

Objective Structured Practical Evaluation: Comparison with the Traditional Practical Examination and Students' Perception

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ABSTRACT

Background: An integral part of a medical curriculum is an appropriate assessment of clinical competencies of the medical students. The Objective Structured Practical Examination (OSPE) can assess practical competencies in an appropriate, step-wise, methodical, objective and time-orientated manner with direct observation of the student's performance during planned practical test stations.

Objective: The purpose of the study was to determine second-year MBBS students' perception of OSPE in Comparison of their views of Traditional practical examination (TPE) in biochemistry.

Methods: A total of 283 MBBS Students of 2014/15 batch under Kathmandu University-affiliated medical colleges were administered a questionnaire which analyzes students' perception that involved a 5 point Likert-scale containing five broad themes with 22 questions. Students opinion was noted for quantitative analysis.

Key Findings: Most of the students felt OSPE is a better learning stimulus. Similarly, more than 84 % students were satisfied by the sequence of the questions being asked. They also felt that OSPE is a reliable and fair examination. 85% believe that there is no bias in grading from an examiner in OSPE. Nearly 76% felt that there are less fearful of examiners and More than 85% students agree, OSPE is fair, unbiased means of assessment compared with TPE.

Conclusion: In spite of the limited use of OSPE in the majority of the medical colleges across Nepal, the current study showed a positive perception towards OSPE as a fair, unbiased, valid, reliable assessment method compared to traditional practical examination.

Keywords: Evaluation, OSPE, TPE, Medical Student, Undergraduates, Perceptions

INTRODUCTION

Medical education involves assessment of students at regular intervals as a source of learning and providing the basis for enhancing the competence level. As assessment drives learning, similarly, faulty methods of assessment can lead to wrong decisions that may have adverse impacts on student's future.¹ As a single process is unable to assess knowledge, comprehension, skills, motivation, and feedback,² thus various methods of student's evaluation in examination exist, each with their advantages and disadvantages. In this context, skill-based assessments are of importance in addition to knowledge-based tests.

Objective Structured Practical Evaluation (OSPE), Objective Structured Clinical Evaluation (OSCE), and Traditional Practical Examination (TPE) are the commonly used methods of evaluation in medical education. OSPE and OSCE are the methods of

skill-based assessment, whereas the laboratory-based examination is termed as TPE. OSPE and OSCE are used for assessment of competencies in the basic sciences during the preclinical and clinical years of a medical curriculum respectively.

Traditional examination methods, which are in practice since decades has many drawbacks. The dissatisfaction among both teachers and students with the conventional methods of practical assessment³ led to a search for alternative methods of evaluation.⁴ Consequently, Harden and his colleagues, in 1975, introduced the OSCE, claiming that it will fulfill all the criteria of an ideal method of assessment of clinical competence.⁵ In, 1975, the OSCE was modified to assess practical knowledge and skills in the basic sciences and was termed OSPE.⁶ OSPE tools have been used for assessment of competencies in the basic sciences during the preclinical years, and clinical years of a medical

curriculum respectively.⁷ During the evaluation, the student goes through some stations, some of which have observers with checklists of behaviors the students should exhibit.⁸ In an International Conference held in Ottawa in 1985, OSPE and OSCE techniques were introduced as a teaching, and evaluation tool and its advantages were compared with disadvantages. Being an actual parameter rather than subjective, OSPE pattern holds transparency in proper assessment of students.⁹ The chief benefits of OSPE include objectivity, reliability, and good capacity for discriminating between different categories of students and structured in such a way that all the objectives of laboratory teaching can be tested.¹⁰ Similarly, it is free of examiner bias and covers a broad range of subjects.¹¹

The use of OSPE, for assessing the knowledge and skills of the medical undergraduates has been increasing and the TPE has been outdated in many parts of the world. Experts in the field have pointed that the present system of evaluation of medical students in Nepal has many drawbacks and need immediate modification.¹¹ However, many universities still practice the TPE methods to assess the practical examination. Since 2011, Kathmandu University has gone through the integrated system for theory examination but not the practical. Whereas a change has to be made in the practical examination system as well for better monitoring and evaluation of the medical students in their pre-clinical sciences. At the moment, the medical colleges under KU have been conducting a mixed-method of examination that integrates both TPE and OSPE in practical examination. Also, KU has a plan of fully adopting OSPE method in practical evaluation in coming years.

