



## "INTRODUCTION OF OBJECTIVE STRUCTURED PRACTICAL EXAMINATION FOR ASSESSING THE PRACTICAL SKILLS STUDENTS- STUDENT AND FACULTY PERCEPTION"

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### ABSTRACT

**Background:** Practical skill set assessment in medical education has always been in talks since years. Experts say that it is rather subjective than been objective. Some also believe that it lacks uniformity and

that examiner bias has a major role to play.

Though many innovative objective methods of assessment have been invented, they have still to be incorporated by the respective governing Councils in their summative examination.

This study aims to study the efficacy of Objective Structured Practical Examination (OSPE) as a assessment method to assess the practical skills of students.

**Materials & Methods:** I & II-BHMS students admitted for 2018-19 of Dr. D.Y. Patil Homoeopathic Medical College & Research Centre, Pune were included as the subjects for the study. Sample size selected for the study was 100 students for I-BHMS & 30 students for II-BHMS OSPE was developed incorporating all aspects of Homoeopathic Pharmacy for I-BHMS & Forensic medicine & Toxicology for II BHMS and tested on I & II BHMS Students. The OSPE included a total of 5 stations – 4 representing the psychomotor domain (Procedural stations) and 1 representing the cognitive domain (Response station) from the Miller's pyramid for I-BHMS & 3 representing cognitive domain (Response station) for II-BHMS students.

1 observer was assigned one OSPE station with a predetermined checklist.

**Results:** Majority of the students gave a feedback that OSPE was much fairer and unbiased form of examination to assess the practical skills of students.

**Conclusion:** Current study showed that OSPE was well perceived by both faculty and students.

**KEYWORDS :** Objective Structured Practical Examination (OSPE), assessment bias, Subjective assessment, Objective assessment, checklist, feedback

### INTRODUCTION:

Medical Education technology gives prime importance to assessment of medical students. The assessment should focus on both- assessment of knowledge as well as practical skills of the students. Overall assessment of the students helps us assess whether the Programme outcomes, course outcomes and the learning outcomes have been achieved or not. Though assessment of knowledge is relatively easy, assessment of practical skills is a big task.<sup>1,2</sup>

Most of the medical councils and universities follow the conventional method of practical examination. One major drawback of this type of conventional assessment method is that more stress is given on "What?" and "Which?" rather than "How"<sup>3</sup>

Also, since the students are assigned different experiments, there is no uniformity in the difficulty level of the experiments assigned to every student. Where every student must be assessed for the same practical skills, the actual scenario been followed is different. Hence, students with relatively easy experiment have a cake walk whereas students who are assigned relatively tough experiment are left to fight it out.<sup>4</sup>

Many attempts have been made in the past to design more objective and uniform methods of assessment of practical skills of students but they are yet to find a place in the curriculum prescribed by the governing councils. Objective Structured Practical Examination is one such method of assessment.

In this methods, all the students are assessed for the same set of practical skills.<sup>5</sup>

This study aims to study the student and faculty perception about OSPE as a method of assessment of practical skills of students as compared to conventional practical examination.

### AIMS AND OBJECTIVES:

#### Aim:

To study whether Objective Structured Practical Examination (OSPE) is more objective and unbiased method of assessment of practical skills of students as compared to the conventional practical examination through student and faculty feedback.

#### OBJECTIVES:

1. To remove the subjectivity and bias in mode of assessment of practical skills of students.
2. To assess practical skill competencies of students through OSPE and analyze their outcome.

### MATERIALS & METHODS:

The OSPE was conducted at the departments of Homoeopathic Pharmacy & Forensic Medicine & Toxicology, Dr. D.Y. Patil Homoeopathic Medical College & Research Centre, Pune for I-BHMS students from 6<sup>th</sup>- 10<sup>th</sup> May 2019 in 4 batches 25 students each. Stations and practical sets for each batch was different. For II BHMS students the OSPE was conducted on 10<sup>th</sup> May 2019 for 30 II-BHMS Students of academic year 2018-19.

I & II-BHMS students admitted for 2018-19 of Dr. D.Y. Patil Homoeopathic Medical College & Research Centre, Pune were included as the subjects for the study. Sample size selected for the study was 100 students for I-BHMS & 30 students for II-BHMS.

All the students had to appear for conventional practical examination before conduction of OSPE.

All the faculty members involved in conduction of OSPE were oriented with respect to the aims, objectives of the study and the methodology.

A peer agreed and structured checklist was formed for I & II-

BHMS students which formed the backbone of assessment of student's practical skills.

