

Study of Comparison of Pass Percentage using Structured Formats and Traditional Method in Biochemistry Internal Practical Examination among First M.B.B.S. Students

P. Aruna¹, S Vasantha², Kalinigiri Pundari Kakshaiah³, Sandya Rani⁴, Haseena. C⁵

¹Associate Professor, Department of Biochemistry, Government Medical College Anantapur, Andhrapradesh

²Associate Professor, Department of Ophthalmology, Government Medical College Ongole, Andhrapradesh

³Assistant Professor, Department of Neurosurgery, Kurnool Medical College, Kurnool, Andhrapradesh

⁴Assistant Professor, Department of Biochemistry, Government Medical College Anantapur, Andhrapradesh

⁵Post Graduate, Department of Biochemistry, Government Medical College Anantapur, Andhrapradesh

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Corresponding Author: Dr. P. Aruna

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Abstract:

Introduction: Structuring of questions and assessment has been emphasized and gained importance in the practical evaluation. The objective structured practical examination (OSPE) is now an accepted tool in the assessment of practical skills in CBME curriculum. If structured formats are designed on various practical aspects, it improves their learning and thereby increases their pass percentage during assessment.

Aims and Objectives: 1) To introduce structured format as a method of assessment of practical skills and learning. 2) To compare pass percentage of students by using structured formats in comparison to traditional methods. 3) To explore faculty perception on introduction of structured formats in practical examinations. 4) To determine students perception on structured format type of practical examination.

Materials and Methods: The study was conducted in Biochemistry department, ACSR Government medical college, Nellore. Phase I M.B.B.S students of 2020-21 Batch were enrolled in the study. One lecture on use of structured format questionnaire was taken for the entire 175 batch of students. The examination was conducted for 7 days with a batch of 25 each day. They were divided into two groups. One group received structured practical examination (SPE) and the other group traditional method (TPE). Cross over of the groups was done on the same day in the afternoon session.

Results & Discussion: In our study the mean values of marks obtained through structured practical examination was statistically significant in comparison to traditional method (p value equal to 0.0002). The percentage of students who scored marks in the range of 60-69 and 70-79 was increased in SPE in comparison to TPE. Feedback given by students was constructive and showed high acceptance.

Conclusion: The mean values of marks obtained through structured practical examination were statistically significant in our study in comparison to traditional method. OSPE is feasible and have good reliability and validity for evaluating practical skills of undergraduate medical students apparent by examiners and students.

Keywords: OSPE (objective structured practical examination), TPE (Traditional Practical Examination), SPE (Structured practical examination), CBME (Competency Based Medical education).

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Introduction

Structuring of questions and assessment has been emphasized and gained importance in the practical evaluation. [1,2] The objective structured practical examination (OSPE) is now an accepted tool in the assessment of practical skills in CBME curriculum. Examiner variability significantly affects scoring. The marks awarded generally reflect only the global performance of the candidate and are not based on demonstration of individual

competencies. [3] Conventional practical examination has many problems where the practical skills are not directly observed and the questions are directed towards the end of the session. Hence there is a need of more evolved study design where educators have the responsibility to develop methods or procedures that fairly evaluate student's achievements and yield accurate results. [4,5] Internal assessment

marks in both theory and practical is important in CBME. Practical and theory 40% each and an aggregate of more than 50% is a prerequisite to pass university final examination. In traditional method internal theory assessment alone was considered. But according to new curriculum, students need to pass in practical examination as well.

Hence practical performance of students needs to be improved in Biochemistry as per CBME. Biochemistry Practical examination is for 80 marks. Dr YSR University of health sciences had proposed the marks under various split sections in Biochemistry practicals as follows. This includes qualitative analysis (20), quantitative analysis (20), Laboratory chart interpretation (20) and spotters (10) and OSPE per se (10). When students are not trained in practical classes they find interpretation of lab data very difficult in clinicals. If structured formats are designed on various practical aspects, it improves their learning and thereby increases their pass percentage during assessment.

Traditional approaches to evaluating competence are not only more open to bias than objective measures, but they also exclude the assessor from seeing the candidate in action. In addition, there may be restrictions on what is really covered. Sensitization towards a new evaluation system of the OSPE is required, as is a more objective and organized assessment approach, feedback from the students, and feedback to the students to recognize their deficiencies and enhance their clinical abilities. [6]

Hence this study was designed to compare pass percentage of students by using structured formats in comparison to traditional methods and to explore student and faculty perspective on the same.

Objectives:

- To introduce structured format as a method of assessment of practical skills and learning.
- To compare pass percentage of students by using structured formats in comparison to traditional methods.
- To explore faculty perception on introduction of structured formats in practical examinations
- To determine students' perception on structured format type of practical examination.