The proper selection of a method of assessment can have a significant impact on study strategy and improve student performance.^{12, 13} A real test must be acceptable to those using it, feasible, valid and reliable.^{14, 15} The existing literature supports the validity and reliability of OSPE and has credited it to be superior to conventional methods of examination; however, each institution must evaluate the acceptability and feasibility criteria of OSPE before adopting it. Although many international studies have shown the acceptability and feasibility of OSPE, it may not be applicable in Nepalese context. Thus, before adoption, it is essential on the part of the institutions to see that the method is effective, feasible and acceptable.¹⁶ Many studies have already suggested the importance of student's feedback towards the assessment tools in undergraduate medical education.¹⁷⁻²⁰ Similarly, students' feedback has significant effect toward more efficient teaching.²¹

MATERIALS AND METHODS

To achieve the study objectives, this study was conducted with 283 medical students studying in Kathmandu University-affiliated medical colleges in Kathmandu. After the approval from the Nepal Medical College, Intuition Research/ Review Committee (IRC) NMC-RESC and a written informed consent from the participants. The students participating in the study were introduced to the OSPE system by short lecture and demonstration. The study population was MBBS students of batch 2014 and 2015.

A five-theme based 23 items self-administered questionnaire was completed by all the 283 students. The five themes for the survey evaluated the structure of the OSPE, content, administration of OSPE, reliability, objectivity, and fairness of the OSPE and the value of OSPE compared with the TPE which they have experienced. The purpose of the questionnaire was to understand the effectiveness of OSPE as a teaching-learning tool since in TPE; there is a less scope of stepwise evaluation of every detail in the clinical procedure hence often, there is a lacuna in the performance and the actual competency requirement from the students. Also, the structure of the OSPE, whether it gives complete justice to the syllabus as blueprinted along with being relevant, reliable and valid since, in TPE, the examiners may deviate from the set pattern of the program. The questionnaire also was framed to understand the feasibility of OSPE regarding its administration cost, conduction, time and manual effort in comparison with TPE. Also, we wanted to gain insight regarding their views about both the assessment methods. All items in the questionnaire were 'Likert-type items' having six response choice points. These points indicate the degree of agreement with the statement in ascending order. In the survey, the students were instructed to tick mark the best response to the 23 statements via; Do not know, strongly disagree, disagree, both are same, Agree, strongly agree. 0 = Do not know; 1 = strongly disagree; 2 = disagree; 3 = both are same; 4 = Agree; 5 = Strongly agree.

At the end of the questionnaire, an open-ended question was asked to elicit opinions regarding both the assessment methods. The participation was voluntary and anonymous. They were assured that no action would be taken against them if they wish not to answer the questionnaire. The students were instructed to reply to their answer sheet without any discussion with the peers. Basic statistical analysis of the 5-point Likert scale was done. A self-administered questionnaire was pre-tested among the students of batch 2013 of Nepal Medical College, Jorpati, Kathmandu. Once the filled questionnaires are collected, data was edited/coded and

entered into Epi Data 3.1 and was analyzed by using SPSS 16. Frequency, Proportion, Mean & SD were calculated.

RESULTS

The study was conducted students in Kathmandu University-affiliated medical college. 283 samples were collected by self-administered questionnaire from the students who were already exposed to OSPE and TPE in their curriculum. The socio-demographic character reveals that the mean age group of the participant

students was 19.81 ± 1 years among which, 50.53% of them were male, and 49.47% were Female (Table-1).

Table 1: Socio-Demographic Characteristics of students

Features	n (%)
Age (Mean + SD)	19.81 ± 1.02
Gender:	
Male	143 (50.53)
Female	140 (49.47)

Is OSPE a better learning stimulus?

Table 2: Is OSPE a better learning stimulus?

Is OSPE a better learning stimulus?	Do not know	Strongly Disagree	Disagree	Both are same	Agree	Strongly agree
encourages paying more attention	3 1.1%	13 4.6%	3 1.1%	10 3.5%	152 53.9 %	101 35.8%
The student thinks in more than one way.	8 2.8%	5 1.8%	1 0.4%	22 7.8%	142 50.5%	103 36.7%
Covered a wide range of knowledge	6 2.1%	4 1.45%	2 0.75%	13 4.6%	162 57.9%	93 33.2%
A better form of examination as well as learning experience.	2 0.7%	10 3.5%	4 1.4%	20 7.1%	152 53.9%	94 33.3%

It is evident from the Table-2 that most of the students felt OSPE is a better learning stimulus because it encourages paying more attention to practical exam. Similarly, it also makes the student think in more critical than one way and covered a broad range of knowledge compared with TPE. Also, 53.9% students agree, and 33.3% strongly agreed that OSPE is an excellent form of examination as well as learning experiences.

