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Original Research Article

Comparative study of evaluation techniques in physiology clinical practicals by objective structured practical examination verses traditional practical examination

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ABSTRACT

Background: Objective structural practical examination assesses students by evaluating their knowledge, attitude, communication skills, interpersonal skills, ethical issues and professional judgement. Objectives were to compare the traditional practical clinical examination with objective structured practical examination. To establish the relation between the TCE and OSPE. To take the feedback from students about the study.
Methods: This interventional longitudinal study was conducted on 100 first-year medical students. They were divided into 4 practical batches each consisting of about 25 students. In TCE each student performed a clinical skill, followed by viva voce on the RS. Assessment of each student were done on the bases of overall performance. In OSPE, students were provided an OSPE map and a written instruction list before the start of the examinations, and they move from one station to another following the audible ring by the timekeeper. Three observation station, six unobserved stations with questions relates to the procedural stations arrange in physiology practical laboratory. An examiner was provided with prevalidated checklist to mark according to the observed procedure.
Results: Marks obtained during OSPE mean was 11.07 was more effective than marks obtained during TCE mean was 8.34. Most of students strongly agreed that OSPE was well structured, performance based, more objective as compared to TCE.
Conclusions: OSPE is a good tool for practical assessment as compared to TCE to improve students' learning process.

Keywords: Assessment, Auscultation, Clinical skills, Inspection, Knowledge, Non observable station, Observable stations, Objective structured practical examination, Palpation, Percussion, Respiratory system, Traditional practical clinical examination

INTRODUCTION

In India knowledge based medical education is moved to competency based medical education to made competent Indian medical graduate. Competent medical graduate has knowledge, skills, values and abilities.[1] For assessing students there must be a good tool which fulfils all criteria of assessment like-objectivity, validity, reliability, and feasibility.[2] For assessing theory examination, we have various tools like long answer questions, short answer questions as well as multiple choice questions. In theory most of aspects of assessment we can assess but in practical examination it is difficult. In physiology traditional clinical examination (TCE) involves

performing a particular clinical procedure and bed side viva voce which is mainly focus on knows and know-how of Millers pyramid of competence.[3,4] This type of traditional clinical examination is biased, monotonous, not able to evaluate students' performance properly on the basis of knowledge, skill and attitude.[5] In TCE only recall knowledge of student is tested In TCE main emphasis was given to the questions, bed side viva-voce less importance was given on procedure and clinical examination. Attitude, communication skills, interpersonal skills, ethical issues and professional judgement would not be tested.[6,7] Objective structural practical examination (OSPE) assesses students by evaluating their knowledge by direct observation of clinical skills and procedure. It overcome all the weakness of TCE.[8] OSPE was derived from objective structured clinical examination (OSCE) in 1975) by Harden and Glessoon and later modified in 1979 to improve practical assessment in pre and para clinical subjects.[9] In OSPE there is direct observation of student's performance during clinical exam station so OSPE assess practical competencies in objective and structural manner. Questions in OSPE are well structured, all aspects of teaching -learning can be assessed with equal weightage to each and every points. It improves validity of examination by minimizing patient and examiner variability.[10,11]

For medical subjects OSPE had been reported as a powerful tool to discriminate between poor and good students in practical examination.[12] It is proved to be a reliable assessment method.[13,14] So, the present study was aimed to compare and establish the relation between the TCE and OSPE. Also, to take feedback about the study by the students. on five-point Likert scale.

Objectives

To compare the traditional practical clinical examination (TCE) with objective structured practical examination. (OSPE). To establish the relation between the TCE and OSPE. To take the feedback from students about the study.

METHODS

The study was conducted on 100 first-year MBBS medical students in the department of physiology at the peoples Medical College and Research Centre, Bhopal, India. Study period was from October 2021to April 2022.

Inclusion criteria

MBBS first year students of age group 17-20 years were included.

Exclusion criteria

Attendance less than 85% in practical, students absent during intervention were excluded.

They were introducing to the system of OSPE by a short lecture, power-point presentation organizes by the faculty members. The questions for OSPE modules were selected as per "must know," "desirable to know," and "nice to know"

A total of 100 students were divided into 4 practical batches (A, B, C, D) each consisting of about 25 students.

