Original Research Paper

Volume-9 | Issue-10 | October - 2019 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Physiology

COMPARISON OF OSPE AND CONVENTIONAL METHOD IN PRACTICAL TEACHING OF MEDICAL PHYSIOLOGY FOR FIRST YEAR BDS STUDENTS: AN OBSERVATIONAL STUDY

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ABSTRACT Teaching- learning is an essential but complicated process in medical education.[1] As time passes by, the competency levels and standards have risen, so have the settings for evaluation. Newer objective methods of assessment like Objective Structured Practical Examination help assess the students in a better way for their clinical skills. The first year students of bachelor of Dental Surgery were exposed to two methods of evaluation namely OSPE and conventional examination in a formative practical test. The average marks obtained by each method were recorded and analyzed using Student t-test. The mean score of the marks was 5.5 ± 2.31, through conventional practical exam which was significantly lesser than that by the objective method of evaluation, 7.89 ± 3.14 ($p < 0.001$), when compared by t- test.

KEYWORDS : OSPE, Practical teaching, Examination, First year BDS Students

INTRODUCTION:

Teaching- learning is an essential but complicated process in medical education.[1] As time passes by, the competency levels and standards have risen, so have the settings for evaluation. With much advancement in technical aspects of learning, we have also moved from the traditional paper and pen to newer methods of objective evaluation. Physiology is a subject that is an essential for developing the concepts for subjects like pathology, pharmacology and essentially medicine.

Assessment is seen as the single strongest determinant of what students have learned as compared to what they have been taught. It is determined as a uniquely efficient tool for improving the education process.[2] Moreover with a sudden shift from the traditional high school course to a higher professional course, there is also a lot of anxiety, apprehension as well as fear of evaluation among the students with respect to assessment methods. Crucial role of assessment in learning has been emphasized by various workers in the field of medical education. There have been continuous attempts to make assessment more objective and reliable rather than subjective.[3] Traditional tools for assessment (e.g. essays) have a drawback of being more subjective than objective. Newer objective methods of assessment like Objective Structured Clinical Examination (OSCE) and Objective Structured Practical Examination (OSPE) assess the students in a better way for their clinical skills thus leading to training, better students' performance and improved teaching methodologies; following faculty feedback by students through proper assessment of their cognitive domain.[4] Moreover, the conventional marking system also has many flaws. Marking should ideally depend only on student variability. Unfortunately, examiner variability significantly affects scoring. Communication skills and attitudes are not judged by the conventional system.[5] These defects in the assessment procedure in Medical Education gave rise to the development of new examination systems that can evaluate all the objectives systematically. Harden et al (1975) from Dundee described the promising role of Objective Structured Clinical Examination (OSCE) for assessment in clinical subjects.[6] Hall & Turner observed that the Professional examinations should be fair, comprehensive, objective, and appropriate to the discipline.[7] OSPE is gaining wide appreciation and acceptance in practical examination in Basic and Para-clinical medical subjects.[8] OSPE offers a fairer test of candidate's practical abilities, as all the candidates are presented to the same task. The marking scheme for each station is structured and determined in advance in the form of checklist. So far not many published documents are available in Indian context about use of OSPE in medical education assessment.[9] A traditional practical examination would focus on the "knows" and "knows how" aspects and is inadequate in evaluating the overall performance of the students.[10] OSPE focuses on the "shows how" aspect of Miller's pyramid of competence. The majority of institutes still follow the conventional method of assessment.[11]

This study was conducted to compare the use of OSPE and CPE as assessment tools in the undergraduate physiology subject by evaluating the scores obtained by the students. Physiology and biochemistry is a combined subject for the students in the first year of BDS (Bachelor of Dental Sciences), and both exams are held together on the same day. The present study is an attempt to compare the traditional and OSPE among the I BDS students and evaluates the practical application of the same technique as a pattern for evaluation in future examinations.

METHODOLOGY-

The study was conducted as a part of formative assessment at Ajinkya DY Patil Dental School, Pune. One hundred first BDS dental students in the subject of physiology were the focus for the research. Ethical clearance was obtained from the institutional ethical committee before the start of the study. Students were also sensitized to OSPE and Conventional Practical Examination (CPE) by showing them examples and demonstration of the technique in a hypothetical environment. A written consent was taken from all the participants before enrolling them in the study. The students were randomly divided into two groups of 50 students each. Group 1 was examined using OSPE whereas Group 2 was subjected to CPE. Both OSPE as well as CPE were conducted simultaneously on 'Estimation of Hemoglobin (Hb) by Sahli's Method'. Students were observed directly by the examiner while performing the procedure (OSPE) and awarded marks to each step as per the predefined checklist (Table 01, Table 2) followed by viva. The examiner observed whether the student was performing all the steps of haemoglobin estimation in their correct sequence with proper technique. '0.5' marks were given for each step performed correctly while mark '0' was allotted if the step was not performed or incorrectly performed. The examiner did not take viva/ talk to the student in this station. So assessment of knowledge was done in a separate Response Station (Non-observed Station) by asking targeted questions. Each correct response was given one mark. Here, both observed & non-observed stations carry 5 marks each and final marks were calculated by summing up the marks of both these OSPE Stations (out of total 10). In CPE, students performed the procedure

