Original Articles

Experience with the objective structured examination as a tool for students' assessment in the Department of Community Medicine and Primary Health Care in a University Hospital in western Saudi Arabia

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ABSTRACT

Objectives: The objectives of this study were to 1. assess the knowledge and attitude of the 5th year female medical students towards the objective structured examination in general and in Community Medicine in particular prior to the exam, 2. Detect any change in students' knowledge and attitude after passing the exam, 3. Identify the students' evaluation for future objective structured examination in Community Medicine and Primary Health Care and 4. Compare the students' performance in the objective structured examination in Community Medicine and Primary Health Care to the results of multiple choice questions evaluation in the department.

Method: There were 2 data sets, the first was collected by self-administered pre and post-objective structured examination questionnaires from all female medical students in the 5th year during the academic year 1996-1997 and the 2nd was copied from the students' results for objective structured examination and multiple choice questions in the department of Community Medicine and Primary Health Care during same academic year.

Results: All the 34 5th year female medical students were enrolled in the study. Most of them reported that they did not receive enough information prior to the objective structured examination and most of their knowledge came from side chats with friends or staff members which was confirmed by their weak knowledge and negative attitude towards the objective structured examination prior to the exam. After setting the objective structured examination, students' knowledge and attitude towards objective structured examination markedly improved and the majority displayed its advantage as an assessment tool and were convinced of its suitability for medical practice in general and community medicine in particular. Most students believed that objective structured examination in Community Medicine and Primary Health Care met their expectations and recommended it for the coming years. Also, students stated the negative and positive aspects that should be considered for future assessments. Moreover, the multiple choice questions were nearly similar and there was a significant correlation between both scores.

Conclusion: The 5th year female medical students did not receive enough information and training on the objective structured examination which influenced their attitude prior to the exam. However, most of them showed a positive attitude after the experience and their marks in the objective structured examination were comparable to their marks in the multiple choice questions. The objective structured examination is a popular method of assessment in medical practice worldwide. The decision to discontinue its use after only one year did not allow space of time for evaluation of its appropriateness as an assessment tool. More research is recommended to study the main causes that lead to disregarding this type of medical assessment in the College of Medicine at King Abdulaziz University.

Keywords: Objective structured examination, objective structured clinical examination, objective structured practical examination, medical education.

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Numerous attempts are made to improve the reliability and validity of exams especially those used to assess medical skills and clinical competence. The objective structured examination (OSE), with its clinical (OSCE) and practical, non-clinical (OSPE) components, is nowadays used all over the world due to its reliability, validity and practicability.[1-3] The OSE consists of a series of tasks, called stations, around which the examinees are asked to rotate. At each station the student is required to perform a clinical task or make some decision. Stations might involve examining patients, technical procedures or data interpretation. The examiners are provided with a checklist to score the performance of the candidate for the different operation that should be performed for each specific task. The idea behind the OSE is that it samples a broad range of standardized clinical and practical skills most of which are observed by the examiners in an objective manner. This approach was introduced to avoid the disadvantages of the traditional clinical examination and the inadequacies of the long-case formats that are restricted to one patient or to one examiner introducing bias.[3-6]

There is an extensive body of research documenting the reliability, validity and practicability of the OSE in assessing fundamental clinical and practical skills in medical practice. The OSE procedure is known to serve in identifying the areas of weakness in the curriculum and teaching methods or both and thus serves as a mechanism to improve educational effectiveness. A well-constructed OSE is known to provide important information regarding the candidates' performance and quality of medical training.[1,7,8] The College of Medicine and Allied Health Sciences of King Abdulaziz University in Jeddah City, Kingdom of Saudi Arabia has introduced the objective structured examination for the assessment of the 5th year medical students during the academic year 1996-1997. At the end of this year, echoes of many complaints emerged from the teaching staff and students that made the university discontinue use of the OSE in the evaluation of medical students.

The Department of Community Medicine and Primary Health Care (PHC) used the OSE during the academic year 1996-1997 according to the university's regulations to assess the clinical competence and medical skills of the 5th year medical students. To evaluate the experience of the female section of the department with the OSE, this study was performed to 1. Assess the knowledge and attitude of the 5th year medical students towards the OSE in general and in Community Medicine in particular prior to the exam, 2. Detect any change in students' knowledge or attitude after passing the exam, 3. Recognize the students' evaluation for the OSE in Community Medicine and PHC and 4. Compare the students' performance in the OSE in Community Medicine and PHC to the results of multiple choice questions (MCQs) evaluation in the department.

