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Objective Structured Practical Examination (OSPE) Verses Conventional Practical Examination (CPE): A Study in Pathology Subject among 2nd Year MBBS Students

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Abstract

Background: Conventional Practical Examination (CPE) or Viva only tests the overall performance of the students (cognitive domain) but other domains like psychomotor skills, comprehension and interpretation ability etc. remain overlooked. So Objective Structured Practical Examination (OSPE) is developed as a tool to overcome these limitations of CPE. *Aims & Objectives:* To compare the effectiveness of Objective Structured Practical Examination (OSPE) with Conventional Practical Examination (CPE) as an assessment tool in pathology subject among 2nd year MBBS students. *Materials & Methods:* OSPE along with CPE were conducted in the subject of pathology among 123, 2nd year MBBS students during the year 2014. Results of both the methods were compared to each other for their effectiveness as an assessment tool in pathology practical examination. *Results:* Students got better results in OSPE as compared to CPE. Mean marks obtained in OSPE were 8.6 while 2.9 in CPE out of 10. Most frequently obtained marks in CPE were 2 while in OSPE its 9. SD (Standard Deviation) is 1.3 in OSPE as compared to 1.7 in CPE. *Conclusion:* OSPE is a reliable, objective, valid and effective method as compared to CPE for assessment of medical student's performance in pathology practical examination. However, OSPE should be used judiciously to complement CPE rather than totally replacing it.

Keywords: Objective Structured Practical Examination (OSPE); Conventional Practical Examination (CPE); Pathology; MBBS.

Introduction

Two types of assessments are being used for assessing the performance of medical students in practical examinations. One is Formative and the other is Summative. Well-designed formative assessment (e.g. Internal exams) focuses student's attention on effective learning with a focus on providing feedback for the students, while summative assessment (e.g. University exams)focuses on getting good grades or marks [1]. Ideally, Practical examinations should be constructed in such a way that they can assess medical undergraduates for all the domains of learning i.e. cognitive, affective and psychomotor [2]. But Conventional Practical Examination (CPE) or Viva only tests the overall performance of the students (cognitive domain), while other domains like psychomotor skills, comprehension and interpretation ability etc. remain overlooked. In CPE many a times, marks are awarded only on the basis of final diagnosis or results, but student's ability to perform the procedure of a particular laboratory test is not directly observed by the examiner. So in 1975 Harden and his group developed Objective Structured Clinical Examination (OSCE) which later in 1979 extended to Objective Structured Practical Examination (OSPE) as an innovative tool to overcome these shortfalls of CPE [3,4]. The method was also the subject of an international conference at Ottawa in 1985 when the worldwide experiences with OSCE and OSPE were exchanged [5]. In many countries most of the medical colleges are using OSPE as a tool of practical skill assessment. OSPE is a tool for evaluation of teaching and learning which is less stressful than CPE and it

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also eliminates experiment variability as well as examiner variability (examiner bias) because here all students undergo a series of same procedure stations while being directly observed by the examiner and given marks according to a predefine checklist [6,7,8].

Material and Methods

This trial study was conducted in 2014 as a formative assessment at our institute in 123 students of second year MBBS during their 2nd internal practical examination in the subject of pathology. Both OSPE as well as CPE were conducted simultaneously on 'Estimation of Haemoglobin (Hb) by Sahli's Method'. Students were observed directly by the examiner while performing the procedure (OSPE) and then viva (CPE) was taken. 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. On the other hand in OSPE, examiner directly observed the procedure in Procedure Station (Observed Station) and gave marks to each step as per the predefined checklist when student was doing the procedure. Predefined checklist of 'Hb Estimation' is shown in Table 1. The examiner observed whether the student was performing all the steps of haemoglobin test in their correct sequence with proper technique. '0.5' mark was 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. Here, both observed & non-observed stations carry 5 marks each. So, final marks were calculated by summing up the marks of both these OSPE Stations (out of total 10). At the end, results of both OPSE & CPE were compared and analysed accordingly using various statistical parameters.

Table 1: OSPE Procedure Station: Predefined Checklist for Hb Estimation

No.	Steps of Hb Estimation by Sahli's Method (Time duration: 15 Min)	Marks 0 / 0.5	Remarks (If any)
1	Keeps all necessary items ready (Sahli's Haemoglobinometer containing Hb tube, Hb pipette, Comparator & stirrer, 0.1N HCL, gloves, distilled water, dropper, Bio-waste container)	-	-
2	Washes hands, wears gloves and checks that all the apparatus are clean & dry.	-	-
3	Fills Hb tube with 0.1N HCL up to mark 2g% with dropper.	-	-
4	Takes blood from given EDTA sample vacutainer with Hb pipette up to 0.02ml mark while making sure that no air bubbles enter into the pipette.	-	-
5	Wipes the tip of Hb pipette, transfers blood to Hb tube containing 0.1N HCL and rinses the pipette 2-3 times with HCL.	-	-
6	Leaves the solution undisturbed in Hb tube for 10 minutes.	-	-
7	After 10 minutes, places Hb tube in comparator and start adding distil water drop-by-drop and mixing it with stirrer till its colour matches with that of comparator.	-	-
8	Notes down the reading of Hb in gm% (lower meniscus).	-	-
9	Cleans all the apparatus thoroughly.	-	-
10	Disposes the used gloves in red colour bio-waste container& washes hands.	-	-
	Total Marks(Out of 5)		