Content of OSPE

Table 3: Content of OSPE

The content of OSPE:	Do not know	Strongly Disagree	Disagree	Both are same	Agree	Strongly agree
The questions asked were more relevant	6 2.2%	7 2.5%	3 1.1%	27 9.7%	174 62.4%	62 22.2%
OSPE measures practical skills better.	9 3.2%	15 5.3%	12 4.2%	55 19.4%	110 38.9%	82 29%
OSPE was more uniform and objective	3 1.1%	5 1.8%	4 1.4%	23 8.1%	128 45.2%	120 42.4%

From the table-3 majority of the student felts that, the content of OSPE and the questions asked were more relevant; of which more than 84 % students were satisfied by the sequence of the questions being asked. OSPE questions are more relevant and also measures practical skills better. It is also logical that, the content of OSPE is more uniform and objective since all students are asked similar questions with the same difficulty level.

Reliability and fairness of OSPE

Table 4: Is OSPE a reliable and fair examination?

Is OSPE a reliable and fair examination?	Do not know	Strongly Disagree	Disagree	Both are same	Agree	Strongly agree
OSPE is a reliable	10 3.6%	8 2.8%	4 1.4%	25 8.9%	178 63.3%	56 19.9%
OSPE decreases element of luck	13 4.6%	22 7.8%	10 3.5%	58 20.6%	118 41.8%	61 21.6%
There is no bias in grading	11 3.9%	7 2.5%	8 2.8%	15 5.3%	122 43.4%	118 42%

The majority of the students felt that OSPE was a reliable and fair examination and they also agree that it decreases the luck factors. From table-4, nearly 85% students also felt that there was no bias in grading from an examiner in OSPE.

Administration of OSPE

Table 5: Administration of OSPE

Administration of OSPE	Do not know	Strongly Disagree	Disagree	Both are same	Agree	Strongly agree
confusing to switch over	6 2.2%	4 1.4%	15 5.4%	78 28.2%	123 44.4%	51 18.4%
Less fear of examiners	7 2.5%	15 5.3%	9 3.2%	36 12.7%	125 44.2%	91 32.2%
Sufficient time given	6 2.1%	10 3.5%	17 6%	99 35.1%	114 40.4%	36 12.8%
OSPE is physically tiring	9 3.2%	9 3.2%	39 13.8%	128 45.4%	81 28.7%	16 5.7%

From table-5, the majority of the students were satisfied by the arrangements of the OSPE. Nearly 76% of the student also felt that there is less fear of examiners as there is no interaction with examiners

Comparison of OSPE as an assessment method with TPE

Table 6 .Comparison of OSPE as an assessment method with TPE

Comparison of OSPE as an assessment method with TPE.	Do not know	Strongly Disagree	Disagree	Both are same	Agree	Strongly agree
OSPE is a fair, unbiased means of assessment	7 2.5%	10 3.6%	3 1.1%	21 7.5%	131 46.6%	109 38.8%
OSPE is easier to pass	4 1.4%	32 11.4%	12 4.3%	61 21.7%	131 46.6%	41 14.6%
OSPE provides chance to score better	6 2.1%	19 6.7%	5 1.8%	33 11.7%	143 50.7%	76 27%
Not much difference between OSPE & TPE	12 4.3%	9 3.2%	50 17.9%	155 55.4%	44 15.7%	10 3.6%

From table-6, OSPE is fair, unbiased means of assessment compared with TPE. Also, the majority of the students agree that OSPE provides a chance to score better.

Comments from the students

Table 7 .Comments from the students

Comments from the students	Do not know	Strongly Disagree	Disagree	Both are same	Agree	Strongly agree
OSPE should be followed as the method of assessment	13 4.6%	16 5.7%	4 1.4%	19 6.8%	152 54.3%	76 27.1%
“Combine TPE with OSPE on a regular basis.”	18 6.4%	2 0.7%	19 6.8%	37 13.2%	125 44.6%	79 28.2%
OSPE was more uniform and objective	3 1.1%	5 1.8%	4 1.4%	23 8.1%	128 45.2%	120 42.4%
I prefer the OSPE to the conventional method	16 5.8%	21 7.6%	10 3.6%	29 10.5%	144 52.2%	56 20.3%

Table 7 shows, OSPE was uniform, objective and also a better method to compare TPE and should be followed as the method of assessment for examination in biochemistry. There are still some feedbacks from students' side to combine TPE with OSPE on a regular basis.

