

Feasibility and Effectiveness of Objective Structured Clinical Examination for Assessment of Field Visits in Community Medicine for Undergraduate Medical Students

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Abstract:


Introduction : The Graduate Medical Education Regulation (GMR) 2019 in the curricular reforms recommends that “Shows How” level of the Miller's Pyramid is assessed through long case, Objective Structured Clinical Examination and Mini-Clinical Evaluation Exercise (Mini CEX). **Objectives :** 1. To utilize OSCE for assessing Field Visits carried out by Undergraduate medical students as formative assessment. 2. To find out the feasibility and effectiveness of Objective Structured Clinical Examination (OSCE) in Community Medicine. **Method :** An Educational Innovation Pilot Project was carried out in the department of Community Medicine of a Medical College in India. A pilot (18) of 3rd MBBS students were assessed through Objective Structured Clinical Examination (OSCE) for epidemiological case study of malaria assigned to the author faculty. These students were also exposed to the oral viva. The analysis of the assessment was through assessment of codes of the procedure stations through checklists and mean scores of procedure and response stations. Qualitative analysis of emerging themes and quantitative analysis as likert scale were utilized for evaluation of the exam were used. **Results :** The mean score of all response stations was 5.1. Almost all students felt that OSCE was better than the conventional oral viva in assessing skills. Furthermore, almost all students and faculties suggested that it should gradually become a part of curriculum and scaled to entire and other batches with suggested modifications. The residents who participated as simulated cases found it to be a novel experience and a different kind of learning process. **Conclusion :** It is feasible to introduce OSCE with some modifications in assessing skills acquired in field visits in Community Case Management.

Key Words : Community Medicine, Field Visit, Internal Assessment, Medical Undergraduates, Objective Structured Clinical Examination

Introduction:

The main aim of medical education is to foster the development of clinical competence in students at all levels. The traditional pattern of practical examination has several problems as reported by previous studies.^[1-3] The variability in practical examination and examiners, lack of objectivity both affects grading in traditional pattern, significantly. Added to this, the traditional pattern of examination does not assess the attitudes and communication

skills of the candidate. In response to these defects of clinical and practical examinations, some attempts have been taken to improve the current scenario.^[1-3] The first innovation in this regard is the introduction of objective structured clinical examination (OSCE) later extended to the practical examination (OSPE) described by Harden and his group from Dundee in 1975 and in greater detail in 1979.^[4-5] OSCE is meant to test “Shows How” level of the Miller's Pyramid.^[4] OSPE has been recommended as an alternative

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instrument for the assessment of practical examinations.^[6] In this, all the educational objectives of an exercise can be assessed through a structured evaluation pattern. The objectivity and uniformity in the questions and marking of students make OSPE better than traditional pattern of examinations.^[7]

Currently OSCE/OSPE is conducted in a few medical colleges in association with other conventional methods in India, and is being allotted a small percentage of marks.^[3,8] Competency assessment has been an obligation and an ongoing challenge for those institutions responsible for training and certification of doctors. The GMR 2019 in the curricular reforms for the competency-based-medical-education (CBME) for undergraduate medical curriculum recommends that "Shows How" level of the Miller's Pyramid is assessed through long case, OSCE and Mini CEX.^[9] There is paucity of studies till date on assessment of students in Community Medicine using OSCE/OSPE. The traditional assessment methods being; spotting, oral viva, epidemiological case studies and reports/logbooks and these methods are not able to test all the skills. The current study utilized OSCE; to assess Field Visits carried out by Undergraduate medical students as formative assessment and; to find out the feasibility and effectiveness of the same in Community Medicine.

Method:

The present Educational Innovation Pilot Project was carried out during August 13, 2013 to November 13, 2013 in a Department of Community Medicine of a college located in western India. Teachers in the department, Postgraduate students of Community Medicine and a pilot of 18 students of 3rd MBBS were the study participants. The teachers were trained by the author who was the co-ordinator of institutional medical education unit and curriculum committee regarding Objective Structured Clinical/Practical Examination with a PowerPoint Presentation, Role play, demonstrations and Interactive discussions. Most of the faculties

were trained in the basics of medical education technologies. Another session was conducted on using Standardized patients. Residents in the department were taken as Standardized patients. The students were also briefed about the importance, concept and method of OSCE. Their consent was sought and queries answered. They were also appraised about feedback to be given and obtained by them.

