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PERCEPTION OF FIRST YEAR MBBS STUDENTS REGARDING PRACTICAL BIOCHEMISTRY EXAMINATION BASED ON REVISED 2024 CBME CURRICULUM.	KEY WORDS: Objective structured practical examination, OSPE, Undergraduate medical education

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ABSTRACT	Background: It is an undeniable fact that assessment drives learning. It is documented that traditional practical examination has several drawbacks. Further, the subjectivity also affects the correlation negatively between marks awarded by different examiners and, therefore, the performance of an equivalent candidate. The objective of the structured practical examination (OSPE) based on the revised 2024 CBME Curriculum is to reduce the chances of examiner bias and assess the students' skills. The aim was to introduce objective structured practical examination (OSPE) as a method of assessment of practical skills in Biochemistry and to determine the perception of students regarding OSPE. Methods: It is a qualitative, observational study conducted at the Department of Biochemistry, Government Medical College & Hospital, Akola, India. The first Professional MBBS students were evaluated by using OSPE to assess their practical perspective in Biochemistry. A pre-validated questionnaire-based on a 5-point Likert scale and descriptive type on various components of the OSPE, was administered to get the feedback. Statistical analysis used: Microsoft Excel and GraphPad Prism 8 software were applied. Results: Most of the students favoured OSPE as an assessment tool. About 65 % of students agreed that OSPE helps to score better; 60 % stated that OSPE eliminates bias in exams, 78 % stated that OSPE should be incorporated as a formative assessment tool. Out of 200 students in the study, 59% were male and 41% were female. Conclusions: The study favours OSPE as a reliable assessment tool for practical examination in biochemistry. OSPE is more objective and eliminates examiner bias, and helps to evaluate all three learning domains - cognitive, psychomotor, and affective domains.
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INTRODUCTION The medical education in India is adapting competency-based medical education (CBME), with many innovative teaching- learning methods and assessment tools for the evaluation of the learning domains-cognitive (knowledge), psychomotor (skills), and affective (soft skills or communication skills). Assessment drives learning. The Objectively Structured Practical Examination (OSPE) is a novel tool introduced by the National Medical Commission used for assessment in competency-based Undergraduate Curricula. ^[1] The objectivity and the validity of practical examination are always a matter of concern. The traditional practical examination has several drawbacks, especially in terms of its outcome. ^[2-4] They are more subjective, wherein practical oral examinations mostly assess the students through viva voce. ^[5] The disadvantages of these are no structured or standard questioning pattern, inconsistent rating, or allotting marks to the students. ^[6] The student attitudes are not tested in this pattern. To overcome these noted problems in assessing students' academic performance, many innovative assessment tools are introduced and emphasized to acquire clinical, scientific, and practical laboratory procedures, including communication skills. This enables the development of three domains of learning: cognitive, psychomotor, and affective domains. ^[7] The goal of medical education using various tools is to enable a medical student to integrate knowledge, apt diagnosis, improve communication skills, patient care, and inculcate the habit of lifelong learning. ^[8] Objective structured practical examination (OSPE) is one such tool to assess students' individual competencies. It is valid, reliable, and objective. It also eliminates examiner bias. ^[9] OSPE is a practical assessment system, where there is a series of stations at which students run through tasks designed to check various skills and are	tested using agreed checklists with observations sitting at some of the stations. ^[9] OSPE helps students obtain feedback at the end of each session on their strengths and weaknesses. This encourages and directs them for self-evaluation, which finally leads to self-directed learning. Similarly, feedback should be taken from the students, which helps the faculty to plan their integrated curriculum, integrated teaching schedule, and assessment methods. ^[9,10] The present study was done to introduce objective structured practical examination (OSPE) as a method of assessment of practical skills in Biochemistry and to determine the perception of students regarding OSPE. METHODS This qualitative observational study was conducted from September 2024 to June 2025 in the department of Biochemistry, Government Medical College & Hospital, Akola, to determine the students' perception of OSPE as an assessment tool of laboratory practical skills in Biochemistry. Inclusion Criteria All 1st professional MBBS students who appeared for the OSPE assessments in the study period of this project were included. Exclusion Criteria Those students who didn't appear for the OSPE assessment or were absent and not willing to participate in the study project were excluded. Out of the total 200 students from the first professional MBBS students, all 200 responses were included for this study. The students who did not give consent or were absent were excluded. Responses were collected on a pre-validated questionnaire regarding OSPE. The study was approved by the institutional ethical committee. Consent from the participants was taken. The students who were absent and not
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willing to participate were excluded. The students were initially evaluated with the traditional methods for practical skills, but for this study, OSPE was introduced as a formative assessment in the third trimester period. Before administering this method for evaluation, all the faculty staff members involved in designing were sensitized about it. The students were oriented about it in advance before administering the method.

