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First Experience with OSCE as an Exit Clinical Examination for General Surgery Residency Program at the Addis Ababa University, School of Medicine.

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Background: The evaluation of clinical skills of surgical residents has long been viewed by surgical educators as problematic and the Objective Structured Clinical Examination (OSCE) is said to address the deficiencies of the traditional clinical examinations. Here, we report findings from evaluation of our first experience with this examination at the Addis Ababa University, Department of Surgery.
Methods: This was a cross sectional survey among surgical students in University, School of Medicine, Department of Surgery, Addis Ababa University.
The study population consisted of 10 final year residents in General surgery sitting for final exit exam in the year 2011 and 20 academic staff at the Department of surgery.
Results : The study showed that both students and instructors found OSCE to be useful and believed that OSCE evaluated very well the history taking and physical examination ability of residents. Students' OSCE results showed that they had borderline consistency (Cronbach's α =0.67) and correlation with viva (Pearson r = 0.65; p-value=0.04) and written test results (Pearson r = 0.58; P-value=0.08).
Conclusion: Overall, the findings indicate that OSCE can be implemented with some level of success provided the students and staffs are adequately oriented and convinced of the justifications for an objective assessment in clinical training. Further plans and activities need to address how OSCE can be made a more reliable measure of students' performance.

Introduction

The evaluation of clinical skills of surgical residents has long been viewed by surgical educators as problematic [1]. Clinical skills refer to the ability of a resident to do an appropriate history and physical examination, problem-solve, arrive at a working diagnosis, and outline a plan of management [1, 2.] Traditionally, clinical skills have been evaluated by means of multiple choice tests, oral examinations, progressive assessment and other forms of written examinations[1,2,3]. These methods have been shown to be lacking in either reliability or validity[3,4,5]. Examinations based on multiple choice questions, although highly reliable, largely test recall of factual knowledge and lack content and construct validity when assessing higher cognitive skills such as problem solving[6,7,8]. Oral examinations have been the major tool by which surgical educators have attempted to assess problem-solving.

The Objective Structured Clinical Examination (OSCE) is an assessment tool consisting of a series of standardized stations testing both clinical and technical skills[2]. Since this methodology was introduced in 1975 by Hardin[3], it has become an increasingly popular evaluation tool for both medical students and residents in a variety of disciplines. Arguably the most effective test for evaluating clinical skills is the OSCE[3,4,5].

Though there are no published documents about post graduate examination in Ethiopia, experience and review of the curriculum has shown that it has been effected through the utilization of Multiple Choice Questions (MCQ) and essay written tests, the traditional long case, short case and viva (interview) examinations. The purpose of this study was to assess the first experience with OSCE in Ethiopia during the exit examination of final year General Surgery residents at the Addis Ababa University, School of medicine.

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We also wanted to analyze the attitude towards and perception of the examiners and residents towards OSCE.

Past experience with OSCE

The department of Surgery had a limited experience with OSCE before September 2009. In fact, the only published experience in OSCE in Ethiopia is from Jimma University [9]. In 2009, the department decided to utilize the OSCE as an admission examination for its fresh residents joining the training in General Surgery. It was also decided to include written MCQ questions and interview as part of the admission examination. To this effect, a pre-examination workshop was organized and all the staff members agreed to undertake it. Two identical examination venues were setup and each consisted of eight different stations. Exam duration in each station was 10 minutes and the examination of 32 candidates was completed in 3 hours. The stations included history taking (2 stations), physical examination   (2 stations), radiology images (one station with 5 x/ray images), basic surgical procedures (one station) and spot diagnosis (two stations). The experience and feedback received from the examiners and examination candidates was very encouraging and most recommended its incorporation into other exams.

Subjects and Methods

Exit examination Preparation: November 2011

Two weeks before the conduct of the exam, all the members of the department of surgery were invited to a one-day workshop on OSCE. This was a refresher discussion for those with previous exposure to the examination and an introductory course for new staff. A general introduction to OSCE, why we need to integrate it to the exit examination process, OSCE blue printing and OSCE designing were discussed. The outcome of the meeting was unanimous agreement that OSCE should be utilized into the final year residents exit examination.

