

Comparing the Effects of Objective Structured Assessment Techniques (OSATS) vs Traditional Assessment Methods on Learning in Medical Undergraduates – A Prospective Observational Study

S. Sree Ranjini¹, A.C. Malarvizhi²

ABSTRACT

Introduction: Assessment of medical under graduate students traditionally involves observation of clinical care and class room teaching. In anaesthesiology, this is of more importance since the competencies primarily involve direct patient intervention during emergencies. The aim of the study was to compare two different types of assessment methods, namely objective structured and traditional methods on student self learning in medical undergraduates posted in Anesthesiology.

Materials and methods: All final year students were taught three competencies namely, performing basic life support (BLS), interpreting Glasgow coma scale (GCS) and airway assessment using modified Mallampati classification (MMPC). At the end of clinical postings, students were evaluated using two methods Objective structured and traditional viva method. Checklist was used by examiners for evaluation and student's feedback was obtained using questionnaire and results were analyzed statistically.

Results: Objective structured methods assessed clinical competencies more precisely compared to traditional method. Student's feedback proved Objective structured method was clear in terms of clarity and promoted deeper learning.

Conclusion: Objective structured method is a better way of assessing clinical competencies than traditional method though it requires meticulous planning, time consuming and costly.

Keywords: Objective Structured, Anesthesia

tool must achieve acceptable level of performance using the following characteristic namely reliability, validity, flexibility, comprehensiveness, feasibility, timeliness and accountability.³ In this study we have incorporated summative assessment to the students in two methods.

Study aimed to compare the effects of Objective structured versus traditional assessment methods on learning in final year medical undergraduates posted in Anesthesiology.

MATERIAL AND METHODS

This study was done in Tagore Medical College and Hospital in Department of Anaesthesiology for a period of six months. All final year medical undergraduate students posted in Anaesthesiology were included in this study (n=125). Inclusion criteria: Willingness to participate. Exclusion criteria: Absence of more than three sessions. All 125 students were divided into 5 batches of 25 each. Each batch had clinical posting in anaesthesiology for two weeks. During the posting, three competencies namely performing basic life support (BLS), interpreting Glasgow coma scale (GCS), Assessment of airway using Modified Mallampati classification (MMPC) were selected to be taught to the students. All the students were taught the same competencies in five separate batches by the same teacher. Evaluation using traditional viva method and OSATS was done at the end of clinical postings. Each student was evaluated in both traditional and OSATS methods, by two different blinded examiners.

For evaluating students, checklists were prepared by faculty members. The appropriateness and content validity of checklists and its reliability was confirmed using the Cronbach's alpha coefficient (0.80).⁴ Each checklist had a score of 10 mark, and students were evaluated for total score of total score of 30 marks for three stations. After the exam

INTRODUCTION

Medical education training primarily involves clinical skills and repeated practice. Success in these fields depends on what they memorize to some extent.¹ Hence all the students should have clear idea about the objectives which will enhance their clinical knowledge. Accurate and precise assessment of these competencies learnt is a big concern to all clinicians. There are various forms of assessment methods used for various purposes. Assessment methods based on clinical scenarios encourage students for more self directed learning.² Assessment can be either summative or formative each method having its own pros and cons. Summative assessment, measures only outcome decisions as compared to formative where it drives learning. Any assessment

¹Associate Professor, Department of Anaesthesiology, ²Associate Professor, Department of Anaesthesiology, Tagore Medical College and Hospital, Rathinamangalam, Melakottaiyur PO. Chennai -600127, India

Corresponding author: Dr. A.C. Malarvizhi, Associate Professor, Department of Anaesthesiology, Tagore Medical College and Hospital, Rathinamangalam, Melakottaiyur PO. Chennai -600127, India

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(both OSATS and Viva), students were given a questionnaire containing items about learning rate and students' estimation of their received scores with respect to their evaluation. These items were responded on a four point Likert scale ranging from strongly agree (= 4) to completely disagree (= 1).

In traditional exam method, examiner asked viva questions for three clinical scenarios, each session for 10 minutes. Scoring in traditional tests depends on the student's presentation, depth of knowledge, and practical application of the taught skill. Assessment was performed using prepared checklists and students were filled a post exam questionnaire. This assessment was done midway of clinical posting, as a formative method. In Objective structured method, three stations which had responses were prepared meticulously. All examiners were faculty members who were previously trained in the objective structural test of clinical skills. In each station, students demonstrated the skill that was asked and the examiner scored with a prepared checklist. Each station timed about 10 minutes. A post exam questionnaire was filled in by the students.