Context: Process of teaching and learning a community case; a group of five students were assigned a family having a case of a disease commonly seen in the community under the guidance of a teacher. During epidemiological case study students spent nearly ten hours at the patient's house and family to learn integrated practice and to apply the principles of holistic patient management and good communication skills. The students were then assessed through oral viva and report presentation. So, to start with and to overcome the shortcomings of conventional examinations it was decided to assess a pilot of 3rd MBBS students through OSCE for epidemiological case study. These students were also exposed to the oral viva as were other students to eliminate bias in assessment.

Preparation for OSCE: In consultation with the four teachers who became part of the examination, OSCE blueprint was constructed, stations, scenarios for Standardized Patient and checklists were prepared and finalized. There were four Procedure and seven Response stations as shown in Table 1. Four senior residents acted as standardized cases and other four assisted in conducting the examination. Community case was a family member suffering from Malaria.

Implementation of OSCE: Included: Preparation of space; Procuring and arranging required materials for the 11 stations; Instructing students on the previous day and solving queries; Briefing with observers and standardized patients as residents. A team was formed for each of the four procedure stations comprising of a senior teacher, a senior resident as a simulated case and a junior resident. The role of each of the member

was further cleared, appraised and the checklist was again discussed with the observer teachers. Two non-teaching staff in form of social workers also assisted in the conduction of the examination. Administering OSCE; the exam was administered and was completed in about two hours, Figure 1. Immediate group and sandwiched feedback was given to the students regarding their performance in the examination. Confidentiality of the stations was maintained up till the end of the examination.

Evaluation of Examination: For evaluation of the exam mixed methods were used viz; **Quantitative and Qualitative.** 1) **Qualitative method:** One Focus group Discussion (FGD) each with students, simulated case and teachers was conducted. A semi-structured guideline for each of them was prepared in order to understand the process of OSCE and obtain their perceptions on the same. The emerging themes were then analyzed. 2) **Quantitative method:** A semi-structured questionnaire was administered to each student just after the exam to get their views about the exam (Some of the questions were: Did learning take place in field visits? (Cognitive); Was OSPE better than the conventional exam (oral exam)?; How skilled do you feel? (On a likert scale). Should it be scaled?; Perception about Visits; Perception about stations; Perception about faculties; Modifications required if any.

Analysis: Assessing codes of the procedure stations through checklists and mean scores of both the stations. Qualitative method analysis of emerging themes and quantitative as % and likert scale.

The approval of the Institutional Ethics Committee for Human Research of the institution was obtained before starting the data collection (approval dated 24th June, 2013).

Results :

Field Visits carried out by undergraduate medical students of 3rd MBBS in Community Medicine at a Medical College in India was assessed by OSCE. A pilot of 18 students, four teachers, 10 residents and two paramedical staff participated in the study.

A) Assessment of OSCE; The scores obtained by the students in the procedure stations are shown in Figure 2.

It is seen from Figure 1 & Table 2 that the students scored well in the 4th station (Mean Score=7.6 & 95%CI= 8.45-6.82) which assessed their skills in dietary history taking and counseling and poorly in the second station that assessed them on arriving at environmental diagnosis and preventive advice. The mean score of all response stations (Table 2) was 5.1 and this shows the need to bring improvement in specific areas of cognitive and psychomotor domain. The response stations were structured and to bring in objectivity, an answer key was prepared and the same were assessed by the same examiner.

Feedback offered to the students by the teachers assessing OSCE : group and sandwiched feedback to the students was given immediately after the exam as the teachers felt that most of the mistakes were committed uniformly by most students. For instance; greeting the patient, use of local language and avoidance of scientific terminology (jargons for eg deficiency / absorption / iron / calorie / quality / quantity). The need for eliciting complete personal history was stressed upon. Feedback on diet included; importance of eliciting complete history on intake of green leafy vegetables/fruits/milk/dry fruits; and inclusion of information on food fads in history taking. Appropriate information on menstrual hygiene should also be asked by male students as most of them skipped it.

