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Original Research Article

Perception of first year MBBS students on objective structured practical examination as an assessment tool in biochemistry

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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 on the performance of an equivalent candidate. The objective of objective structured practical examination (OSPE) is to reduce the chances of examiner bias and assess the students' skills. 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 Department of Biochemistry, Assam Medical College, Assam, 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 82% of students agreed that OSPE helps to score better; 62.3% stated that OSPE eliminates bias in exams; 91.6% supported OSPE to be incorporated as a formative assessment.
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.

Keywords: Biochemistry, Objective structured practical examination, OSPE, Undergraduate medical education

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 objectivity and the validity of practical examination is always a matter of concern. The traditional practical examination has several drawbacks especially in terms of its outcome.[1-3] They are more subjective, wherein practical oral examinations mostly assess the students through viva voce.[4]

The disadvantages of these being no structured or standard questioning pattern, inconsistent rating, or allotting marks to the students.[5] 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 emphasized to acquire clinical, scientific, and practical

laboratory procedures including communications skills. This enables the development of three domains of learning cognitive, psychomotor, and affective domains.[6] The goal of medical education using various tools is to ensure a medical student to integrate knowledge, apt diagnosis, improvise the communication skill, patient care, and inculcate the habit of lifelong learning.[7]

Objective structured practical examination (OSPE) is one such tool to assess students' individual competencies. It has been found to be valid, reliable, and objective. It also eliminates examiner bias.[4]

Harden and his colleagues, in 1975, introduced OSCE as a perfect method of assessment of clinical competencies. This was later modified to assess practical knowledge and skills within the basic medical sciences and was termed OSPE. OSPE is an objective and structured method of skill-based assessment, which directly observes the student's performance in an adaptable examination set-up.[8]

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.[4] OSPE helps students to obtain feedback at the end of each session on their strengths and weaknesses.[9] 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 more systematically their integrated curriculum, integrated teaching schedule, and assessment methods.[10]

The present study was done to introduce OSPE as an assessment tool to assess the practical skills of undergraduate students in the department of Biochemistry.

METHODS

This qualitative observational study was conducted from September 2017 to June 2018 in the department of Biochemistry, Assam Medical College & Hospital, to determine the student's perception on 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 OSPE assessment or were absent and not willing to participate in the study project were excluded.

Out of total 170 students from the first professional MBBS students, 161 responses were included for this study. The students who did not give consent or absent were excluded. Responses were collected on pre-validated questionnaire regarding OSPE. The study was approved by institutional ethical committee. Consent from the participants was taken. The students that were absent and not 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 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 10 stations, which included three observer stations or procedure stations and rest non-observer stations or response stations. Each station was of 4 (four) minutes duration. Students were instructed to rotate in the clockwise direction and attend all the stations.

Entry and exit were in separate direction. 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 Benedict's test); while the response stations included relevant questions to test higher level of cognitive domain and the application of knowledge in clinical practice, targeting the learning objectives within the curriculum. For example, the response stations included interpretation of laboratory report with a case scenario, or identification of laboratory instrument with its application. Also for evaluation of affective domain, a standardized patient (Department staff acting as a patient) was given with a case scenario for communication skills (soft skill), example communicating with patient for preparing the patient for OGTT (oral glucose tolerance test).

Statistical analysis

A pre-validated questionnaire on various components of OSPE was administered to get the feedback. Feedback questionnaire included close ended and open -ended questions. Likert's 5-point rating scale was applied to know their degrees of agreement with the statements. Responses from the students in the form of 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 161 responses, out of 170 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).

Table 1: Perception of students regarding OSPE as an assessment tool (n = 161).

Questions	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	No response (%)
My experience on OSPE for practical exam was satisfied.	42.6	50.8	3.3	1.6	0	1.6
OSPE improve practical skills better than the traditional method of assessment.	68.9	29.5	1.6	0	0	0
OSPE improved reasoning skills better than traditional method of assessment.	50.8	39.3	8.2	1.6	0	0
OSPE covers a wide range of topics.	32.8	50.8	14.8	1.6	0	0
OSPE was stress free as compared to VIVA	47.5	31.1	14.8	6.6	0	0
I did not feel threatened of the examiner.	31.1	36.1	31.1	1.6	0	0
OSPE removes bias in examination.	31.1	31.1	26.2	3.3	1.6	6.6
OSPE provides chance to score better as compared to traditional method.	44.3	37.7	16.4	1.6	0	0
The time given for stations was adequate.	24.6	49.2	14.8	9.8	1.6	0
Do you agree that OSPE should be incorporated as routine assessment method in biochemistry?	52.5	39.3	6.6	0	0	1.6

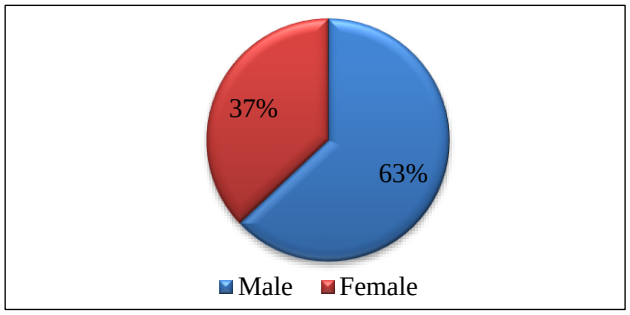

Figure 1: Pie chart showing gender distribution of students. (n= 161).

About 93.4% students were satisfied with the OSPE examination. About 98.4% of students agreed that OSPE improves their practical skills, and 90.1% stated that OSPE improves the reasoning skills. About 83.6% of students agreed that OSPE as practical assessment tool may cover a wide range of topics. About 62.3% of students agreed that OSPE eliminates bias in exams. 78.6% said that OSPE is less stressful when compared with viva voce. About 82% supported OSPE because it helps to score better.

67.2% students responded that they did not felt threatened of the examiner. About 73.8% students agreed that the time provide was sufficient for completion of OSPE station. 91.6% stated that OSPE should be incorporated as a formative assessment tool. Out of 161 students in the study, 63% were male and 37% were female (Figure 1). 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 assessment tool:
   "Time duration should be increased for performing a few particular tests".

DISCUSSION

Several studies have proved that OSPE is a reliable assessment tool.[11,12] 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.[13,14] 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.[15] Rajkumar et al emphasizes that OSPE is a better assessment tool to measure practical skills in anatomy, physiology, and biochemistry.[16] Excellent acceptance and wide appreciation have been observed from students' perspectives in many literatures.[17,18] 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.[19]

All the learning domains with good spectrum of clinical aspects may be covered by OSPE. In an allotted time, the examiner can test a wide range of student skills.[20] Improving the communication skills of a student are 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 does possess certain drawbacks like it takes a lot of time in structuring the program, demands teamwork, more faculty, careful and proper organization. However, student's 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.[16,21] 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 threatening sense while performing in the observer station.[18,22,23] 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.[24]

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.[25] The key factors determining the successful implementation of OSPE requires as an assessment tool would be meticulous planning, prior sensitization and briefing to the students before the examination, preparation of procedure/response stations in an appropriate ratio (matching the number of students).[26] Good rapport with colleagues and team efforts, systematic conduct with clear instructions, repetitions, and experience were significant aspects for the successful implementation of OSPE.[14]

The limitation of this study was that more of faculty members could not be motivated for the OSPE procedure as it was a new technique and needs 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 teacher's point of view for the OSPE/OSCE assessment.

CONCLUSION

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

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