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The Use of OSCEs in Nursing Education: A Review Paper

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Abstract

***Background*:** Objective structured clinical examinations (OSCEs) are effective clinical evaluation method. In nursing education OSCEs have been used in a limited way with few reports at the graduate level. ***Objective*:** This paper is a review of the literature presenting the advantages and disadvantages of using OSCEs in advanced nursing education. ***Method*:** Nine studies from advanced practice education and eight studies in undergraduate education were reviewed for advantages and disadvantaged of OSCEs/SPs. ***Results*:** OSCEs are objective, valid, reliable and offer opportunities for students to practice wide range of clinical skills. However, OSCEs are expensive and constitute a source of anxiety among students. Nevertheless, students valued the OSCE experience and educators confirmed that its benefits outweigh its cost. ***Conclusion*:** The advantages of the OSCEs are greatly supported in the literature. However, OSCEs are better used in addition to, not to replace, the currently used methods.

Keywords: "Nursing education", "OSCE", "Standardized patients".

INTRODUCTION

Evaluating the clinical performance of nursing students has been a long standing area of debate in the nursing education arena. Nursing educators historically have been challenged to find the most effective evaluation methods that can objectively and reliably assess clinical performance of nursing students at all levels of education (Eldarir & Abd el Hamid, 2013; Hatamleh & Abu Sabeeb, 2015; Katowa-Mukwato, Mwape, Kabinga-Makukula, Mweemba & Maimbolwa, 2013; Kurz, Mahoeny, Martin--Plank, & Lidicker, 2009; O'Connor, Albert, & Thomas, 1999; Ward & Willis, 2006). In addition, nursing students frequently have had difficulties integrating the knowledge they learn in classrooms into clinical practice (Ajani & Moez, 2011). Therefore, faculty members are continuously investing their efforts into finding and developing teaching methods that can reduce the gap between acquiring theoretical knowledge and applying it in clinical practice. For the aforementioned issues, educational institutions at all levels have implemented creative evaluation approaches such as the objective structured clinical examination (OSCE) and standardized patients (SP) (Ebbert & Connors, 2004; Hatamleh *et al*., 2015; Khattab & Rawlings, 2001; Kurz *et al*., 2009; Ward & Willis, 2006).

At the advanced practice level, evaluation of clinical skills is critically important since nurse practitioners (NPs) are expected to practice a broad scope of clinical skills such as history taking, assessment, and diagnosis. Thus, NP educators have the responsibility to ensure that NP students graduate with the adequate knowledge and skills that are crucial for safe and high quality practice (Clark, 2015; Ward & Barratt, 2005). This paper reviews the current literature related to the use of OSCE/SPs in nursing education specifically at the graduate level. The objective of the review is to provide a summary of the advantages and the drawbacks of using OSCE/SPs in NP programs. Moreover, the paper will conclude with recommendations on the use of OSCEs/SPs in NP education supported by evidence from the literature.

METHOD

The first author searched Science Direct, CINHAL, and Cochrane using phrases such as "OSCE in nursing education" and "OSCE use in NP education". The review included seventeen articles published from 1999 to 2015. Nine articles were implementations of OSCEs/SPs in NP education in the U.S. and U.K. Eight articles were cross sectional and quasi experimental studies on the use of OSCE in undergraduate nursing education done in the U.S., U.K., Jordan, Egypt, Saudi

Arabia, and in Zambia. At a graduate level, publications are limited and dated. On the other hand, there are more studies on the use of OSCE/SPs at an undergraduate level and the reports are relatively recent.

BACKGROUND

OSCEs are defined as "a circuit of assessment stations, where a range of clinical skills are assessed by an examiner using a previously determined objective marking scheme" (Selby, 1995, pp.1187). Harden (1975) was the first to describe OSCEs to assess clinical skills of medical students. Harden designed OSCEs in an attempt to find an alternative evaluation method that is more reliable and valid as compared to the traditional methods that were in use (Harden & Gleeson, 1979). An integral part of the OSCE, that can also be used as an evaluation method by its own, is standardized patients (SPs). SPs are defined as "Lay persons who are given detailed case history and trained to portray it" (O'Connor *et al*., 1999, pp.241). In the 1960s, Barrows (1993) realized that the hospital unit in which he was teaching was busy enough to not offer him the chance to observe all of his students by himself. Therefore, Barrows developed SPs approach to better assess students' clinical and interpersonal skills (Barrows, 1993). During OSCEs, students are assessed as they move from one station to the other. The implementation of OSCEs/SPs varies from school to school. Generally, in one station students will be presented with a clinical case portrayed by a standardized patient or in a case study format. Then students will be asked to examine the case. In a following station students will be asked to answer questions related to the previous case either in writing or verbally. The number of stations usually ranges between 6 and 10. The duration of each station also varies according to the content and the skills being tested. In each station students are evaluated by one or more than one examiner using a predetermined grading criteria (O'Connor *et al*., 1999). Schools of medicine across the world have been using OSCE for over than 30 years (Clark, 2015). In nursing, however, the use of OSCE /SP has been limited with majority of the work done on the undergraduate level (Khattab & Rawlings, 2001; O'Connor *et al*., 1999).

