ORIGINAL ARTICLE

Assessing clinical skill competence of nursing students through Objective Structured Clinical Examination

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ABSTRACT

Aim To investigate the possibility of assessing clinical skill competence of nursing students by using the Objective Structured Clinical Examination (OSCE).

Methods The search for empirical articles on the assessment of clinical skill competence of nursing students was based on the SCOPUS electronic database. Search strategy included the utilization of two or three key words based on the MeSH index (OSCE, nursing students and clinical competence*).* The analysis was restricted to papers in the English language during the last ten years. Bibliography of selected papers was used to search for additional empirical studies as well.

Results A review of the literature showed that since 1975, when the first objective structured clinical examination was introduced, there has been a growing interest in the assessment utilization of clinical skill competence of nursing students. This method of assessment included direct evaluation of clinical skills in the classroom or hospital room. Application of objective structured examination required a good organization, prepared checklists, as well as a number of examiners, time and money. By analyzing the efficiency of this method some authors have pointed out that the use of this method could lead to considering health care as a simple set of tasks to be performed, while others have emphasized that by a customized implementation of this method other clinical skill competence of nursing students can be also evaluated. Students' opinion about this method of assessment is different.

Conclusion The widespread use of OSCE for the assessment of clinical skill competence also imposes a number of questions for those involved in its planning, implementation and assessment.

Key words: nurse education, skills checklists, practice, standardized patient, educational measurement, evaluation.

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INTRODUCTION

In addition to learning, assessment of clinical competence is an essential component of nursing education, as clinical competence is the foundation of their professional practice (1,2). For nearly fifty years nurse educators have been trying to assess them objectively by using a variety of techniques (3). The lack of a clear definition of the concept of competency is one of the reasons that complicate an objective assessment of clinical competence in nursing (4). However, Yanhua and Watson (5), reviewing current assessment of clinical competence in nursing, indicated that there was a significant progress in the clarification of the concept. Respectively, the researchers and regulatory bodies advocated for the implementation of the holistic concept of competence including knowledge, skills, habits, attitudes and values, allowing for more precise development of standards and instruments for their measurement. The Nursing and Midwifery Council in the UK, for example, defines competence as possessing a comprehensive set of knowledge, skills and attitudes required for lawful, safe and effective professional practice without direct supervision (6), while the Australian Nursing and Midwifery Council defines competence as a combination of skills, knowledge, attitudes, values and skills that are the foundation of successful and / or extraordinary performance of duties in a professional / practice setting (7). One way to assess clinical competence of nursing students is the objective structured clinical examination (OSCE) (4). It is defined as a method of assessment of clinical competence in which the components of competence are evaluated in a well-planned and structured way, with attention focused on the objective (8), or as an assessment of certain clinical skills (9). Originally, it was a method of the assessment of clinical competence in the mid-70s of the last century, created and used by Harden et al, in the education of physicians (10). Although OSCE was initially invented by the British school, its implementation quickly spread throughout North America, Canada, Australia and other Western countries (11). So, ten years later, the OSCE, according to Ross et al, was for the first time adapted and implemented in the education of nurses at Mac Master University in 1984 (3).

Traditional OSCE consists of a number of test stations (10 to 20), with the limited time duration of 5 to 10 minutes at which the respondents i.e. students are required to demonstrate competence in the given task, at every station. Test stations are two component stations: one station for questions and one for tasks. At the task station a student is given to perform virtually any task (history taking, physical examination, blood pressure measurement, interpretation of laboratory results, splint sets and the like.). At station for questions students should answer the questions, which are related to the task at the previous station, which the student has received (assimilated) during the training. Student's performance is assessed by examiner who has checklists with detailed and objective criteria related to the components of the observed skills (1,10). The first OSCE exams were conducted in real clinical settings, and today can be implemented in skill classrooms, usually on a standardized patient or gyms with the video camera (3,10).

In relation to a framework for development of clinical competence described by Miller (12) who outlines four levels: knows, knows how, shows how and does, implementation of the OSCE may conform to the achievement of the third level of competence. This means that it is focused on assessment of performance of specific skills in a controlled setting. Knows and knows how levels are traditionally assessed by different types of written exams (essay, MCQ, etc.) or an oral exam, while the level 'does' can be evaluated only in a real clinical setting (12). Given that a large number of papers and researches of OSCE implementation were originally used in education of physicians, the objective of this study was to examine the feasibility assessment of clinical competence of nursing students using the objective structured clinical examination (OSCE).

MATERIALS AND METHODS

The search for empirical articles on the assessment of clinical skill competence of nursing students was based on the electronic database SCOPUS. The search strategy included the utilization of keywords based on the MeSH index. It was the combination of two key words ''OSCE" and ''nursing student" that resulted in 65 papers, whereas during the scope of ten years, from 2002 to 2012, 54 papers were selected. The combination of three key words ''OSCE", ''nursing students" and ''clinical competence" selected 48 papers, 39 of which

were over the last ten years. The analysis was restricted to the papers written at full length in the English language. Bibliography of selected papers was used to search for additional empirical studies as well.
The analysis included historical development of the OSCE, various applications of this assessment, its reliability and validity as well as advantages and disadvantages, then students' and lectures' perceptions of the process and outcomes of OSCE.