Materials and Methods:

The study was conducted in Biochemistry Department, ACSR Government Medical College, Nellore. First M.B.B.S (Phase 1) 175 students of 2020-21 Batch were enrolled in the study. The study was conducted for a period of 6 months from August 2021 to January 2022. It was a quantitative interventional study. Institutional Ethical committee clearance was obtained after explaining about the Fair use of structured formats as an educational tool. Informed consent was obtained from the students.

Intervention Done: Structured questionnaire was administered to students on qualitative analysis, quantitative analysis and Lab chart interpretation, OSPE, spotters. One lecture on use of structured format questionnaire was taken for the entire 175 batch of students. The examination was conducted for 7 days with a batch of 25 each day. They were divided into two groups (Group A= 13) and (Group B =12) students each. First group received the structured format examination and the second group had traditional examination. Crossover of the groups was done the same day in the afternoon session and each other group attended the other method of examination. (Figure No1). Check lists were prepared for assessment and distributed to examiners who conducted Structured practical examination. Mean values of marks were obtained in both the methods of examination for every test. Student perception was assessed. Faculty perspectives also were assessed. Questionnaire relevant to structured practical examination were validated by department faculty. A 5point likert's scale was used to measure the perceptual responses of faculty and students about the use of structured formats. The data collected from validated structured questionnaire was analysed. Percentage of responses to scores 1-5 on likert scale was calculated. Unpaired t test was used to determine statistical significance for the marks obtained between the variation in the use of structured formats and traditional method.

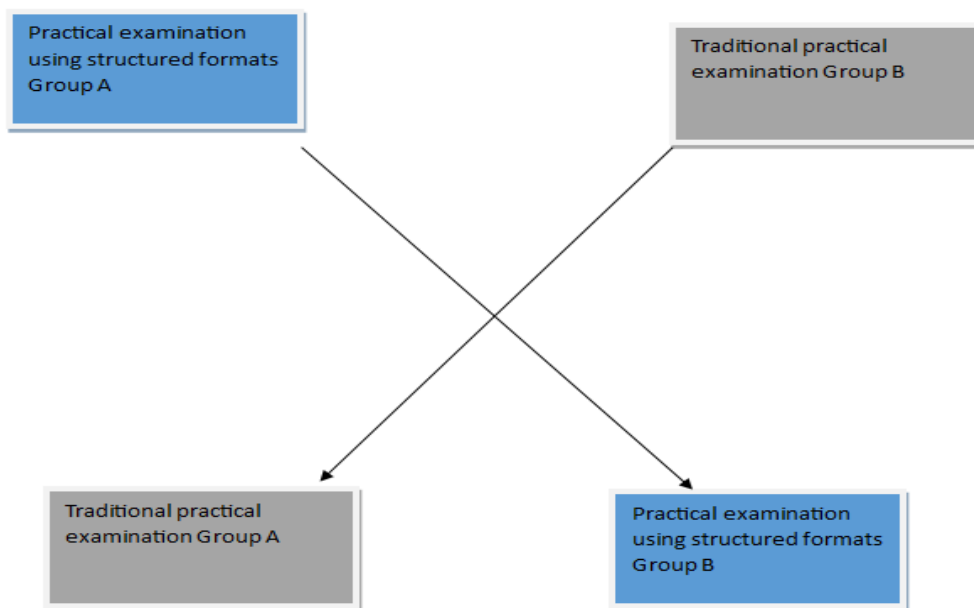


Figure 1: representing crossover of two groups taking structured practical examination (SPE) and traditional practical examination (TPE)

Results: Mean and S.D values of marks were obtained in structured format practical examination (S.P.E) and traditional practical examination (T.P.E) with N value of 175. p value was calculated using graph pad calculator.

Table 1: Mean ± S. D values of marks scored in TPE and SPE

TPE	SPE	t = 3.8187
N value: 175	N value: 175	Standard error of difference = 1.194
Mean ± S. D	Mean ± S. D	P value equals 0.0002 and was extremely significant*
54.77 ± 11.14	59.33 ± 11.20	