TCE examination were taken by examiner and it is followed by OSPE in respiratory system. In the traditional assessment method, each student performed a clinical skill, which was follow by viva voce on the RS, and the assessment of each student were done on the bases of overall performance of the student. For TCE, all the examiners were brief about the content and the flow of the examination but no structured format was available for their reference. The entire TCE session ended in 90 min

While with the OSPE, students were oriented by providing an OSPE map and a written instruction list before the start of the examinations, and they move from one station to another following the audible ring by the timekeeper. Stations are made according to availability of space OSPE consisted of 10 stations of 3-5 minutes of 25 marks: one station on communication skills (1 mark); three observation/procedure station on inspection and palpation, percussion, auscultation of respiratory system (18 marks); six unobserved stations with questions relates to the procedural stations (1 mark so 1×6=6).

One rest station arranged in physiology practical laboratory in a clockwise manner. The entire session last for 50-60 minutes on all 4 days.

An examiner appointed at procedural stations provided a prevalidated checklist to mark immediately according to the observed procedure. All the questions were validated by the experts of physiology from various medical colleges of Madhya Pradesh.

Observed stations

Stations on communication skills (1mark). Assessment about communication skills (1 mark)- self introduction- 1/4, rapport with subject- 1/4, consent- 1/4, explain the procedure and Ensure comfort- 1/4

Checklist for inspection and palpation of chest is described in Appendix-I. Checklist for percussion, auscultation of respiratory system is described in Appendix-II. Checklist for non-observable stations is described in Appendix-III.

Data analysis

All statistical analysis was carried out using SPSS version 20 and appropriate statistical tools will be applied.

RESULTS

Demographic data of students are summarized in (Table 1) with mean±SD, there were no any significant variation in their age groups, height and weight.

Table 1: Demographic data of students.

	Male n=60	Female n=40
Age (years)	18.25±2.47	18.20±2.37
Height	160.35±09.55	155.35±03.52
Weight	62.72±5.54	60.72±5.44

Table 2: Comparison between marks obtained during traditional practical examination and marks obtained during OSCE.

	Mean	SD	t	df	P value	Significance
Marks obtained during traditional practical examination	8.34	1.929	29.689	198	0.000	S
Marks obtained during OSCE	11.07	1.945				

We have applied unpaired t test for comparison

Table 3: Correlation between marks obtained during traditional practical examination and marks obtained during OSCE.

	Correlation	P value	Significance
Marks obtained during traditional practical examination and marks obtained during OSCE	0.887	0.000	S

Table 4: Close ended feedback from students.

Questions	Yes	No
Did you know about OSPE earlier?	10	90
Did you think objective structured practical examination (OSPE) is time consuming?	95	5
Did you think traditional practical clinical examination (TCE) is time consuming?	10	90
Do you agree that OSPE evaluation is performance based only?	90	10
Do you agree that TCE evaluation is performance based only?	30	70
Do you think evaluation by OSPE are valid and unbiased?	90	10
OSPE is a good form of examination and learning process	20	80
OSPE reduces the chance of failing in exam compared to TCE	50	50
OSPE reduces the element of luck in examination	80	20
There is no much difference between OSPE and traditional method of assessment	80	20

Table 5: Feedback from students on five-point Likert scale.

	Strongly agree	Agree	Strongly disagree	Disagree	Neutral
OSPE was a better way of assessment as compared to traditional assessment	30	40	05	10	15
OSPE assessments are time consuming	40	40	10	05	05
TCE assessments are time consuming	20	20	20	30	10
Assessment by OSPE or the traditional method are similar	10	05	50	30	05
assessment by OSPE is a more objective as compared to assessment by traditional method	30	30	10	20	10
OSPE questions are well structured as compared to traditional teaching	50	35	02	03	10
OSPE is more stressful as compared to the traditional method	20	10	40	20	10
Evaluation by OSPE is valid and unbiased	50	40	03	02	05
Evaluation by TCE is valid and unbiased	05	03	50	40	02
OSPE evaluation should be performance based only	40	50	03	02	05
TCE evaluation should be performance based only	30	20	30	20	00
I feel more confident in performing practical tests after OSPE	30	30	20	10	10
I feel more satisfied with my assessment with OSPE as compared to the traditional method	50	40	05	05	00

In this above Table 2 showing marks obtained during OSCE mean was 11.07 was more effective than marks obtained during traditional practical examination mean was 8.34.

