

“Comparative Analysis and Evaluation of a Checklist by two different examiners in a 1- Station OSPE”

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Abstract: *The objective structured practical examination (OSPE) was used as an objective instrument for assessment of laboratory exercises in preclinical sciences, particularly Homoeopathic Pharmacy. It was adapted from the objective structured clinical examination (OSCE). The OSPE was administered to consecutive batches during Preliminary examination of I-BHMS 2015 batch in conjunction with the conventional examination in which the candidate is expected to perform a given experiment. 2 different examiners judged 1 student on the basis of a common checklist. The scores of the students by the 2 examiners were used to compare the OSPE with respect to validity, standardization of the checklist to avoid bias & to evaluate the new instrument of assessment. The OSPE appears to be a reliable device with a good capacity for discriminating between different categories of students. It is better in these respects than the conventional practical examination. Moreover, it has scope for being structured in such a way that all the objectives of laboratory teaching can be tested and each aspect can be assigned the desired weightage.*

Keywords: *Instrument for assessment of practical skills in medical education, formative & summative assessment, specific learning objectives*

I. Introduction

Assessment for practical skills in medical education needs improvement from subjective methods to objective ones. An Objective Structured Practical Examination (OSPE) has been considered as one such method. This study is an attempt to evaluate the feasibility of using OSPE as a tool for the formative assessment of undergraduate medical education in Homoeopathic Pharmacy.²

Assessment of students in medical college has always remained a topic of debate. Student assessment is often described as ‘the tail that wags the dog’ of medical education. It is seen as the single strongest determinant of what students actually learn (as opposed to what they are taught), and is considered to be uniquely powerful as a tool for manipulating the whole education process. There are continuous attempts to make assessment more objective and reliable rather than subjective. Traditional, age-old methods like essay/essay type questions, which suffer from lack of objectivity, are giving way to newer objective methods of assessment in the form of multiple choice questions, short answer questions, and such other tools, for assessment of cognitive domain. As far as skills assessment is concerned the conventional methods are not only subjective in nature, but also lack scope for direct observation of the performance of skills by the assessor. Moreover the coverage of contents may be limited. Hence, attempts have been made to introduce methods that can overcome the above-mentioned limitations.⁴

The OSPE had been introduced as a reliable approach to assess the basic practical skills. It is a flexible test format based on a circuit of ‘stations’. At each station, a specific leaning objective is tested. The OSPE has been widely used for formative and summative assessment in various medical disciplines worldwide, including the non-clinical disciplines. For assessment in preclinical and paraclinical subjects, the objective structured practical examination (OSPE) has been introduced. In India, the use of OSPE for assessment of pharmacology skills has been reported from some institutes.¹

However, a majority of institutes still follow the conventional method of assessment. Hence, this study was planned to evaluate OSPE as a tool for term ending assessment of practical skills in the undergraduate Homoeopathic Pharmacy curriculum. The students’ perceptions regarding this new tool of assessment were also assessed.¹

Our study was aimed at evaluating OSPE as a method of formative assessment of practical skills in Homoeopathic Pharmacy at the undergraduate medical curriculum, so as to find out the feasibility and acceptability of this method of examination. The study also compares OSPE with conventional assessment.¹

Purpose of Selection of Topic:

The conventional clinical and practical examination is beset with several problems. Although marking should depend only on student variability, patient (or in the case of practicals - experiment) variability and examiner variability significantly affect scoring. In fact, the subjectivity involved may reduce the correlation coefficient between marks awarded by different examiners for the same candidates performance. The marks

awarded also reflect only the global performance of the candidate and are not based on demonstration of individual competencies. Problems in communication significantly affect the outcome. Attitudes are usually not tested at all by the conventional examination. Even in practical skills, often the student is questioned only regarding his final conclusion. The ability to perform an experiment and arriving at that conclusion is not observed by the examiners. The final score indicating his overall performance gives no significant feedback to the candidate.³

These defects of clinical and practical examinations have been realised for long and have given rise to attempts at improving the current scenario. All these attempts are relatively new and are still in the process of being tried out.³