B) Evaluation of OSCE : The OSCE administered to the students was assessed by Qualitative methods: a) Semi structured questionnaire administered to the students to get their feedback and b) Focus Group Discussion with the students, teachers and simulated cases to understand the process and perceptions of participants.

Students' perspective on overall assessment: In the present study almost all the students felt that

Table 1: Stations of OSCE

Station No.	*Station Details/Objectives	Domain assessed	Patient used
1.	Procedure: To assess complete clinical history taking using good communication skills	Cognitive and Affective	Simulated patient
2.	Procedure: To assess environmental history taking and advising on prevention of malaria next time, also in the family and community.	Cognitive and Affective	Simulated patient
3.	Procedure: To assess socio-cultural history taking regarding mother and child care.	Cognitive and Affective	Simulated patient
4.	Procedure: To assess dietary history taking and counselling on the improvement of the same.	Cognitive. Psychomotor and Affective	Simulated patient
5.	To assess management of the case as per National Guidelines.	Higher cognitive	Response station
6.	a) To identify type and stage of malaria parasite in the given photograph of peripheral smear of blood b) To identify the given vector (female anopheles mosquito) through a microscope	Cognitive and Psychomotor	Response station
7.	To comment on the photograph of a house from urban slum regarding breeding places of mosquitoes and enlisting measures to prevent the same.	Higher cognitive	Response station
8.	To comment on the table of diet consumed by the patient.	Higher cognitive	Response station
9.	To calculate malariometric indices from the given data	Higher cognitive	Response station
10.	To depict through a flow diagram health organisation for malaria in slums.	Higher cognitive	Response station
11.	To prescribe chemoprophylaxis to prevent malaria to a patient visiting an endemic area.	Higher cognitive	Response station

*Seven Minutes & Ten Marks for each Station

Figure 1 : Stations of OSCE



A Procedure Station



A Response Station

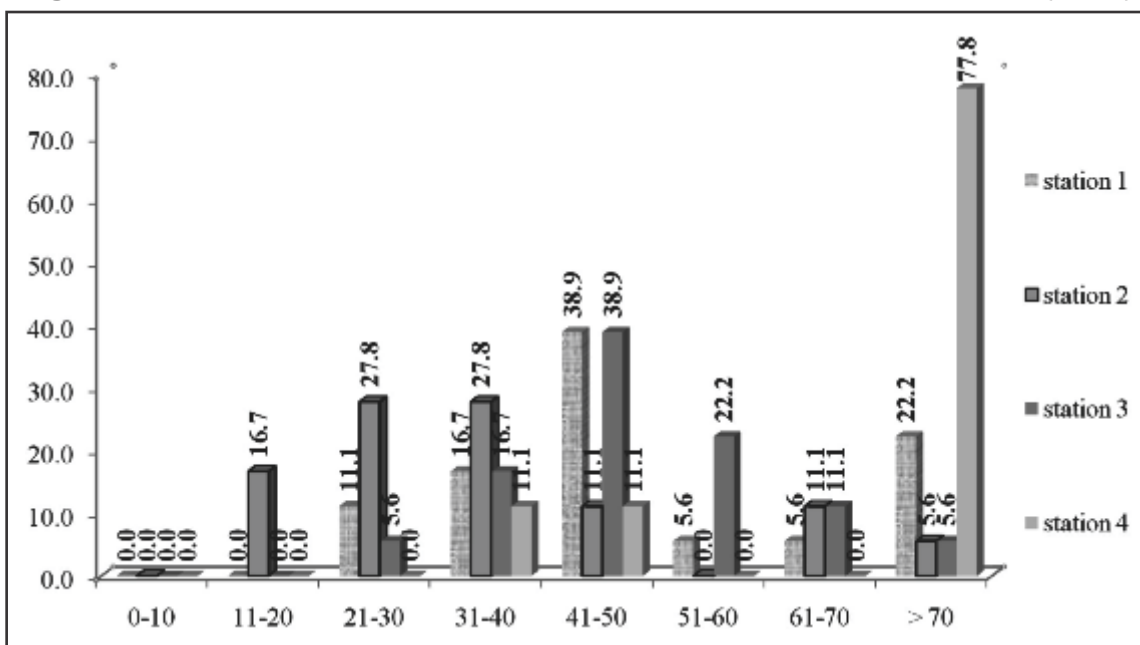
Table 2: Score of the students at different Procedure & Response Stations of OSCE (N=18)

