

The exam skills workshop as formative assessment for medical students

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ABSTRACT

Background: The assessment of medical students is a complicated process with medical schools making constant updates. This ensures that assessment is not only comprehensive and robust, but also standardised and fair. Nowadays, there is more stress laid upon the importance of formative assessment in medical schools.

Introduction: Some University of Nottingham students undertake their final year surgical placement at the Lincoln County Hospital. Each rotation has 6 students and runs over 9 weeks with an exam skills workshop being conducted in the final week of the placement as a formative assessment tool. The workshop is a 6 station OSCE conducted using real patients and a number of examiners with varying levels of experience. Candidates have 7 minutes to perform the allocated task in each station, followed by 2 minutes for the examiner to give feedback to the candidate about his/her performance in that particular station.

Objective: To assess the importance of an exam skills workshop as a formative tool for final year medical students at the end of their surgical placement at the Lincoln County Hospital.

Method: All the candidates were asked to complete an anonymous post-exam questionnaire. The results were tabulated on an excel database and then analysed. Student performance in the summative (annual) OSCE was compared against those Nottingham students who had not attended the workshop (control group).

Results: 24 students attended the workshop during the course of the academic year (2010-2011). 75% of them felt that it was reflective of the summative OSCE. 16% of the students felt that the examiners were not being strict with time-keeping in the exam skills workshop, which made this less reflective of the annual OSCE where time-keeping is strict. All the students felt that this experience would help them in coping better with the summative OSCE as they now had an idea about what to expect on the day. Pass rate in the annual OSCE for the students who attended the exam skills workshop was 100% as compared to 83% for the control group (p-value 0.0197).

Limitations: The results are limited by the small number of students who were exposed to this workshop. Another difficulty is ascertaining the extent that the exam skills workshop contributed to the student's overall success in the summative OSCE.

Conclusion: The use of a formative assessment, an exam skills workshop, is valued by students. An exam skills workshop may improve performance in summative assessment. Further research that identifies and controls for confounding factors is needed to confirm this observation.

Keywords: formative, assessment, OSCE, medical students.

Background

The assessment of medical students is a complicated process with medical schools making regular changes in the assessment methodology. This ensures the assessment process is not only comprehensive and robust, but also standardised and fair. The significance of standardisation is especially important for medical schools who conduct their exams over multiple centres, such as the Nottingham medical school. The biggest challenge currently facing medical schools in the UK is to meet guidance from the GMC in 'tomorrow's doctors' [1] particularly stating the competencies expected of new graduate doctors. In addition, the General Medical Council (GMC) has published guidance to medical schools regarding assessment [2].

Introduction

In this article, we will focus on an exam skills workshop conducted for final year Nottingham medical school students who are based in the Lincoln County Hospital for their surgical placement. The Lincoln County Hospital is a busy 599 bed district general hospital that serves the population of North Lincolnshire. Final year medical students are based at the hospital for a period of nine weeks as part of their surgical placement. They are exposed to patients on the wards, in outpatients, as emergency admissions and in theatre. Teaching is in the form of bedside teaching and formal tutorials in the Undergraduate Medical Education Centre. The students are taught by medical staff with varying levels of experience, foundation doctors to consultants.

Here at Lincoln, at the end of each surgical placement, we conduct an exam skills workshop for the final year surgery students as a formative tool in the last week of their placement with us. The purpose of this assessment is not only to point out any weaknesses amongst the students that need addressing prior to their annual exam at the end of the year, but also to provide them with a sense of achievement as to how much they have gained from this placement. Further, this exercise is also meant to give the students a feel of what a real exam scenario might be like.

The assessment is conducted in the form of an Objective Structured Clinical Examination (OSCE) which is nowadays considered as the most reliable form of assessment of clinical skills and its use as an effective formative assessment is well described in the literature [3,4]. An increasing number of skills (history taking, physical examination, technical skills, communication skills and attitudes) are now being tested on an OSCE platform [5]. The traditional Objective Structured Long Examination Record (OSLER) exam has been reported to

have problems with reliability and standardisation [6] and has been replaced by an OSCE in the final year exam for Nottingham medical school students.

A total of six students are examined over six stations in the exam skills workshop conducted at Lincoln. Each station lasts for a total of nine minutes of which the first seven minutes are for the candidates to perform the allocated task, then there is a verbal warning given at seven minutes after which the examiner has to stop the student performing the task and provide personalised feedback. Feedback includes any findings they have missed on the patient, such as a toe amputation. There is a bell at the end of the full nine minutes when the candidate has one minute to move to the next station.

The mark sheets used by the examiners at each station have been designed by the teaching fellows at the Lincoln County Hospital to reflect the Nottingham medical school curriculum.

