

OSPE IN ANATOMY: NEW DIMENSIONS IN ASSESSMENT

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ABSTRACT

Introduction: As teaching methodology has been going through a methodological transformation to a student-centric approach, problem-based learning and early clinical exposure; so should be the examination and evaluation technique. Considering the fact that still the 1st year undergraduates are being evaluated using the Traditional Practical Examination (TPE) technique; we considered to revamp it with Objective Structured Practical Examination (OSPE); the analogue of Objective Structured Clinical Examination (OSCE) in evaluation of practical perspective. Objectives of the present study are to determine the accuracy, efficacy, practicality and prospect of Objective Structured Practical Examination (OSPE) as a tool for assessment of teaching-learning outcome in anatomy among 1st year medical undergraduates.

Materials and Methods: 150 undergraduate students were evaluated using OSPE after undergoing through their TPE, during the pre-university examination. The event was followed by filling of a pre-set Likert-type questionnaire for their respective views about both TPE and OSPE. Their performance and responses were then analysed.

Result and Conclusion: OSPE emerged as a better tool in terms of assessment and performance as well as from the student's point of view.

KEY WORDS: Medical Anatomy, Practical assessment, TPE, OSPE.

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INTRODUCTION

Medical Anatomy, a basic science about the human architecture; taught to the medical undergraduates. Being a basic science subject it is vast and so as the evaluation of the teaching-learning outcome. With the recent advances in teaching methodology as the focus has now shifted towards problem based learning as well as it is now student centric [1]; so should be the assessment of the teaching-learning. Considering these scenario we acknowledge the need for newer assessment

methodology and hence came our trial of OSPE.

OSPE (objective structured practical examination) is adapted from OSCE (objective structured clinical examination), which is the modern assessment methodology for evaluation of clinical skill performance and competence [1,2]. OSPE is same as OSCE in the evaluation of practical skill in preclinical setting [3]. There have been reports of use of OSPE as a tool for evaluation by various institutions in different preclinical subjects [4-10]. But no study of anatomy assessment using OSPE whatsoever

was found by author in an Indian perspective [11-14]. However a limited study of OSPE in embryology was done by Gaikwad AP and Patil AD at B. J. Govt. Medical College Pune, India [12]. Hence we were more compelled to take a trial of this modern day assessment technique in Indian perspective so that our students also get benefitted. The present study is also done to ascertain the view of students towards OSPE and its future implementation prospect.

Aims and Objectives: Determination of accuracy, efficacy, practicality and prospect of Objective Structured Practical Examination (OSPE) as a tool for assessment of teaching-learning outcome in anatomy among 1st year medical undergraduates by exposing them to OSPE alongside TPE.

MATERIALS AND METHODS

Undergraduates at RDGMC undergo two sessional examinations before undergoing the university examination. In each of these exams they have a written examination followed by a practical assessment. Traditional practical exams (TPE) consist of spotting, surface marking, histology slides, radiology and genetics and gross anatomy assessment. We introduced OSPE in 2 successive years (13-14 and 14-15) into both the sessional exams two days after TPE were over but in this study only the 14-15 batch is taken into the account. Prior to the exams the students were primed with the methodology of OSPE with suitable examples and also we answered their relevant queries. 11 OSPE stations were prepared; from which 10 were OSPE stations and 1 was resting station which was interspaced in-between. Each OSPE station was of 5 minutes duration including the resting station. OSPE stations were student centric based on problem based learning and were peer-reviewed. OSPE stations were based on applied/clinical aspect of human anatomy and designed in a way to evoke analytical thinking; also they were devised to test a particular set of skill appropriate to the assessment at one station. Stations consist of a maximum of 2 modalities; for example a radiographic mammogram and histological slides. Each day we considered to take 50 students for evaluation; hence it lasted 3 days each year (for

