

Objective Structured Clinical Examinations (OSCEs) As Predictors of Performance on Work-Based Placements

Heather Wanstall, Faculty of Life Sciences
London Metropolitan University

Keywords: *OSCE, placements, dietician, assessment*

Introduction

Communication is the key to Dietetic practice but is difficult to measure by traditional assessment techniques such as essay style exams or multiple choice question papers (Pender & de Looy 2004, Rushforth 2006, Oberle & Muma 2008, Rethans et al 1991). Objective Structured Clinical Examinations (OSCEs) were first described by Harden and Gleeson in 1979 when they were used to replace the traditional clinical exams taken by medical students (Harden & Gleeson 1979). Since then they have been widely used in the training of medical and dental students (Rushforth 2006, Oberle & Muma 2008, Johnson & Reynard 1994, Zartman et al 2002) and more recently by other allied health professions and nursing (Rushforth 2006, Austin et al 2003) as a means of testing the acquisition of clinical skills.

OSCEs and have been shown to be both valid and reliable for this purpose when used in the original format of 15-20 x 5 minute test “stations” (Rushforth 2006, Oberle & Muma 2008, Harden & Gleeson 1979, Zartman et al 2002). They now take a variety of forms ranging from 20-30 x 5 minute stations to 4-5 x 20 minute tasks, although the original version described by Harden and Gleeson comprised 16 x 5 minute stations (Rushforth 2006, Harden & Gleeson 1979). The type of task can also vary e.g. case studies giving a series of scenarios which often test problem solving, critical thinking and ethical decision making. Multiple choice quizzes may be used to give a short, sharp test of knowledge or recall. Small scenarios may be used to test patient-centeredness or professionalism e.g. how to deal with a difficult situation. Some stations ask one or more short theoretical questions, similar to a standard exam and others use simulations or role plays giving a chance to assess communication and clinical reasoning, as well as knowledge. Some OSCEs include rest stations where students have a 5 minute break (Rushforth 2006).

Several British Universities offering courses which lead to eligibility to register as a Dietitian use OSCEs as a means of formative assessment (Queen Margaret’s University 2008, University of Plymouth 2008, Quality Assurance Authority 2006). However, none have formally examined the ability of the OSCE to predict which

students will do well on the three compulsory work-based placements, which is where students begin to practise their clinical skills with real patients; and conversely, which will struggle to achieve all of the learning outcomes, therefore requiring extra support.

In view of its social justice policy, London Metropolitan University (LMU) actively encourages applicants from non-traditional backgrounds, therefore attracting a high percentage of mature students, many of whom have been out of formal education for several years or who are returning to education via science access courses. The aim of introducing OSCEs prior to the second of 3 placements was to assess the students' communication skills, as this had been identified as an area of weakness by the practice educators. OSCEs were introduced at LMU in the spring of 2007 for all undergraduate and postgraduate students due to undertake placement B later in that academic year. Students who failed the OSCE would be counselled on how to improve their communication skills prior to attempting their placements.

The aim of this study was to examine the hypothesis that OSCEs are a reliable predictor of performance on placement.

Method

Four stations were set up to represent 4 stages of the dietetic interview and assessment tools were developed using a modified version of those published by Pender and de Looy (2004).

The stations were:

1. Meet, greet and assessment of body mass index
2. Taking a diet history
3. Justifying a plan to a supervisor
4. Writing a report for a referring doctor.

Actors were recruited to play the part of the patients and practicing dietitians, experienced in placement supervision and assessment, played the parts of supervisors and assessors. Nutrition and dietetics lecturers who are registered dietitians, were also assessors. Each station was assessed by two people on 10 factors, using a Likert scale of 1-10, giving a maximum score of 400. The mean of the 4 stations was then calculated to give an overall percentage score.

All students (n=65) who were due to undertake their second placement in 2007 were included in the study. The students were advised that as this was a pilot, failure would not prevent them from progressing to placement, but would result in them being directed to remedial activities.

Results

Sixty-five students took part in the OSCEs on 3 different dates thereby including all students who were due to undertake their second placement in the autumn of 2007 or the spring of 2008. All of the students passed the OSCE. Five students did not progress to placement for a variety of reasons such as changes in personal circumstances or failure to meet the academic pre-requisites. Thirteen students experienced difficulty on placement and required extra support and/ or time. Of these, two were due to ill health. The OSCE scores of the students who did progress to placement are shown below (Table).

Table: OSCE scores of students who progressed to placement

Percentage score range	Number of students
40-49	1
50-59	9
60-69	13
70-79	23
80-89	14
Total	60

Using Spearman's rank correlation test, it was found that there was a weak but positive correlation between the score at OSCE and the outcome of placement ($t=2.56$, $p<0.01$), which would increase as greater numbers of students passed through the process.