An earlier innovation in this regard is the objective structured clinical examination (OSCE) later extended to the practical examination (OSPE) described in 1975 and in greater detail in 1979 by Harden and his group from Dundee. This method with some modifications has stood the test of time and has largely overcome the problems of the conventional practical examinations mentioned earlier. The purpose of this project is to introduce OSPE both as an evaluation and a teaching tool and to draw attention to its advantages and disadvantages.⁵

In an OSPE, check-list is one of the most important components on the basis of which assessment of student is done. If there is marked difference in observation and marks of a student assessed by 2 different examiners, that means either there is bias in the mind of the examiner or else the checklist itself is not valid and standardized. To avoid this bias, validation and standardization of check-list is must. This research topic will help us achieve our objective of using OSPE as an unbiased tool of assessment of practical skills of students. The OSPE method attempts to control for the variability of the examination by providing examiners with a checklist that contains the micro-skills required from the student to be able to effectively complete the practical technique and by providing clear instructions to examiners, students and models.

Aim:

To Compare, Analyze, Evaluate & Standardize a Checklist by two different examiners in a 1- Station OSPE to avoid bias.

Objective of the study

1. To plan and implement OSPE (Objective Structured Practical Examination) as a tool of internal assessment in the undergraduate homoeopathic pharmacy curriculum.
2. To validate and standardize the checklist of a 1-station OSPE by 2 examiners to avoid bias.
3. To compare the conventional practical examination (CPE) with OSPE (Objective Structured Practical Examination).

II. Material & Methods

The present study was undertaken in the Department of Homoeopathic Pharmacy, Dr. DYPHMCRC, Pune. The CCH curriculum in India mandates 1 yr of study in the subject of Homoeopathic Pharmacy as a basic homoeopathic subject along with two other subjects, anatomy and physiology, in the first year. One hundred students who enrolled for the BHMS course at the institution in the academic year of 2015–2016 formed the study group. The present study was conducted in the Department of Homoeopathic Pharmacy in May 2016. During this period, students faced three OSPE sessions and a conventional viva exam as part of the prelim internal practical assessment.²

Ethics Committee approval was taken though the study pertained to research on educational practices and is exempted by the Indian Council of Medical Research.

OSPE Sessions

For each OSPE session, the whole batch of students was divided into 3 batches of 33 students each. Each batch had the OSPE on 3 separate days. There was no mixing of students waiting for the OSPE with those that finished earlier.²

There was one skill station in each session. 33 students could be accommodated at a stretch with 2 faculty members allotted for the same station. Skill stations would not repeat for different batches. The portions included were those covered in the theory and practical classes.²

Skill station questions were regarding jumping potency, medication of globules, succussion etc. Marks were compiled to a total of 5 marks for each student, 1 mark per step according to a systematically prepared checklist. The same checklist was given to the 2 examiners for one student.

In departmental meetings, elaborate arrangements required to be made for the conduct of the OSPE, framing of the questions, time allotment, and preparation of checklists/keys were thoroughly discussed to reach a consensus without any ambiguity. Marks were tabulated in an OSPE score sheet/grid sheet.¹

Before the first OSPE session, students were thoroughly oriented and sensitized regarding various aspects of the OSPE: questions, checklists, time allotted for stations, scorings, logistics involved, etc.¹

At the end of the third OSPE session, feedback was taken from all students to know their perceptions on the subject in general and the OSPE in particular using an indigenously designed structured questionnaire.¹

Statistical analysis was done comparing the marks of the 2 checklists by 2 different examiners for the same student w.r.t uniformity in evaluation (without favoritism/subjectivity).

Null Hypothesis: The given checklist is uniform and standardized

Alternative Hypothesis: The given checklist is not uniform and standardized.