A week before the exam, an examination committee consisting of two of general surgeons, a urologist, a pediatric surgeon and a thoracic surgeon met to design the actual examination. After discussion, it was decided to replace the traditional long case and short case exams with OSCE and modify the traditional viva exam with a structured exam. The total exam duration was decided to be two hours and 12 different stations, each for 10 minutes were considered to be adequate. The examination was conducted at the hospitals' semi-private ward where 12 separate rooms put in a row were available. The actual exam venue was deemed appropriate to host the 12 stations. The distribution and case mix of the stations is shown in Table 1.

Table 1. Distribution and Case Mix of the First OSCE Exit Examination: December 2011

Station	Unit	Case	Assessment
1	Neurosurgery	Severe brain trauma	CT, MRI, management
2	Urology	Bladder outlet obstruction	H & E, management
3	Orthopedic surgery	Skeletal and nerve injury with deformity.	H & E, management
4	General Surgery	Goiter	H & E, management
5	Thoracic surgery	Dysphagia	H & E, management
6	Pathology specimens	5 different specimens	Interpretation
7	Urology	Urolithiasis	H & E, Management
8	General Surgery	Abdominal Mass	H & E, management
9	Orthopedic surgery	Skeletal trauma	H & E, management
10	X/rays	8 different x/rays	Interpretation
11	Pediatric surgery	Pediatric abdominal mass	H & E
12	General Surgery	Breast mass	H & E, management

Key: H and E: History and physical examination-

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The ten clinical stations were planned to be manned by two examiners each and the two stations with X/rays and pathologic specimens to be observed were unmanned. Three staffs were placed strategically for smooth station transition of candidates and time keeping. The examination started at 9:00am and all the ten candidates exited at 11:05 am.

The afternoon viva was also structured to include one emergency case management and one emergency surgical technique in the first station; one elective case management and one elective surgical technique in the second, each station taking 30 minutes.

At the end of the examination, 10 residents that sat for the exam and 20 examiners filled out a questionnaire about the examination. Items included in the questionnaires were whether the respondent had previous experience with OSCE, whether they believed this exam was well organized, whether they believed this OSCE evaluated the physical examination, history taking, radiology interpretation ability of residents and if they would recommend its utilization in the future exams, to name a few.

Data processing and analyses:
The data was entered into Epi-info version 2002 and exported to SPSS version 14 for analyses. Consistency of students' result for the 12 stations which were evaluated out of 40 was checked using Cronbach's alpha. Extent of relationship of OSCE with the viva and long exams was assessed using Pearson correlation coefficient (r).

Results

Students' verdict on OSCE
All had no previous experience with OSCE. All agreed that the current exam was well organized, while 9 admitted they received adequate pre-examination orientation and the examination instructions were clear. The major criticism is significant time shortage which was claimed by 5. Seven agreed that this OSCE evaluated their history taking, physical examination and radiology interpretation ability very well. Nine examinees agreed that this OSCE is better at assessing surgical residents than the traditional long and short exams they were used to, and all recommended its permanent integration into resident exit examination in the future.

Examiners' opinion about OSCE
Majority of the examiners, 13(61.9%), had previous exposure as examiners in OSCE. 16(80%) thought that the OSCE evaluated the history taking and physical examination ability of the candidates very well. 17(85%) believed that the OSCE is better than the traditional long and short case examination and 15(75%) recommended its use in the future. 4(20%) thought the exam organization, especially time allotment needs significant improvement.

Results of the examination
Each OSCE station was marked out of 40%, the compiled OSCE result contributing to 40% of the final results. The distribution of the OSCE results from sample stations i.e Neurosurgery, General Surgery, thoracic Surgery, urologic surgery, orthopedics, pediatric surgery, X/ray and specimen stations are shown in figure 1 and the compiled final examination result is shown in Table 2.
A measure of the internal consistency of the test scores of the 12 stations shows that the questions generally have borderline/questionable consistency (Cronbach's alpha=0.67. The test measures the degree to which a set of items measures a single one-dimensional latent construct, in this case knowledge and skills in surgery.