STATISTICAL ANALYSIS

Descriptive and inferential statistics were used. Paired t-test and Frequency distribution was used to evaluate the scores. A *P* value of <0.05 was taken significant.

RESULTS

Formative assessment, (traditional viva exam) was

Station	Competency
1	Basic life support
2	Glasgow coma scale
3	Modified Mallampati airway assessment

Table-1: Stations

Score	Total 30 marks	Mean+ SD	P value
Self evaluation	OSATS A	27.36+ 1.94	0.0614
	Traditional B	26.84+ 2.41	
Actual	OSATS A	27.89+ 1.89	0.0353
	Traditional B	27.41+ 1.69	

Table-2: Scores in osats vs traditional exam

conducted one week after clinical posting and summative assessment after two weeks (objective method). As shown in table 2, the mean of the actual student' score in Objective Structured method was significantly higher than their mean score in traditional method (*P* = 0.03) (table-2). However compared to the objective based exam, students mean actual score in traditional viva method was significantly lower than their actual score. This might be because the traditional exam was conducted within one week of posting into Anesthesiology, were student's self score was more than actual score. From the post exam questionnaires', many of them felt Objective methods were simpler, easy to understand, tested skills appropriately, provided more self directed learning. Moreover, 49.6% of students believed that the quality of Objective method was higher than traditional methods and better option for clinical skills. In addition, 73.6% of them declared it provided opportunity for deeper self directed learning. Both the exams had adequate time (80%) given which was self sufficient. These observations concluded that Objective based methods was better in assessing clinical based skills, promoted learner centered learning and improved decision making among students in different clinical scenarios (table-3). The only disadvantage was communication skill was not adequately by Objective

S. No	Task	Response	Marks
1	Check safety to approach	Checked	1
2	Check responsiveness	Checked	1
3	Opens airway	Checked	1
4	Checks for breathing	Checked	1
5	Checks for circulation	Checked	1
6	Mouth to mouth breathing	Good	2
		Average	1
		Poor	0
		No attempt	0
7	Chest compressions	Good	2
		Average	1
		Poor	0
		No attempt	0
8	Reassess circulation	Checked	1

Table-3: Model checklist for basic life support station

Questions	Totally agree		Agree		Disagree		Totally disagree	
	O	T	O	T	O	T	O	T
1. Does it measures the objective indicated ?	46	36	28	25	25	45	18	27
	4636.8%	28.8%	22.4%	20%	20%	36%	14.4%	21.6%
2. Does it promote deeper learning?	49	43	10	18	22	42	10	55
	39.2%	34.4%	8%	14.4%	17.6%	33.6%	8%	44%
3. Relates theory to practice?	32	30	31	28	18	16	45	50
	25.6%	24%	24.8%	22.4%	14.4%	12.8%	36%	40%
4. Was communication skills tested?	2	25	66	40	42	15	56	4
	16%	20%	52.8%	32%	33.6%	12%	44.8%	3.2%
5. Was the time to assess sufficient?	65	35	62	38	20	18	5	7
	52%	28%	49.6%	30.4%	16%	14.4%	4%	5.6%
6. Is it precise in improving decision making?	52	34	1	8	25	44	14	72
	41.6%	27.2%	0.8%	6.4%	20%	35.5%	11.2%	57.6%

O: Objective based method (n=125), T: Traditional method (n=125)

Table-4: Students opinion on assessment methods:

methods. Objective based methods as a formative tool of assessment will improve the students self confidence in final exam (table-4).

DISCUSSION

Various multi centered projects done before, has mandated that each program must establish the teaching and assessment of these competencies.⁵The challenge for anesthesiology is to make this practical and feasible in the context of anesthesiology. Anesthesiology being a branch which requires high quality of clinical skill with good precision, teaching clinical competencies is very vital. The assessment of these clinical skills is also difficult. By various projects done before it has being made mandatory that training programs should measure learning appropriately and periodically.^{5,6} The literature has a large number of reports about various assessment tools, and it is better to incorporate each one in each step of evaluation whether formative or summative^{7,8} Any type evaluation, should be specific in its objective, fair, specific, and always be documented. Objective based assessment methods meets all this criterion whether it is used as formative or summative.⁹

