



# VALUE OF OBJECTIVE STRUCTURED CLINICAL EXAMINATION IN THE FORMATIVE ASSESSMENT OF CLINICAL POSTING IN COMMUNITY MEDICINE GRADUATE TRAINING PROGRAMME

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## ABSTRACT

**Background:** Objective structured clinical examination (OSCE) was designed to improve reliability of the clinical examination. Objective of the study was to find the effectiveness of OCSE in comparison with the conventional method this study was conducted in Community Medicine end-posting examination.

**Methods:** An educational interventional study was conducted among the 7<sup>th</sup> semester students to find the effectiveness of OCSE in comparison with the conventional method of 'end-posting examination' using stations and checklists as a part of formative assessment at the end of their clinical posting in the department of Community Medicine.

**Results:** The mean score obtained by the students in group one by conventional method was lesser than OSCE method; this difference was statistically significant. By OSCE method, maximum number of student had provided improved performance.

**Conclusions:** Performance by students in the applying OSCE in the formative assessment was found to be significantly better in comparison with the conventional method. Maximum number of students performed above average in the OSCE compared to the conventional pattern of assessment.

**Key words:** Objective structured clinical examination, formative assessment, reliability

## INTRODUCTION

Medical teachers are concerned about the assessment of students that has led to attempts to

improve the reliability and objectivity of written examination with the introduction of multiple choice questions and modified essay questions. Objective structured clinical examination (OSCE)

was designed to observation of students' performance and the clinical competence by the bedside while simultaneously improving objectivity and reliability. It was later extended to practical examination, i.e., objective structured practical examination (OSPE).<sup>1</sup>The intricacies of assessing clinical acumen is possible through OSCE with some inherent limitations.<sup>2</sup> Since 2013 several workshops on OSCE and OSPE have been conducted by the Medical Education Unit under the quality assurance of IQAC (Internal Quality Assurance Cell) of Sri BalajiVidyapeeth University under the guidance and supervision of very eminent and learned faculty from the university. After several workshops on OSCE/OSPE almost all the departments were well equipped to conduct the examinations in OSCE/OSPE pattern.

With the above academic scenario it was internalized that these should stand true for the department of Community Medicine also, thus an interventional study among the student to find the effectiveness of OCSE in comparison with the conventional method of 'end-posting examination' was conducted in the month of 28<sup>th</sup> August 2014 to 28<sup>th</sup> September 2014 among the 7<sup>th</sup> semester student, since they were the only batch/semester posted in Community Medicine. With the research question 'Is OSCE an effective method of formative assessment among 5<sup>th</sup> to 7<sup>th</sup> semester MBBS students for the department of Community Medicine?', the objectives of the study was to find the effectiveness of OSCE during their clinical posting in the department as a method of assessment and to compare the performance of OSCE with conventional methods.

## METHODS

An educational interventional study was conducted among the 7<sup>th</sup> semester students to find the effectiveness of OCSE in comparison with the conventional method of 'end-posting examination' using stations and checklists as a part of formative assessment at the end of their clinical posting in the department of Community Medicine in Mahatma Gandhi Medical College & Research Institute.

The batch of 150 MBBS students per year are attached with the department of Community Medicine since the first year of their admission. But for clinical posting the students are allotted batch-wise on rotation after completion of first year, i.e. from their third (3<sup>rd</sup>) semester to sev-

enth (7<sup>th</sup>) semester, till they appear their final MBBS part I examination. Among these postings, when they are posted during 5<sup>th</sup> and 7<sup>th</sup> semester they are exposed and trained for "Clinic-Social Case" history-taking, examination, management at various levels of prevention (Primary, Secondary and Tertiary) and management at various levels of targets (Case, Family and Community). At the end, conventionally, they were assessed by clinic-social case presentation.

The whole regular batch of 7<sup>th</sup> semester had been divided into five groups namely A, B, C, D and E (routinely done by academic wing of Dean's office for rotation into various departments). During the period of study group A were undergoing the clinical with the department of Community Medicine and group E had just finished their posting with end-posting examination in conventional method on 23<sup>rd</sup> of August 2014, where 21 students (Named as **G1** for the present study) were posted but only 20 had turned up for the examination. The students presented their case to a specified examiner as allotted randomly by lottery method to each of them. The ongoing group A (33 students, named as **G2** for the present study) were trained in "Clinico-Social Case" history-taking, examination, management at various levels of prevention (Primary, Secondary and Tertiary) and management at various levels of targets (Case, Family and Community) skills as well as examination pattern of OSCE/OSPE with checklist.