Discussion

All of the OSCE formats have strengths and weaknesses, however, almost all of the evidence relating to their reliability and validity as assessment tools relates to the original format of 15-20 x 5 minute stations (Rushforth 2006, Wallace et al. 2002). Any variation from this format weakens the relevance of the original evidence (Rushforth 2006). The most cited way of increasing the reliability of an OSCE is to increase the number of stations, although this must be balanced against the problem of student fatigue (Rushforth 2006). The issue of examiner fatigue may also become a problem with large cohorts of students (Rushforth 2006, Humphris & Kaney 2001) and the cost implications of increasing numbers of assessors must be considered (Zartman et al 2002).

The main advantages and disadvantages of OSCEs are summarised below:

Advantages

- Greater objectivity than most assessment of practice
- Wide range of examiners reduces examiner bias
- Reduced risk of students being assessed by different assessors
- Positively viewed by students and staff
- Broader range of skills tested
- Motivation for learning
- High level of reliability & validity

Disadvantages

- Student stress
- Resources/ complexity
- Confidentiality regarding the stations
- OSCE undermines holism

OSCEs are generally more objective than most other assessments of practice and the wide range of assessors involved reduces the risk of examiner bias (Rushforth 2006). However, all of the examiners require training and descriptors of what constitutes a pass/ fail/ different grade for each of the stations need to be developed (Rushforth 2006, Smee 2003). OSCEs mean that all of the students are assessed on the same task by the same examiners, again reducing bias (Rushforth 2006).

A balance is required between the number of assessors employed and the costs of increasing the number of staff involved. The resource implications of incorporating OSCEs into the assessment process are significant in terms of organisation, staffing, rooms and possibly disposables (Smee 2003). A number of centres videotape the stations to provide a record of the event in case of an appeal (personal communications). It is often argued that OSCEs destroy holism by breaking consultations down into a series of short tasks (Van der Vleuten 2000) but the OSCE only forms a part of the assessment process and assessment of competence on clinical placement still remains the gold standard for assessing a student's ability to translate the theory into practice and draw all of their skills together into a holistic approach.

Grading schemes for OSCEs are controversial with little agreement in the literature as to what is most appropriate (Rushforth 2006, Austin et al 2003, Townsend et al. 2001). Likert scales giving a range of 1-5 or 1-10 need detailed descriptors of what constitutes each level to ensure fairness and reliability. Percentage scores also need descriptors of the different levels and decisions regarding what constitutes the pass mark need to be made and justified e.g. is it acceptable to have a pass mark of 40 or

50% which is usual for most written examinations, meaning that somebody who performs half of a clinical task incorrectly would be passed as competent? Some schemes use a simple pass/ fail system and others use essential and desirable criteria, but all of them need defining and defending. In addition, the consistency of marking has been shown to fall where the tasks are diverse and increase where they are similar (Rushforth 2006). A 40% pass mark was used in this study, in line with the LMU regulations for undergraduate students (London Metropolitan University 2008).

To address the issue of relatively low pass marks still indicating competence, some organisations use the concept of dangerous practice e.g. failure to check the identity of the patient, triggering an immediate fail, or of “killer stations” where activities regarded as crucial have to be performed perfectly to achieve an overall pass (Rushforth 2006). Again, there are divergent views on which tasks are seen as critical, and how much allowance should be made for students’ performance anxiety (Rushforth 2006).

Student anxiety around any changes in the format of the curriculum is generally high (Zartman et al 2002, Frank 2006) and our students exhibited high levels of nervousness during the OSCEs. However, these students will be required to perform reliably in stressful situations on placement and later as healthcare professionals, so to be realistic, an element of stress is appropriate.

To reduce these feelings of anxiety to a manageable level for future cohorts and allow students to perform at their best, however, a number of changes have been made to the process for future years:

- The OSCEs are taken at the beginning of the 3rd year of study, so 2nd year students will be recruited to play the simulated patients meaning that when their cohort comes to be tested, there are members of their group who have previously been a part of the process and can share their knowledge with their peers.
- Two, half day placement/ OSCE preparation sessions will be held in order to allow students to revise and practice the skills that they will be tested on.
- The marking schemes will be published prior to the OSCEs so that the students know what the assessors will be looking for. The actual scenarios will not be published.

Despite the difficulties associated with OSCEs and the doubts cast by several authors over their ability to predict performance in practice (Rushforth 2006, Rethans et al 1991, Townsend et al. 2001), it should be remembered that they were introduced because of problems encountered with other methods of assessing clinical skills (Rushforth 2006).

All of the students passed the OSCE in this study, including those who had been identified informally by academic staff as having weak communication skills. However, the students who had their second placements in the Autumn of 2007, rather than being a single cohort who had been progressing through their studies together, were a collection of individuals who had been delayed in the system for a variety of reasons, such a shortage of clinical placements or failure to meet the pre-requisites at the first attempt. Several of these students went on to experience difficulties on placement, including those whom lecturers had identified as being at high risk of failure but who had passed the OSCE. Of those who scored less than 60% in the OSCEs, only 43% passed the placement, whereas of those who scored more than 70% in the OSCE, 77% were successful at the first attempt. It would appear that the outcome of work-based placements can be predicted to some extent by the OSCE scores, but that the scoring system and the pass/fail criteria need careful preparation in order to reflect the students' abilities accurately.

