Have OSCEs come of age in nursing education?

Marian Traynor and Despina Galanouli

Abstract

This article is intended to contribute to the current debate as to whether the objective structured clinical examination (OSCE) should become a standard assessment tool for undergraduate nursing education as they currently are for medicine. The authors describe how one UK university developed an OSCE for a nursing undergraduate programme with the aim of emphasising the need for nursing students to be competent in clinical skills and offering a means of standardising the assessment of these skills. There has been an increasing number of research studies carried out in this area at international level and this article's main contribution to the literature is the description of the Angoff standard-setting procedure that was used to calibrate the OSCE at this University and which makes it the first nursing OSCE in the UK to incorporate a scientific standard-setting procedure.

Key words: Nursing education ■ Nursing assessment ■ Clinical competence ■ Calibration

The objective structured clinical examination (OSCE) was first developed for medical education in Scotland by Harden et al (1975), and is now widely accepted as a fit-for-purpose instrument for measuring clinical reasoning skills with a high degree of technical accuracy. It is a practical examination of what the candidate does with the emphasis on assessing components of competence in a structured way, in order to arrive at a technically sound measure of clinical reasoning. Norman et al (2002) refer to the work of O'Connor and McGraw (1994) and Fowell and Bligh (1998) to suggest that the OSCE is widely considered to provide a reliable and valid assessment of clinical skills and is superior to traditional methods based on the physical examination of real patients, the evaluation of oral presentations of cases and written work. The OSCE has therefore been adopted by many universities for the assessment of healthcare competencies (Marshall and Harris, 2000; Wessel et al, 2003) and is generally accepted as a valid assessment tool (Schuwirth and van der Vleuten, 2003) and also as a formative teaching tool (Alinier, 2003).

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McWilliam and Botwinski (2012) argue that a wider range of skills can be tested through an OSCE. In a study to identify the strengths and weaknesses of using an OSCE in a nursing programme in New England, USA, with 60 full-time students, they concluded that:

> **'A well-designed and implemented OSCE can provide students with opportunities to demonstrate interpersonal and interview skills, problem-solving abilities, teaching, assessment skills, and application of basic clinical knowledge.' (McWilliam and Botwinski, 2012: 38–9)**

Rentschler et al (2007) also refer to students' ability to 'think on their feet', when presented with a simulated real-life health issue, as another skill educators can observe during an OSCE.

The importance the OSCE has assumed in nursing education is also evidenced in the increasing number of international research studies aiming to develop and improve the OSCE process. For example, in Australia, such research has resulted in the development of an implementation framework for using OSCEs in nursing (Henderson et al, 2013) and also in the establishment of best practice guidelines for use of OSCEs in order to improve student learning (Nulty et al, 2011). In Sweden, OSCEs have been used as a component of a multi-method assessment strategy in combination with real-life (in vivo) conditions (e.g. bedside observation examinations (Mårtensson and Löfmark, 2013), and in the USA OSCEs have proved effective for multidisciplinary learners (Corcoran et al, 2013). Numerous other studies on the OSCE experience of students and its impact on them and other stakeholders have provided evidence that this type of examination has been judged worthwhile (Brosnan et al, 2006; Rentchler et al, 2007; McWilliam and Botwinski, 2010; Nulty et al, 2011).

Assessment of clinical competence

The study reported in this paper took place at a UK university that implemented a dual-process approach to the assessment of clinical competence in 2002. This approach entailed working in close collaboration with clinical practitioners to develop a robust assessment methodology for clinical skills. The resulting assessment tool combined the validity associated with a performance-based assessment, i.e. a measurement of what the student can do in the practice placement, and the enhanced reliability associated with an OSCE, a competency-based assessment of what the student can do in controlled representations of professional practice (Boursicot et al, 2011; Nulty et al, 2011). The model of clinical competence described

by Miller (1990) with regard to mentorship and assessment was influential in developing this approach.

Developing the OSCE

Aim

The OSCE was developed for an undergraduate nursing programme with the aim of emphasising the need for nursing students to be competent in clinical skills and offering a means of standardising the assessment of these skills. It also aimed to identify students' strengths and weaknesses in skills performance and to enable them to identify future learning needs. More importantly, the OSCE identifies those who achieve a pass standard for clinical skills and who can progress to the next year of their programme. Since originally described by Harden and Gleeson in 1979, the use of the OSCE has become widespread in both undergraduate and postgraduate medical education and also in a number of schools of nursing and midwifery. It is important to note that the OSCE was not implemented in this school in order to replace the assessment carried out by the clinical mentor in practice, but rather it was intended to complement assessment in the clinical setting. This flexibility of the OSCE to be used both as a formative and summative assessment tool has been described as one of its advantages (Nulty et al, 2011; Liddle, 2014). It is emphasised to the students that the acquisition of clinical skills is paramount to the development of a competent safe practitioner and the OSCE is one means to facilitate the learning, teaching and assessment of these skills.