At the end of the posting, on 22<sup>nd</sup> of September 2014, OSCE was applied with 10 stations, each of which was of 5 minutes' duration, with checklists and observers. The stations were of various categories related to Clinico-Social Case along with Checklists as a method of formative assessment. 28 students out of 33 were present during the end-posting examination.

The results of their performance were compared with the immediate previous conventional end-posting examination method (case Presentation) conducted on 23<sup>rd</sup> of August 2014. Immediate feedback were given at the end of the examination regarding their performance in each station, regarding their weaknesses and strengths so that they could utilize these feedback for corrective measure and better performance during their summative assessment examinations.

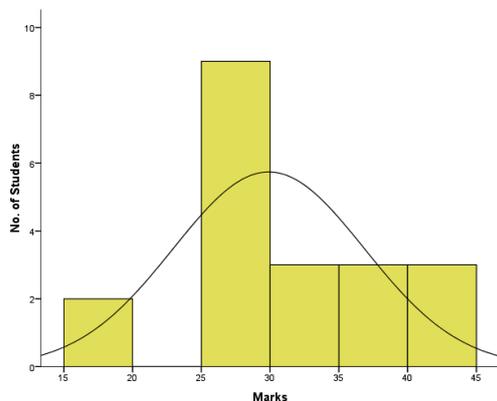
In this interventional Study, group A (G2) was the study group to which OSCE (intervention) method of assessment was applied using OSCE pattern of formative assessment as interventional

method, Checklists for observers, Mannequins, Standardized Patients and group E (G1) was taken as a control group to which conventional method of assessment was applied. The study was conducted between 28<sup>th</sup> August 2014 to 28<sup>th</sup> September 2014 at the Department of Community Medicine, Mahatma Gandhi Medical College and Research Institute, Puducherry. Groups of 7<sup>th</sup> semester students posted in the department of Community Medicine for clinical postings were participants in this study. The data were entered in SPSS version 16 and analyzed. Students' T test was applied for comparison of performances between the two methods of assessments. The results are presented in the form of table and charts as shown in the "Result" section.

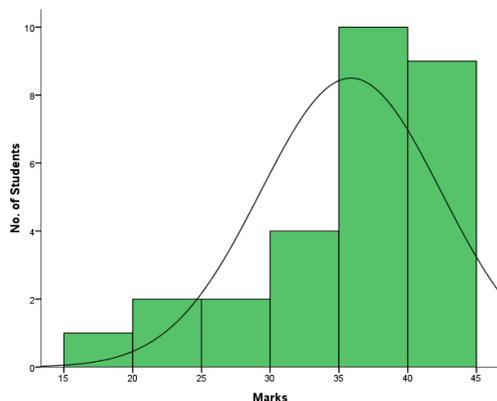
**RESULTS**

**Table 1: Comparison between Conventional and OSCE method of formative assessment**

Method	Count (subjects)	Mean Score	Standard Deviation	Standard Error	95% LCL	95% UCL	t-test
Conventional (G1)	20/21	29.9000	6.9502	1.5541	26.6472	33.1528	-3.0281
OSCE (G2)	28/33	35.8661	6.5700	1.2416	33.3185	38.4136	(0.0040)



**Fig.1: Histogram of marks obtained by G1 with Conventional method**



The mean marks (score) obtained by the students in G1, i.e. by conventional method was 29.90 out of 50 whereas in G2, i.e. by OSCE method, it was 35.86 out of 50 which is a statistically significant difference. [Table 1]

The marks obtained by the students in the group G1 is normally distributed, a bell shaped curve when plotted in histogram. The range of marks obtained was from 15 out 50 to 45 out of 50. But maximum number of students obtained marks between 25 out of 50 to 30 out 50. [Figure 1]