Structured questions were formed for question stations and key answers for the same were also prepared by the teaching faculties of the departments of Homoeopathic Pharmacy & Forensic Medicine & Toxicology with reference to the practical skills to be evaluated.

Since the assessment was being carried out for the first time for this batch, the students were oriented towards such a system in advance before administering the tool. A total of 100 students of I-BHMS & 30 students of II-BHMS were assessed.

OSPE was developed incorporating all practical aspects of Homoeopathic Pharmacy for I-BHMS & Forensic Medicine & Toxicology for II BHMS and tested on I & II BHMS Students. The OSPE included a total of 5 stations – 4 representing the psychomotor domain (Procedural stations) and 1 representing the cognitive domain (Response station) from the Miller's pyramid for I-BHMS & 3 representing cognitive domain (Response station) for II-BHMS students.

1 teaching faculty of the allied subjects other than the subjects on which OPSE was conducted was stationed as observer at each OSPE station with a checklist to score the candidates.

Each procedural OSPE station had a procedural question which the students had to read, perceive, and perform the necessary practical steps.

Each response station had a question which the students had to read, perceive and answer to the best of his or her knowledge.

At the procedural stations, all the requisite instruments, reagents were kept and at the response stations mainly for Forensic Medicine and Toxicology photographs related to Wound Identification, Firearm (Ballistic) Injuries, Cause of Death, Medical Jurisprudence were placed which the students had to answer the related questions.

At the end of every 3 minutes, the participant moved to the next OSPE station till all 5 stations for I-BHMS and 3 response stations for II-BHMS were completed. All participants had to face the same OSPE stations After completing the exam session, the students were asked to wait in the demonstration room and were not allowed to leave the hall till the entire batch was through in order to avoid unfair means.

The faculty of allied departments like Anatomy, Physiology which were not in-charge of Objective Structured Practical Examination were invited as observers for reviewing the examination procedure.

After the OSPE was over through all the stations, both faculty and students were asked to fill a pre-validated feedback related to their perception on OSPE as a tool for assessing the practical skills of the students.

#### Research Question:

Is Objective Structured Practical Examination (OSPE) more objective and unbiased method of assessment of practical skills of students as compared to the conventional practical examination?

#### Hypothesis:

##### Null Hypothesis:

Objective Structured Practical Examination (OSPE) is not an objective and unbiased method of assessment of practical skills of students as compared to the conventional practical examination.

#### Alternative Hypothesis:

Objective Structured Practical Examination (OSPE) is an objective and unbiased method of assessment of practical skills of students as compared to the conventional practical examination.

#### RESULTS:

The OSPE was conducted at the departments of Homoeopathic Pharmacy & Forensic Medicine & Toxicology, Dr. D.Y. Patil Homoeopathic Medical College & Research Centre, Pune for I-BHMS students from 6<sup>th</sup> to 10<sup>th</sup> May 2019 in 4 batches 25 students each. Stations and practical sets for each batch was different. For II BHMS students the OSPE was conducted on 10<sup>th</sup> May 2019 for 30 II-BHMS Students of academic year 2018-19. On conclusion of the OSPE the performance was above average to good.

At the end of the OSPE, each student was counselled regarding the difficulties he or she faced, their strengths and areas of improvement based on evaluation of their OSPE marks.

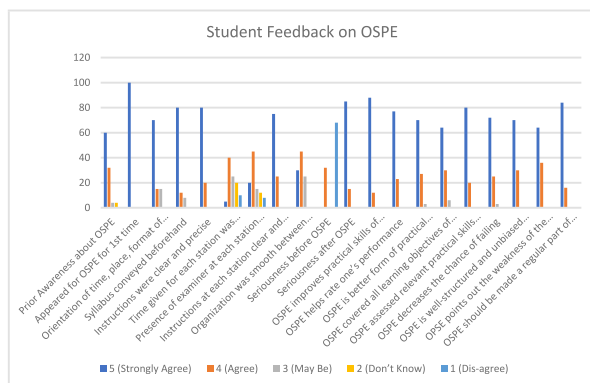
Feedback given by students was constructive and showed high acceptance of this form of assessment for assessing the practical skills of the students as presented in Table 1. Table 2 shows faculty feedback on evaluation system based on OSPE.

