A Comparison between Objective Structured Practical Examination and Traditional Practical Examination as an Assessment Tool in Biochemistry

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Abstract

Introduction: The competency based medical curriculum implemented in 2019 stresses on assessment systems aligned to the teaching-learning process. Assessment drives the learning process, so assessment tools have to be objective, uniform, valid and reliable. Traditional practical examination is more subjective and prone to examiner bias and is suspect to its validity and reliability. OSPE has been advocated as a tool to be used in CBME as it possesses the requisite criteria of an ideal assessment tool. However OSPE is not widely used in our country. **Methods:** In this study the performance of 1st MBBS students in traditional practical examination & OSPE was compared & perception of students towards it evaluated. 150 first MBBS students of 2020-21 batch were included. Assessment by traditional and OSPE was conducted on "Blood sugar Estimation". OSPE was conducted with 2 observer & 3 response stations. Mean was calculated and analysed for statistical significance using MS Excel. A well-structured questionnaire was administered to the same students and a feedback was obtained about the process of OSPE. **Results:** There was statistically significant difference between the mean scores of traditional format and OSPE ($P < 0.001$). Analysis of students' feedback showed that more students found OSPE better in terms of scoring, passing and catering to psychomotor domain evaluation. Anumber of students felt that OSPE was more useful and comfortable than the conventional pattern of examination. Most students did not find OSPE intimidating and opined that it should be kept as assessment method in internal and university examination. **Interpretation & Conclusion:** Our study observed OSPE scores to be better than traditional format. OSPE eliminated examiner bias by integration of cognitive, psychomotor and affective domains. Therefore we conclude that OSPE though time and labour intensive, should be introduced and adopted as an assessment tool.

Keywords : Assessments, Learning domains, OSPE, Practical Examination, Reliable, Valid

Introduction:

Assessment tools are designed to test the attainment of educational objectives and need to be valid and reliable. Along with the knowledge domain, assessment of practical skills is a core requirement and needs to be measured in a reliable and uniform way with proper differentiation between various levels of performers.[1,2] In medical education, in the aftermath of competency based curriculum implementation, many institutes are experimenting with objective structured practical examination (OSPE) scheme though most centers are still continuing with the traditional practical based assessment. OSPE in pre and para clinical subjects emerged as a variant of the existing objective structured clinical examination (OSCE) sometime in 1975.[2, 3] Traditional practical examination is more subjective and that leads to doubts over its validity and reliability while OSPE overcomes these shortcomings as it is objective and tests through direct observation, assesses knowledge and the analysis of that knowledge. Currently OSPE is used for formative assessment during internal examinations in many institutes as universities have still not incorporated

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it. [2,4] This study tries to compare the performance of 1st year MBBS students in traditional practical examination and OSPE format and also compare their use as tools of assessment.

Aims and objectives:

This study aims

1. To check the feasibility of OSPE in our set up by comparing the scores obtained in OSPE and the conventional practical examination in Biochemistry subject.
2. To obtain feedback of students towards this structured assessment tool.

Methods:

The study was conducted in the department of Biochemistry, GCS Medical College, Ahmedabad, India. Teaching-learning and assessment have to be properly aligned. Assessment checks the level of adequate preparation and effect of teaching considering their broad objectives. Traditionally assessment techniques judge students on their cognitive domain and not on affective and psychomotor domains. [5,6]

All the 150 students are divided into three groups (A,B,C) of 50 for practical classes. Each group was assessed first by OSPE and then a week later they were assessed by the traditional practical examination

Both the tests were conducted on the current topic being taught i.e., Estimation of Blood glucose level. For OSPE, there were five stations out of which 2 were observer station and 3 were response stations. At the Procedure station, the student's psychomotor skill is assessed. At the response stations, the cognitive skills are tested. The examiner uses a check list to record the performance. [2]

The time allotted for each station was 3 minutes. Total score was 20 in both the examination schemes. The marks were tabulated and the mean of the two schemes compared by a paired student 't' test. Feedback of the students about OSPE and TPE were obtained using a validated questionnaire The results of the feedback was analysed with Microsoft Excel.

Results:

Table No. 1 shows the comparison of mean marks obtained by the students in traditional practical test with OSPE. Significant difference in scores of traditional practical examination & OSPE was noted i.e. (OSPE > CPE). Students found questions understandable, easy to score, but some of them said that time was insufficient.