The OSCE in the undergraduate nursing curriculum of this university therefore aims to:

- Contribute to the learning and teaching of clinical skills
- Assess the clinical competency of undergraduate nursing students in a range of clinical skills
- Standardise the assessment process
- Encourage students to develop essential clinical skills in the practice setting
- Identify potentially weak students who may require additional support in clinical practice
- Identify students who can progress to the next year of their studies.

Standard setting

Standards are not only difficult to define; they are also difficult to set. According to Tarrant et al (2009) pass standards for any examinations should be set relative to the difficulty of the test using any one of a number of established absolute standard-setting methods such as the Ebel procedure or Angoff method that define a cut-off score, thereby identifying candidates who are competent and eligible for progression There is no perfect standard setting method and the decision on which method to use is based on the most important criteria for that particular examination (Cizek and Bunch, 2007; Bejar, 2008; Dijkstra et al, 2012). Berk (1986) suggests that there are over 30 standard-setting procedures for an OSCE and one of the most robust is the 'Angoff Procedure' (Angoff, 1971). The Angoff standard-setting procedure normally involves three stages and a minimum of 30 judges in order to minimise error. In stage one, judges consider the test items and make a judgement about a 'minimally acceptable' student's probability of answering each item correctly at the end of a period of training. This is carried out in private, by the judges. During stage two, a sample of students' actual scores is given to the judges and the judges are given the opportunity to reconsider their initial judgements. Again this stage is carried out in private. The third and final stage involves judges clarifying their reasons for the standard they set in stage two and all judges are given the opportunity to revisit the standards set during the second stage.

The cut score is taken as the average of the judgements at the end of stage three and can be defined as the minimum standard of competence to be achieved. By comparing the score the student receives, with the cut score, inferences about the competence of each student can be made. The cut score is therefore of great significance to the assessment tool. If, for example, in the case of an assessment tool designed for nursing students, the cut score is set too low, many incompetent professionals could conceivably attain professional status. Alternatively, if the cut score is set too high, many capable students will fail the assessment and therefore be unable to register with the profession.

Calibration of the pass score

The OSCE has been used in nursing assessment in other UK universities, but there is no published literature to suggest the procedure chosen to set a defensible, reliable standard setting has been addressed. The school in this study chose a modified Angoff (1971) standard-setting procedure to calibrate the OSCE making it, effectively, the first nursing OSCE in the UK to incorporate a scientific standard-setting procedure.

Two panels of experts were established for the standard setting: one consisting of clinical mentors (n=10) who were experienced assessors and one consisting of nurse lecturers (n=20) currently involved in assessing student clinical performance. To encourage full participation from clinical mentors it was made clear to them that the standard setting process was about professional judgement and did not involve assessing students. Ten mentors agreed to be involved.

The participants (judges) were given an outline of the OSCE structure and an explanation of the different stations. At each station candidates are assigned a specific clinical task to perform, for example, they may be asked to measure blood pressure, or provide post-operative care. They may be asked to do this on a simulated patient or on a manikin. This form of assessment does not use real patients but while validity may be compromised, it is not sacrificed, and the design does enhance reliability. Each of the 30 participants (10 mentors and 20 lecturers) was given copies of what would happen at each station and a checklist of the competencies to be assessed at each station. After looking through this information, each participant was given a copy of each of the standard-setting checklists. The standard setting was completed using a modified Angoff approach.

The Angoff-determined passing score is the mean of the passing scores calculated from the second-stage judgement proformas. The passing score was found to be 648 (the maximum score on the OSCE was 750). The passing score therefore was the judges' standard (648) minus two

standard errors of measurement (SEM). If no SEM is added to the cut score the probabilities of making two errors are approximately balanced. These are when a passing student is failed or a failing student is passed. Adding one SEM makes the likelihood of failing a passing student about five times more likely than passing a failing student. Adding two SEM makes the likelihood of failing a passing student about twenty times that of passing a failing student.

Following adjustment for test fallibility, a passing score of 600 (80%) was established for the first year nursing OSCE (the same process was employed for the second year nursing OSCE with a pass score of 70%). The second year OSCE stations were testing higher-order clinical skills.

Implementation

The university has two intakes of nursing students each year, which means that 400 students undertake an OSCE during the first year of the undergraduate programme. Typically, in the first year OSCE there are seven individual stations lasting 5 minutes each and they include measuring blood pressure, recording vital signs and urinalysis. In the second year there are ten stations lasting 10 minutes each and include post-operative care, recording and interpreting Glasgow Coma Scale scores.

Preparation of students

Research suggests that student preparation for the OSCE, as well as subsequent feedback on their performance, is crucial for a successful OSCE process. For example, findings of a qualitative study by Cazzell and Rodriguez (2011) on the experiences of nursing students with the OSCE suggest that some students experienced high levels of stress and a loss of control, which they related to lack of preparation. Students have also reported that they failed to make the connection between the OSCE experience and future clinical practice owing to the lack of immediate feedback (Liddle, 2014; Cazzell and Rodriguez, 2011).

