

The Objective Structured Clinical Examination (OSCE): Optimising its value in the undergraduate nursing curriculum.

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KEYWORDS

Objective assessment, real world competence.

ABSTRACT

This article explores the use of the Objective Structured Clinical Examination (OSCE) in undergraduate nursing education. The advantages and limitations of this assessment approach are discussed and various applications of the OSCE are described. Attention is given to the complexities of evaluating some psychosocial competency components. The issues are considered in an endeavour to delineate the competency components, or skill sets, that best lend themselves to assessment by the OSCE. We conclude that OSCEs can be used most effectively in nurse undergraduate curricula to assess safe practice in terms of performance of psychomotor skills, as well as the declarative and schematic knowledge associated with their application. OSCEs should be integrated within a curriculum in conjunction with other relevant student evaluation methods.

INTRODUCTION

Assessment of clinical competence is an essential requirement of health professional education. Since its development in the 1970s, the Objective Structured Clinical Examination (OSCE) has gained acceptance as a benchmark for clinical skills assessment (Bartfay, et al 2004). The OSCE is defined as “an approach to the assessment of clinical competence in which the components of competence are assessed in a well planned or structured way with attention being paid to objectivity” (Harden 1988, p. 19), or as an assessment of well-defined clinical skills (Ward & Willis 2006). An OSCE requires each student to demonstrate specific skills and behaviors in a simulated work environment with standardized patients. It typically consists of a circuit or series of short assessment tasks (stations), each of which is assessed by an examiner using a predetermined, objective marking scheme (Bartfay et al 2004; Major 2005; Ward & Barratt 2005). The OSCE has become a well-established method of assessment in medical education (Ward & Barratt 2005) and is increasingly being used as a method of assessment in nursing and allied health curricula (Bartfay et al 2004; Wessel et al 2003).

A framework for the development of clinical competence has been described (Miller 1990) which outlines four levels at which a learner can be assessed: *knows*, *knows how*, *shows how* and *does* (see Figure 1). The OSCE conforms to the third *shows how* level of Miller’s pyramid (see Figure 1) which focuses on assessment of performance of specific skills in a controlled setting (Hamdy 2006; Issenberg et al 2005; Schuwirth & van der Vleuten 2003; Selby et al 1995). This makes it particularly relevant for the early stages of undergraduate curricula, where assessment comprises compartmentalized exercises (Friedman Ben-David 2000).

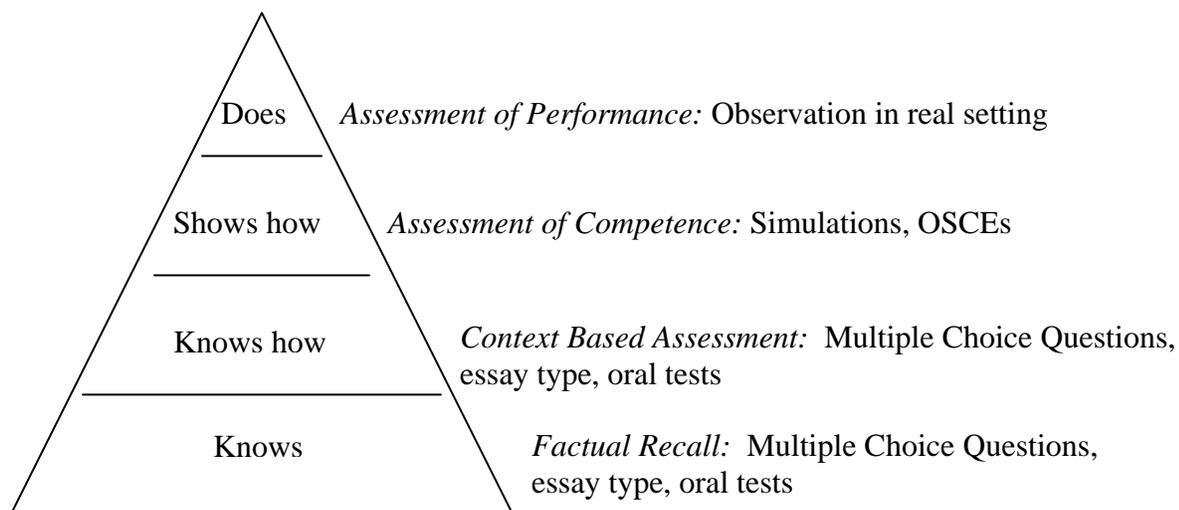


Figure 1. The Development of Clinical Skills / Competence / Performance (adapted from Miller 1990)

