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**Original Research Article**

# Objective structural clinical examination: a superior assessment tool for community medicine

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## ABSTRACT

**Background:** Traditional assessments in community medicine usually emphasize on theoretical understanding, with a limited capacity to evaluate practical competencies. The objective structured clinical examination (OSCE) has been widely recognized for its structured, skill-based assessment in various clinical disciplines, though its implementation in Community Medicine remains very limited. To assess the effectiveness of OSCE in evaluating undergraduate competencies in Community Medicine subject and to compare its outcomes with the traditional viva assessments and explore the student perceptions regarding its utility.
**Methods:** An educational interventional study was conducted on 156 MBBS students from the two MBBS batches. Participants were assessed by both traditional viva and a six-station OSCE method. The Performance scores were recorded using standardized checklists. Feedback was gathered by structured questionnaire. Paired t-test was applied for the comparative analysis and internal reliability of OSCE was assessed using Cronbach's alpha.
**Results:** It was seen that the students achieved significantly higher scores in OSCE (mean 13.41±6.14) as compared in the traditional viva (mean 9.09±3.89, $p<0.001$). The highest performance was observed in the 24-hour dietary recall station, whereas the lowest in ORS preparation. Student feedback indicated high levels of acceptance, perceived relevance and confidence gained from OSCE. Internal consistency was strong as Cronbach's $\alpha=0.86$.
**Conclusions:** OSCE was found to be a reliable and effective assessment tool in Community Medicine subject, offering improved objectivity, skill evaluation and student engagement.

**Keywords:** Assessment, Competency-based learning, Community medicine, Medical education, OSCE

## INTRODUCTION

Assessment in medical education plays a crucial role in evaluating not only theoretical understanding but also the practical application of clinical and public health competencies. In Community Medicine, which requires proficiency in communication, field-based interventions and preventive strategies, traditional assessment methods such as written exams and viva voce often fall short in capturing practical capabilities.[1] The OSCE offers a structured and competency-based framework for skill assessment. Consisting of stations designed to simulate real-life scenarios, OSCE allows students to demonstrate clinical and communication skills under observation using standardized checklists.[2] While OSCE has gained popularity in clinical disciplines, its use in community medicine remains underexplored.[3]

With the increasing emphasis on competency-based medical education (CBME), particularly by national regulatory bodies, the need for practical, skill-oriented assessments has grown. OSCE aligns well with these demands, providing structured assessment of diverse competencies such as procedural tasks, health education delivery and interpersonal communication.[4-6] The present

study evaluates the effectiveness of OSCE in assessing medical students in Community Medicine. It further compares student performance with traditional assessments and gauges student perceptions on OSCE's utility, aiming to establish evidence for its curricular integration.

### *Objectives*

To assess the effectiveness of OSCE as an assessment tool in community medicine, compared to traditional methods. To compare student performance across OSCE and viva assessments. To evaluate perceptions of students and faculty regarding the use of OSCE in community medicine.

## METHODS

This educational interventional study was carried out over a six-months' time period from March to August 2025 in the Department of Community Medicine at the Integral Institute of Medical Sciences and Research, Lucknow. The study received clearance from the Institutional Ethics Committee at IIMSR (Ref.IEC/IIMSR/2025/02). Written informed consent was obtained from all participants. Confidentiality was maintained throughout.

The study adopted a prospective quasi-experimental study design to assess the clinical competencies of undergraduate medical students via structured formative assessments. A total of 156 MBBS students from the batches 2022 and 2023 year, who were actively involved in their clinical postings during the study period, were included. Before study, the faculty members who were going to be involved in the evaluation process, were given instructions to make sure that the assessment procedures were the same for everyone.

A convenient sampling method was used, that only included students who were present on the day of the assessment and provided written informed consent. Students who declined to participate or were absent on the day of the scheduled OSCE were excluded. Prior to the study, approval was obtained from the Institutional Ethics Committee and confidentiality was maintained.

The intervention assessed the students across six OSCE stations, each intended to evaluate a core competency in community-based clinical skills. These stations included oral rehydration solution (ORS) preparation steps, body mass index (BMI) calculation, 24 hours dietary recall method for nutritional assessment, handwashing technique steps, biomedical waste segregation process and intramuscular injection technique.