a batch of approximately 150 students each year). Each day the OSPE questions were re-structured to retain confidentiality. Assessment was done using preserved anatomical specimen both wet and dry, specimen of embryology and their models, coloured pictures, diagram and pictures of genetics, imaging films (plain radiographs and contrast films, ultrasound, CT, MRI), histological slides and cadavers. Out of these 10 OSPE stations, 8 stations were structured in a way to test the cognitive skill with analytical thinking in a problem based scenario. Also of these 10 stations, we devised 2 "observed OSPE stations" to test the psychomotor skills i.e. surface marking, cranial/spinal nerves testing, cerebellar function testing, testing of a particular group of muscle etc. At the "observed OSPE stations" an observer gave marks to the student in a pre-designed sheet based on their performance.

OSPE during the 1st sessional exam was regarded as sensitization measure only since it includes less than half of their academic curriculum and hence was not taken into account. 2nd sessional exams is usually regarded as pre-university as it is towards the end of curricular session and almost includes the whole syllabus. So we exposed the undergraduates to OSPE following TPE during that and evaluated their performance as well as their views for both through a preset sheet of questionnaire. The questionnaire consists of a set of 10 questions to be answered in Likert type scale. Each question/view was to be rated in the scale of 1-5, where 1 denotes for least liked and 5 for most liked response. The students were well informed beforehand about the questionnaire to clear their doubts about each of these 10 points. Performance of the students was evaluated statistically using paired t-test; and the outcome of the questionnaire was analysed subjectively as well as statistically.

RESULTS AND OBSERVATION

This table is showing mean marks of student in traditional (TPE) and objective structured practical examination (OSPE). It shows the mean marks obtained are higher in the OSPE (~14) as compare TPE (<12). Maximum marks were 20.

Table 1: Paired Samples Statistics.

	Mean marks	Total study population N	Std. Deviation	Std. Error Mean
Traditional Practical Exam (TPE)	11.83	150	1.33	0.109
Objective Structured Practical Exam (OSPE)	13.91	150	1.699	0.139

Fig. 1: Distribution of study population according to sex.

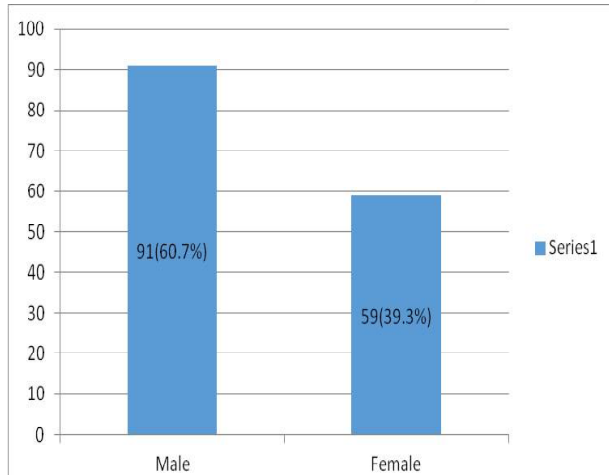
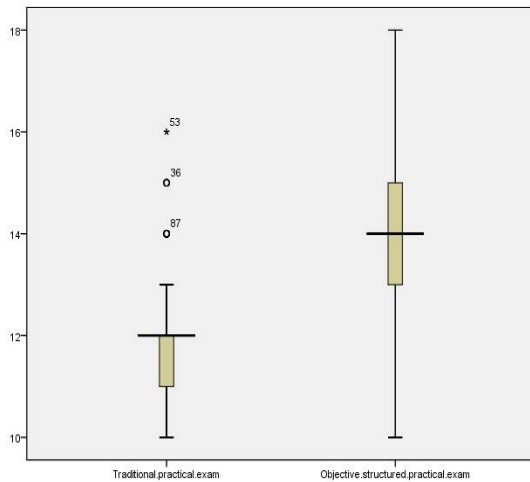


Fig. 2: Box plot showing the mean marks obtained in TPE and OSPE.