The exact stations vary slightly with each group depending upon patient availability to attend for the exam. A typical exam would have the following six stations:

- Abdominal examination: This station tests the candidate's skills in abdominal examination on a real patient.
- Vascular examination: This station tests the candidate's ability to examine for peripheral vascular disease on a real patient.
- Surgical history taking: This station tests the candidate's history taking skills using a simulated patient with a common surgical condition such as acute pancreatitis.
- Radiology station: This station comprises of four X-rays that test the candidate's ability to describe abdominal and chest radiographs demonstrating common surgical conditions and to then discuss management with the examiner.
- Counselling and communication skills: This station tests the candidates counselling & communication skills using a simulated patient, for example breaking bad news.
- Acute care: This station tests the candidate's skills in acute assessment & immediate management of an acutely ill surgical patient using a sim-man scenario, such as hypovolemic shock post-laparotomy.

In addition to the above mentioned domains, all the stations simultaneously also assess a number of other skills which include:

- Professionalism
- Ability to demonstrate empathy
- Maintain patient dignity
- Problem solving skills

The examiners utilised for this exam have varying levels of experience ranging from consultants to keen foundation doctors. The reason for having examiners with varying degrees of experience is not only because the availability of six consultants is very difficult to ensure, but also because junior doctors (especially foundation doctors) have recently been through the summative OSCE and are well placed to give advice and a unique perspective to the students regarding the exam [7]. Further, the involvement of junior doctors in the process provides an invaluable opportunity to young doctors to brush up on their teaching skills. Involvement in teaching is a requirement of the GMC [1].

The exam lasts for a total of 1 hour, after which all the candidates and examiners gather for a joint feedback session giving the opportunity for not only the examiners to explain how it all went and what their impressions were of the group, but also giving the opportunity to students to ask questions either in front of the group or separately about their performance.

Objective

To assess the impact of an exam skills workshop conducted for final year surgery medical students as a formative tool to promote learning and improve student performance in the annual (summative) OSCE.

Methods

There are two ways in which we have assessed the value of this particular formative tool and they are as follows:

- Student performance in the annual OSCE (summative assessment): Performance in the annual OSCE of the students who participated in the exam skills workshop was compared to the rest of the University of Nottingham students. Performance of the two groups of students was tabulated using a 2x2 contingency table (table 1) and compared using the Fisher's exact test.
- Feedback from the students: Post-workshop feedback was gathered from the students in the form of an anonymous questionnaire.

Results

24 students in the academic year 2010-2011 attended the exam skills workshop at Lincoln while the rest of the 289 Nottingham University students did not attend.

- Performance of the students in the summative OSCE: All the 24 students who participated in our exam skills workshop passed their summative final year OSCE at their first attempt ensuring a 100% success rate. However, the control group, who were not

exposed to the exam skills workshop, had a pass rate of 83% in the summative OSCE. Fisher's exact test has calculated a p-value of 0.0197 thereby indicating a difference between the two groups of students that is statistically significant. It is not clear how much the exam skills workshop contributed to their success.

- Feedback from the students: All the students completed the post-exam survey (response rate 100%). All the students felt that the exam skills workshop was well organised and that the difficulty level of the assessment was right for their level of experience. Further, all of them felt that the attitude of the examiners was excellent and the feedback provided to them both at the end of their stations and at the end of the exam was valuable as a formative tool to improve their performance in the future. 18/24 (75%) of the students felt that the exam was reflective of their annual OSCE, which is their summative assessment conducted at the end of the entire course (fig. 1). The 25% who did not think it was reflective of the summative OSCE felt this was because of the time difference as in the summative OSCE they would be given only 6 minutes to perform the tasks. Another reason was that 4/24 (16%) of them felt that some examiners were not being strict with time-keeping so they were allowing students to continue performing the task for longer than 7 minutes. Lax time keeping meant that time for feedback was reduced and that the workshop became less reflective of the summative OSCE (fig. 2), where time-keeping is normally very strict. Further, reducing the time for feedback at the end of the station negatively affected the formative aspect of this tool.

All the students felt that this was a very helpful exercise as it exposed them to an OSCE atmosphere, giving them an idea about what to expect from the end of year (summative) exam. They felt more relaxed about the summative OSCE afterwards, as they had a vague idea as to what to expect on the day. They felt that they had a better chance at passing the summative OSCE than someone who had not been exposed to the exam skills workshop.

All the students felt that the most important aspect of the exam skills workshop was the 2 minutes feedback time at the end of each station. This reflects the literature, which states that feedback should be timely and constructive for it to be maximally effective [8].