Furthermore, as a method of clinical skills assessment, the OSCE possesses a number of intrinsic advantages. Firstly, it can include both summative and formative components, in which a judgment or evaluation of an individual's performance is made (summative) followed by the provision of feedback, from which the student can learn (formative) (Taras 2005). Secondly, because each student is required to demonstrate specific behaviors in a simulated work environment, strict control over the clinical context is possible, while at the same time, reflecting real-life professional tasks. This control eliminates the 'luck of the draw' problem that arises when students are assessed within the 'real-world' clinical environment with actual patients (Bartfay et al 2004) as well as the risk of harm occurring to a patient. The underlying premise is that such standardised procedures ensure objectivity and maximise reliability in assessment (Bartfay et al 2004; Major 2005).

The purpose of this paper is to review and evaluate the range of approaches and applications of OSCEs in health professional education, and to make recommendations as to how OSCEs may best be used in the assessment of nurse undergraduates. In doing so, we discuss the differences between examinations undertaken in a simulated environment versus the 'real world' in the evaluation of student performance as well as the performance and cognitive level at which nurse undergraduates function. These considerations assist in delineating the competency components or skill sets that best lend themselves to evaluation by OSCEs.

APPLICATION OF THE OSCE TO NURSE EDUCATION

Since its inception in 1979, the OSCE has become widely recognised as an effective assessment instrument, both in terms of the types of skills tested and the number of tasks that can be incorporated into the assessment. The original OSCE (Harden et al 1975) comprised a series of 16 to 20 stations, with each station taking approximately five minutes to complete, and was specifically focused on clinical skills assessment of medicine students. Since then, however, the OSCE has been adapted for use in other health professional curricula, particularly nursing. Many of these adaptations feature longer, fewer stations or case scenarios that concentrate on a total patient consultation (Bujack et al 1991a). Typically, total patient format comprises one integrated station of approximately 30 minutes or longer. This latter approach has been referred to as an Objective Structured Clinical *Assessment* (OSCA) because of its more complete and holistic assessment rather than a specific, focused examination or evaluation of a sub-component of a patient assessment (Ward & Willis 2006; Rushforth 2007).

Applications of OSCEs with its many stations with the focus on specific tasks or skills vary from the single integrated assessment station of an OSCA which provides an holistic patient assessment (Major, 2005). The OSCA single station integrates many areas such as communication skills, observation and recording of vital signs, assistance with personal hygiene, movement from bed to chair, observations, and reporting of wound status. Khattab and Rawlings (2001) report using a two-component OSCA for student nurses: one for tasks (skills assessment) and one for questions (knowledge assessment). The emphasis in the first component was on techniques and communication skills; and in the second on the clinical findings and their student's interpretation of these findings. Students were required to perform a whole examination including a general examination of cardiovascular, respiratory, nervous, and musculoskeletal systems and the abdomen and glands. Students were then questioned on three levels of cognitive activity: knowledge of anatomy and physiology, clinical reasoning, and the relationship of the physical examination to clinical significance.

However, the multi-station OSCEs have also been used for undergraduate nurse students to assess not only advanced clinical practice skills but also student's interpretation of these findings. Ward and Barratt (2005), developed a 10-station OSCE consisting of three physical examination stations, three history taking stations, three communication stations (incorporating interpretation and giving a laboratory result, patient management, patient education / health promotion, and exploration of a problem relating to mental health), and one question-and-answer station. Others have used even larger OSCEs - up to 20 stations - with a wide array of skills being incorporated for evaluation (Chesser et al 2004; Wilkinson et al 2000; Humphrey-Murto & MacFadyen

2002). In short, there is a broad variety in the application of the OSCE, ranging from assessment of the purely technical - evaluating brief tasks or students' acquisition of skills, to assessment of professional competence - evaluating intellectual components such as clinical judgment and/or integration of a range of skills and knowledge (refer Table 1).