and when they completed it, the examiner came to their station to verify the results, took viva and gave marks. Here the procedure was not directly observed by the examiner. At the end, results of both OSPE & CPE were compared and analyzed.

The findings were evaluated using Students t-test with the SPSS software version 22.0 (IBM Analytics, USA).

RESULTS:
The results are summarized below.

It was observed that overall students scored more in OSPE than the CPE method. Of the 100 students, 32 got 1-2 marks, and 40 scored 3- 4 marks and 28 scored between 7- 8 marks, as per the CPE. Therefore statistically significant students scored lower marks ($p< 0.001$). Table 03 shows the pattern of marks distribution among CPE and OSPE.

There was more frequent scoring of less than 5 in CPE while students scored more than 7 in OSPE. By CPE the mean score of the viva marks was 5.5 ± 2.31, which was significantly lesser than that by the objective method of evaluation, 7.89 ± 3.14 ($p <0.001$), when compared by t-test.

Table 01: Checklist for OSPE Procedure Station.

Procedure	Marks (0/ 0.5)	Remarks (if any)
Keep all app ready		
Wash hand and sanitize		
Fill Hb tube with N/10 HCL		
Prick & take blood up to mark		
Wipe the tip of pipette		
Rinse & empty		
Leave for 10 min		
Place the tube in Comparator & add H2O		
Note the reading		
Clean the app		

Table 02: shows the questions for which students were marked at the stations.

Questions	Marks (0/ 1)
Which is the best method	
Name of app	
Normal range of Hb	
Rise or fall of Hb	
Use of N/10 HCL	

Table 03: Distribution of students based upon the marks obtained by CPE and OSPE

Score range	CPE	OSPE	P value	Inference
1-2	32	11	<0.001	Significantly higher scores in OSPE as compared to CPE.
3-4	40	20		
5-6	00	11		
7-8	28	40		
9-10	00	18		
Total	100	100		

DISCUSSION:
The conventional practical examinations format as an assessment tool has its own drawbacks. Conventional/ traditional marking depends on student variability, practical task variability and examiner variability which significantly affect scoring. The marks awarded also reflect only the global performance of the candidate and are not based on demonstration of individual competence. Attitudes are usually not tested at all by the conventional examination. 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. This method with some modifications has largely overcome the problems of the conventional clinical examinations. Main features of OSCE/OSPE are that, both the methods give importance to individual competencies[1-5].

Assessment of students in medicine has always remained debatable. It is seen as the single strongest determinant of what students actually learn (as opposed to what they are taught), and is considered to be uniquely powerful as a tool for manipulating the whole education process. There are continuous attempts to make assessment more objective and reliable rather than subjective. Traditional, age-old methods like essay type questions, which suffer from lack of objectivity, are giving way to newer objective methods of assessment in the form of multiple choice questions, short answer questions, and such other tools, for assessment of cognitive domain. As far as skills assessment is concerned the conventional methods are not only subjective in nature, but also lack scope for direct observation of the performance of skills by the assessor. Moreover the coverage of contents may be limited. Hence, attempts have been made to introduce methods that can overcome the above-mentioned limitations. In India, the use of OSPE for assessment of skills has been reported from some institutes. OSPE assessments have been a core element of evaluation in competency based medical education. OSPE enable assessment of the theoretical, practical and problem-solving skills at multiple stations. A single assessment tool does not fulfill all the functions. Every evaluation tool has its own advantages and drawbacks, same is true about OSPE. Despite a radical shift in assessment methodologies over the last decade, the majority of medical colleges still follow the Traditional Practical Examination (TPE). TPE raises concerns about examiner variability, standardization, and uniformity of assessment. OSPE is a practical examination system where there are a series of work stations. The students are rotated through different predefined response stations, at which the students perform task designed to test various skills. They are asked to answer the given short objective type question or identify the given instrument/gross or interpret the provided data or perform some short practical exercise in a specified period of time. They are tested using various agreed checklists with the observers sitting at stations. Increasing experience with the Objective Structured Performance Evaluation has devised its use not only as an evaluation tool but also as a teaching method. This has greatly been attributed to the feedback that is received from both the students and teaching faculty. The conventional practical examinations have several problems. The final score indicating overall performance gives no significant feedback to the candidate and are not based on demonstration of individual competencies. OSPE does not give any advantage to memory and luck, so it is most effective to separate better performing students from the average and poorly performing students. The main reason for getting higher score in OSPE is not only that the students are well informed about the marking system in advance but also the mechanical pattern of the examination.[13] It also involves wider coverage of the course and it tests individual knowledge in different topics and skills by asking targeted questions at the Non Observed (Response) Station. But drawback is that the response stations in OSPE can become mechanical as questions become repetitive with each exam.[14] While in CPE, examiner can make the viva more dynamic by asking the same questions in different possible ways. Communicative skills and concepts understanding (affective domain) can be better judged by viva in CPE. But drawback is that it evaluates randomly the subjective recall of the given practical. So instead of pure OSPE or pure CPE, a combination of both should be preferred and majority of students considered it as an effective, useful, interesting and challenging examination. Thus, combination of both methods can improve the validity of the examination. OSPE should be used in those pathology exercises which involve practical skill (psychomotor domain) e.g. hemoglobin estimation, urine examination, blood grouping or peripheral smear examination, while CPE can be used where skill is not required and only knowledge (cognitive domain) has to be tested; e.g charts or problem based exercise. This is also supported by some researchers who suggest that OSPE should be used not more than 50% of total marks or exercises.[15]