Limitations

The two main limitation of this study are as follows:

- The small number of students involved with this assessment process (only 24). The reason for this was the small number of final year students who are allocated to come to Lincoln for their surgical placement during the academic year. Only those students who had come to Lincoln to for their surgical placement were involved in the workshop. We did not feel that it was appropriate to have students on other modules attend the workshop as most of them would not have had their surgical placement yet and might not perform as well as those who were on the surgical module. In addition, trying to organise the workshop for a larger number of students would have required more patient and examiner time (which is already difficult to secure).

- It is difficult to ascertain the extent this formative tool contributed to the over-all success of the students in the annual (summative) OSCE. There are multiple confounding factors, for example:
 1. The control group in this study did not undertake their surgery module at Lincoln. The large control group attended the same module in other hospitals for example Queens Medical Centre, Nottingham. This means that their teaching was not identical to the control group. Unfortunately, with students going to different sites, it is impossible to ensure 100% identical teaching due to multiple factors for example different teachers, patient volume, etc.
 2. In addition, the final year summative OSCE has other stations as well which are not covered in the exam skills workshop, for example prescribing. The results of the study do not take into account student performance in individual stations which makes it difficult to correlate these results with the exam skills workshop.
 3. Variables such as the location of the other modules for example medicine and orthopaedics during the final year could not be controlled for which makes the control and experimental group less comparable due to variable experience.

Nevertheless, the Nottingham University has a very comprehensive curriculum that is delivered across its various sites in a very organized fashion, making every attempt possible to ensure all students have a similar experience. For every topic there are learning objectives which are forwarded to all teachers well in advance to make sure the core objectives are met at all sites. In addition, the University of Nottingham has an online portal 'Networked Learning Environment (NLE)' [9] on which teachers from various sites can put up their presentations for the students at other sites to see as well. This ensures all students have access to the material even if they are on a different site. Hence, despite the above limitations, the students at Nottingham do have a similar, if not identical experience, which makes our experimental and control groups comparable to an extent.

Discussion

Assessment in medical education is a topical issue that often starts an extensive discussion. Arguments and debates on assessment in medical education are often based on tradition and intuition. Following traditions is not always a bad thing though as it is good to learn from the past. This fact was very well stated by George Santayana, a renowned philosopher and novelist. He has been quoted as saying 'Those who do not learn from history are doomed to repeat it' [10].

Assessment forms a very important part of medical education. It is widely accepted that assessment not only drives learning [11] but also it affects what students learn and how they learn [12].

These assessments have three main goals [13]:

- To optimize the capabilities of all learners and practitioners by providing motivation and direction for future learning
- To protect the public by identifying incompetent physicians
- To provide a basis for choosing applicants for advanced training.

Generally, there are two main forms of assessment [14]:

- **Summative:** Is an assessment carried out towards or at the end of a course or study programme. The purpose of this assessment is to ascertain how much a student has learnt. This form of assessment is usually formal and is associated with a grade representing the students' performance.
- **Formative:** Is a range of formal and informal assessment procedures employed by teachers during the learning process in order to modify teaching and learning activities to improve student attainment.

In short, formative assessment is an assessment for learning whereas summative assessment is an assessment of learning.

Traditionally, the assessment process in medical schools was purely summative. However, now more importance is being given to formative assessments as it has been recognised that:

- This is an effective way to facilitate student learning [15] and promote deep learning amongst the students [16].
- It helps in identifying any weakness in the student(s) in advance, so that corrective measures may be taken to improve subsequent performance and avoid disappointment when it comes to the summative assessment later on in the year.
- Well-designed formative assessments can predict student performance in subsequent summative assessment [17].
- Exposure to formative assessments improves student performance in subsequent summative assessments [18,19].

Nowadays, all attempts are made to have a formative aspect to even the summative assessments, such as the end of year annual assessments, which were traditionally purely summative, as this has been proven to be a good tool to improve learning [3].

In general, students prefer formative assessments as they value the feedback, consider it as a better tool to encourage deep learning and associate summative assessments with stress and anxiety [20,21]. On the other hand, teachers value the role of formative assessment but also feel it is too time consuming [21].

Indeed, we believe that formative assessments are important and are the way forward, but it is pertinent to note here that summative assessments still have, and should continue to have, a role to play in medical education. Formative and summative assessment do not represent contrasting

but rather complementary approaches to assessment and should be used together to get the optimum result [22].

The general concept behind the exam skills workshop as a formative tool is based upon the Kolb's cycle of experiential learning (fig. 3). In this context, the exam skills workshop is a concrete experience that leads to the students' reflecting on their performance and then developing an action plan for the next time they are faced with a similar scenario. The similar scenario in this case will be the summative OSCE at the end of the academic year.