During OSPE, students were made to rotate through 5 stations, which included two observer-type and three were responsive-type (unobserved responsive type, responsive type, and coupled OSPE). Each station was of 20 (twenty) minutes duration. Students were instructed to rotate in a clockwise direction and attend all the stations. Entry and exit were in separate directions. Enough care was taken to avoid any interactions between students who faced OSPE and those who had to face it. Structured and objective questions were asked in OSPE stations, and observation was done by faculty on every observation station with a checklist provided.

The procedural stations included questions to test the laboratory practical skills, like qualitative or quantitative estimation of analytes (example Rothera's test); while the response stations included relevant questions to test higher-level cognitive domains and the application of knowledge in clinical practice, targeting the learning objectives within the curriculum. For example, the response stations included the interpretation of a laboratory report with a case scenario, or the identification of a laboratory instrument with its application.

Statistical Analysis

A pre-validated questionnaire on various components of OSPE was administered to get the feedback. The feedback questionnaire included closed-ended and open-ended questions. Likert's 5-point rating scale was applied to determine their degrees of agreement with the statements. Responses from the students in the form of a feedback questionnaire were analysed by descriptive statistics. To ensure frank responses by the participants, anonymity was maintained. Microsoft Excel and GraphPad Prism 8 software were applied for statistical analysis.

RESULTS

A total of 200 responses of students from first year MBBS students on perception of OSPE as an assessment tool to evaluate their practical skills were collected based on Likert's 5-point rating scale to know their degree of agreement with the statements (Table 1).

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	No Response
1	Do you think - station based i.e -non performance practical assessment of 2nd term .is useful	52 (26.0 %)	71 (35.5 %)	48 (24 %)	19 (9.5 %)	10 (5%)	NIL
2	what do u think- whether performance based OSPE -1st term exam better to analyse knowledge ,skills	42 (21 %)	100 (50 %)	43 (21.5 %)	8 (4%)	7 (3.5 %)	
3	Grand Viva should be a part pf practical exam ; what do you think ?	25 (12.5 %)	76 (38 %)	46 (23 %)	35 (17.5 %)	18 (9 %)	

4	Examination approach used as station based helps in reducing anxiety as compared to traditional practical examination.	65 (32.5 %)	96 (48 %)	22 (11 %)	11 (05.5 %)	6 (3 %)	
5	Identification of image based question was better with station based as compared to traditional spot examination	49 (24.5 %)	95 (47.5 %)	31 (15.5 %)	18 (9%)	5 (2.5 %)	2 (1 %)
6	Critical thinking was enhanced by station based compared to traditional practical examination.	34 (17 %)	83 (41.5 %)	57 (28.5 %)	18 (9%)	6 (3 %)	2 (1 %)
7	Long term knowledge retention will be enhanced by station based as compared to traditional practical examination	33 (16.5 %)	91 (45.5 %)	38 (19 %)	31 (15.5 %)	6 (3 %)	1 (0.5%)
8	Station based examination was interesting enjoyable session as compared to traditional practical examination	40 (20 %)	91 (45.5 %)	37 (18.5 %)	22 (11 %)	9 (4.5%)	1 (0.5%)
9	Adaption of visual based applied content of station based is ineffective for learning Biochemistrys compared to traditional Practical examination?	32 (16 %)	96 (48 %)	41 (20.5 %)	22 (11 %)	8 (4 %)	1 (0.5%)
10	The content used for both mode of examination useful and relevant?	37 (18.5 %)	91 (45.5 %)	45 (22.5 %)	18 (9 %)	8 (4 %)	1 (0.5%)
11	. My experience on OSPE for practical exam was satisfied	41 (20.5 %)	90 (45 %)	39 (19.5 %)	25 (12.5 %)	4 (2 %)	1 (0.5%)
12	OSPE improves practical skills better than the traditional method of assessment	40 (20 %)	97 (48.5 %)	41 (20.5 %)	18 (9 %)	3 (1.5 %)	1 (0.5%)
13	OSPE improved reasoning skills better than traditional method of assessment	43 (21.5 %)	92 (46 %)	34 (17 %)	26 (13 %)	4 (2 %)	1 (0.5%)

