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Original Article

OSPE as a Learning & Evaluation Tool For Biochemistry : First Experience

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ABSTRACT

Background: *Objective structured practical examination (OSPE) is an accepted tool in assessment of practical skills.*

Objectives: *1. To Introduce OSPE as a method of learning and an assessment tool for practical skills in Biochemistry*

2. To evaluate the student and faculty perception of the method through feed back

Methods: *The first year medical students of Sri Devaraj Urs Medical College, Kolar were subjected to 12 OSPE stations for a practical session on 'Reactions of Carbohydrates' designed and conducted by trained faculty of Department of Biochemistry. The internal reliability of the OSPE stations was determined by calculating Cronbach's alpha from the mean scores obtained by the students in each stations. The effectiveness of the OSPE assessed through a student and faculty feed-back questionnaire.*

Results: *The results of the study indicate that the OSPE introduced for the practical session in 'Reactions of Carbohydrates' is a reliable assessment method with high internal consistency (Cronbach's alpha score of 0.80). It was observed from the student feedback, 99% believed that OSPE helped them to improve and 81% perceived it both as learning and evaluation tool. However 65% of students expressed OSPE to be introduced only as a part of the final exams. The most appreciated aspects of OSPE by students were for its objectivity (38%), time saving (31%) and uniformity (28%). 100% of the faculty agreed or strongly agreed that such assessment tested objectivity, 88% felt that it measured practical skills better and 63% felt eliminated examiner bias to a greater extent.*

Conclusion: *We found OSPE to be a reliable tool to test practical skills in Biochemistry. It was well appreciated by the students and accepted to be a useful learning and assessment tool by students and faculty.*

Keyword: *OSPE ; Evaluation*

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INTRODUCTION

Structuring of questions and assessment through highlighting on objectivity has been emphasized and gained importance in the practical evaluation. The objective structured practical

examination (OSPE) is now an accepted tool in the assessment of practical skills in Pre- and Para-clinical subjects.[1,2] However there are no strict or limiting guidelines on the types of scenario that are used in the OSPE examinations. Experience and experimentation will inevitably result in the refinement of the OSPE as a tool for learning and evaluation. Several universities still have adopted a similar pattern of practical evaluation, which is uniform and largely subjective. Examiner variability significantly affect scoring and the subjectivity factor involved may reduce the correlation coefficient between marks awarded by different examiners for the same candidates performance to as low as 0.25.[3] The marks awarded generally reflect only the global performance of the candidate and are not based on demonstration of individual competencies.

An earlier innovation in this regard is the objective structured clinical examination (OSCE) later extended to the practical examination (OSPE) described in 1975 and in greater detail in 1979 by Harden and his group.[4,5] These methods with some modifications have stood the test of time and have largely overcome the problems of the conventional clinical/practical examinations mentioned earlier.

In view of this, we tried the system of OSPE for the assessment of practical in the subject of biochemistry for the first time.

AIMS AND OBJECTIVES

1. To introduce OSPE as a method of learning and assessment of practical skills in Biochemistry

2. To explore the student and faculty perception of OSPE as a learning and assessment tool

MATERIAL & METHODS

The first M.B.B.S students admitted for 2010-11 batch of Sri Devaraj Urs Medical College, Kolar were the subjects for the study. After successfully completing the syllabus pertaining to the topic on 'Reactions of Carbohydrates' in practical and 'Chemistry of Carbohydrates' in theory, OSPE notification was announced 15 days in advance.

Before administering this tool for evaluation, all the staff members involved in designing and conducting OSPE were trained by attending an 'Workshop on OSPE/OSCE' conducted by Medical Education Unit, Sri Devaraj Urs Medical College, Kolar. Ready made and peer agreed upon check list formed the basis of assessment in procedure station. Structured questions were formed for question stations and key answers for the same were also prepared.