Objective based methods has been used widely now because it simple, easy, better clinical skill evaluation and more precise than traditional methods. Because objective based methods are specific in the skills tested it has been implemented in many healthcare disciplines.^{10,11} The popularity of objective based method among many medical specialities is because of its reliability, objectivity, more of self directed learning and more of students satisfaction.¹²⁻¹⁵

As a clinician, learning a skill is important to develop a safe and competent practioner.¹⁶ Objective based methods, is a practical form of assessment as it is based on students performance, tests specific competencies, more clinical, which is fundamental for all health care professions.¹⁷ In this study, the effectiveness of objective based method on self learning of students, many felt is promoted more self directed learning than traditional viva methods. This is very well reflected in the scores as student's actual score was higher in objective based method than traditional method. This finding is congruent with Agarwalet al, who compared different methods of assessing clinical skills, and concluded that OSCE method can be used as a very valuable method for assessing clinical competency of students.¹⁸

Another observation from this study, student's satisfaction was more in Objective based exam. This is in par with studies by Sloan et al, who studied medical student's satisfaction with OSCE method.¹⁹ The result showed that the majority of students were satisfied and expressed that its effect on improving clinical skills. Also, Critchley et al, implemented objective method sin medical undergraduates. The results showed that the students had more self-confidence for doing clinical practice. Also, students mentioned that it is best suited for clinical skills²⁰

Student's opinion regarding, the effectiveness of objective methods in self directed learning process, the indicated that, Objective methods measures precise clinical

objectives, improves teaching from faculty, more practical based, better decision making from students and is more easier to understand the skill to be demonstrated. They ranked objective method as very satisfactory to satisfactory by majority of them. This feedback can suggest that OSCE is an objective tool for evaluating clinical skills. These findings are in agreement with a study by Franzese et al and Hodges et al which reported that most students viewed OSCE as a foolproof assesment method. It has an advantage of being used in any time of learning process as summative or formative.^{21,22}

Traditional exam was the biggest disadvantage that, students being questioned directly, inability to respond when examiners ask, language and communication skills of the student, whether the students is known or unknown to examiner, examiners expectations, inability to pick clues which are prompted etc. Stress, anxiety all are added factors. Turner and Dankoski, tested whether objective methods assessed validity, reliability and feasibility, the majority of students felt that they had been marked fairly.²³ Positive feedback was got from majority of them. The quality of OSCE performance in terms of the clarity, sequence, the precision of the tasks taught and timing for each station was evaluated in a study Pierre et al, who indicted that most students viewed objective methods positively.^{24,25}

Objective methods are favoured by most students and is in regular use in medicine regularly.¹⁰ Mitchell et al, also suggested that bed side clinical skill evaluation using objective methods will have more favorable results.^{26,27}

Thus from this study it can be concluded that with better planning and familiarizing the students with the stations, anxiety and stress can be decreased.²⁸ Objective based methods in clinical skill evaluation has many advantages than traditional methods. It improves performance and more appreciated by students as it promotes self learning.²⁹ Therefore Objective based methods, is a valid and reliable technique which is uniquely capable of assessing many fundamental clinical skills that are not being assessed usually in medical undergraduates. Objective methods examination an attractive option for evaluating practitioner to assess clinical competencies.

CONCLUSION

These observations concluded that Objective based methods was better in assessing clinical skills, promoted learner centered learning and improved decision making among students. The only disadvantage was communication skill was not being adequately tested.

REFERENCES

1. Casey PM, Goepfert AR, Espey EL, Hammoud MM, Kaczmarczyk JM, Katz NT, N, et al. To the point: reviews in medical education — the Objective Structured Clinical Examination. *American Journal Obstetetric Gynecology*; 2009;200: 25-34.
2. Miller GE: The assessment of clinical skills/competence/performance. *Acad Med* 1990; 65:S63-7.
3. Turnbull J, Gray J, MacFadyen J: Improving in-training