The limitations of this study are that it only examined one cohort of students at one British university and did not consider other influences on the success or otherwise of this cohort. The examiners were still gaining experience in this style of assessment and may have lacked the confidence to give low scores to poorly performing students. More detailed training of the examiners may have improved this. A small number of OSCE stations were used due to resource limitations, despite the evidence that a greater number improves the reliability and validity.

As a result of this the number of stations was increased to 8 for 2008 and the scoring was changed to a pass/ fail system with the aim of improving the sensitivity of the OSCE as a predictor of outcome on placement. The use of OSCEs to identify students requiring extra support prior to clinical placements, along with other changes to placement preparation, has helped to increase the pass rate for the second placement for LMU students to over 90% for 2008 and 2009. From the feedback received from practice educators, it seems that the profession recognises the value of OSCEs as a way of assessing clinical skills, but there is wide variation in the timing and design of them.

Conclusion

OSCEs can provide a valid and reliable means of assessing the clinical skills of students, however there is no "one size fits all" model and the number and style of the stations as well as the grading system used will have to be devised according to the aims of the examination. It is recommended that the selected model be piloted in any given situation before being fully adopted and that resource implications are fully assessed at the outset (Austin et al 2003).

References

- Austin Z., O'Byrne C., Pugsley J & Munoz L. ((2003). Development and Validation Processes for an objective Structured Clinical Examination (OSCE) for Entry- to-Practice Certification in Pharmacy: The Canadian Experience. *Am J Pharmaceutical Education*. **67(3):**Article 76
- Frank C. (2006). Evidence based checklists for objective structured clinical examinations. *BMJ*.**333**:546-548
- Harden R. & Gleeson F. (1979) Assessment of clinical competence using an objective structured clinical examination. *Medical Education*. **13**:41-54
- Humphris G.M. & Kaney S. (2001). Examiner fatigue in communication skills objective structured clinical examinations. *Medical Education*. **35**:444-449.
- Johnson G. & Reynard K. (1994). Assessment of an objective structured clinical examination (OSCE) for undergraduate students in accident and emergency medicine. *Journal of Accident and Emergency Medicine*. **11**:223-226.
- London Metropolitan University. (2008). <http://www.londonmet.ac.uk/academic-regulations/> Accessed online 03/09/08
- Oberle B. & Muma R. (2008). The OSCE compared to the PACKRAT as a predictor of performance on the PANCE. *Proc 4th Annual GRASP symposium, Wichita State University*. <http://soar.wichita.edu/dspace/bitstream/10057/1594/1/Oberle.pdf> Accessed online 05/03/09
- Pender F.T. & de Looy A.E. (2004). The testing of clinical skills in dietetics students prior to entering clinical placement. *J Hum Nutr Dietet*. **17**:17-24
- Quality Assurance Authority. (2006). <http://www.qaa.ac.uk/reviews/reports/health/uniofchester06.asp> Accessed online 03/09/08
- Queen Margaret's University. (2008). http://www.qmu.ac.uk/registry/docs/DNBS_PG_Dietetics.pdf Accessed online 09/03/09
- Rethans J-J., Sturmans F, Drop R., van der Vleuten C & Hobus P. (1991). Does competence of general practitioners predict their performance? Comparison between examination setting and actual practice. *BMJ*. **303**:1377-80
- Rushforth H.E. (2006). Objective structured clinical examination (OSCE): Review of literature and implications for nursing education. *Nurse Education Today*. **27**:481-490
- Smee S. (2003). ABC of Learning and Teaching in Medicine. Skill based assessment. *BMJ*.**326**:703-706
- Townsend A.H., McIlvenny S., Miller C.F. & Dunn E.V. (2001). The use of an objective structured clinical examination (OSCE) for formative and summative assessment in a general practice clinical attachment and its relationship to final medical school examination performance. *Medical Education*. **35**:841-846.
- University of Plymouth (2008). <http://www.plymouth.ac.uk/courses/undergraduate/3843/BScHonsDietetics> Accessed online 03/09/08
- Van der Vleuten C. (2000). Validity of final examinations in undergraduate medical training. *BMJ*. **321**:1217-1219

Wallace J., Rao R. & Haslam R. (2002). Simulated patients and objective structured clinical examinations: review of their use in medical education. *Adv in Psychiatric Treatment*. **8**:342-348

Zartman R.R., Mc Whorter A.G., Seale N.S. & Boone W.J. (2002). Using OSCE-based Evaluation: Curricular impact over time. *J Dental Education*. **66(12)**:1323-1330.

Biographical note

Heather Wanstall is a Senior Lecturer Human Nutrition & Dietetics in the School of Health Sciences, Faculty of Life Sciences, at London Metropolitan University.

Email: h.wanstall@londonmet.ac.uk