Student preparation therefore plays an important role when planning an OSCE, and the school of nursing and midwifery where the nursing OSCE was developed takes the measures described below to ensure student familiarity with the assessment procedure, in an attempt to reduce potential stress and anxiety:

- All students on the undergraduate nursing programme are made aware of the format of the OSCE and that it is part of the assessment process for the clinical modules
- Lecturing staff meet with the students to offer advice and answer questions related to the administration of the OSCE examination
- Information on the OSCE is posted on the student resources pages of the virtual learning environment (VLE); this includes a short video of a typical OSCE. Students are therefore made aware of the range of clinical skills that could be tested in the OSCE. Students are made aware of the fact that they can schedule sessions in the clinical skills education centre to practice and refine specific skills
- Students are advised that they must present for the examination in uniform with a valid student identity card
- The date and time of the examination are posted on the student resources pages of the University's VLE.

Preparation of OSCE assessors

From the beginning of the nursing OSCE-development process, the school recognised the importance of involving clinical mentors in the assessment process. A partnership approach was adopted and both clinical mentors and nurse lecturers were invited to act as examiners for the OSCE. It is important to note that, while other professional bodies, such as the General Medical Council (GMC), set out clear guidelines on the roles and responsibilities of assessors in OSCEs (GMC, 2009), no such guidelines exist within the Nursing and Midwifery Council (NMC). It is therefore the responsibility of each higher education institution to develop their own standards and guidelines. However, the NMC does recommend the OSCE for the assessment of medicines administration (Liddle, 2014) and, notably, the latest NMC guidelines on overseas competency testing for UK registration have included the OSCE as a practical assessment (NMC, 2014).

The school promotes consistency in the operation of its OSCEs by inviting all OSCE examiners to attend a briefing session before the examination. Examiners are fully briefed on the nature of the examination, i.e. the number of stations, the pass score and the compensatory aspect of the examination (the pass mark is aggregated across the stations and therefore a student may do less well in one station but can compensate in another). They are also advised of their roles and responsibilities and are shown the marking criteria for each station, with a detailed question and answer session for any queries they have.

This school recognises that the organisational aspect of the OSCE is very demanding and has therefore assigned specific administration support to academic staff in the planning and execution of the OSCE. The school has invested in an optical computerised reader to assist in the scanning of the OSCE papers and calibration of results. The School administrator attends regular meetings to agree the stations, to timetable the examiners and to timetable the simulated patients who are at the different stations in the OSCE. The clinical allocations manager in the school is advised of the OSCE dates and circulates the dates to the clinical areas so that mentors can put their names forward to act as examiners. Mentors who participate in the OSCE are provided with a certificate and this is recognised as evidence to support mentorship updates. Currently the school has in excess of 200 mentors on the OSCE examiners' database. Mentors cite the OSCE as not only providing them with insight into the undergraduate

KEY POINTS

- Objective structured clinical examinations (OSCEs) offer the potential for highly valid and reliable assessments of clinical practice
- The high reliability of OSCEs is warranted by a standard setting procedure such as Angoff
- OSCEs may be used formatively (to improve learning) or summatively to determine competence
- OSCE-development benefits from a partnership between clinical mentors and nurse lecturers

curriculum but also credit the OSCE with encouraging students to concentrate on achieving competence in clinical skills while on practice placement.

Conclusion

The role of the nurse is changing and will continue to change alongside the needs and expectations of patients. Now more than ever there is a need to demonstrate to the public that higher education institutions with a responsibility for undergraduate nurse education are prepared to invest in implementing procedures that ensure nursing students are tested using the best assessment methods available.

Since their original development OSCEs have become established as one of the main methods of assessing clinical competence in medical education (Gormley, 2011). This is not replicated in nursing education where the uptake is sporadic and, according to Rushforth (2007), in some HEIs the OSCE process has been subject to major adaptations which may have undermined important elements of the original model. Although the OSCE is not without its critics, the potential for high reliability (Swanson 1987; Swanson and van der Vleuten 2013) and the emerging evidence on its increased validity (Petrusa 2002, Downing 2003), cannot be ignored, making it a valuable assessment method.

The challenge, therefore, is to persuade those with responsibility for validating nursing curricula within the UK to adopt the OSCE in combination with other methods, as a standard assessment tool for undergraduate education. It is important to note that the OSCE does not provide a complete profile of a student's level of competency but there is enough evidence to support the adaptation of the OSCE as one method to assess competence. This will also require those higher education institutions who have a responsibility for undergraduate nurse education to invest in the OSCE as means of not only achieving excellence in education but also ensuring public confidence in the profession. There are cost implications, of course, as good assessment methods are resource intensive. However, as van der Vleuten (1996) argued, investing in assessment is investing in teaching and learning; good assessment will facilitate good learning. Ultimately, therefore, good assessment methods are more likely to produce nurse graduates who are not only academically qualified but also have the required proficiencies at the point of registration; something which the NMC require and the public demand. BJN

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