The use of SPs/OSCE in NP education is dated to 1984 at the University of Washington and University of Pittsburg (McDowell, J., Nardini, D. L., Negley, S. A., & White, J. E., 1984). According to Khattab & Rawlings (2001), the Royal College of Nursing in the U.K. was the first nursing school to incorporate the OSCEs in NP education. Although the use of OSCEs/SP in NP education have gained popularity within the last 20 years, their use is less frequently reported (Ward & Barratt, 2005).

RESULTS

In all the studies included in the review, the use of OSCEs and SPs in NP education was shown to have the following advantages:

1. Guided by learning theories:

The theoretical framework that underpins OSCEs and SPs is influenced by long standing learning theories such Reilly & Oermann's work on clinical teaching in nursing, Bloom's taxonomy, Guba & Lincoln's constructivism theory, and Gangne's nine levels of learning.

Based on Reilly & Oermann (1990), skills are classified into cognitive and psychomotor skills and it is hard to evaluate one without the other. Actions are results of integration of the knowledge we have about why we do things and how we do it. Therefore, testing students using only one method such as writing exams will not reflect such an integration (Kattab & Rawlings, 2001). In OSCEs/SPs encounters, students' knowledge and psychomotor skills can be tested at the same time, whereas, in written exams faculty can only assess knowledge acquisition.

According to Bloom's taxonomy, learning goals are categorized into six domains ranging from simple to complex knowledge, comprehension, application, analysis, synthesis, and evaluation (Slavin, 2003). The incorporation of various assessment methods in different stations such as in OSCE/SP encounters allows educators to test more than one domain (Rushton & Eggett, 2003).

According to Guba and Lincoln (1989), learning is not a linear process, rather learners construct knowledge through back-forth interaction with the environment. In the OSCEs/SPs experiences, students are tested and allowed to learn from interacting with SPs. In many studies, SPs were acting as teaching associates guiding students through the examination process by giving ongoing feedback (Ebbert & Connors, 2004; O'Connor *et al*., 1999).

According to Gagnes's nine steps of instructing, providing guidance to students before, while, and after they perform tasks and giving immediate feedback enhance performance and knowledge retention (Gagen, 1989). In the majority of the studies, the feedback students received during OSCEs and SP encounters was greatly valued by students and also by faculty members (Ebbert & Connors, 2004; Khattab & Rawlings, 2001).

2. Customization by faculty

In OSCEs/SP encounters, cases are tailored by faculty members to match course objectives. Also, faculty have the opportunity to create case studies that can test student's knowledge and skills in dealing with wide range of clinical cases that might not be always available in clinical settings (Kurz *et al*., 2009; Vessey & Huss, 2002,). It has been shown that 60 different clinical cases can be portrayed by SPs (Barrows, 1993). In some NP programs such as the one at London South Bank University, OSCEs have been designed to match

the NP competencies described by the National Organization of Nurse Practitioner Faculties (Ward & Barratt, 2005).

3. Summative and formative evaluation:

OSCEs/SP encounters can be effectively used for summative and formative evaluation. Many nursing schools in the U.S. and the U.K have implemented OSCEs as an integral part of their final clinical evaluation of NP students, and also as a method for ongoing teaching throughout the semester (Ebbert & Connors, 2004; Khattab & Rawlings, 2001; Kurz *et al*., 2009; O'Connor *et al*., 1999; Vessey & Huss, 2002; Ward & Willis, 2006; Ward & Barratt, 2005). When used for summative evaluation of NP students in health assessment and physical exam courses, nursing educators reported that OSCEs allowed them to test objectively a wide range of clinical skills (Khattab & Rawlings, 2001). OSCEs/SP experiences are highly objective because they are customized and easily controlled by examiners. SPs are reported as able to reproduce the same clinical case accurately. Thus, OSCEs/SPs can ensure comparable testing situations for all students (Colliver & Williams, 1993), unlike in real life situations where factors related to the patient, the environment, and the faculty influence student's performance (Kurz *et al*., 2009). In addition, OSCEs/SP encounters test a wide range of skills such as intellectual, psychomotor, and interpersonal skills. OSCEs/SP experiences offer nursing educators the chance to test high level skills such as critical thinking, decision making, problem solving, and time management (Eldarir & Hamid, 2013; Pierre, Wierenga, Barton, Branday & Christie, 2004). Vessey & Huss (2002) described SPs as pedagogic method that help students develop appropriate clinical behavior. Kowlowitz, Hoole & Sloane (1991) suggest that OSCE is a tool for teaching as well as for assessment and it had a positive effect on the curriculum.