Table 1. Clinical assessment formats and components in health professional education

Author	Target population for assessment	Skills / competency components used.	Examination format
Khattab & Rawlings (2001)	Undergraduate Nurse students	General examination of the patient as well as examination of cardiovascular, respiratory, nervous, and musculoskeletal systems and of the abdomen and glands (task station); knowledge and critical thinking (question station).	OSCA; 2 stations: a task station duration 70 minutes; and a question station duration 40 minutes
Ward & Willis (2006)	Masters level nurse students	History taking; physical examination; clinical reasoning and diagnosis (2 parts): questions evaluating underpinning knowledge related to physical examination and decision-making and rationale; interpretation of investigations; and treatment and management.	OSCA: 2 long cases, each of one hour duration
Brosnan, Evans, Brosnan & Brown (2006)	First and second year nurse undergraduate students	First year: Blood pressure station, CPR station, short question station; Second year: Moving and handling station, CPR station, question station.	OSCE: 3 stations; each of 5 minutes duration
Wessel, Williams, Finch & Gemus (2003)	Undergraduate physiotherapy students	Skills in patient communication and assessment; safe technique; treatment skills for chronic musculoskeletal conditions.	OSCE: 8 stations each of 5 minutes duration
Humphrey-Murto & MacFadyen (2002)	Fourth year Medical students	Skills evaluated related to 8 types of stations/ subject areas: infection, cardiac, diabetes, surgery, pediatrics, neurology, psychiatry and respirology.	OSCE: 10 stations, 2 of which were written stations
Ward & Barratt (2005)	Final year undergraduate nurse students:	Interpersonal and communication skills; history-taking skills; physical examination of a specific system; mental health assessment; clinical decision making.	OSCE: 10 stations, each of 10 minutes duration
Selby, Osman, Davis & Lee (1995)	Medical undergraduate students	Fundoscopy; cardiovascular examination; blood pressure measurement; respiratory examination; urine analysis; knee joint examination; cardiovascular history; abdominal examination; neurology: deep tendon reflexes; respiratory history.	OSCE: 10 – 15 stations; each of 6 minutes duration
Chesser, Laing, Miedzybrodzka, Brittenden & Heys (2004)	Medical undergraduate students	4 history-taking and/or communication stations: haematemesis, lower abdominal pain, palpitations, dealing with a request for a sleeping tablet; 4 physical exam stations: chest, cardiac, neurological and abdominal; 3 interpretation of investigations stations: chest x-ray, prescribing warfarin, paediatric growth chart; 1 basic life support station.	OSCE: 12 stations; each of 5 minutes duration
Wilkinson, Newble, Wilson, Carter & Helms (2000)	Medical undergraduate students	Patient assessment, management and/or education (including taking a focused history, examining, performing a procedure, forming a differential diagnosis, estimating disease severity and/or selecting/interpreting investigations).	OSCE: 18 stations, each of 5 minutes duration

Validity and Reliability

Intuitively, it makes sense to use OSCEs (i.e. many stations) because they have high face validity (Newstead 1992), that is, both students and examiners see them as measuring skills relevant to clinical practice. Moreover, a large part of the success of the OSCE in its original form was because it was found to be more reliable and valid than other more traditional forms of clinical assessment, such as long cases and viva voce examinations (Bartfay et al 2004; Brosnan et al 2006; Harden & Gleeson 1979). However, despite consistent findings of high face validity (Ward & Barratt 2005; Brosnan et al 2006; Bujack et al 1991b), the large number of adaptations has resulted in inconsistencies in the reliability and validity of the OSCE, which have been well documented (Rushforth 2007). To overcome these and ensure acceptable reliability and content validity, a recurring recommendation in the literature is to include a larger number of short stations (approximately five minutes) (Schuwirth & van der Vleuten 2003; Selby et al 1995; Bartfay et al 2004). In particular, the need for more rigorous evaluation of OSCEs in nurse education programs has been highlighted (Khattab & Rawlings 2001; Brosnan et al 2006), as these assessments are directed towards assurances that passing students can practice safely in the clinical setting with patients.

