learning. In a study by Zhu X et al, problem-based, and nursing process-driven OSCE format effectively assessed nursing students' clinical competencies, and clinical and critical thinking⁷. A similar trend was observed in other studies done in the recent past^{8,9,10}.

Despite the huge popularity, OSCE has gained since its conception, many flaws still exist. Overall scores on the OSCE are often not very reliable. Brannick MT et al (2009), reported that it was more difficult to reliably assess communication skills than clinical skills in a given OSCE. They recommended that, using two examiners and large numbers of stations, may help in avoiding a scoring error, and that for reasons that are not yet fully understood, some OSCEs appear more reliable than others^{11,12}. It has been postulated that, examiner behavior and training and other local factors are important contributors to variations in scores between different medical schools¹³. In our study, all the examiners had enough experience in the conduct of OSCE, however; not all of them had been formally trained previously.

Examiners' fatigue and decrease in concentration over time in a given OSCE is one of the different factors which can influence the results of OSCE⁴. Tiredness over the course of an examining session may introduce systematic error and affect the overall pass/fail results. However, in a study by Humphris GM et al, no evidence was found, that the duration of examining in a communication OSCE influenced examiners, and affected their ability to concentrate and the marks they awarded¹⁴. This is in contradiction to our observations as our examiners fatigued significantly over time and had low levels of ability to concentrate at the end of OSCE rather than at the start. Another study revealed that candidates' assessments' were influenced by different types of evaluators. It was found that statistically significant difference existed in student OSCE scores based on the examiner type, with less trained, less experienced, part-time faculty members awarding higher scores than full-time well trained faculty members or postgraduate residents¹⁵. It must be noted that all the examiners in our study group were the senior faculty members of Khyber Medical College and had an average exam experience of 8 years. Moreover, the junior and less experienced examiners in our OSCE were observed by relatively more senior and trained examiners to avoid any bias in scoring.

Considering the scarcity of studies evaluating examiners' fatigability and ability to concentrate over the course of OSCE, we conducted this study to record the level of tiredness and decline in concentration of the OSCE examiners. We observed that the examiners tended to get fatigued with the passage of time and had a decline in ability to concentrate. These are important findings which may influence the scoring of OSCE and the final pass/fail results. Further studies are recommended in this regard, so as to make conduct of OSCEs more efficient.

CONCLUSION

It is suggested that in the conduct of OSCEs, examiners' fatigability increases with the passage of time, causing a similar decline in their ability to concentrate. Moreover, unlike a progressive and sustained increase in fatigability level over time during an OSCE, the decline in ability to concentrate becomes more pronounced towards the end of OSCE.

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- Haider I:** Idea of article abstract.
Badshah A: Data collection results discussion writing.
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Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.