Methods. ***Study population.*** During the academic year 1996-1997, the 5th year female medical students in the Department of Community Medicine and PHC were classified into 5 groups, each group underwent a 6-week training course, at the end of which they were subject to an objective structured examination and multiple choice questions (MCQs) assessment. The OSE included 15 stations that were a mixture of OSCE in clinical aspects and OSPE in non-clinical aspects. The department made use of true patients, and simulated patients who were sometimes the staff members. The MCQs included 15 questions; each contained 5 sub-questions related to a specific subject. Both the OSE and MCQs were scored out of 15 marks.

Data collection. There were 2 data sets considered, one collected by self-administered pre and post OSE questionnaires and the other copied from the OSE and MCQs results in Community Medicine and PHC at the end of each training rotation. All female medical students, who were in the 5th year during the academic year 1996-1997, were enrolled in the study and given pre and post-OSE questionnaires. Both questionnaire forms were anonymous and thus results of each form were analyzed separately. The pre-OSE questionnaires were filled at approximately 2 weeks prior to any OSE even in other departments while the post-OSE questionnaires were filled after passing the OSE in all the departments of College of Medicine and Allied Health Sciences.

The pre-OSE questionnaire included closed questions on students' knowledge and attitudes towards the objectives, methodology, process and utility of the OSE and if the students have received enough pre-test information regarding this new process and open question on the source of this information. The post-test questionnaire contained similar knowledge and attitude questions, in addition to, closed questions regarding their opinion of the suitability of OSE to all medical specialties in general and Community Medicine in particular and open questions on their evaluation for the OSE in Community Medicine and PHC. Also, students' marks in OSE were compared to their marks in MCQs for Community Medicine and PHC.

Data entry and analysis were carried out using SPSS (version 9.0) for windows. Z-test was used to detect significant difference between 2 proportions. Paired t-test was used to detect significant difference between the mean score in OSE and that in MCQs and coefficient correlation of Pearson (r) was used to detect significant correlation between both results.

Table 1 - Lack of received information on the objective structured examination as reported by 34 5th year female medical students prior to exam.

Lack of received information	N (%)
Lack of information on objectives	22 (64.7)
Lack of information on methodology	23 (67.6)
Lack of information on objective structured examination organization	25 (73.5)
Lack of enough overall information	29 (85.3)

N=number

Table 3 - Attitude of the 34 5th year female medical students towards the objective structured examination before and after passing the exam.

Attitude	Pre-OSE N (%)	Post-OSE N (%)
Requires more studying*	26 (76.5)	11 (32.4)
Long & tiring exam*	28 (82.4)	3 (8.8)
Stressful exam*	29 (85.3)	8 (23.5)
Afraid of the examiner*	32 (94.1)	3 (8.8)
Prefer clinial rather than objective structured examination*	25 (73.5)	4 (11.8)
Suitable for all departments*	11 (32.4)	26 (76.5)
Suitable for Department of Community Medicine*	6 (17.6)	32 (94.1)

OSE=objective structured examination, N=number, *P,0.001

Results. All the 34 5th year female medical students filled the pre and post OSE questionnaires. As shown in **Table 1,** from 64.7% to 73.5% of the students reported that they did not receive any information from the teaching staff on the objectives, methodology and process of this approach and that most of the information received was just chats from their friends or side-talks with the a staff member. Approximately, 85.3% reported that they did not receive enough information on the OSE that they will undertake in a few weeks. **Table 2** shows the knowledge of the 34 5th year female medical students regarding the OSE. Before passing the OSE in any department, few students were aware of its utility as a method of assessment and its advantage in minimizing stress and bias. After passing the exam, students' knowledge regarding OSE markedly improved and 64.7% were aware of the its utility while the majority (70.6%) admitted that it reduces stress and 88.2% were convinced that it was more advantageous than the clinical format in minimizing both the examiner's and the patient's bias.