Clinical education in health care settings involve a number of ethical concerns and risks of violation of patients' privacy and confidentiality. In OSCEs/SPs, such concerns are greatly minimized (Vessey & Huss, 2002). Hence, students are able to practice taking patients' history and performing physical examinations repeatedly with less stress and anxiety. Furthermore, when SPs are implemented as a clinical evaluation method for a psychosocial NP program, students were able to practice discussing sensitive topics and dealing with complicated cases (O'Connor *et al*., 1999). Although OSCEs/SP involve unreal case studies, exam content is considered confidential and student are required by the Certified Health Simulation Educator to sign a contract to maintain content confidentiality (Wilson & Wittmann-Price, 2014).

When using OSCEs/ SPs as formative evaluation methods, students are motivated to apply their critical thinking, decision making, and time management skills (Ebbert & Connors, 2004; Hatamleh & Abu Sabeeb, 2015). Moreover, students at one station are asked to answer questions related to one clinical case, then they are asked to examine the same case at the following station. Thus, students can progressively learn how to integrate knowledge into practice (Eldarir & Abd el Hamid, 2013). In many studies, NP students reported that OSCEs/SPs enhanced their learning skills and promoted long-term behavioral changes (Ebbert & Connor, 2004; Vessey & Huss, 2002).

4. Liked by faculty

A survey that included NP faculty from 135 schools showed that 29 % used SPs as a teaching method (Kelly, Kopac, & Rosselli, 2007). Faculty members used SPs to reduce the gap between faculty expectations and students' performance (Hessey & Huss, 2002). Moreover, educators use OSCEs/SPs to learn more about student's abilities and limitations and provide immediate feedback accordingly (O'Connor *et al*., 1999), consistent with formative feedback approaches. Additionally, OSCEs and SPs can be used at an institutional level to assess faculty performance and to evaluate program outcomes (O'Connor *et al*., 1999; Vessey & Huss, 2002).

5. Liked by students:

Nursing students at all levels reported high satisfaction with OSCEs/ SPs as fair, objective, and creative evaluation methods. Students perceived OSCEs/SPs as positive experiences that enhanced their learning skills and self-confidence (Ebbert & Connor, 2004; Eldarir & Hamid, 2013; Vessey & Huss, 2002). Additionally, students reported that OSCEs motivated them to learn and apply different learning strategies such as group studying and role playing (Bartfay *et al*., 2004,). Compared to NP students tested by written exams, students who were tested by OSCE reported more satisfaction, improved clinical skills, higher scores, and less anxiety (Kruz *et al*., 2009).

6. Validity and reliability

The majority of the articles included in this review reported that the use of OSCEs and SPs for clinical evaluation is highly reliable and valid (Ebbert & Connor, 2004; Eldarir & Hamid, 2013; Khattab & Rawlings, 2001; Vessey & Huss, 2002). In some studies, the OSCE was considered to be the gold standard for assessing health professionals (Bartfay *et al*., 2004). Sloan, Donnelly, Schwarts & Strodel (1995) found that OSCE are more reliable and valid than multiple choice questions (MCQs). High correlation was found between scores from OSCEs and scores from MCQs (Walsh, Bailey & Koren, 2009). Beckham (2013) found that OSCE scores strongly correlated with one of a three clinical evaluation scores among family nurse practitioners. Hawker, Walker, Barrington, & Andrianopoulos (2010) found a moderate to high correlation between OSCE scores ad scores achieved at

the end of the clinical placement rotation at the third year of a four year nursing undergraduate program.