Result

In our study, we observed a trend of getting lower marks in CPE method and higher marks in OSPE method. In CPE method, most of the students scored lower marks. Out of 123 students, 44 students got 1 to 2 marks and 32 students got 3 to 4 marks. So total 76 (44+32) students scored ≤ 4 marks, which contain the major chunk of the students. On the other hand in OSPE, majority of the students scored higher marks. 56 students secured 9 to 10 marks and 30 students got 7 to 8 marks. So total 86 (56+30) students scored ≥ 7 marks. Thus, clustering of students was noted towards lower marks in CPE while around higher marks in OSPE. The marks scoring pattern is shown in Table 2 & Chart 1. Most frequently obtained marks in CPE were 2 while in OSPE its 9. Mean of marks obtained is 2.9 in CPE, whereas it is 8.6 in OSPE method. Range of marks obtained is 1-9 in CPE and 2-10 in OSPE method. Statistical analysis is shown in Table 3. Feedback from students was also taken. More than 85% of the students feel that OSPE is relatively less stressful, comfortable and more objective method for testing their psychomotor skills as compared to CPE. While CPE is good for testing cognitive domain.

Table 2: Marks Scoring Patterns in CPE & OSPE

Marks Obtained	Number of Students	
	CPE	OSPE
1-2	44	05
3-4	32	11
5-6	25	21
7-8	14	30
9-10	08	56

Table 3: Statistical Analysis between CPE & OSPE

Parameter	CPE Marks	OSPE Marks
Mean	2.9	8.6
Mode	2	9
Range	1-9	2-10
Standard Deviation (SD)	±1.7	±1.3

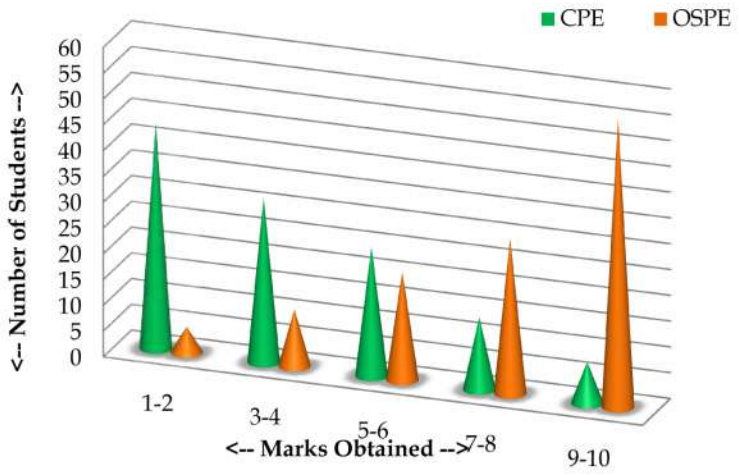

Chart 1: Scoring pattern in CPE & OSPE

Discussion

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. OSPE is very much objective and more effective in assessing practical skills or ability to perform (Psychomotor domain) because here the examiner is observing the students while they are performing the laboratory procedure (Procedure station) [9]. 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 [10]. 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 and it has been considered as a reliable device to discriminate between different categories of students. Thus, combination of both methods can improve the validity of the examination [11]. OSPE is time consuming, requires thorough planning and management as compared to CPE [12,13]. We suggest that OSPE should be used in those pathology exercises which involve practical skill (psychomotor domain) e.g. haemoglobin 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 [14].

Conclusion

OSPE tests different desired components of competence better. It is an objective, valid and reliable method eliminating examiner bias. Students also feel that OSPE is more comfortable and less stressful than CPE. Owing to its many advantages, we should start using OSPE in formative (day-to-day) assessment of students to improve their practical competency and to get an objective score for internal assessment. And then gradually it can be included to some extent for the summative evaluation in final university examinations. In Pathology practical examination, OSPE can be used for haemoglobin estimation, Blood grouping or peripheral smear examination which should be followed by viva for the same, so that the assessment is complete (skill and knowledge both are tested). On a final note, rather than replacing the CPE totally, OSPE should be used in combination and should complement it.

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Conflict of Interests

None declared

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