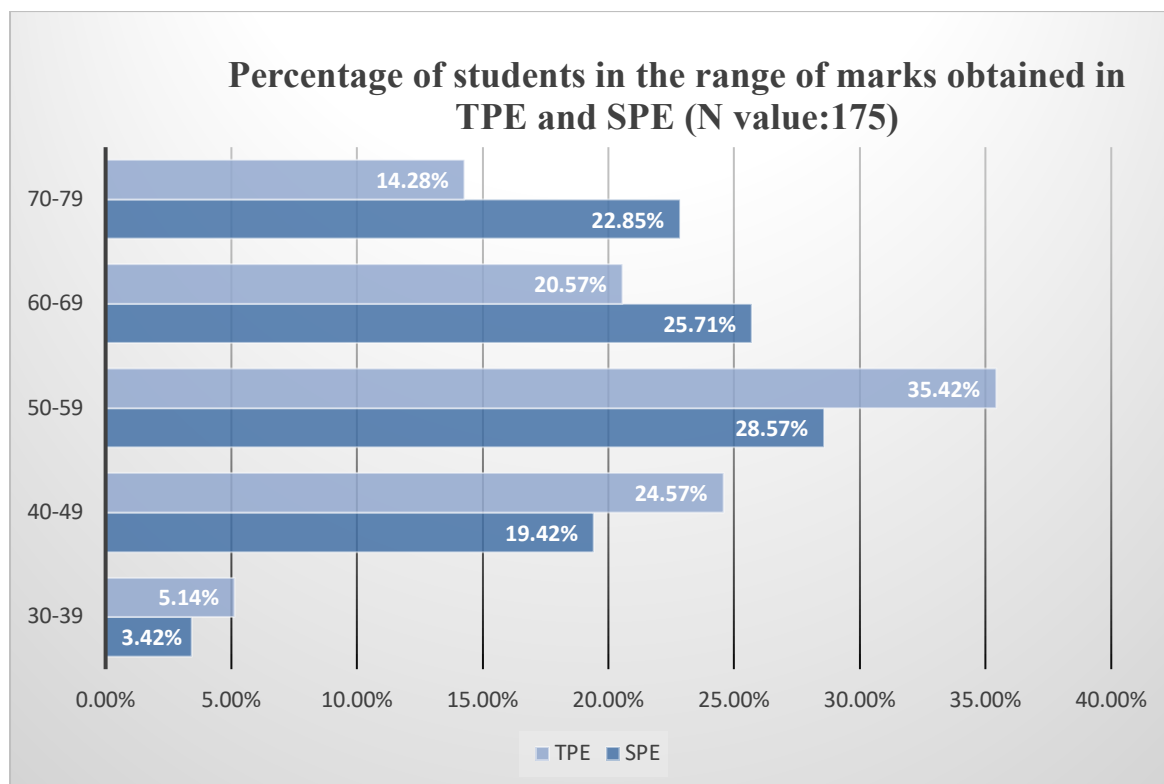


Figure 2: Percentage of students in the range of marks obtained in TPE and SPE (N value:175)