In the histogram of the distribution of marks obtained by group G2, the curve is skewed towards right side depicting that maximum number of student had obtained marks between 35 to 45 out of 50, even though the range of marks was from 15 to 45. [Figure 2]

**Fig.2: Histogram of marks obtained by G2 with OSCE method**

**DISCUSSION**

Medical science has ultimately transformed from 'Knowledge based' to 'Skill based' applied social science. Traditional assessments in medical education need a overhauling with radical modifications as we have genuine concern on how much students have learnt from the teaching-learning set ups. To improve the reliability and objectivity of written examination in the clinical setting OSCE is being frequently used for precise judgments in relation to various spheres of performance to move away from the bedside to patient management problem scenario. Performance by students in the OSCE pattern of formative assessment was found to be significantly better in comparison with the conventional method in our study. Maximum number of students performed above average in the OSCE pattern of assessment unlike conventional method, according to the present study. Another important factor which is found to be quite remarkable from this study is that within a very short span of time, i.e. around 1 to 2 hours, a substantial number of students can be examined. Difficulty levels were equal for each student and each student can be examined in each specified area thoroughly to find out

where and what are their deficiencies in OSCE pattern. Our study noted that by OSCE method of formative assessment the students performed significantly better than the conventional method and maximum number of students had secured marks ranging from 35 to 45 out of 50. Whereas in conventional method the maximum number of students obtained marks between 25 to 30 out of 50. Similar findings was quoted by Brian E Mavis in his study even though he commented that the students whose performance was above average seemed to be the talented students whose records indicated a history of academic success.<sup>3</sup>

In conventional method each students were examined by only one examiner and their performance were based on factors like their presentation, their previous rapport with the particular examiner, attendance in class, nature of the case they got (factor of luck/chance), knowledge about that particular case, mood of that particular examiner, confidence and stress factor of the students, etc. where lots of personal or subjective and general biases were possible.

Whereas in case of OSCE method there were 10 stations checklists were used, and 10 different observers were there to assess the performance, which eliminates those above biases and improve reliability with lesser anxiety of viva and if any one student did not performed well in any particular station he/she always had chances to do better and score in the next upcoming stations. Each station had different observer which had tried to eliminate the subjective bias.

Similarly OSCE was noted as a better method of assessment in students' point of view as by this method the students have performed significantly better as compared with the conventional method. Another important factor which was found to be quite remarkable is that within a very short span of time, i.e. around 1 to 2 hours, a substantial number of students can be examined, which is quite impossible in conventional method of practical and clinical examinations. Difficulty levels are equal for each student and each student can be examined in each specified area thoroughly to find out where and what are their deficiencies in OSCE pattern. Thus it is found to be a very useful method of formative assessment. It can also be a useful tool for assessing the practical aspect of any medical subject during for summative assessment to minimize bias and other factor which may actually affect the result of students.

The above average performing students seemed to be the talented whose records indicated a history of academic success. The amount of time they reported for OSCE preparation was comparable to that reported by students with below average performance. It appears that prior academic performance rather than preparatory phase is a better predictor of OSCE outcomes.<sup>3</sup>

Regehr Get al mentioned that global rating scales scored by experts showed higher inter-station reliability, better construct validity, and better concurrent validity than did checklists. Further, the presence of the checklists did not improve the reliability or validity of the global rating scale over that of the global rating alone. These results suggest that global rating scales administered by experts are more apt summative measure when assessments are based on performance.<sup>4</sup>

In the Tehran study, feedback from all students in their final year of studies in their pre-internship OSCE showed that three-fourths indicated OSCE as a useful learning experience. More than half approved that OSCE assessed a broad range of clinical skills and knowledge.<sup>5</sup>

At the end of clinical posting of learning of physical examination skills, assessment was done in Nepal in fifteen OSCE stations, each of 5 minutes with standardized patients and validated checklist. Almost all student attended the OSCE session and reported that standardized patient were co-operative in a non-threatening environment. The majority of the faculties was satisfied with the selection of simulated patients and was satisfied with student's approach towards them.<sup>6</sup>

In a South-Indian study, mental health trainees got exposure to weekly OSCE training on various aspects of clinical work. In their e-mail feedback they endorsed OSCE for their enhancement in clinical and interpersonal skills particularly on communication, empathy.<sup>7</sup>