**Table.1 Student Feedback on OSPE**

Questions in feedback	5 (Strongly Agree)	4 (Agree)	3 (May Be)	2 (Don't Know)	1 (Dis-agree)
Prior Awareness about OSPE	60	32	4	4	---
Appeared for OSPE for 1 <sup>st</sup> time	100	---	---	---	---
Orientation of time, place, format of examination beforehand	70	15	15	---	---
Syllabus conveyed beforehand	80	12	8	---	---
Instructions were clear and precise	80	20	---	---	---
Time given for each station was adequate	5	40	25	20	10
Presence of examiner at each station affects the performance	20	45	15	12	8
Instructions at each station clear and precise	75	25	---	---	---
Organization was smooth between each station	30	45	25	---	---
Seriousness before OSPE	---	32	---	---	68
Seriousness after OSPE	85	15	---	---	---
OSPE improves practical skills of students	88	12	---	---	---
OSPE helps rate one's performance	77	23	---	---	---
OSPE is better form of practical examination	70	27	3	---	---

OSPE covered all learning objectives of the syllabus	64	30	6	----	----
OSPE assessed relevant practical skills of students	80	20		----	----
OSPE decreases the chance of failing	72	25	3	----	----
OSPE is well-structured and unbiased for of examination	70	30	----	----	----
OPSE points out the weakness of the student	64	36	----	----	----
OSPE should be made a regular part of practical examination	84	16	----	----	----

Analysis of feedback is done in percentage. The marks entered depict the % of students which have opted for that option.

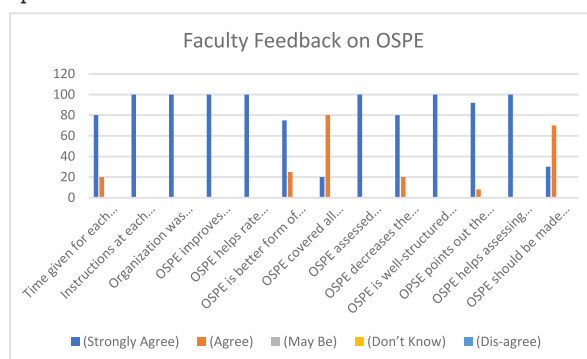


**Table.2 Faculty Feedback on OSPE as a tool for Formative Assessment of Practical skills of students**

Questions in feedback	5 (Strongly Agree)	4 (Agree)	3 (May Be)	2 (Don't Know)	1 (Dis-agree)
Time given for each station was adequate	80	20	---	---	---
Instructions at each station clear and precise	100	---	---	---	---
Organization was smooth between each station	100	---	---	---	---
OSPE improves practical skills of students	100	---	---	---	---
OSPE helps rate student's learning standards	100	---	---	---	---
OSPE is better form of practical examination	75	25	---	---	---
OSPE covered all learning objectives of the syllabus	20	80	---	---	---
OSPE assessed relevant practical skills of students	100	---	---	---	---

OSPE decreases the chance of failing as compared to conventional examination	80	20	---	---	---
OSPE is well-structured and unbiased for of examination	100	---	---	---	---
OPSE points out the weakness in the practical skills of student	92	8	---	---	---
OSPE helps assessing practical skills of students better than conventional practical examination	100	---	---	---	---
OSPE should be made a regular part of practical examination	30	70	----	----	----

Analysis of feedback is done in percentage. The marks entered depict the % of Faculty which have opted for that option.



#### STATISTICAL ANALYSIS:

For I-BHMS Students undergoing OSPE as compared to Conventional Practical Examination.

S.D: 22.21

T (Cal)= 0.99

T(table value) at 99 degrees of freedom and 5% level of significance= 1.98

Since the calculated t value is less than the table value, we reject the null hypothesis & accept the alternative hypothesis.

#### STATISTICAL ANALYSIS:

For II-BHMS Students undergoing OSPE as compared to Conventional Practical Examination.

S.D: 17.2

T (Cal)= 0.93

T(table value) at 29 degrees of freedom and 5% level of significance= 2.05

Since the calculated t value is less than the table value, we reject the null hypothesis & accept the alternative hypothesis.

Thus, we can infer that Objective Structured Practical Examination (OSPE) is an objective and unbiased method of assessment of practical skills of students as compared to the conventional practical examination.

#### DISCUSSION

##### Analysis of Student Feedback:

1. 100 students of I-BHMS & 30 students of II-BHMS of the

academic year 2018-19 appeared for the OSPE.