Procedure Stations of OSCE (4)	Station 1	Station 2	Station 3	Station 4
*Mean Score and SD (standard deviation)	5.1&1.4	3.6 &1.8	5 &1.4	7.6 &1.7
95% CI (Confidence Interval)	5.67-4.21	4.45-2.77	5.58-4.33	8.45-6.82
**Response Stations of OSCE (7)	**Mean Score and SD(standard deviation): 5.1 & 1.4 95%CI (Confidence Interval): 5.79-4.48			

* From the score in the checklist (Out of 10)

**From mean of the total of seven stations. (Out of 10)

Figure 2: Score of the students at different Procedure Stations of OSCE in % (N=18)



OSCE was better than the conventional oral viva in assessing skills. In students' own words, "It was too near to the practical approach as required in MBBS. Till now, we had only learnt to give viva and not dealt with patients and that is what we have to actually do in future. As a doctor, it gives complete assessment of intellectual, emotional, communication skills and social aspects (of patients). It checks the skills (personal and performance) at community level and increases practical knowledge. In case of viva, there are theory questions, so there is less exposure to actual communication. Oral viva depends on the mood of the examiner & topics are jumped (skipped) in oral viva. Helps develop communication skills & it

(OSCE) is perfect. Furthermore, almost all students suggested that it should become a part of curriculum and scaled to entire and other batches, however few modifications suggested by them were; minor changes required regarding the scenario and the patients; not only a single disease, but all-important diseases should be covered by OSCE.

Students' perspective on OSCE: from FGD conducted with students immediately after the exam the following points emerged; "Time was not enough though OSCE stations were easy". "It was first exposure of counseling so we were hesitant, more so because the cases were simulated by resident teachers from the department". Almost all said that,

one demonstration of what is ideal counseling is needed.

On importance of Field visits/Epidemiological Visits; almost all students (17/18) mentioned that exposure to the community is necessary. In students' own words, "You cannot study ground level people by sitting in Air-Conditioned Chambers. So, one has to go to community level and know what the reality is". "Learning through visits/natural environment, provides learning at community level (problems and practical aspects). Base of clinical visits is really excellent if properly implemented". "There is good learning through visits". "Nutritive advice to the patients in the local language within the limits of their economic status improved our (students') diet consciousness". "Learnt about community practice and their culture. Acquired more knowledge by seeing the patients in their natural environment". A modification required by a student was, "Patients should be present at the time of case presentation so that the students can be cross checked". I would like to counsel the community by conducting one day program and similar such programs can be held for under-graduate students".

Regarding teachers' support, important quotes were; "Co-operative and friendly attitude of teachers and staff". "Co-operative and friendly attitude and acceptive approach of most of the faculty members". "Co-operative and skilled teaching faculty. Good demonstrations on part of the teachers".

Feedback on OSCE from simulated cases (residents): A focus group discussion was also conducted with the simulated cases as residents and the following salient quotes/points emerged;

"Good initiative by the department to introduce OSCE on experimental basis this year". "New experience and different kind of learning process". "Helps improve counseling and communication skills of undergraduate by taking history from the epidemiological point of view". "Tests Knowledge, Attitude and Practice about housing, environmental condition and how to improve it". "Teaches students

integrated practice of Public Health problems in family and community and to understand problems from patients' perspective"

Feedback on OSCE from teachers: A focus group discussion was conducted with the teachers and the following salient points in form of modifications required emerged;

Process modification; Students need to be sensitized about OSCE before starting visits in order to align objectives with assessment i.e., during postings or lectures.