Table 3 shows the attitude of the 34 5th year female medical students towards the OSE. Prior to the exam, the majority of students felt that the OSE required more studying and complained that it was a long, tiring and stressful method of evaluation. Around 94% were afraid of the examiner and 73.5% preferred the traditional clinical exam. After passing the OSE, all these fears were markedly reduced and only 11.8% preferred the clinical exam rather than the OSE. Prior to the OSE, approximately 32.4% felt it could be suitable for all departments in general and only 17.6% have seen it suitable for community medicine evaluation. Students declared that after passing the OSE, they found it easier than expected and the majority (76.5%) found it suitable for all medical specialties in general while 94.1% believed that it was suitable for community medicine in particular.

After passing the OSE, there was a detectable positive attitude from the 5th year female medical students towards the use of the OSE as an assessment tool for Community Medicine and PHC **(Table 4).**

Table 2 - Knowledge of the 34 5th year female medical students about the objective structured examination before and after passing the exam.

Knowledge	Pre-OSE N (%)	Post-OSE N (%)
Assesses clinical/practical competence*	4 (11.8)	22 (64.7)
Minimizes stress*	6 (17.6)	24 (70.6)
Minimizes examiner & patient bias*	9 (26.5)	30 (88.2)
Reliable, valid & practical*	6 (17.6)	27 (79.4)

OSE=objective structured examiner, N=number, *=P<0.001

Table 4 - Attitude of the 34 5th year female medical students towards the objective structured examination in Department of Community Medicine and Primary Health Care

Attitude	N (%)
Recommend OSE for coming years	31 (91.2)
Met expectation	25 (73.5)
Suitable number of stations	29 (85.3)
Completely satisfied with the exam	25 (73.5)

OSE=objective structured examiner, N=number

Table 5 - Evaluation of the 34 5th year female medical students for objective structured examination in the Department of Community Medicine and Primary Health Care.

Negative Aspects	Positive Aspects
1. No orientation session was given in advance to provide information on the objective structured examination	1. Easy and less stressful than clinical exam.
2. Some questions were long and unclear	2. Gives students more than one chance
3. Use of staff members as simulated patients and examiners at same time increased stress in the corresponding stations	3. The objective structured examination respected all explained subjects during the training rotation
4. Interference by some staff members during the exam had a negative impact	4. Appropriate organization and cooperation of all staff members
5. Long distance between some stations	5. Answer sheet was clear and well organized
6. Time was not enough in some stations and time should be calculated according to requested tasks in each station	6. Fair method of assessment for students

The majority of students (91.2%) recommended OSE in Community Medicine for the coming years. Approximately, 74% declared that the questions have met their expectations and were completely satisfied with the exam and 85.3% found that the number of stations were quite satisfactory. From the students' evaluation for the OSE in the Department of Community Medicine and PHC **(Table 5)** emerged the negative aspects that should be avoided in future exams and displayed the positive attitude towards the OSE in the department.

As regards the students' results in the OSE and MCQs at the end of each training rotation in Community Medicine and PHC, the mean OSE mark (9.2/15marks, SD=1.6) did not significantly differ from their mean mark in MCQs (10.2/15, SD=1.7). Also students marks in both exams were significantly correlated (r=0.537, P= 0.001).

Discussion. The popularity of OSE for assessment of medical students has been increasing in the recent years all over the world[2,7,9] and even in the few studies in the Kingdom of Saudi Arabia.[8] The OSE exam with its 2 components, the OSCE and OSPE, when first implemented in the Department of Community Medicine and PHC of King Abdulaziz University had to be repeated 5 times per year to evaluate every group of students after the clinical rotation. This frequency especially when newly used constituted a true burden on the staff members who were using it for the first time and had to build up their bank of exam stations in a short period of time. Also, this frequency had put an overload on the staff members for the preparation and implementation of the stations. It did not leave enough space of time for staff members either to prepare true patients, prepare simulated patients nor to train the students on the OSE technique. In addition, as there were 10 stations, the OSE demanded at least 10 staff members every session for students evaluation, which was difficult to assure regarding their teaching load and other departmental activities. Moreover, as this was the first experience of the department with the OSE as a method of students' assessment, the staff members did not have enough time to evaluate the OSE technique as compared to other methods of assessments and its suitability for students' evaluation. This could have been reflected on the staff members' attitude towards the OSE and consequently the students. The results of this study have shown that the possible defect responsible for the negative echoes on OSE form the students' side in the College of Medicine of King Abdulaziz University, was mainly due to the insufficient information and training given to them prior to the exam. The fact that made them miestimate the utility of such assessment. However, after setting the exam the majority of students displayed a positive attitude towards the OSE as a method of assessment on undergraduate level. They have also realized the benefits of such process in reducing patient's and examiner's bias as compared to the traditional clinical examination format. These results coincide with previously published students' opinion regarding the OSE.[6,8,10,11]