The results of the feedback obtained from the students are presented in the Table 2.

Most students (82%) agreed that the OSPE is well structured clear and uniform while 6% students disagreed that it was well structured. Most students (72%) felt that OSPE is useful and feasible examination pattern while 62% students felt that OSPE was not intimidating when compared to the traditional format and could be kept as a part of university examinations. Some students (21%) found that the presence of observer in observation station made them slightly conscious and was somewhat embarrassing. As OSPE is structured and objective, 70% of students felt that pass rates would be better with OSPE.

Table 1: Comparison of marks obtained in traditional examination and OSPE (Total marks = 20)

Test	Mean & SD	P value
Traditional Practical Examination	14.2 ± 1.46	<0.001
OSPE	16.6 ± 1.44	

Table 2: Feedback of students to the OSPE scheme

Sr. No	Give your feedback regarding OSPE format:	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Questions well structured	69	13	12	0	6
2	Questions were well framed, clear	65	10	10	8	7
3	Examination system was fair to all students	49	30	15	0	6
4	OSPE is somewhat intimidating	36	12	18	17	15
5	OSPE is difficult compared to traditional practical examination format	12	15	19	19	35
6	Presence of observer is embarrassing	12	9	39	9	30
7	Time for each station adequate	39	18	6	3	34
8	Sensitized properly as what to expect	55	12	30	3	0
9	OSPE evaluates skill and performance better	67	18	6	0	9
10	OSPE is good to score and pass examination	70	6	18	0	6
11	OSPE helps in clinical applications	66	12	11	6	5
12	Examination well conducted	64	12	24	0	0
13	OSPE should be conducted regularly in Biochemistry	72	10	8	3	5

Discussion:

The students were sensitized about OSPE procedure and marking pattern a week before. At the Procedure station, the student's psychomotor skill is assessed. At the response stations the cognitive skills are tested. The examiner uses a check list to record the performance. The performance of students measured in the form of marks obtained was better in the OSPE format than when compared to the marks obtained through traditional format. The mean marks in traditional method were 14.2 & 1.46 while the mean marks in OSPE format were 16.6 & 1.44. The difference was statistically significant ($p<.001$). The performance and scoring abilities of students vary with the type of assessment tool used. Different assessment tools can be used to test different abilities of the students. [6,7]

Studies done by Frank J.R et al [1] also reported similar observations, Ananthkrishnan [8], Watson and Houston [9], Vijaya and Alan [10] , KL Bairy et al [11] and Mokkapati et al.[12] noted that OSPE was a well structured, easy assessment format which the students found to be well organized, easy and less stressful and it covered the learning domains and syllabus appropriately than conventional examination. Students are more alert during the movement around various OSPE stations and take interest because of the division of competencies into various stations; something that is not seen in traditional format.

Many students also have fear of facing examiners as various examiners have their own pet questions or biases. In table viva this fear leads to simple mistakes or lack of confidence may greatly affect the result. In these prevailing situations, in OSPE, students' performance is directly observed and it is objective with

equal time to all and uniform scoring.[1] So, OSPE may be the answer. Traditional approach on the other hand may help in assessing complete knowledge of student. OSPE has been well received by the students as a fair system of assessment which eliminates examiner bias. Faldessai et al., Praveen Singh et al [13, 14] reported that 90% of student participants expressed OSPE as a better alternative to conventional examination and it was better structured and uniform. Students were clear that OSPE assessed the relevant practical skills and it covered the appropriate knowledge consistent with the learning objectives.

Similarly in our study, OSPE was well accepted by the students as they found OSPE easy to score and less stressful than CPE. OSPE was very much appreciated by the students.

Conventional practical examination has many deficiency areas where the practical skills may not be adequately observed throughout the time of practical performance. The questions are directed at the end of practical performance. OSPE helps in improving the practical skills, as students demonstrate their practical skills rather than just answering the viva. This makes it more reliable. OSPE though time and labour intensive, can be adopted as an objective tool for assessment of laboratory exercises because of its high reliability. [15]

Conclusion:

The traditional Practical Examination in Biochemistry is subjective and associated with examiner variability and raises concerns over its validity and reliability. It lacks uniform structure and standardization. Objective Structured Practical Examination (OSPE) addresses this problem as it includes objective testing through direct observation, assessment of knowledge, comprehension and skills. Our study supports the introduction of OSPE in medical education for the evaluation of practical skills of undergraduate medical students

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