CONCLUSION:
The present study highlighted the following-

1. Students scored more marks with OSPE as compared to the conventional system, since they knew what level of competency skills was expected from them.
2. CPE did not contribute to evaluate the actual knowledge instead it is better to evaluate memory or recall type questions only.
3. OSPE can serve as an improved tool, less subjective, less stressful to both students as well as examiners for examination purposes.

Further studies are required to emphasize the importance of this method in other fields of medical teaching.

REFERENCES-

1. Bashir A, Tahir S, Khan JS. Objectively structured performance evaluation─A learning tool. Biomedica.2014; 30:139─147.
2. Lowry S. Assessment of students. BMJ. 1993; 306:51─54.
3. Firoze M, Jacob AJ. Objectively Structured Practical Examination (OSPE) in Pathology. Indian Journal of Pathology and Microbiology 2002; 45:53─57.
4. Ozuah PO, Curtis J, Dinkevich E. Physical examination skills of US and international

medical graduates. JAMA. 2001; 268:1021-1024.
5. Munjal K, Bandi PK, Varma A, Nandedkar S. Assessment of medical students by OSPE method in Pathology. Internet Journal of Medical Update 2012;7:2—7.
6. Stiliman PL, Brown DR, Redfield DL, et al. Construct validation of the Arizona Clinical Interview Rating Scale. Educ Psycol Meas.1977;37:1031—1056.
7. Harden RM, Stevenson M, Downie WW, Wilson GM. Assessment of clinical competence using objective structured examination. BMJ. 1975;1:447—451.
8. Hall—Turner WJ. An experimental assessment carried out in an undergraduate general practice teaching course (OSCE examination).Medical Education 1983;17:112—119.
9. Malhotra SD, Shah KN, Patel VJ. Objective structured practical examination as a tool for the formative assessment of practical skills of undergraduate students in Pharmacology. J Edu Health Promot. 2013; 2:53-55.
10. Ananthakrishnan N. Objective structured clinical/practical examination (OSCE/OSPE). J Postgrad Med 1993; 39:82-84.
11. Malhotra SD, Shah KN, Patel VJ. Objective structured practical examination as a tool for the formative assessment of practical skills of undergraduate students in pharmacology. J Educ Health Promot 2013; 30; 2: 53.
12. Kundu D, H. N. Das, Gargi Sen, Manish Osta, T Mandal, and Divyendu Gautam. Objective structured practical examination in biochemistry: An experience in Medical College, Kolkata. J Nat Sci Biol Med 2013; 4(1): 103–107.
13. Roy V, Tekur U, Prabhu S. A comparative study of two evaluation techniques in pharmacology practicals: Conventional practical examination versus objective structured practical examination. Indian J Pharmacol. 2004; 36(6):386-388.
14. Patil AD, Gaikawad AP, Shriram VD, Baheti BH. Introduction of Objective Structured Practical Examination for Osteology. Med Pulse International Medical Journal 2014; 1(2):43-45.
15. Deshpande RP, Motghare VM, Padwal SL, Bhamare CG, Rathod SS, Pore RR. A review of objective structured practical examination (OSPE) in pharmacology at a rural medical college. Int J Basic Clin Pharmacol. 2013; 2(5):629-633.