There was significant positive correlation between marks obtained during traditional practical examination and marks obtained during OSCE (Table 3).

DISCUSSION

From the academic year 2019-2020 the MCI has implemented CBME curriculum where assessment has given very important place to analyze the knowledge and acquired skills of the learner.[15,16]

In an attempt to improve the practical evaluation in the subject of physiology, OSPE was introduced it assess individual capacities by the assessment process. Assessment in OSPE is more objective, it checks the skills.

Good students can do well in any form of evaluation. In OSPE setup we have to made students very comfortable, explain the procedure, which is observe by the observer when he is evaluating students in OSPE.[17]

In our study, a total of 100 undergraduate medical students were included. There was a statistically significant difference in the mean scores between the TPE and OSPE ($p<0.05$); the standard deviation of scores for group II (OSPE group) also showed significance difference as compare to group I (TCE). A similar study done by Nigam et al their mean score for OSPE was 13.75 and for TCE was 9.13 and p value was <0.0001 which was statistically significant.[18] The study by Vijaya et al, they found their mean OSPE score 68.18 and their mean TPE score 49.28, the p value obtained was <0.001.[19] Study done by Bairy et al their observed their mean value for OSPE (43.41) and TPE (40.29) which was statistically significant at $p<0.05$.[20] In a study done by Malhotra et al, there was no significant difference in the mean OSPE (13.16) and TPE (12.82) scores obtained in their study.[21]

The examiner recorded the performance using a checklist. When we compared to marks obtained using the traditional format, as well OSPE. Marks obtained during OSCE mean was 11.07 which was more effective than Marks obtained during traditional practical examination mean score was 8.34. There was significant positive correlation between marks obtained during traditional practical examination and marks obtained during OSCE. The study by Trivedi et al also concluded that using OSPE as a better assessment tool with the students gives a chance to score better.[22] A study done by Prasad et al they were found that students score higher in OSPE than in traditional methods of assessment.[23] When we took feedback from students on five-point Likert scale 50% of students strongly agreed that OSPE questions are well structured as compared to traditional teaching. 50% of students said OSPE evaluation should be performance based only. 30% said assessment by OSPE is a more objective. Most of the students 30% said they feel more confident in performing practical tests after OSPE similar studies was done by Manjula et al, in their study 81% of students thought that OSPE is a much better tool for assess students in practical examination. 56% students said it is well structured examination. Also 36% students reported that OSPE is less stressful as compared to TPE. Most of the students said that OSPE examination was more useful so 42% said chances to fail in examination was less in OSPE.[24] Similar study done by Faldessai et al states that 90% of students found that OSPE was the better way of examination then the traditional examination similar study was done by Manjula et al in their study 81% of students thought that OSPE is a much better tool to assess students in practical examination. 56% students said it is well structured examination. Also 36% students reported that OSPE is less stressful as compared to TPE. Most of the students said that OSPE examination was more useful so 42% said chances to fail in examination was less in OSPE.[25]

There are some limitations of the study. Sufficient number of faculties are not available to conduct OSPE. less resources are available to conduct the OSPE.

CONCLUSION

Objective structured practical examination is a good tool for practical assessment of first year MBBS students as compared to traditional practical clinical examination (TCE) to improve students' learning process.

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REFERENCES

1. Prasad HK, Prasad HK, Sajitha K, Bhat S, Shetty KJ. Comparison of objective structured practical examination (OSPE) versus conventional pathology practical examination methods among the second-year medical students- a cross-sectional study. Med Sci Educ. 2020;30:1131-5.
2. Al-Naami MY. Reliability, validity and feasibility of the objective structured clinical examination in assessing clinical skills of final year clerkship. Saudi Med J. 2008;(12):1802-7.
3. Ananthakrishnan N. Objective structured clinical/practical examination (OSCE/OSPE). JPGM. 1993;39(2):82-4.
4. Miller G. The assessment of clinical skills/competence/performance. Acad Med. 65;1990(9):S63-7.
5. Bijlani RL. Assessment of laboratory exercises in Physiology. Med Educ. 1981;15(4):216-21.