Each station utilized a standard format and a validated checklist to ensure objective and reproducible scoring. All the students received similar instructions at each station and were assessed independently using the checklists, followed by a structured viva to evaluate their cognitive understanding and application of knowledge. Both OSCE and viva scores were documented separately for the statistical comparison.

To collect the student perceptions on the assessment process, a structured feedback questionnaire based on a five-point Likert scale was used. This instrument captured student's feedbacks regarding the clarity of instructions, relevance of tasks, level of engagement and confidence gained through the OSCE experience. The data collected was tabulated in Microsoft Excel and analyzed using SPSS version 26.0.

The Descriptive data was represented as mean and standard deviations, to summarize the performance scores and feedback responses of students. A paired t-test was used to assess the difference between OSCE and viva scores, with a p value less than 0.05 as statistically significant.

The internal consistency and reliability of the OSCE station checklist tool were evaluated using Cronbach's alpha, with a threshold of 0.7 considered acceptable. The study was planned and conducted with academic rigor, ensuring that both the pedagogical objectives and ethical standards were comprehensively addressed.

## RESULTS

### *Objective structured clinical examination station performance*

The mean scores and standard deviations (SD) for each OSCE station are shown in table 1. The highest mean performance was observed in 24 hours dietary recall assessment (17.64±10.59), while the lowest was in ORS preparation (9.16±5.34).

### *Student feedback on objective structured clinical examination*

The majority of students strongly agreed that OSCE stations reflected real-life public health scenarios, were clear to follow and enhanced their practical application of knowledge (Table 2).

### *Comparison of objective structured clinical examination and viva scores*

A paired t-test was used to compare OSCE scores with traditional viva scores. The results (Table 3) show that the mean OSCE score (13.41±6.14) was significantly higher than the mean viva score (9.09±3.89), with a mean difference of 4.32±2.25. The difference was statistically significant ($t=14.719$, $p<0.001$).

### *Reliability of objective structured clinical examination*

Internal consistency across the six stations was high, with a Cronbach's alpha of 0.86.

**Table 1: Mean objective structured clinical examination scores and standard deviations by station.**

| Station no. | OSCE station activity | Mean Score | SD |
|---|---|---|---|
| **1** | ORS preparation demonstration | 9.16 | 5.34 |
| **2** | BMI Calculation | 14.40 | 2.68 |
| **3** | 24-hour dietary recall assessment | 17.64 | 10.59 |
| **4** | Handwashing steps | 13.32 | 3.70 |
| **5** | Biomedical waste segregation | 12.20 | 4.43 |
| **6** | Intramuscular injection techniques | 13.76 | 3.82 |

**Table 2: Student perception of objective structured clinical examination (n=156).**

| Q. no. | Feedback statement | Strongly agree (%) | Agree (%) | Neutral (%) | Disagree (%) | Strongly disagree (%) | Mean±SD |
|---|---|---|---|---|---|---|---|
| **1** | OSCE stations reflected real-life public health scenarios | 103 (66) | 41 (26.2) | 8 (5.1) | 3 (1.9) | 1 (0.6) | 4.55±0.74 |
| **2** | Instructions were clear and easy to follow | 110 (70.5) | 36 (23.07) | 6 (3.84) | 3 (1.9) | 1 (0.6) | 4.61±0.71 |
| **3** | OSCE helped me understand practical applications | 101 (64.7) | 45 (28.84) | 7 (4.48) | 3 (1.9) | 0 | 4.56±0.67 |
| **4** | OSCE was more engaging than traditional assessments | 104 (66.66) | 38 (24.35) | 10 (6.41) | 3 (1.9) | 1 (0.6) | 4.54±0.76 |
| **5** | Feedback after OSCE was useful | 100 (64.1) | 41 (26.28) | 10 (6.41) | 5 (3.2) | 0 | 4.51±0.76 |
| **6** | OSCE improved my confidence in clinical/public health skills | 103 (66) | 37 (23.7) | 11 (7.05) | 3 (1.92) | 2 (1.28) | 4.51±0.82 |