Appropriate Use of OSCEs

Given the wide variety of assessment tasks to which the OSCE has been applied, there is a need to explore how and where they may best be used within the nurse undergraduate curriculum (Salas & Burke 2002). In addressing this issue, it is particularly

important to consider the effect on reliability and validity of using the OSCE for different types of assessment tasks.

Four essential areas of revising competence will now be discussed in relation to OSCEs.

i) Measuring context-reliant competence: Nursing is a dynamic process that constantly changes in response to a variety of social contextual influences making it difficult to replicate within an examination context (Benner 1984; Hodges 2003a; McMullen et al 2003; Piercey 1995). McMullen et al (2003) argue that if the objective of the assessment is to obtain an holistic perspective of competence, then complex combinations of knowledge, skills, attitudes and values need to be brought together in context-specific situations that incorporate interacting contextual factors and ethics. A case in point is the myriad of organizational demands, for example staffing and availability of appropriate resources, placed on a nurse that may mediate the nature of the nurse's critical thinking ability and behaviour, at a specific point in time. Evaluating critical thinking skills such as problem-solving, clinical reasoning, decision-making, by simulated assessment cannot capture the complex and changing nature of organizational demands (Benner 1984). Insofar as the OSCE is unable to take account of interacting contextual factors that are common in the clinical environment, this presents a major limitation with regard to its predictive validity when used for this purpose. Although an important advantage of the OSCE is its ability to provide a standardized clinical assessment, it is this very advantage which prevents it accommodating the myriad cultural, economic and sociopolitical contexts that exist within the larger clinical nursing context (McGrath et al 2006). In other words, the level of competence in critical thinking

as assessed by an OSCE is unlikely to fully reflect the student's ability to competently apply critical thinking in the real-life clinical setting.

ii) Measuring Competence versus Measuring Performance: Circular logic is an important factor that affects the predictive validity of all forms of observed assessment including the OSCE, and highlights the difference between assessment of competence and the assessment of performance. OSCEs assess the presence of behaviours that the OSCE itself has the proclivity to affect (Hodges 2003a). To illustrate, sociologist Goffman (1959, cited in Hodges 2003b), notes that when emphasis is placed on performance of a social interaction such as ensuring a patient's psychological comfort through the use of effective communication and interpersonal skills and empathic treatment, individuals become adept at altering their performance to portray an interaction they believe would demonstrate their competence. That is, the examination context itself may encourage the individual to behave in a socially desirable manner which may not truly reflect the way the individual would perform in a real world situation. Thus, one may query the extent to which OSCEs adequately assess some psychosocial skills sets / competency components and consequently query the OSCE's predictive validity for these types of competencies.

iii) Measuring Professional Behaviour: Nursing practice is complex, consisting of a mix of different competency components. Some, such as technical skills, are essential for safe practice, are readily quantified using standardized instruments, while others require a more qualitative approach (McGrath et al 2006). For example, there are difficulties inherent in measuring the construct of caring – a core component of nursing practice (McGrath et al 2006). Specifically, an OSCE may not be able to adequately

assess the range of behaviours within the concept of caring. As Bartfay et al (2004, p.19) state, “the completeness of an examination depends on the number of behaviours sampled”; and as McGrath et al (2006) illustrate further, the aspects that are assessable in an OSCE may not be sufficient to confirm (or refute) that the nurse is in fact, a caring nurse. Thus, the assessment of complex and essentially subjective constructs, such as caring, empathy and other interpersonal skills are vulnerable to findings of low validity and poor inter-rater reliability within an OSCE. Again, contextual information is needed to judge the appropriateness of a nurse’s behaviour; therefore the extent to which psychosocial constructs, such as caring, are appropriate for evaluation via the OSCE approach is questionable.

iv) Measuring Integration of Skills: Another concern that needs to be addressed when developing an OSCE is its potential to reduce nursing practice to a mere set of tasks to be performed, raising concern that the patient will not be viewed as a whole (Brosnan et al 2006; Major 2005). To overcome this matter, Bujack et al (1991a) recommended structuring the assessment such that all stations relate to one scenario (the long case), reflecting the philosophy of holistic patient care. They reported that this could enable students to “integrate a range of knowledge and skills and to demonstrate the use of these in planning, implementing and evaluating care given in response to a single patient encounter” (Bujack & Little; cited by Major 2005, p.443).