Stations modification; As more time was being spent on reading questions, instead a play (2-5 minutes) or case scenario would-be easy for the students to comprehend and to answer questions. The presence of junior teachers (residents) enacting roles of patients made students awkward due to their seniority, instead of them interns or social workers could play role as simulated cases. Students can be asked to prepare a small role play themselves (citing as doctor-patient) for a particular scenario given to them was suggested by a few. Almost all teachers felt that the OSPE should be introduced and scaled gradually as a pattern of internal assessment in Community Medicine. It could be taken up with some modifications and gradually be started with clinical posting examinations.

Discussion:

Field Visits carried out by undergraduate medical students of 3rd MBBS in Community Medicine at a Medical College was assessed by OSCE. The aim of the study was to find out the feasibility and effectiveness of the same in Community Medicine. Till date, there is less information available on effectiveness and feasibility of OSCE/OSPE in Community Medicine in India. The study found out that it is feasible to introduce OSCE with some modifications in the Community Medicine examination as well, to start with as formative assessment. Several studies have proved objective structured practical examination to be a reliable assessment tool.^[10,11] Previous studies have reported

that OSCE/OSPE is an effective tool in discriminating between good and poor performers in practical examinations of medical subjects.^[12-13] In a study by Muthusami Anitha, et. al^[14], 49 surgery residents in Pondicherry were assessed, they concluded that OSCE is a reliable, valid and feasible method for evaluating surgery residents at various levels of training. Bhatnagar, et. al^[15], administered OSCE in Maharashtra and found the OSCE to be feasible to conduct and had high perceived construct validity. Both students and faculty members expressed a high degree of satisfaction with the format. In a study by Mazumder, et. al^[16] conducted in West Indies, the OSCE was perceived very positively and welcomed by both the students and examiners. To overcome challenges regarding OSCE better orientation of the faculty and preparation of the students for the OSCE was suggested. Mishra Priyadarshini, et. al^[17] concluded that OSCE could be used as a complement to a traditional examination. Adding two or three relevant questions on applied aspects to each station would be more helpful in the assessment procedure. In systematic reviews conducted by Varghese Abin and George Gagini^[18] and Rao Pallavi, et. al^[19] in India, authors found out that the faculty and students perceived OSCE as an effective tool for competency assessment. Time allotted at different stations, student anxiety and the implementation cost were addressed as barriers.

In the present study almost all the students felt that OSCE was better than the conventional oral viva in assessing skills. Similarly, previous study reported that OSCE/OSPE can examine both the clinical and experimental skills, better than a conventional examination.^[20] Furthermore, almost all students suggested that it should become a part of curriculum and scaled to entire and other batches, however few modifications were also suggested by them. Majority of the students found the assessment by OSCE to be very important to them. The residents who participated as simulated cases found it to be a novel experience and different kind of learning process. They opined that it would help improve counseling

and communication skills of undergraduate by taking history from the epidemiological point of view. Almost all teachers felt that the OSCE should be introduced and scaled gradually as a pattern of examination in Community Medicine. It should be taken up with some modifications and gradually be started with clinical posting examinations.

Conclusion :

All stakeholders felt that this pattern of assessment along with the traditional method can be easily incorporated in the competency based medical education (CBME) as envisaged in the GMR 2019 reforms for undergraduate medical education in India. It is feasible to introduce OSCE with some modifications in the Community Medicine examination as well, to start with as formative assessment. However, more studies are needed with larger subject numbers and also experience from other subjects before the implementation of OSCE in university examination.

Recommendations:

Based on the results from this study (pilot project), it is recommended to scale up this OSCE method of assessment to entire batch of students with modifications as suggested by the students and the teachers. We also recommend that other departments of medical sciences should incorporate OSCE/OSPE as an assessment tool for assessing "Shows How" level of the Miller's Pyramid also suggested in the GMR 2019 reforms for undergraduate medical education in India. National Medical Council for Technical Education can develop guidelines to implement OSCE.

Learning Experience while carrying out the project:

The process was not difficult as many teachers in the department felt the need to assess skills taught to the students. The higher authority and staff were supportive. This knowledge building task project got the teachers to work together. Teaching leads to learning and learning leads to thinking and therefore,

all stakeholders felt that this pattern along with the traditional method can be easily incorporated in the competency based medical education (CBME) as envisaged in the GMR 2019 reforms for undergraduate medical education in India. Overall study was conducted very smoothly.

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