



FROM SUBJECTIVITY TO STANDARDIZATION: COMPARING CONVENTIONAL PRACTICAL EXAMINATION AND OBJECTIVE STRUCTURED PRACTICAL EXAMINATION IN DMLT STUDENTS- A PILOT STUDY

Pathology

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ABSTRACT

Background In Laboratory education, the accuracy of practical skills directly influences the quality of future diagnostic services. Despite the widespread use of conventional practical examinations, concerns regarding subjectivity and inconsistent assessment have led to increase interest in Objective Structured Practical Examination (OSPE). However, evidence among DMLT students is scarce. **Methods** This prospective single-group pilot study included 30 second year DMLT students. Following routine teaching on peripheral blood smear preparation, students underwent both conventional practical examination and a five station OSPE. Scores obtained in both assessments were compared using the paired *t*-test. **Results** The mean score in the conventional practical examination was 29.47 $\pm$ 2.89, compared with 35.00 $\pm$ 3.36 in the OSPE. Students performed significantly better in the OSPE ($p < 0.001$). **Conclusion** OSPE proved to be a feasible, objective and effective method for assessing practical competencies among DMLT students. Larger multicentric studies are recommended to validate these findings

KEYWORDS

Objective Structured Practical Examination, DMLT, Practical Assessment, Peripheral Blood Smear

INTRODUCTION

Every laboratory result begins with a technically competent professional, making the assessment of practical skills as important as the acquisition of theoretical knowledge. For Diploma in Medical Laboratory Technology (DMLT) students, proficiency in laboratory procedures is fundamental, as the accuracy and reliability of laboratory investigations directly influence clinical diagnosis and patient management.(1)

Conventional practical examinations have long been used to assess laboratory competence; however, they are often influenced by examiner subjectivity, variability in questioning and inconsistent evaluation of practical skills (2). Consequently, there is a growing need for assessment methods that are standardized, objective and capable of evaluating multiple domains of learning.

The Objective Structured Practical Examination (OSPE) is a structured assessment method that evaluated cognitive, psychomotor, and interpretative skills through a series of standardized stations using predetermined checklists. By ensuring uniform tasks and objective scoring, OSPE minimizes examiner bias and provides a more comprehensive assessment of students' practical competencies (3-5) Although OSPE has been widely adopted in medical and nursing education, evidence regarding its implementation among DMLT students remains limited. Therefore, the present pilot study was undertaken to compare conventional practical assessment with Objective Structured Practical Examination among DMLT students and to evaluate students' perceptions of OSPE as an objective and effective assessment tool.

Materials and Methods

This perspective, single-group educational interventional pilot study was conducted among second year DMLT students in the Department of Pathology at a tertiary care teaching institution over a period of 6 months. After obtaining written informed consent, all eligible students who had completed routine teaching on peripheral blood smear preparation were enrolled

Inclusion Criteria

- Second year DMLT students enrolled in the study institution
- Students who had completed the routine teaching and demonstration on PBS
- Students who provided written informed consent to participate in the study.

Exclusion Criteria

- Students who were absent during either the conventional practical examination or the OSPE
- Students who declined to participate or withdrew consent at any stage of the study

All participants first underwent a conventional practical examination on PBS preparation, during which they were assessed based on smear preparation, smear quality, and viva. Following an interval of one

week, the same students were assessed using a five-station Objective Structured Practical Examination (OSPE), comprising smear preparation, Leishman staining, spotter identification, smear interpretation and microscopy/viva. Each station was assessed using a standardized checklist with predetermined marks to ensure objective evaluation. Immediately after the OSPE, students completed a structured feedback questionnaire using a five-point Likert scale to assess their perceptions regarding the fairness, objectivity, acceptability and educational value of OSPE.

The primary outcome measure was the comparison of students scored in the conventional practical examination and the OSPE. Secondary outcomes included perceptions of OSPE. Data were entered into Microsoft Excel and analyzed using appropriate statistical software. Continuous variables were expressed as mean $\pm$ standard deviation, and categorical variables as frequencies and percentages. Scores obtained in the two assessment methods were compared using the paired *t*-test, with a *p*-value of < 0.05 considered statistically significant.