Observations & Statistical Analysis:

Student	Marks given by Dr. Rajgurav	x-mean	(x-mean) ²	Marks given by Dr. Aphale	x-mean	(x-mean) ²
1	0	-2.39	5.712	0	-2.36	5.569
2	0	-2.39	5.712	0	-2.36	5.569
3	0	-2.39	5.712	0	-2.36	5.569
4	0	-2.39	5.712	0	-2.36	5.569
5	5	2.61	6.812	5	2.64	6.969
6	1	-1.39	1.932	0	-2.36	5.569
7	0	-2.39	5.712	0	-2.36	5.569
8	0	-2.39	5.712	0	-2.36	5.569
9	0	-2.39	5.712	0	-2.36	5.569
10	0	-2.39	5.712	0	-2.36	5.569
11	4	1.61	2.592	4	1.64	2.689
12	4	1.61	2.592	4	1.64	2.689
13	5	2.61	6.812	5	2.64	6.969
14	5	2.61	6.812	5	2.64	6.969
15	1	-1.39	1.932	0	-2.36	5.569
16	5	2.61	6.812	5	2.64	6.969
17	4	1.61	2.592	5	2.64	6.969
18	0	-2.39	5.712	0	-2.36	5.569
19	5	2.61	6.812	5	2.64	6.969
20	0	-2.39	5.712	0	-2.36	5.569
21	5	2.61	6.812	5	2.64	6.969
22	0	-2.39	5.712	0	-2.36	5.569
23	0	-2.39	5.712	0	-2.36	5.569
24	0	-2.39	5.712	0	-2.36	5.569
25	4	1.61	2.592	4	1.64	2.689
26	4	1.61	2.592	4	1.64	2.689
27	5	2.61	6.812	5	2.64	6.969
28	5	2.61	6.812	5	2.64	6.969
29	4	1.61	2.592	4	1.64	2.689
30	4	1.61	2.592	4	1.64	2.689
31	5	2.61	6.812	5	2.64	6.969
32	4	1.61	2.592	4	1.64	2.689
33	0	-2.39	5.712	0	-2.36	5.569
Mean	2.39		Total= 165.85	2.36		Total=177.61

S.D (standard deviation) =

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

S.D 1 (Dr. Rajgurav)= 2.275

S.D 2 (Dr. Aphale)= 2.355

t-test:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}}$$

= 0.03/0.569

= 0.052

i.e. $t_{calc} = 0.052$

$t_{tab} = 2.042$

If $t_{calc} > t_{tab}$, we reject the null hypothesis and accept the alternate hypothesis. Otherwise, we accept the null hypothesis.

Above we can see that $t_{calc} (0.052) < t_{tab} (2.042)$.

Hence, we accept the null hypothesis, i.e. the given checklist is uniform and standardized.

III. Discussion

An OSPE was conducted for the students of I-BHMS as a part of their practical assessment during their prelim practical examination conducted from 10-12th May 2016. The students were divided into 3 batches of 33 students each. Blueprint of objectives for the OSPE was made, checklist to be tested was finalized, question for the station was formulated. For the OSPE conducted on 10/05/2016, there were 2 examiners namely Dr. Atul Rajgurav, H.O.D, and Dr. Parth Aphale, Assistant Professor, Department of Homoeopathic Pharmacy. Each student was assessed by both the examiners at the same time having the same checklist. The marks given by both the examiners to individual student based on the checklist were compared. Statistical analysis of the marks was done (mean, standard deviation, sample size etc.), t-test was applied and value of t_{calc} was compared with the value of t_{tab} . As calculated, t_{calc} was 0.052 which was less than t_{tab} which was 2.042.

If $t_{calc} > t_{tab}$, we reject the null hypothesis and accept the alternate hypothesis. Otherwise, we accept the null hypothesis.

Hence, we accept the null hypothesis, i.e. the given checklist is uniform and standardized.

IV. Summary & Conclusion

As we can see from the observations and statistical analysis,

$t_{calc} < t_{tab}$.

If $t_{calc} > t_{tab}$, we reject the null hypothesis and accept the alternate hypothesis. Otherwise, we accept the null hypothesis.

Hence, from the above readings it is evident that $t_{calc} < t_{tab}$.

Therefore, we accept the null hypothesis, i.e. the given checklist is uniform and standardized.

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