**Table 3: Comparison between OSCE and Viva Scores.**

| Parameter | Mean | SD | Paired t | P value |
|---|---|---|---|---|
| **OSCE score** | 13.41 | 6.14 | | |
| **Viva score** | 9.09 | 3.89 | 14.719 | <0.001 |
| **Difference** | 4.32 | 2.25 | | |

## DISCUSSION

The present study contributes to the ongoing debate on the assessment modifications in the medical education by evaluating the OSCE as an effective tool for assessing competencies in Community Medicine subject. The findings of our study clearly shows that OSCE, not only provides a more reliable and objective assessment framework as compared to traditional viva voce but is also more acceptable to students.

It enhances learner engagement and better identifies practical skill gaps which are essential to public health practice. The statistically significant difference between OSCE and viva scores (mean difference=4.32, $p<0.001$) strengthen the long-standing criticism of viva voce as an inconsistent and examiner-dependent subjective way of assessment.[5,7] In contrast, OSCE standardizes evaluation across the multiple stations using validated checklists, thereby reducing the examiner bias and enhancing reliability. The high internal consistency in our OSCE implementation (Cronbach's alpha=0.86) reflects the strength of its design and supports its scalability and reproducibility in undergraduate medical education settings. Notably, in the present study, the 24 hours dietary recall station emerged as the highest scoring, while ORS preparation recorded the lowest mean score. This disparity demonstrates the key strength of the OSCE format its ability to find the specific gaps in clinical or procedural competencies that are often hidden in conventional assessments. These insights enable the educators to implement targeted remediation, curriculum enhancement and skills-based learning interventions aligned with the principles of CBME as outlined by National Medical Council of India.[4,8]

From a pedagogical perspective, the overwhelmingly positive feedbacks from the students on OSCE including perceptions of relevance, clarity and real-world applicability is aligned with findings from similar studies in both clinical and preclinical disciplines.[5-7] In present study two-third of the participants strongly agreed that OSCEs increased their confidence in applying clinical and public health skills. This is an important indicator that carries significant importance in disciplines like community medicine, where the ability to convert the theoretical knowledge into practical interventions is crucial. These results support previous studies by Rajani

et al, Ghewade et al and Dewan et al which showed that OSCEs were not only more engaging and learner-centered but also concluded superior performance outcomes compared to the traditional formats.[3,4] Moreover, thde findings are consistent with the similar research conducted by Harden et al which established the OSCE as a gold standard in the objective assessment of clinical competence.[6] The combination of communication, procedural and interpretive tasks in our six-stations of OSCE shows the wide range of skills required in public health, making it a great way for the assessment in Community Medicine.

One of the great advantages of OSCEs is the that it provides the immediate, structured feedback a feature that is highly appreciated by students in our cohort. Feedback-driven learning is a cornerstone of adult learning and has been shown to significantly enhance skill acquisition and long-term retention.[9] The structured post-OSCE debriefing sessions probably helped to improved learner satisfaction and perceived utility, further justifying the resource investment associated with OSCE implementation.

Despite its strengths, this study does have limitations. Being a single-institution, short-term study, the generalizability is limited. The sample was derived through convenience sampling, which potentially leading to selection bias. Additionally, the six-station format, though logistically feasible, may inadequately capture the full spectrum of competencies within Community Medicine.

Future studies should consider a multicenter framework, a larger number of OSCE stations and longitudinal tracking to assess the impact of OSCE performance on summative outcomes. Nevertheless, the study affirms that OSCE is a superior, student-focused and competency-based assessment tool for undergraduate community medicine teachings. Its incorporation into routine formative and summative assessments can enhance the academic experience, promote skill development and ensure better alignment with the goals of modern medical education.

## CONCLUSION

OSCE emerges as a reliable, structured, and student-centered assessment modality in Community Medicine. It facilitates the evaluation of diverse skills and promotes better alignment with competency-based learning goals. The findings advocate for its systematic integration into undergraduate curricula to enhance both teaching and assessment standards in public health education.

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