DISCUSSION

This method of examination eliminates subjectivity, favoritism and simultaneously the student has greater chances to express their knowledge. It is not only the excellent opportunity of medical education research but generates enormous amount of data to improve the quality of next examination, however, in different locations, this system also has some limitations, i.e., there is a risk of fatigue of observer to observe the same type of skills in several numbers of students.²² This kind of examination has a growing international popularity. It can be used to measure pre-clinical skills that other tests do not perform.²³ Currently, in India, OSPE is conducted as a formative or summative examination in selected medical colleges all over India and allotted an insufficient percentage of the marks.²⁴ Similarly, in Nepal, the medical colleges under the Kathmandu University are also adopting OSPE as a part of the practical exam in biochemistry during pre-clinical sciences of MBBS, which consist of minimal marks.

This particular study was aimed to understand the acceptability of the OSPE among students as well as feedback from the faculty; it was a relatively new assessment tool for them and also seeks to compare the student's perspective among OSPE and TPE; which was the aim of our study. Moreover, this was the basis for the future development to reform and refine the OSPE as an assessment tool. The majority of students perceived that OSPE had a better content and construct validity since the OSPE, thus helping them know their weaknesses in clinical examination making OSPE a better testing method and a learning stimulus compared with the TPE.^{25, 26}

Regarding the content of the OSPE, they felt that the questions were more relevant and logical with the proper

content of syllabus. Since all the students were exposed to similar types of questions with the same difficulty level; they felt that the system is a fair and unbiased method of the minor element of luck playing any part in the assessment. This also stimulated the critical thinking ability of the students which was welcomed by the students. Similar views were put forward by Duffield however Imami M, Hosseinie et al.²⁷ had a contrasting view regarding the fair and unbiased nature of OSPE which could be due to lack of awareness about the new system. Regarding the administration of OSPE, in spite of their new experience with OSPE, many felt that the instructions were clear and adequate. This could be attributed to habituation to the traditional format of the examination. With switching from one station to other, some students were confused and anxious while the majorities were relaxed since they only had to perform without answering anything feeling less stressed. This is paradoxical with many studies showing that OSPE is more stressful and anxiety driven.

Overall, they felt OSPE was more satisfying experience and suggested for more OSPE sessions in future. However, some of the students did mention that, to combine OSPE with TPE on a regular basis. They also felt the lack of interaction with the examiners was depressing since they could not get the clue by the facial expressions or the hints thrown by the examiners during the examination. During the entire OSPE session, the areas where the majority of the student committed similar mistakes, were noted and at the end of the sessions, the feedback regarding their performance at both the observed and unobserved stations along with the common mistakes performed by the students was discussed.²⁸

There were few limitations in the present study since; it was the new encounter of the students with OPSE. The stations were also reusable for different classes and could be tailored to suit various disciplines. 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. Evaluated marks of question station and a checklist of procedure station were made available to the students, who appreciated what they achieved and identified and where they need to improve. Feedback given by students was constructive and showed high acceptance, Feroze and his team have also reported having got an appreciable feedback.²⁹

However, in the process of setting OSPE, the department of biochemistry could develop a validated OSPE banks for future use. The feedback from the students was invaluable, and it facilitated in forming more comprehensive, compact OSPE checklist which would evaluate and check more practical knowledge and skills, which also emphasized the need for continuous faculty development in the field of medical education for its betterment.

CONCLUSION

OSPE has several distinct advantages. We found that OSPE was more objective, measured practical skills better and also eliminated the examiner bias. Student feedback reflects that such assessment helps them to improve, as it is effective both as teaching and evaluation tools. Faculty participated in organizing OSPE felt that such exercises can frequently be given for formative evaluation before introducing it in summative evaluation. It will help students to develop different learning skills and make them better learners. Experience and experimentation will inevitably result in the refinement of the OSPE as a tool for learning and evaluation. OSPE is feasible given the tremendous advantages that it offers, to include the formative assessment of students to improve their clinical competence and to derive an objective score for formative assessment. In spite of the limited use of OSPE in the majority of the Kathmandu University-affiliated medical colleges across Nepal, the current study showed a positive perception towards OSPE as a fair, unbiased, valid, reliable assessment method compared to traditional clinical examination.

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