Regarding extent of agreement with the existing assessment methods, it was found that the OSCE test results are significantly correlated with students' viva scores (Pearson r=0.65; p-value=0.04) but not with the written test (r=0.58; P-value=0.08). See table 3.**Figure 1 A and B**. Distribution of OSCE exam results of candidates sitting for exam: December 2011 (Graded out of 40).

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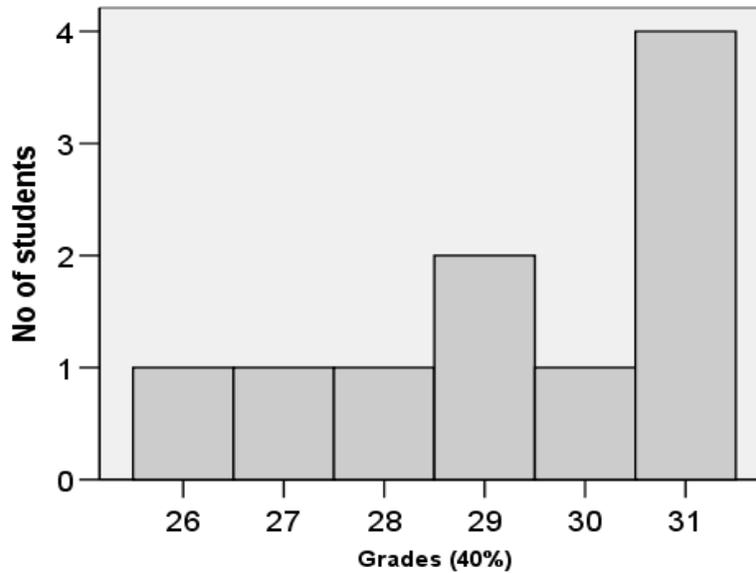Fig 1. Residents overall score in OSCE, Dec 2011

Table 2. Final compiled scores of candidates sitting for exit exam: December 2011.

Candidate NO.	Written exam (100%)	OSCE exam (100%)	Viva exam (100%)
1	72.8	79.5	77.5
2	65.4	74.7	75
3	70	79.7	76.5
4	71.2	82.5	77.5
5	69.6	82.7	76
6	50	73.7	72.5
7	66.2	84	73.5
8	73.7	82.2	74
9	67.4	72.2	72.5
10	74.8	81.5	79

Table 3. Correlations between OSCE and Viva and Written Exams, Dec 2011

		Written	Viva	OSCE
Written	Pearson Correlation	1	0.65	0.58
	P-value		0.04*	0.08
	N	10	10	10
Viva	Pearson Correlation	0.65	1	0.50
	P-value	0.04		0.14
	N	10	10	10
OSCE	Pearson Correlation	0.58	0.50	1
	P-value	0.08	0.14	
	N	10	10	10

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*r- significant at 0.05.

Discussion

During our current experience with OSCE, the results of the candidates was shown to be a reliable and valid format for the assessment of clinical skills. All candidates were examined using the same clinical cases, which contributed to a high degree of standardization, a feature that is lacking in the traditional long and short case assessments[3,4,5]. The other strength of this OSCE was the objective assessment of clinical performance. This was accomplished by using structured checklists to evaluate candidates' performances, which has been shown to eliminate the possibility of subjective assessment [5, 6]. In our case, the checklists were developed prior to the examination by a team of surgeons in each specialty unit and the finalized checklists were reviewed by the examination committee consisting of representatives of each unit.

We also found OSCE to be a practically feasible exam to organize for graduating class of surgical residents. In addition, we didn't face significant organizational problems as each unit of the department was fully engaged with the preparation of the checklists, patient selection and actual implementation of the examination.

In general, both candidates and examiners expressed favorable views towards the examination. The general consensus among all participants seemed to be that the OSCE was much better at assessing history taking, physical examination and interpretational skills than the traditional long and short examinations and it should replace the latter methods of clinical evaluation. Specific weaknesses of the clinical competence assessment was expressed in such a way that the examination failed to punish candidates who revealed they know very little about the given subject matter during the examination, as what is required in the spot was to concur with what was written in the check list. Most instructors expressed their feeling that the checklist should be structured in such a way that there is room to probe deeper into the knowledge base of the candidates. The concept of negative marking should also be considered. Time allocation in some of the stations, particularly the X/ray stations and combined physical exam/history stations was also not enough.