14	OSPE covers a wide range of topics	41 (20.5 %)	90 (45 %)	30 (15 %)	27 (13.5 %)	4 (2 %)	1 (0.5 %)
15	OSPE was stress free as compared to VIVA	61 (30.5 %)	93 (46.5 %)	27 (13.5 %)	15 (7.5 %)	3 (1.5 %)	1 (0.5 %)
16	I did not feel threatened of the examiner	39 (19.5 %)	81 (40.5 %)	59 (29.5 %)	11 (5.5 %)	8 (4 %)	2 (1 %)
17	OSPE removes bias in examination	34 (17 %)	86 (43 %)	69 (34.5 %)	14 (7 %)	5 (2.5 %)	5 (2.5 %)
18	OSPE provides chance to score better as compared to traditional method	35 (17.5 %)	95 (47.5 %)	54 (27 %)	22 (11 %)	6 (3 %)	1 (0.5 %)
19	The time given for stations was adequate	39 (19.5 %)	86 (43 %)	68 (34 %)	4 (2 %)	2 (1 %)	1 (0.5 %)
20	Do you agree that OSPE should be incorporated as routine assessment method in Biochemistry	61 (30.5 %)	95 (47.5 %)	18 (9 %)	16 (8 %)	8 (4 %)	2 (1 %)

About 71 % students were satisfied with the OSPE examination. About 68.5 % of students agreed that OSPE improves their practical skills, and 67.5 % stated that OSPE improves the reasoning skills. About 65.5 % of students agreed that OSPE as practical assessment tool may cover a wide range of topics. About 60 % of students agreed that OSPE eliminates bias in exams. 77 % said that OSPE is less stressful when compared with viva voce. About 65 % supported OSPE because it helps to score better. 60 % students responded that they did not feel threatened of the examiner. About 62 % students agreed that the time provide was sufficient for completion of OSPE station. 78 % stated that OSPE should be incorporated as routine assessment tool. Out of 200 students in the study, 59% were male and 41% were female (Figure 1).

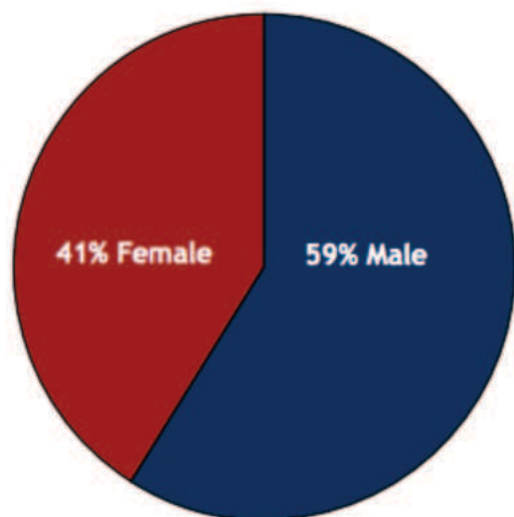


Fig1: Pie Diagram Showing Percentage of Male & Female

A few responses from the students on open-ended questions were:

1. What is good about OSPE?

"Every step of the practical tests is better understood and clear"; "Reduces chances of cheating"; "Logical reasoning and thinking speed were improved"; "Interesting and fun." "All students went through similar types of exams".

2. Suggestion for improvement about OSPE as an assessment tool:

"Time duration should be increased for performing a few particular tests".

DISCUSSION

In the present study, a total of 200 students of batch 2023-24, phase I MBBS, participated. About 71 % students were satisfied with the OSPE examination. About 68.5 % of students agreed that OSPE improves their practical skills, and 67.5 % stated that OSPE improves their reasoning skills.

In the present study, about 60 % of students agreed that OSPE eliminates bias in exams. The majority of the time following the examinations, students often complain that they have performed well in the practical examinations but they do not obtain their expected scores, irrelevant questions or differences in the level of questions asked to them simple to difficult: some students were asked basic questions and some were asked difficult questions and on the other end the external examiners during university examinations complain about the extensiveness of the examination pattern during university examinations. OSPE minimizes all the factors encountered during CPE. Some students mentioned that OSPE gives them better confidence and defines them with what exactly needs to be studied and prepared for practical examinations, as objectives and competency skills are well-defined in the OSPE.