2. There were 5 stations out of which 4 were procedural stations and 1 was response station for I-BHMS and 3 response stations for II-BHMS.
3. At each station there was 1 examiner who had a structured checklist for scoring the candidates.
4. Feedback was taken in the form of structured questionnaire from both the faculty as well as students regarding their perception of OSPE as a method of formative assessment.
5. Both the feedbacks were critically analysed.
6. Out of 130 students, 92% students said that they were properly oriented and prior awareness was made about this method of assessment.
7. All 130 students agreed that they were facing OSPE for the first time.
8. 85% students agreed that they were made aware of the time, place and format of examination beforehand.
9. About 92% students agreed that the syllabus of the examination was conveyed to them well beforehand.
10. All 130 students agreed that the instructions conveyed to them before the examination were clear and precise.
11. Out of 130 students, 45% agreed that the time given for each station was adequate while remaining 95 % were skeptical about the time given for each station. Many were of the opinion that more time should have been given at some stations.
12. 65% of the students were of the opinion that presence of examiner with the checklist at every station affected their performance in some way or the other.
13. All 130 students agreed that the instructions and question at each station was clear and precise.
14. 75% students agreed that the flow of students between the stations was smooth without any chaos.
15. All 68% students agreed that they were not that serious about the OSPE before start of the examination. They also agreed that after the examination they became serious with reference to their performance since in OSPE feedback can be given immediately and there is a structured checklist with each examiner.
16. All 130 students unanimously agreed that such method of assessment like the OSPE helps improving one's practical skills.
17. All the students also agreed that it also helped them rate their own performance at the end of respective OSPE stations.
18. 94% students agreed that the OSPE covered all the learning objectives of the syllabus which was assigned for the OSPE.
19. All 130 students agreed that OSPE is a better form of practical examination as compared to conventional practical viva and that it assessed all relevant practical skills of students pertaining to the syllabus.
20. 95% students agreed that such form of examination decreases the chances of failing.
21. All 130 students agreed that OSPE was one such examination which pointed out their weakness in practical skills on the spot.
22. Finally all 130 students agreed that OSPE is a well-structured & unbiased form of practical examination which reduces the chance of bias in the minds of examiners and should be made a regular part of practical assessment of students.

#### Analysis of Faculty Feedback:

1. There were a total of 5 examiners, 1 for each station for I-BHMS and 3 examiners for II-BHMS.
2. Each examiner was given a structured checklist for that respective station with the help of which they were to assess the students.
3. At the end of the OSPE, each examiner was given a structured questionnaire as feedback regarding their

perception of OSPE as a tool for formative assessment.

4. All faculty feedbacks were also critically analyzed.
5. Out of the 8 examiners, all agreed that the time given for their own station was adequate.
6. All 8 examiners agreed unanimously that the instructions at each station were clear and precise.
7. They also agreed that flow of students between the stations was smooth without any chaos.
8. All agreed that such assessment method such as OSPE improves the practical skills of the students as compared to a conventional practical viva.
9. They also agreed to the point that OSPE helps rate student's learning standards.
10. They also unanimously agreed that OSPE is a better form of practical examination and assessed relevant practical skills of the students pertaining to the syllabus.
11. All 5 examiners agreed with the point that OSPE covered all the learning objectives behind every station.
12. They also agreed that OSPE would decrease the chances of failing as compared to the conventional practical examination wherein relevant practical skills are not assessed and there may be bias in the mind of examiner.
13. They also agreed that OSPE pointed out the weakness in his/her practical skills directly to the students
14. All agreed that OSPE is a well-structured and unbiased form of assessment of practical skills during practical examination which reduces the chances of bias. The only condition being the instructions at every station and the checklist for the same should be accurate and precise without any loopholes.
15. To conclude, all 8 examiners totally agreed that OSPE should be made regular part of practical examination to assess the practical skills of students.

Thus, OSPE is an objective valid and reliable method of assessment to assess the practical skills of students. It helps overcome examiner bias as compared to the conventional practical examination

#### Summary & Conclusion:

Assessment is one of the major factors in the curriculum of medical education. Students will perform well only when they know that they are going to be assessed. Conventional practical examination is said to be more subjective, biased method of assessment of practical skills of the students. Examiner bias plays a major role in such methods of assessment. To overcome these biases, efforts are being made to design newer assessment methods which are more objective and lacking this examiner bias. OSPE is one such method of assessment. This study aimed to study the utility of OSPE for assessing the practical skills of students as compared to conventional practical examination and student and faculty feedback regarding the same.

#### Learning Experience:

It was an overall great experience working on this educational research project. Highlights of this project were formation of OSPE stations, formation and validation of checklists, formation of feedback questionnaire etc. Orientation of students towards this type of assessment method was a big task but received full co-operation from the students as well as faculty who participated as examiners.

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#### **Conflict of Interest:**

There is no conflict of interest amongst the authors.

#### **Abbreviations Used:**

1. OSPE- Objective Structured Practical Examination
2. Dr.- Doctor
3. B.H.M.S.- Bachelor of Homoeopathic Medicine and Surgery
4. I-First
5. II- Second
6. S.D.- Standard Deviation
7. T(cal.)-t calculated

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