The concept of assessing integration of skills in nurse undergraduates contravenes Benner’s (1984) Novice to Expert taxonomy which describes the development of competence. Benner defines the performance of junior undergraduate nurses as being at the novice level, where the focus is on remembering rules with little or no attention being

paid to contextual factors. Specifically, novices concentrate on learning discrete, context-free skills such as measuring patients' weight, recording fluid intake and output, temperature, blood pressure, pulse and other such "objectifiable, measurable parameters of a patient's condition" (Benner 1984, p.20). Benner's conclusion that nursing students operate at the novice level has been echoed by others (Ellerton & Gregor 2003; Fisher & Parolin 2000; Pigott 2001; Watkins 2000) and includes recognition of an approach to nursing practice that is largely procedural (Ellerton & Gregor 2003).

Major (2005) acknowledged the benefits of assessing discrete skills for novices, and introduced workstation activities such as urine testing, injection technique and resuscitation technique, as well as the skills required for safe practice prior to students' first clinical placement, including hand washing, basic life support and safe manual handling (Major 2005). For second year undergraduates, Major (2005) recognises taxonomies of learning through the use of OSCEs where more complex skills are divided into a series of related steps. Similarly, Friedman Ben-David (2000), who has contributed significantly to developing protocols for OSCE construction, recommends an approach similar to Major (2005) where simulations in assessment should progress from discrete to integrated abilities, as the student progresses through their degree. Not only is this recommendation in line with Benner's Novice to Expert taxonomy (Benner et al 1996), it also supports the notion that an important requirement in using OSCEs is to ensure that the level of the assessment task is consistent with the expected level of performance and limited clinical experience, rather than attempting to take an integrated holistic approach which incorporates more complex cognitive processes such as critical thinking.

Matching Assessment to Expected Level of Competence

Three factors indicate that at the undergraduate level, OSCEs are best used for the assessment of discrete psychomotor skills –Firstly, that undergraduate nurses operate towards the novice end of the novice-expert continuum. Secondly, that nurses must be sufficiently competent for safe practice prior to clinical placement, and finally acknowledgement of the difficulties of replicating a real-world clinical environment in an examination context. (Borbasi & Koop 1993; Bartfay et al 2004). Students may possess procedural knowledge (“knowing how”) without declarative (“knowing that”) or schematic knowledge (“knowing why”) (Burnard 1987; Shavelson & Huang 2003). For instance, a student might know how to administer an intravenous antibiotic without knowing why it was given or knowing that certain complications may develop due to its administration (Burnard 1987). To ensure that assessment encompasses conceptual understanding as well as dexterity and precision of movement, assessing psychomotor skills in combination with the knowledge that underlies their safe application is recommended with the understanding that synthesis of the two types of knowledge does occur – more often towards the end of a unit of study (Khattab & Rawlings 2001).

SUMMARY AND CONCLUSION

In summary, it is argued that at the undergraduate level, it is the concrete, measurable aspects of clinical performance that are best assessed by the OSCE. Using OSCEs primarily to assess technical skills and the underlying knowledge required for their safe and accurate application also minimizes the impact of context specificity and circular logic. That said, the recommendation to utilize the OSCE for this purpose is not

to underestimate or deny the importance of assessing competency components such as critical thinking skills, interpersonal / communication skills; and certainly not to deny the need to ensure that nursing students are able to view the patient as a whole. What is apparent is the need for a variety of assessment methods to capture the diverse nature of nursing practice. Thus, it is essential to consider the recommended use of the OSCE prescribed here, within the wider context of nursing curriculum evaluation models. It is only by utilising a variety of appropriate assessment strategies, that a rigorous and valid assessment of the competency of an individual can be achieved.

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