As the study population is following the normal distribution, paired t-test was applied to compare the mean

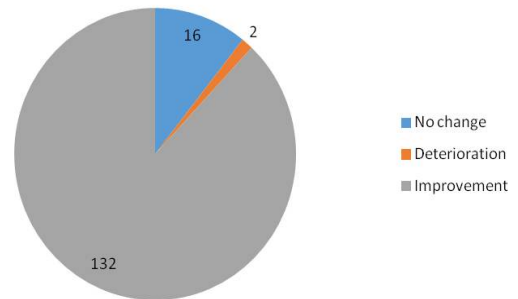
Table 2: Paired Samples Test.

	Paired Differences				t	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pair 1 Traditional Practical Exam - Objective Structured Practical Exam	-2.087	1.321	0.108	-2.3	-1.874	-19.351	149	0

After application of the paired t-test the difference is found to be statistically significant as the p value is 0.000 (<0.05) it means the

difference in marks of the student is not by chance.

Fig. 3: Pie chart showing the change in academic performance from TPE to OSPE.



Pie chart is showing that there was no change (marks were equal in TPE and OSPE in both the type of examination) in performance of 16 students, deterioration (means marks was more in the TPE as compare to the OSPE) in performance of 2 students and improvement (marks were more in OSPE in comparison to TPE) was noted in 132.

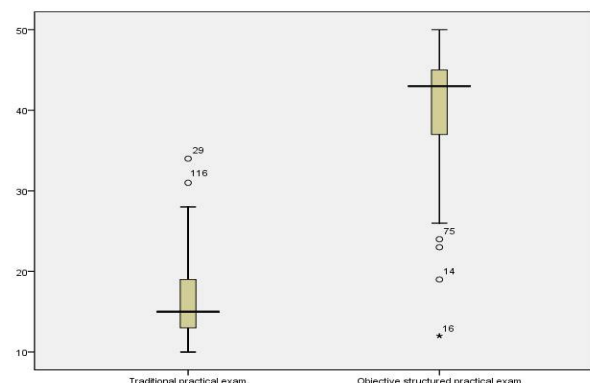
Pre-set Likert-type questionnaire for students respective views was done for both TPE and OSPE

Table 3: Paired Samples Statistics.

	Mean Score given by students to exam pattern	Study population N	Std. Deviation	Std. Error Mean
Traditional Practical Exam (TPE)	16.67	150	4.987	0.407
Objective Structured Practical Exam (OSPE)	40.66	150	6.971	0.569

Table is showing total score given by student to each exam pattern. Total mean score was more for OSPE (40.66) as compare to TPE (16.67).The maximum score was from 50.

Fig. 4: Box plot showing mean of total score given by students to different exam pattern (TPE and OSPE)



For seeing the significance difference in both the mean score; Paired t-test was applied and the difference obtained was found to be highly significant statistically as the p value is 0.00. Here 29, 116, 75, 14, were outliers and 16 was extreme outlier

Table 4: Paired Samples Test.

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Traditional Practical Exam - Objective Structured Practical Exam	-23.987	9.087	0.742	-25.453	-22.521	-32.329	149	0

DISCUSSION

The proficiency of OSCE as a tool of evaluation is well established [2,3] and even the role of OSPE as an adept method for practical evaluation is proven in different subjects and settings [4-10]. Study assessing the evaluation of comprehensive anatomical knowledge in clinical/applied problem based curriculum and using OSPE are meagre [11-14]. Thus we were compelled to do this assessment of OSPE and we were amused with the fascinating results and response obtained.

150 students (91 boys and 59 girls) were assessed through this study and an improvement was observed in the mean marks obtained as it was higher in the OSPE (~14) as compared to TPE (<12) maximum marks were 20. When put to statistical analysis using paired t-test the difference is found to be statistically significant as the p value is 0.000 (<0.05). Also comparatively a notable improvement in overall performance was observed in 132 students facing OSPE and no change was noted in 16 students. However there are only 2 students have failed to improve their performances.