Another South-Indian study noted OSCE highly as the competency-based evaluation methodology to be used in cancer education to be reliably used at all levels of health care from care seekers to caregivers in Indian palliative care settings.<sup>8</sup>

OSCE has growing approval in the medical disciplines, chiefly due to its emphasis on objective assessment and effectively been implemented by regulatory bodies in pediatrics, ophthalmology, and otolaryngology in India with a potential for application in undergraduate, postgraduate, continuing education, and licensure and certifying exams.<sup>9</sup>

Awareness on Evidence-based Medicine has been rising since early nineties. In contrast to OSCEs ranging between 6-8 minutes, EBM-specific OSCE has been recommended as a 'double' station to afford satisfactory time to evaluate all portion of EBM aptitude.<sup>10</sup>

### Strengths of the study

Augmenting skills of the medical graduates as primary health practitioners will enhance the quality of health care in India. Our study generated alertness about further research on medical education among students as well as teachers across disciplines on which few studies have been reported so far in this region, though research in teaching learning in undergraduate medical course is much needed. Further, instant feedback at the end of the examination on their performance in each station, regarding their weaknesses and strengths helped them as mirror for corrective measure and better performance during their summative assessments.

### Limitations of the study

We had several limitations. Firstly, a small sample was used for the assessment of effectiveness of newly developed study module for any scientific conclusion for this kind of formative assessment. Secondly, ideally similar group of students should have been examined with both the methods (conventional and OSCE) for more accurate results and inferences instead of two different group or set of students as the schedule were made for their rotation immediately from the next day. Thirdly, the results show the trends from one medical institution. Lastly, teachers also need to be adequately trained how best we can administer OSCE for the learners.

### Future directions of the study

With the encouraging results on constructive gains and acceptability by the students and faculty, we hope to continue the study every year. Further, we hope to propose to the authorities to bring to a change in medical curriculum and teaching methods. We suggest that similar studies are needed with inputs from the multidisciplinary sources available in our country along

with larger study participants for more significant results. Our overall impressions underline the fact that medical students are not adequately prepared in pre-hospital care of fractures.

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### REFERENCES

1. Oumachigui A. Objective structured clinical/practical examination, book: medical education principal and practices, in N. Ananthakrishnan N, Sethuraman KR, Kumar S. 2000; 2<sup>nd</sup> edition; page: 145- 52.
2. Walsh M, Bailey PH, Koren I. Objective structured clinical evaluation of clinical competence: an integrative review. *J Adv Nursing* 2009; 65(8): 1584-95.
3. Mavis BE. Does studying for an objective structured clinical examination make a difference? *Medical Education* 2000; 34(10): 808- 12.
4. Regehr G, MacRae H, Reznick RK, Szalay D. Comparing the psychometric properties of checklists and global rating scales for assessing performance on an OSCE-format examination. *Acad Med* 1998; 73(9):
5. Labaf A, Eftekhari H, Majlesi F, Anvari P, Sheybaee-Moghaddam F, Jan D, Jamali A. Students' concerns about the pre-internship objective structured clinical examination in medical education. *Educ Health* 2014; 27:188-92.
6. Piryani RM, Shankar RP, Piryani S, Thapa TP, Karki B, Khakurel MP, Bhandary S. Conducting Integrated Objective Structured Clinical Examination: Experiences at KIST Medical College, Nepal. *Arch Med Health Sci* 2013; 1:166-70
7. Sharma MK, Chandra PS, Chaturvedi S K. Objective structured clinical examination and its impact on clinical and interpersonal skills: Follow-up study. *Indian J Psychol Med* 2013; 35: 299-301
8. Kumar SP, Prasad K. Use of objective structured clinical examination and structured clinical instruction module for interprofessional education on cancer: A focused review. *Int J Health Allied Sci* 2012;1:135-41
9. Agarwal A, Batra B, Sood A K, Ramakantan R, Bhargava SK, Chidambaramathan N, Indrajit I K. Objective structured clinical examination in radiology. *Indian J Radiol Imaging* 2010; 20: 83-8.
10. Ilic D. Rationale for Using OSCEs to Assess Student Competency in Evidence-based Medicine. *Educ Health* 2010; 23: 434