Since the assessment was being carried out for the first time, the students were oriented towards such a system in advance before administering the tool. A total of 150 students were assessed. The assessment was conducted for a period of six days. Each day assessment was limited to 25 students only. Each student was assessed by attending 4 procedure and 8 question stations. Each station was designed such that the task could be completed comfortably within 5 minutes. Coefficient of reliability of questions administered was done by calculating Cronbach's alpha.[6,7] A questionnaire on

various components of the OSPE was administered to get the feedback.

RESULTS

Among the 150 students, 146 students were present and took this OSPE exercise.18 students failed to achieve an average of 50% or above in the assessment. However, 47 students on an average achieved > 75%, 50 students achieved between 65to75% and 31students scored between 50to65%. This has been shown in figure 1.

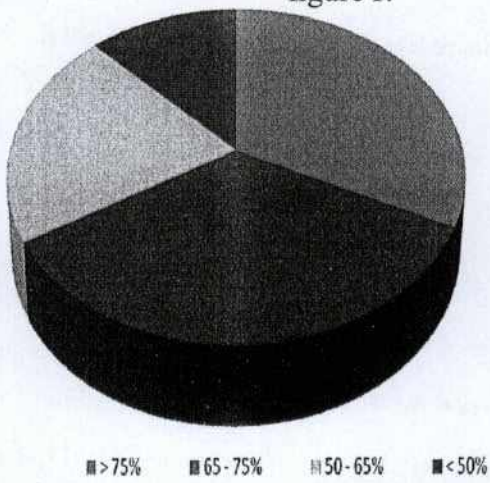

Figure 1: Average scores of students

Table 1 depicts the mean scores of each station and the score obtained by calculation of Cronbach's alpha for testing the internal consistency of the questions administered

Table 1 : Mean scores and Cronbach's alpha of OSPE stations

Type of Station	Station Number	Mean Scores
Procedure	1	3.51
	2	3.14
	3	3.43
	4	3.41
Question	5	3.39
	6	3.03
	7	3.18
	8	3.30
	9	3.41
	10	3.60
	11	3.38
	12	3.61
Cronbach's alpha: 0.80		

Table 2: Feedback analysis on various aspects of OSPE and on response to questionnaire Of 81 students

Criteria	Choice 1	Choice 2	Choice 3	Choice 4
Orientation to OSPE	Very Helpful = 19 (23%)	*Helpful = 55* **(68%)**	Somewhat Helpful = 7 (9%)	---
Relevance to syllabus	*Yes = 79* **(98%)**	No = NIL	Somewhat = 2(2%)	---
Environment of OSPE	Very Comfortable = 10 (12%)	*Comfortable = 53* **(65%)**	Somewhat Comfortable = 12 (15%)	Uncomfortable = 6 (8%)
Questions in Response Station	*Relevant = 80* **(99%)**	Irrelevant = 1(1%)	---	—
Time for Procedure Station	*Adequate = 41* **(51%)**	Somewhat adequate = 32 (40%)	Inadequate = 8 (9%)	—
Effect of OSPE	*Helps to improve = 80* **(99%)**	Does not help = 1(1%)	—	---
Assessment System	Only Evaluation = 4 (5%)	Only Learning = 11 (14%)	*Learning and Evaluation = 66* **(81%)**	—
Introduction in Final exams	Completely = 21 (26%)	*Partially = 53* **(65%)**	Not at all = 7 (9%)	