RESULT ANALYSIS

A total of 30 second year DMLT students participated in this pilot study. All participants completed both the conventional practical examination and the OSPE, resulting in a 100% completion rate

Comparison of Students' Performance

The mean score obtained the conventional practical examination was 29.47 $\pm$ 2.89, whereas the mean score obtained in the OSPE was 35.00 $\pm$ 3.36. The OSPE scores were consistently higher, with a mean improvement of 5.53 marks over the conventional practical examination. Statistical analysis using the paired *t*-test revealed that the difference in scores between the two assessment methods was highly statistically significant ($t=12.54$, $p < 0.001$), indicating superior student performance during the OSPE.

Table1: Comparison of Conventional Practical Examination and OSPE Scores (n=30)

Assessment Method	Mean $\pm$ SD	Minimum	Maximum
Conventional practical Examination	29.47 $\pm$ 2.89	25	34
OSPE	35.00 $\pm$ 3.36	30	42

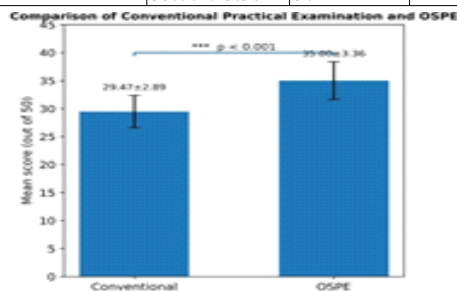


Figure1: Comparison of mean scores obtained by DMLT students in the conventional practical and the OSPE. The mean score in the OSPE (35.00+/- 3.36) was significantly higher than that in the conventional practical examination (29.47+/-2.89) ($p<0.001$).

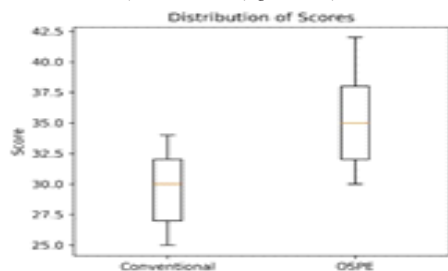


Figure2: The box and whisker plot demonstrated an upward shift in the overall distribution of OSPE scores compared with conventional practical examination scores, indicating improved student performance and a higher median score in the OSPE.

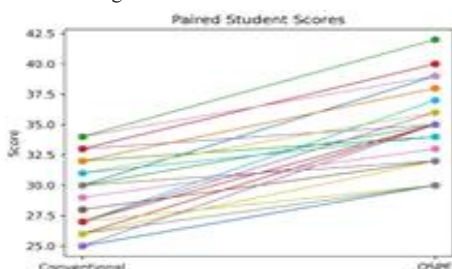


Figure3: Paired comparison of individual student scores in the conventional practical examination and the OSPE. Most students demonstrated improved performance in the OSPE, reflecting the effectiveness of the structured assessment method.

The overall findings of this pilot study suggest that the OSPE provided a more structured and objective method of assessing practical competencies in DMLT students. Compared with the conventional practical examination, students achieved significantly higher scores in the OSPE, supporting its feasibility and potential utility as an assessment tool in laboratory education.

DISCUSSION

The present pilot study demonstrated that DMLT students performed significantly better in the OSPE than in the conventional practical examination. The structured format of OSPE, together with the use of standardized checklists, provided a more objective and uniform assessment of practical skills while minimizing examiner bias.

Our findings are in agreement with Patil et al.(6) who reported that OSPE is a reliable and objective method of practical assessment that improves the evaluation of students' competencies. Similarly, Menzes et al.(7) observed that students perceived OSPE as a fairer and more effective assessment tool than conventional practical examinations. Khan et al.(8) also highlighted that structured practical examinations assess multiple domains of learning and provide a more valid measure of practical competence.

While most published studies have focused on undergraduate medical and nursing students, the present study extends these observations to DMLT students by evaluating a core laboratory skill- peripheral blood smear preparation and examination. The findings support feasibility of incorporating OSPE into routine DMLT practical assessment and suggest that it can serve as an effective alternative to conventional practical examinations.

CONCLUSION

Excellence in laboratory medicine begins with excellence in practical training. The present pilot study demonstrated that OSPE is a feasible, objective and structured method for assessing essential laboratory competencies among DMLT students. By promoting uniformity and reducing subjectivity, OSPE has the potential to complement conventional practical examinations in competency-based laboratory education. The findings, although derived a strong platform for future large scale research and broader implementation of OSPE in DMLT curricula.

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