In our study, we found that about 60 % students responded that they did not feel threatened by the examiner. These findings were by the findings of the studies conducted by Ananthkrishnan^[11], Watson and Houston^[12], Vijaya and Alan^[13], KL Bairy et al.^[14], and Mokkaapati et al.^[15], these authors noted that the OSPE was a well-structured, easy assessment format in which the students were well organized and easy and less stressful, and that it covered the learning domains and syllabus appropriately than did conventional examinations. Faldessai et al.^[16], Praveen Singh et al.^[17] reported that 90% of student participants expressed OSPE as a better alternative to conventional examination, and it was better structured and uniform. The students were clear that the OSPE assessed the relevant practical skills, and it covered the appropriate knowledge consistent with the learning objectives.

In the present study, we found that 78% students stated that OSPE should be incorporated as a routine assessment tool. Also, several studies have proved that OSPE is a reliable assessment tool.^[18,19] Rahman et al and Menezes et al emphasize OSPE as a better assessment technique over the traditional method for measuring practical skills of MBBS students in pathology and forensic medicine, respectively. Feroze et al in their study found that OSPE was more objective and measured practical skills better as compared to the conventional method in Pathology. Rajkumar et al emphasize that OSPE is a better assessment tool to measure practical skills in anatomy, physiology, and biochemistry.^[20] Excellent acceptance and wide appreciation have been observed from students' perspectives in many studies. Besides testing the cognitive and psychomotor skills, OSPE also helps in assessing the communication skills.

The merits of OSPE are-it is valid, reliable, objective, and discriminatory. It has standard questioning patterns for all students.^[21] All the learning domains with a good spectrum of clinical aspects may be covered by OSPE. In an allotted time, the examiner can test a wide range of student skills. Improving the communication skills of a student is yet another advantage of OSPE, which could not be achieved through the traditional way of practical assessment. It ensures that all the students face the same test pattern and interaction irrespective of the examiners. OSPE, unlike other methods, also possesses certain drawbacks, like it takes a lot of time in structuring the program, demands teamwork, more faculty,

careful and proper organization. However, students' perception of OSPE is quite satisfactory and supportive. The present study further supports the findings of earlier studies as we have observed favourable responses from the students regarding OSPE. Most students favoured the implementation of OSPE in the context of scoring and improving higher-order thinking and eliminating bias. Thus, OSPE tends to be a useful assessment tool if planned meticulously with clear aims and flexibility in the initial stages of learning. OSPE facilitates an easy and better way to examine the practical skills of the students in a large group in a fixed amount of time. It is a reproducible and adaptable tool for different skills, irrespective of various disciplines.^[22] OSPE was rated as a reliable, effective, useful, and challenging examination, although considered taxing, both mentally and physically. Disapproval was only with respect to the performance station, as they expressed a threatening sense while performing in the observer station. Gupta et al suggested that care must be taken while introducing OSCE, especially in basic sciences, as students might find performing in front of an observer a threatening experience. But this can be overcome by explaining the purpose and effectiveness of direct observation in providing constructive feedback and making learning better. The OSPE process is, however, not without limitations. There is a risk of observer fatigue if the observer must record the performance of several candidates on lengthy checklists. All stations must invariably demand an equal time. Therefore, OSPE requires careful planning.^[23,24]

The key factors determining the successful implementation of OSPE as an assessment tool would be meticulous planning, prior sensitization and briefing to the students before the examination, and preparation of procedure/response stations in an appropriate ratio (matching the number of students). Good rapport with colleagues and team efforts, systematic conduct with clear instructions, repetitions, and experience were significant aspects for the successful implementation of OSPE.

Limitations of the Study

The limitation of this study was that more faculty members could not be motivated for the OSPE procedure, as it was a new technique and needed a lot of planning and hard work, so feedback could not be properly taken from the faculty. Feedback from faculty could have highlighted the advantages and disadvantages from the teacher's point of view for the OSPE assessment.

CONCLUSION

The study favours OSPE as an effective tool in the evaluation of the practical perspective in biochemistry. OSPE was more objective, valid, and reliable, and measured practical skills better, and eliminated examiner bias as compared to the traditional practical examination. All three learning domains (cognitive, psychomotor, and affective) can be evaluated by OSPE. The practical and clinical skills of the students will improve by using OSPE methods as an assessment tool, and this will make the future doctors more skilled and thereby provide better patient care.

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