Now it was the turn to evaluate the assessment methodology itself. Students evaluated the examination processes i.e. TPE and OSPE in a Likert type 10 pointer which includes level of bias, fear and anxiety, evoking analytical thinking, its future prospect etc. Students may also give their valuable suggestion to improve the current scenario. First point was to evaluate them in term of how systematic or haphazard are they? TPE was regarded as disorganised and

uncoordinated with respect to OSPE. When asked about level of fear and anxiety evoked by the examination process; both got almost similar response. However some of students wrote that they were more anxious towards OSPE before it begun, once they have gone through 2-3 stations, the fear was no more. Also some of them wrote that because of one to one interaction or even scolding or negative remarks by the examiner and they grew more anxious. 3rd point how unbiased was the approach got many positive comments towards OSPE and the result was almost unanimous in favour of OSPE. Students wrote about OSPE that it was like freedom from a preoccupied mind or even from their previous bad performance. Whereas TPE was criticized for its higher levels of bias with all the individuals. On the point of evoking analytical or applied thinking; since OSPE was designed in that way so it was preferred. When asked about differentiating capability of both examination process OSPE was selected better in that capability because of its comprehensive and analytical approach through which one can differentiate between excellent performer, the mediocre and the poor performer. The question related to comprehensive coverage of subject, OSPE was found to be slightly better than TPE. Most suggestions were towards increasing the topics to include some important topics being left which only points towards increasing the number of stations. Moreover, a limited number of stations may not always be a constraint for formative assessment [16]. When lower level of distraction was compared OSPE was chosen over TPE. Students found that there were more student-student and student-examiner interference in TPE as compared to OSPE. On "time limitation" scale OSPE was found better than TPE as the former was found to have better time management. When asked about the prospect of both, OSPE was chosen as the successor of TPE because of being more student centric and many other points described above. However, Hassan S et al [14], Malik S et al. [15] reported the higher score of traditional practical examination as compared to OSPE as assessment tool; hence we have to analyse and re-valuate OSPE for time and again against TPE.

When these results were statistically analysed

by using their Likert's scale figures; Here again significance difference in both the mean score was observed and in Paired t-test the difference obtained was found to be highly significant statistically as the p value is 0.00.

INFERENCE AND CONCLUSION

Traditional practical examination have been the mainstay of evaluation of practical knowledge for many decades and even was modified (mcq,spot etc) to overcome its shortcomings [17]; but there are many flaws which can not be rectified without completely revamping it. However as reported by Mahajan AS [9], Hasan S [14] and Malik SL [15] there are few points where TPE has an edge over OSPE like better coverage of topics, less space needed, teacher-student interaction, the hint-factor; hence they favour a admixture of both. But Abraham RR [7] and Yaqinuddin A [12] differ with their views and favours OSPE. We also agree with their view of completely replacing TPE with OSPE as we acknowledge the need of the changing era of learning and assessment.

Hence now we need to consider OSPE as an evaluation process as it has no shortcomings/flaws of TPE as well as it cope with the changing scenario of medical education which involves problem based learning, early clinical exposure, inter-subject collaboration etc. However we came to know about some valuable suggestion to improve the OSPE. These steps are:

1. Placement of a specific topic/ modality at one station
2. Increase the number of OSPE station
3. Increase the number of observed OSPE station to evaluate the skill aspect
4. Placement of dummy patient to evaluate the relevant clinical aspect.
5. After every 5 OSPE station there should be a rest station to calm and compose.

With these considerations we would recommend OSPE for the final exams as well and till then we continue to give exposure of OSPE to the students during internal examinations to evaluate more of its prospect.

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ABBREVIATIONS

TPE - Traditional practical examination

OSPE - objective structured practical examination

OSCE - objective structured clinical examination

Conflicts of Interests: None

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