Moreover, it was seen from our results that after setting the exam, most students were satisfied from the OSE as an assessment tool in medicine in general and Community Medicine and PHC in particular, recommending it for the coming years. Even their evaluation was quite reasonable and objective giving beneficial remarks for improvement of future assessments. Also, there was no significant difference in mean marks between the OSE and the MCQs scores and there was a significant correlation between the marks in both exams. This confirms previously published relationship between types of assessments.[3,12]

In conclusion, the 5th year female medical students did not receive enough information and training regarding the OSE which influenced their attitude towards this method of evaluation prior to the exam. However, after the experience, most of them manifested a positive attitude towards OSE and their scores in the OSE evaluation was comparable to their MCQ scores. It is evident that the OSE requires training and increasing experience for preparation of stations from the staff members' side and training

and experience from the students' side. Thus, canceling the OSE as an assessment tool for medical students after only one year of practice did not give enough space of time neither to develop staff members' skills nor to evaluate this process and its appropriateness for undergraduate medical education. The results of this study recommend further objective research to identify the main causes for disregarding the OSE as an assessment tool for medical students in the College of Medicine and Allied Health Sciences at King Abdulaziz University.

References

1. Tervo RC, Dimitrievich E, Trujillo AL, Whittle K, Redinius P, Welliaman L. The Objective Structured Clinical Examination (OSCE) clinical clerkship: an overview. *S D J Med* 1997; 50: 153-156.
2. Prislin MD, Fitzpatrick CF, Lie D, Giglio M, Radecki S Lewis E. Use of an objective structured clinical examination in evaluating student performance. *Fam Med* 1998; 30: 338-344.
3. Coovadia HM, Moosa A. A comparison of traditional assessment with objective structured clinical examination (OSCE). S *Afr Med J* 1985; 67: 810-812.
4. Jolly BC, Jones A, Dacre JE, Elzubeir M, Kopelman P, Hitman G. Relationships between students' clinical experiences in introductory clinical courses and their performances on an objective structured clinical examination (OSCE). *Acad Med* 1996; 71: 909-916.
5. Frye AW, Richards BF, Philp EB, Philp JR. Is it worth it? A look at the costs and benefits of an OSCE for second-year medical students. *Med Teach* 1989; 11: 291-293.
6. Johnson G, Reynard K. Assessment of an objective structured clinical examination (OSCE) for undergraduate students in accident and emergency medicine. *J Accid Emerg Med* 1994; 11: 223-226.
7. Famuyiwa OO, Zachariah MP, Ilechukwu ST. The objective structured clinical examination in undergraduate psychiatry. *Med Educ* 1991; 25: 45-50.
8. A-Latif A. An examination of the examinations: the reliability of the objective structured clinical examination and clinical examination. *Med Teach* 1992; 14: 179-183.
9. Kilminster SM, Delmotte A Frith H, Jolly BC, Stark P, Howdle Teaching in the new NHS: the specialised ward based teacher. *Med Educ* 2001; 35: 437-443.
10. Lazarus J, Kent AP. Student attitudes towards the objective structured clinical examination (OSCE) and conventional methods of assessment. *S Afr Med J* 1983; 64: 390-394.
11. Black NM, Harden RM. Providing feedback to students on clinical skills by using the Objective Structured Clinical Examination. *Med Educ* 1986; 20: 48-52.
12. Adeyemi SD, Omo-Dare P, Rao CR. A comparative study of the traditional long case with the objective structured clinical examination in Lagos, Nigeria. *Med Educ* 1984; 18: 106-109.