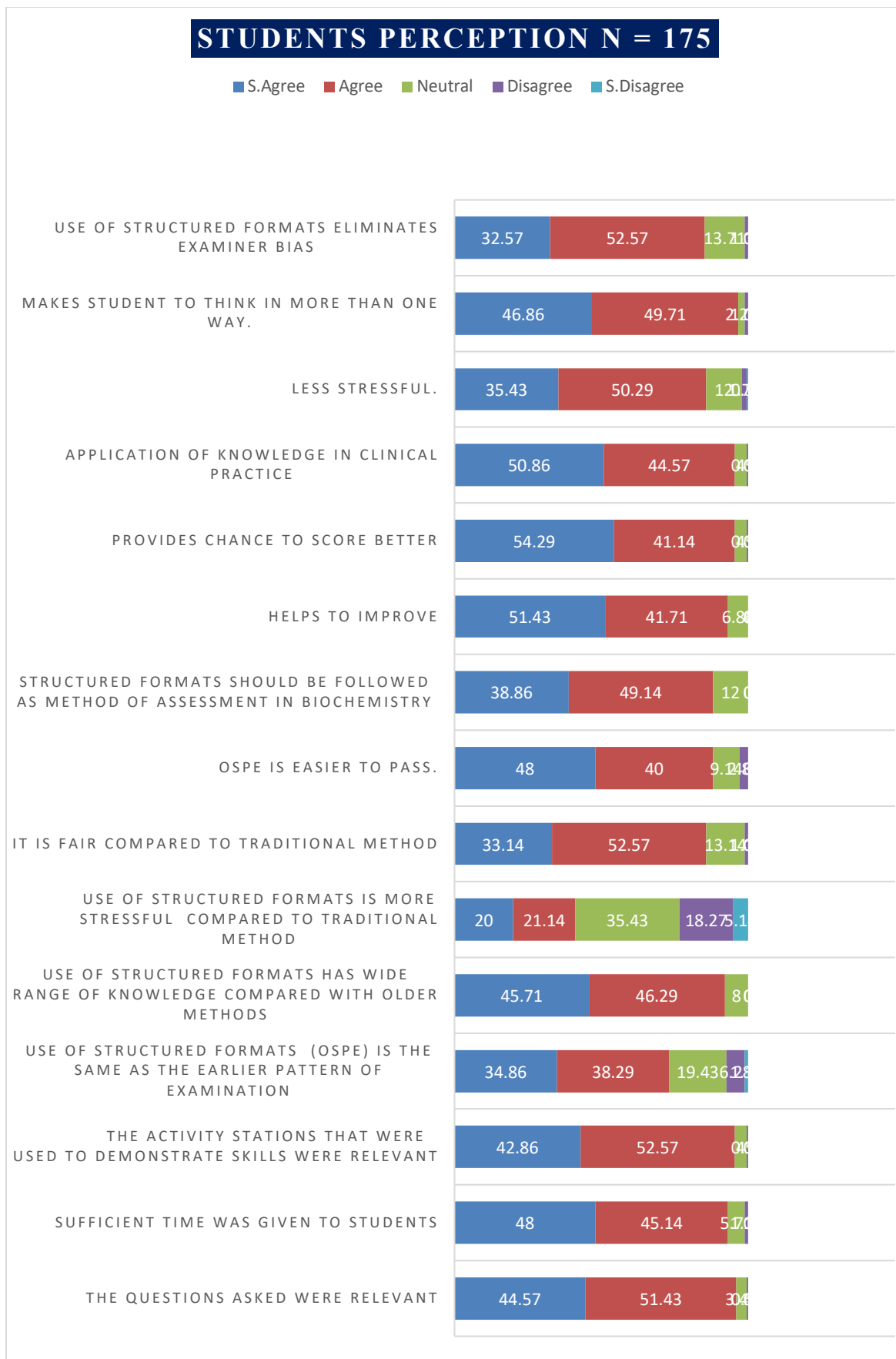


Figure 3: Students Perception N = 175

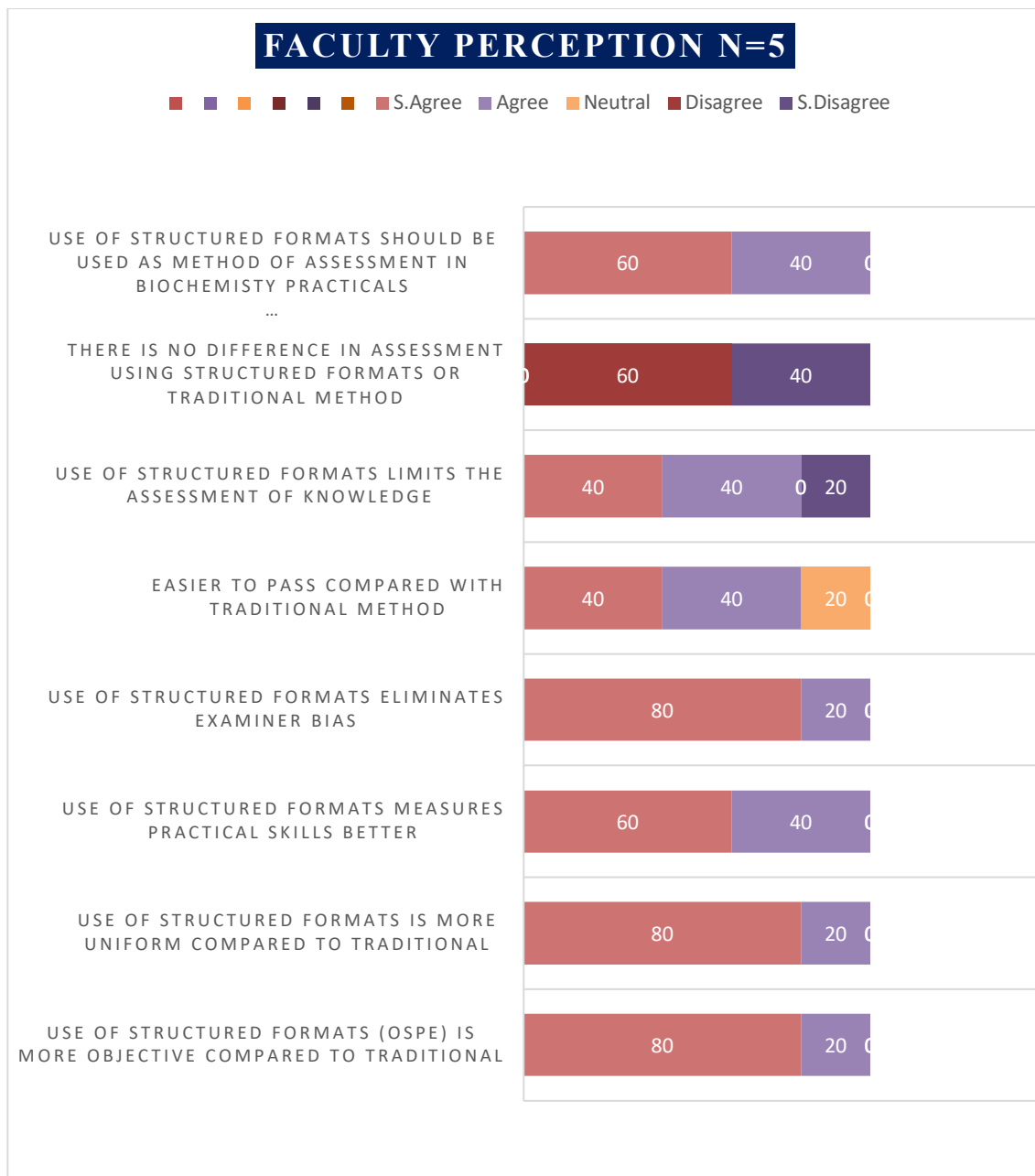


Figure 4: Faculty Perception N=5

Discussion:

Structuring of questions and objective assessment has been emphasized and gained importance in the practical examination. The OSPE has over the years gained importance not merely as an evaluation tool, but as a teaching method as well. This has been attributed to the feedback that OSPE gives to both the students and the faculty.

Structuring the questions on various aspects of Biochemistry practical examination that includes Qualitative, Quantitative, Lab chart interpretation may be helpful both as a teaching methodology and assessment tool. This eliminates examiner bias. Rajkumar et al [7] in their study emphasized that OSPE was a better assessment tool to measure

practical skills in anatomy, physiology, and biochemistry. In our study the mean values of marks obtained through structured practical examination was statistically significant in comparison to traditional method (p value equal to 0.0002) as shown in table no1. The percentage of students who scored marks in the range of 60-69 and 70-79 was increased in SPE in comparison to TPE as shown in figure no. [2]. Similarly the percentage of students who scored marks in the range of 30-39 was 3.42% with SPE and 5.14 % with traditional practical examination (TPE) which means overall scores improved in SPE.(as shown in Figure no.2) Deori R et al [8] in their study concluded that all three learning domains

(cognitive, psychomotor and affective) can be evaluated by OSPE/OSCE.

A study done by Dipankar kundu et al [9] on OSPE concluded that OSPE had several advantages. The student feedback in their study reflected that the assessment was effective both as teaching and evaluation tool.

A study done by Vidyabati Devi Rajkumari et al [10] concluded that objective structured practical examination was a new tool for assessment of teaching and learning.

Studies done by Vijaya and Alan, [11] KL Bairy et al., [12] and Mokkapati et al. [13] noted that OSPE to be a well organised, easy and less stressful examination covering and testing the appropriate knowledge than conventional examination