Figure 2: Feedback on most appreciated aspects about OSPE by students

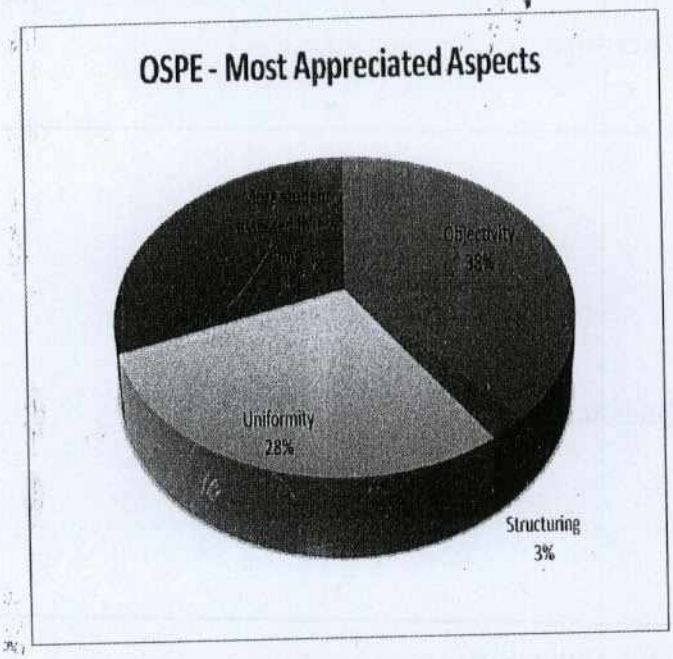

Table 3: Feedback from faculty on OSPE as an evaluation system

Criteria	Choice 1	Choice 2	Choice 3	Choice 4
Tested objectivity	Strongly agree = 50%	Agree = 50%	Somewhat Agree = Nil	Disagree = Nil
Measured practical skills better	*Yes = 88%*	Somewhat = 12%	Not at all = Nil	---
Eliminated examiner bias	To a large extent = 63%	To some extent = 37%	Not at all = Nil	---
Intervals to conduct OSPE	More frequently = 63%	Less frequently = 37%	Not at all = Nil	—
Introduction of OSPE for evaluation	Only formative = 50%	Only summative = Nil	Both = 50%	—

DISCUSSION

Over the years, increasing experience with the procedure has led to the use of OSPE not merely as an evaluation tool but as a teaching method. This has largely been attributable to the feedback that OSPE gives both to students and teachers.

Among 150 students in 1st MBBS (2010-11) batch, 4 students could not attend due to their personal reasons. Of the 146 students, 97 students performance was highly satisfactory, who scored > 65% of marks on an average. However, 18 students did not manage to get even 50% of average marks as their performance was equally poor in both performance and question stations, which have been shown in figure 1. Mean scores of all the procedure and question stations has been shown in table 1. Questions administered were checked for coefficient of reliability by calculating Cronbach's alpha. It showed is a reliable assessment method with high internal consistency (Cronbach's alpha score of 0.80). Evaluated marks of question station and check-list of procedure station were made available to the students, who appreciated what they achieved and identified where they need to improve.

Feedback given by students was constructive and showed high acceptance as presented in table 2. Feroze and his team have also reported to have got an appreciable feedback.[8] Majority of students appreciated orientation towards OSPE, syllabus and relevance of questions asked. Many students found that the manner in which the assessment was conducted was comfortable. 99% of students believed that OSPE helps them to improve and 81% perceived it both learning and evaluation tool. However 65% of students expressed that OSPE to be introduced partially in the final exams. The most appreciated aspects of OSPE by students were for its objectivity (38%), time saving (31%) and uniformity (28%) as depicted in figure 2.

Table 3 shows faculty feedback on evaluation system based on OSPE. 100% of the faculty

agreed or strongly agreed that such assessment tested objectivity, 88% felt that it measured practical skills better and 63% felt eliminated examiner bias to a greater extent. Majority of faculty felt that such exercises need to be given more frequently. However 50% of faculty agreed upon the use of OSPE in both formative and summative evaluation.

CONCLUSION

In conclusion, OSPE has several distinct advantages. From our first experience, we found that OSPE was more objective, measured practical skills better and eliminated examiner bias. Student feedback reflects that such assessment helps them to improve as it is effective both as teaching and evaluation tool. However, many students felt such system to be only a part of their final assessment system. Faculty participated in organizing OSPE felt that such exercises can be given frequently for formative evaluation before introducing it in summative evaluation.

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