NP students are traditionally evaluated by direct observation by the faculty or the preceptor (Ebbert & Connors, 2004). Although the same grading criteria are used for all students, evaluation by preceptors are inherently biased and lacks inter-rater reliability when different students are evaluated by different preceptors (Rushforth, 2006). Moreover, preceptors are practicing NPs who are usually taking care of full load of patients, which may influence the preceptor's willingness and availability to evaluate students objectively and consistently (O'Connor *et al*., 1999). However, in OSCEs/SP encounters, all students are examined by the same team of examiners, which in many cases composed of a faculty member and a practicing NP. Therefore, the risk of examiners' biases and subjectivity are reduced (Bartfay *et al*., 2004). Furthermore, direct observation by the faculty is affected by the time available for the faculty to be in the clinical setting, availability of cases, cooperation of patients, the environment of the unit, personal biases and subjectivity of the faculty member (Watson *et al*., 2002). As a result, educators can not ensure comparable assessment situations for all students. Therefore, faculty members can practically implement OSCEs/SP encounters in a way that guarantees that all students encounter the same cases and asked the same questions, and graded with same grading checklist by the same examiners. Thus, reliability can be maintained at its highest levels. When used to examine surgical residents, Sloan *et al*., (1995) reported that students' performance varied according to the level of training, senior residents performed better than interns, which reflects high validity. In MCQs and essay questions, students are generally only tested for what they know not how they do it and students are given answers to choose from which does not happen in real life situations (Rushforth, 2006). Also, OSCEs are designed to match the objectives of the curriculum and the expected competencies from the students. Many educational institutions used experts panels that regularly review the content of the OSCEs and the grading criteria to ensure face validity and content validity (Khattab & Rawlings, 2002; Ward & Barratt, 2005). Some schools used external examiners to monitor the fairness, consistency, and objectivity of the OSCEs

Many NP programs have utilized the use of Mock OSCE to enhance reliability (Ward & Barratt, 2005). However, many factors need to be considered when preparing and conducting OSCEs/SP encounters that can influence reliability and the validity such as number, length, and content of stations, grading criteria, adequate SPs training, and preparation of students. The lack of consistency in the way OSCEs and SPs are being implemented in NP programs resulted in considerable variability in the reliability and the validity from one study to the other (Khattab & Rawling, 2001). Therefore, many authors maintained that the implementation of OSCE is still new in nursing and there is a need to further investigate its validity and reliability (Ebbert & Connor, 2004; Eldarir & Hamid, 2013; Khattab & Rawlings, 2001; Vessey & Huss, 2002). Some researchers, on the other hand, suggested that OSCEs/SPs are not highly valid and reliable because they are simulations of the real world and they should be considered as the second best method for assessing clinical skills (Rushforth, 2006; Watson, Stimpson, Topping & Porock, 2002). However, reliability and validity concerns were the main reasons why Harden *et al*. (1975) first designed OSCEs (Rushforth, 2006) and Harden & Gleeson (1979) argued that only because OSCEs are controlled they are highly valid and reliable.

The drawbacks of using OSCEs/SP were reported as expensive as well as anxiety producing among students.

1. Expensive

There is a consensus between studies that the implementation of the OSCEs/SPs is expensive and time consuming (Ebbert & Connor, 2004; Kurz *et al*., 2009; Mukwato *et al*., 2013; Vessey & Huss, 2002). Educational institutions need extra funding to cover for the cost of hiring and training SPs, training faculty and students, hiring examiners from the clinical area, coordinators, and time keepers. The number of faculty members needed to conduct OSCEs may dramatically increase compared to the number of those needed for conducting traditional clinical exams. However, there is a strong support that the assessment and the learning outcomes of OSCEs/SPs outweigh the cost of the administration (Khattab & Rawlings, 2001; Vessey & Huss, 2002; Ward & Barratt, 2005).

2. Anxiety producing

Students reported that the nature of the OSCEs/SP encounters induced anxiety (O'Connor *et al*., 1999; Ward & Willis, 2006). Anxiety resulted from having faculty members as SPs (Ward & Willis, 2006), and from having students' performance videotaped (O'Connor *et al*., 1999, Walsh *et al*., 2009). Anxiety among students may also result from being in an untraditional testing situation where multiple skills are tested at the same time. However, students valued the process of OSCE despite the high level of stresses involved (Eldarir & Abd el Hamid, 2013; Hatamleh & Abu Sabeeb, 2015). Moreover, Bartfay *et al*. (2004) suggested that the stress induced by the process of OSCE can increase its validity because it can be comparable to the stress of real life situations.

CONCLUSION

OSCEs/SP are overwhelmingly found to be effective and practical evaluation methods. For formative evaluation, OSCEs/SPs offer a creative as

well as a customized educational method allowing faculty members to test multiple clinical skills and different topics while providing ongoing feedback. For summative evaluation, OSCEs/SPs provide a more objective, valid, and reliable evaluation method compared to the traditional clinical evaluation methods. However, due to the lack of nationally developed and evidence based guidelines for implementing OSCEs across NP programs, the limited published research on the use of OSCEs/SPs in NP education, and need for incorporating of an amplitude of assessment methods to assess the clinical skills of practitioners in healthcare, OSCEs/SPs must not substitute evaluation of students in real life situations (Vessy & Huss, 2002) and are better used in addition to the currently used clinical evaluation methods. Therefore, nurse educators in NP programs will want to incorporate OSCEs/SPs as part of their evaluation strategies and not necessarily a replacement for existing evaluation approaches.

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