Feedback given by students was constructive and showed high acceptance as shown in Figure no.3. This was in accordance to a study done by kundu et al [1] Feroze and his team also reported that they have got an appreciable feedback. [14] Faculty feedback also showed high acceptance towards SPE as shown in Figure no 4.

Azeema et al in their study reported the limitations of OSPE. They explained the risk of observer fatigue if the observer must record the performance of several candidates on lengthy checklists. All stations invariably demand an equal time and concluded that OSPE requires careful planning. [15]

The key factors determining the successful implementation of OSPE requires a perfect assessment tool. This also requires meticulous planning, prior sensitization and briefing to the students before the examination. [16]

Conclusion

The mean values of marks obtained through structured practical examination were statistically significant in our study in comparison to traditional method.

OSPE is feasible and have good reliability and validity for evaluating practical skills of undergraduate medical students apparent by examiners and students.

Use of structured formats in Biochemistry practical examination has several advantages. OSPE was more objective, measured practical skills better, and eliminated examiner bias.

Student feedback reflects that such assessment helps them to improve as it is effective both as teaching and assessment tool.

Implications

Student feedback about educational methodologies is a useful basis for improving medical education. Areas of strength and/or weakness of teaching methodology used can be identified so that steps can be taken to rectify the deficiencies and achieve the intended goal.

Limitations: SPE examination was time consuming when compared with traditional practical examination (TPE). Preparation of checklists on every aspect like qualitative, quantitative analysis also requires cooperation from faculty and other supporting staff.

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