It is quite obvious that OSCE requires more time and staff during the preparation and administration of the examination than the traditional clinical format of assessment. However, the entire OSCE was conducted in one morning, as opposed to 10 hours (2 days). We believe all it takes is more efficient use of examiners and designing of unmanned stations. Whether our OSCE itself was a valid test is still to be determined. However, the marginal scores on internal consistency and correlation with the viva points to the need to work more on standardization of questions across and within each subject area.

Conclusion and recommendations

- The exercise showed that OSCE can be implemented with some level of success provided students and staffs are adequately oriented and convinced of the justifications for an objective assessment in clinical training.
- Both surgical residents and their instructors had favorable views on the appropriateness of OSCE as a well organized objective assessment strategy and recommended its integration in the evaluation of residents at AAU.
- Both the residents and examiners expressed concern about shortage of time allocated and therefore needed to be revised.
- The fact that the reliability and correlation with existing tests are marginal also indicates the need to address these important issues.
- Further plans and activities need to address how OSCE can be made more reliable measure of students' performance.

References

1. Robert Cohen, Richard K. Reznick, Bryce R. Taylor, John Provan, and Arthur Rothman. Reliability and Validity of the Objective Structured Clinical Examination in Assessing Surgical Residents. The American Journal of Surgery, Vol 160 September 1990.

2. Nicholas J. Zyromski, Edgar D. Staren, and Hollis W. Merrick. Surgery Residents' Perception of the Objective structured Clinical Examination (OSCE). Current Surgery, Volume 60/Number 5, September/October 2003.

3. Hardin R, Stevenson M, Downie W, Wilson G. Assessment of clinical competence using objective structured examination. Br Med J. 1975;1:447-451.

4. David Sloan, Micheal B. Richard W. Schwartz, Janet L. Felts, Amy V. Blue and William E. Strodel.. The Use of the Objective Structured Clinical Examination (OSCE) for Evaluation and Instruction in Graduate Medical Education. Journal of Surgical Research 63, 225–230 (1996), Article No. 0252.

5. Sloan, D. A., Donnelly, M. B., Schwartz, R. W., and Strodel,W. E. The Objective Structured Clinical Examination (OSCE): the new gold standard for evaluating resident performance. *Ann. Surg.* 222: 735, 1995.

6. Schwartz, R. W., Donnelly, M. B., Sloan, D. A., Johnson, S. B., and Strodel, W. E. The relationship between faculty ward evaluations, OSCE, and ABSITE as measures of surgical intern peformance. *Am. J. Surg.* 169: 414, 1995.

7. Levine HG, McGuire CH. The validity of multiple choice achievement tests as measures of competence in medicine. Am Educ Res J 1970; 7: 69-83.

8. Robb KV, Rothman AI. The assessment of clinical skills in general medical residents: comparison of the objective structured clinical examination to a conventional oral examination. Ann RCPSC 1985; 18: 235-8.

9. Belay Shitu, Tsinuel Girma. Objective Structured Clinical Examination (OSCE): Examiners perception at department of pediatrics and child health, Jimma university. Ethiop J Health Sci. Vol. 18, No. 2 July 2008

10. Michael J. Griesser, Matthew C. Beran, David C. Flanigan, Michael Quackenbush, DO, Corey Van Hoff, and Julie Y. Bishop. Implementation of an Objective Structured Clinical Exam (OSCE) into Orthopedic Surgery Residency Training. Journal of Surgical Education • Volume xx/Number x • Month 2011

11. Gilad E. Amiel, Mark Tann, Michael M. Krausz, Arie Bitterman, Haifa, Israel, Robert Cohen. Increasing Examiner Involvement in an Objective Structured Clinical Examination by Integrating a Structured Oral Examination. The American Journal of Surgery, Volume 173 June 1997.

12. D Scott Lind, Adeline M Deladisma, Jorge I Cue, Andria MThomas, Bruce V MacFadyen, Robert R Nesbit. Survey of Student Education in Surgery. J Am Coll Surg 2007;204:969–976.