6. Edelstein DR, Ruder HJ. Assessment of clinical skills using video tapes of the complete medical interview and physical examination. Med Teach. 1990;12:155-62.
7. Verma M, Singh T. Experiences with objective structure clinical examination (OSCE) as a tool for formative evaluation in pediatrics. Indian Pediatr. 1993;30:699-702.
8. Debbarma A, Sarkar D, Choudhuri S. Traditional clinical examination versus objective structured practical examination in physiology of 1st year MBBS students: examiner's bias. Int J Pharm Clin Res. 2023;15(3);1268-72.
9. Harden RM, Stevenson M, Wilson DW, Wilson GM. Assessment of clinical competencies using objective structured clinical examination. Br Med J. 1975;5955(1):447-51.
10. Nayar U, Malik SL, Bijlani RL. Objective structured practical examination: a new concept in assessment of laboratory exercises in preclinical sciences. Med Educ. 1986;20(3):204-9.8.
11. Huseyin Cahit Taskiran. A new competency level system for practical and procedural skills in an undergraduate curriculum. Foundation for Advancement of International Medical Education and Research (FAIMER) Institute, 2003. Available at: http://www.faimer.org/education/fellows/abstracts/03taskiran.pdf. Accessed 30 June 2009.9.
12. Sandila MP, Ahad A, Khani ZK. An objective structured practical examination to test students in experimental physiology. J Pak Med Assoc. 2001;51:207-10.
13. Hilliard RI, Susan TE. The use of an objective structured clinical examination with postgraduate residents in pediatrics. Arch Pediatr Adolesc Med. 1998;152:74-8.
14. Sloan DA, Donnelly MB, Schwartz RW, Strodel WE. The objective structured clinical examination. The new gold standard for evaluating postgraduate clinical performance. Ann Surg. 1995;222:735-42.
15. Lockyer J, Carraccio C, Chan MK, Hart D, Smee S, Touchie C, et al. Core principles of assessment in competency-based medical education. Med Teach. 2017;39:6,609-16.
16. Shaifali I, Ahsan M, Mallick AK. A study on objective structured practical examination (OSPE) as a tool for assessment of medical students. Indian J Basic Appl Med Res. 2016;5(2):784-90.
17. Newble DI, Swanson DB. Psychometric characteristics of the objective structured clinical examination. Med Educ. 1988;22:325-34.
18. Nigam R, Mahawar P. Critical analysis of performance of MBBS students using OSPE and TDPE-a comparative study. Nat J Community Med. 2011; 2:322-4.
19. Vijaya DS, Alan S. A comparative study to evaluate practical skills in physiology among 1st phase medical under graduates at JNMC Belgaum: Traditional practical examinations versus objective structure practical examinations (TPE versus OSPE). Int J Educ Res Tech. 2014;5:126-34.
20. Bairy KL, Adiga S, Shenoy S, Magazine BC, Amberkar M, Kumari MK, et al. OSPE in pharmacology: comparison with the conventional method and students. Perspective towards OSPE. Br Biomed Bull. 2014;2:218-22.
21. Malhotra SD, Shah KN, Patel VJ. Objective structured practical examination as a tool for formative assessment of practical skills of undergraduate students in pharmacology. J Educ Health Promot. 2013;2:53.
22. Trivedi RS, Diwan JS, Shah CJ, Jani RD, Anand AK. The influence of objectively structured practical examination (OSPE) on scoring pattern. Int J Biomed Adv Res. 2014;5:87-9.
23. Prasad HK, Prasad HK, Sajitha K, Bhat S, Shetty KJ. Comparison of objective structured practical examination (OSPE) versus conventional pathology practical examination methods among the second-year medical students- a cross-sectional study. Medical Science Educator. 2020;30:1131-5.
24. Manjula A, Shashikala P, Nagaraj P. Student's perception on objective structured practical examination in pathology. J Med Educ Res. 2013;1(1):12-4.
25. Faldessai N, DharwadkarA, Mohanty S. Objective-structured practical examination: a tool to gauge perception and performance of students in biochemistry. AJMS. 2014;2(8):32-8.

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