- evaluation programs. *J Gen Int Med* 1998; 13:317–23.
4. Tavakol M, Dennick R: Making sense of Cronbach's alpha. *Int J Med Educ* 2011; 2:53–5.
 5. Leach DC. A model for GME: shifting from process to outcomes. A progress report from the Accreditation Council for Graduate Medical Education. *Med Educ*. 2004;38:12–14.
 6. McIndoe AK: Modern anaesthesia training: Is it good enough? *Br J Anaesth* 2012; 109:16–20.
 7. Ben-Menachem E, Ezri T, Ziv A, Sidi A, Brill S, Berkenstadt H: Objective Structured Clinical Examination-based assessment of regional anesthesia skills: The Israeli National Board Examination in Anesthesiology experience. *Anesth Analg* 2011; 112:242–5.
 8. Kaufman DM, Mann KV, Muijtjens AM, van der Vleuten CP: A comparison of standard-setting procedures for an OSCE in undergraduate medical education. *Acad Med* 2000; 75:267–71.
 9. Blew P, Muir JG, Naik VN: [The evolving Royal College examination in anesthesiology]. *Can J Anaesth* 2010; 57:804–10.
 10. Bromley LM: The Objective Structured Clinical Exam—Practical aspects. *Curr Opin Anaesthesiol* 2000; 13:675–8.
 11. Harden RM: What is an OSCE? *Med Teach* 1988; 10:19–22.
 12. Newble D: Techniques for measuring clinical competence: Objective structured clinical examinations. *Med Educ* 2004;38:199–3.
 13. Matsell DG, Wolfish NM, Hsu E: Reliability and validity of the objective structured clinical examination in paediatrics. *Med Educ* 1991; 25:293–9.
 14. Barman A: Critiques on the objective structured clinical examination. *Ann Acad Med Singapore* 2005; 34:478–82.
 15. Carraccio C, Englander R: The objective structured clinical examination: A step in the direction of competency-based evaluation. *Arch Pediatr Adolesc Med* 2000; 154:736–41.
 16. Hodder RV, Rivington RN, Calcutt LE, Hart IR: The effectiveness of immediate feedback during the objective structured clinical examination. *Med Educ* 1989; 23:184–8.
 17. Brookes, D. Objective Structured Clinical Examination assessment. (2007)
 18. Agarwal A, Batra B, Sood A, Ramakantan R, Bhargava SK, Chidambaramathan N, ndrajit I: Objective structured clinical examination in radiology. *Indian J Radiol Imaging* 2010;20:83–8.
 19. Sloan DA, Donnelly MB, Schwartz RW, Strodel WE: The Objective Structured Clinical Examination. The new gold standard for evaluating postgraduate clinical performance. *Ann Surg* 1995; 222:735–42.
 20. Critchley LAH, Short TG, Buckley T, O'Meara ME, Gin T, Oh TE. An adaptation of the objective structured clinical examination to a final year medical student course in anaesthesia and intensive care. *Anaesthesia* 1995; 50:354–8.
 21. Franzese CB: Pilot study of an Objective Structured Clinical Examination (“the Six Pack”) for evaluating clinical competencies. *Otolaryngol Head Neck Surg* 2008; 138:143–8.
 22. Hodges B, Turnbull J, Cohen R, Bienenstock A, Norman G: Evaluating communication skills in the OSCE format: Reliability and generalizability. *Med Educ* 1996; 30:38–43.
 23. Turner and Dankoski, Turner, J.L. and Danksoki, M.E. Objective structured clinical exams: a critical review. *Family Medicine*. 2008;574-578.
 24. Pierre RB, Wierenga A, Barton M, Branday JM, Christie CD. Student evaluation of an OSCE in paediatrics at the University of the West Indies, Jamaica. *BMC Med Educ*. 2004;4:22.
 25. Menezes RG, Nayak VC, Binu VS, Kanchan T, Rao PP, Baral P, et al. Objective structured practical examination (OSPE) in Forensic Medicine: students' point of view. *J Forensic Leg Med*. 2011;18:347–9.
 26. Mitchell et al. Mitchell M L, Henderson A, Groves M, Dalton M, and Nulty D The objective structured clinical examination (OSCE): Optimizing its value in the undergraduate nursing curriculum. *Nurse Education Today*; 2009;29: 398-404.
 27. Merrick HW, Nowacek GA, Boyer J, Padgett B, Francis P, Gohara SF, Staren ED: Ability of the objective structured clinical examination to differentiate surgical residents, medical students, and physician assistant students. *J Surg Res* 2002;106:319–22.
 28. Sloan DA, Donnelly MB, Schwartz RW, Strodel WE: The Objective Structured Clinical Examination. The new gold standard for evaluating postgraduate clinical performance. *Ann Surg* 1995; 222:735–42.
 29. Stewart CM, Masood H, Pandian V, Laeeq K, Akst L, Francis HW, Bhatti NI: Development and pilot testing of an objective structured clinical examination (OSCE) on hoarseness. *Laryngoscope* 2010; 120:2177–82.

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