Conclusion

We feel the exam skills workshop conducted at the Lincoln County Hospital is an effective formative tool, which students' value and which may contribute to their overall success in the summative OSCE. This concept behind the workshop has always been praised by the examiners, who feel it is an excellent formative tool.

The organisation and conduct of such an assessment is not only time-consuming from an administrative point of view, but also has financial and clinical implication as clinicians have to devote time to it to examine, taking them away from their clinical commitments. Further, all patients attending for this workshop, are paid a stipend as courtesy. Despite the administrative and other issues, we feel this tool is effective in facilitating student learning and would encourage the regular use of such formative assessment tools.

Finally, further research that identifies and controls for the various confounding factors is needed to confirm how much this workshop impacts on student performance in the summative OSCE.

Conflict of Interest: None declared.

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Table 1: Summary of results

	Passed annual OSCE	Failed annual OSCE
Attended Exam skills workshop	24	0
Did not attend exam skills workshop	240	49

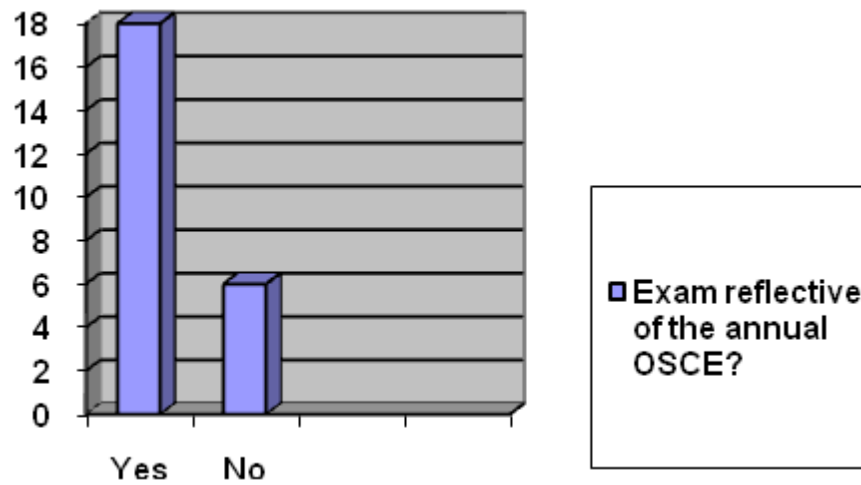


Figure 1: Was the exam skills workshop reflective of the summative OSCE?

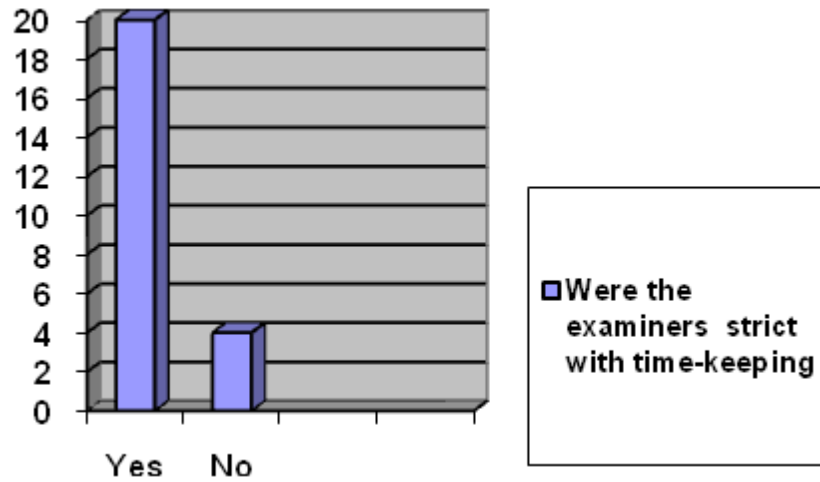


Figure 2: Were the examiners strict with time-keeping

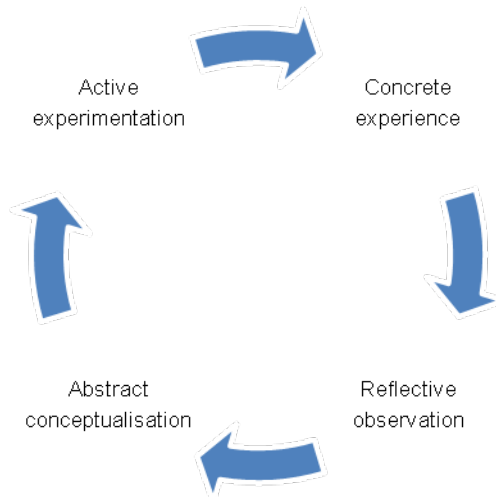


Figure 3: Kolb's cycle of experiential learning