RESULTS

According to analysis of available publications, the implementation of OSCE in nursing education has increased significantly over the last ten years. The OSCE has been successfully used to assess the clinical competence of nursing students at different levels of study (1,11,13–15) in different fields: orthopedics, psychiatry, intensive care, rheumatology, pediatrics and so on (16–20) and different educational systems (e.g. distance learning) (21).
Regarding the number and duration of test stations they were different among the analyzed studies, and they both differed in comparison to the traditional OSCE. Clarke et al at Queen's University in Belfast implemented 60-minute OSCE with 5 stations, lasting for 10-minutes and a one 10-minute rest station to assess competence in orthopedics (16). Selim et al at the University of Alexandria in Egypt developed 13-station OSCE lasting for 5 minutes with 11 working stations and 2 rest stations to assess undergraduate psychiatric nursing students' clinical skills (17), while Brosnan et al in Ireland designed 3 stations with a time limit of 5 minutes. Exceptions were made by Khattab and Rawlings from Bournemouth University who modified the assessment of the traditional OSCE, and to assess clinical competence using two test stations with a time limit of 70 minutes for the station no. 1 and 40 minutes for the station no. 2, respectively. A rest time for students was placed between the stations, during which the examiner filled in a final written report on students' performance (15).
The contents of all OSCEs were evaluated through different aspects of learning by Bloom's taxonomy which includes psychomotor skills, knowledge and attitudes. Special attention was paid to the cognitive aspects, because one student may have practical knowledge without having at the same time conceptual, or equivalent knowledge. For example, a student may be able to give an injection without understanding why it is given or what complications might arise from its use (15,18).
In nursing education OSCE was implemented both as a tool for summative and formative assessment, and as a learning tool (1,13,14).
For the successful implementation of the OSCE, it was important to test its reliability and validity. Unlike its implementation in the education of physicians, only in a small number of studies the implementation of OSCE has been tested for its reliability and validity (1,11). The authors tested reliability and validity of the OSCE in the education of nurses by assessment of the degree of agreement between examiner /assessor, internal consistency, test-retest, as well as by testing face, content and criterion validity checklists (23–25). An important component of reliability and validity was a "passing grade", as well (11).
Roberts & Norman (1990), for example, in the assessment of clinical competence of the 71st student of the first year of nursing studies at the 10-station OSCE, have found that a high inter rater reliability (IRR) (0.80–0.99) test-retest reliability for the same station was good (0.66–0.86), but the correlation between stations was low (23).
The important component that contributed to the reliability and validity of the OSCE was a checklist (11). The checklist is a tool for assessing in which the observed task is divided into a number of individual actions. Options for assessing each item were different; for example, a two-column "did or did not do" to multiple columns "excellent, satisfactory, needs more practice" or points on the Likert scale measured from 0 to 5 (2,11,16).
The issue, which could also affect the reliability and validity of the OSCE, with all above, was the exam passing grade (11). Basically, 40% was the passing grade at the undergraduate studies, and 50% at master studies (15). To reduce the possibility that the student passes the exam with 60% poorly performed or missed nursing procedures, some schools have used the so-called "mandatory" or "red flag" questions (11,15). In order to increase the reliability and validity of the OSCE in recent studies the procedures of standardization or harmonization of passing grades are increasingly being used (2). The most commonly used method of standardization was Angoff method or its modified version which proved to be better

(2,16). In a modified version of this method, a group of 6–8 experts who are familiar with the OSCE and the level of student assessment, first discuss the required minimum level of knowledge to pass the exams, and then each expert individually for each task item, according to his opinion, determines the threshold level of knowledge that students must meet in order to pass the exam. After that, the group discuss their decisions with opportunities for individuals to change their attitudes. At the end the number of criteria set by each expert is recorded and their sum represents students' passing grade (2).

OSCEs were accomplished with the standardized patient - a person who had been trained to reliably reproduce typical clinical case whose resolution is assessed (26,27). Depending on the study standardized patients were students themselves, examiners, health personnel or specially trained persons (14–17,19,26). In some studies, standardized patient task was also to provide descriptive assessment of student's behavior (27). In addition, the requirements for training standardized patients were different. According to McMilliam&Botwinski cites, McDonald's recommendation is that standardized patient has 10 hours of training for each scenario, but the attitudes of some authors are that every institution should determine the required number of hours of training in order to achieve an adequate level of performance (26,27). Certain ethical issues must be considered before including a child as a standardized patient (20). For the successful implementation of the OSCE it was important to examine the participants' views of assessing clinical competence in this manner (28). For this purpose, they used both qualitative and quantitative techniques (14,18). Students generally felt that the OSCE implementation makes sense, that it is necessary and fair means of assessment, and they believed that after such examination they were better prepared for clinical experience (14,16,26,28). Although known as a stressful way of testing, results obtained from Brosnan et al study indicated that the greatest stress was manifested in the hallway before entering the classroom for assessment, and the lowest stress was associated with the waiting time for feedback after the test (14). However, in the study that was conducted to assess the feelings, beliefs, and attitudes of pediatric care students after implementing the OSCE in medicine dosing, students expressed high levels of anxiety and feelings of loss of control, they believed that the execution of the task under stress affected their performance in the exam but they showed a positive attitude about the "safety first" which they had to demonstrate at the examination (28).

DISCUSSION

The aim of this study was to determine the opportunities to assess the clinical competence of practicing nursing students through objective structured clinical examination – OSCE. Literature review shows the increase of the OSCE implementation over the last ten years, but more attention should be paid to some issues such as determining the reliability and validity of performance and costs in order to have better and more often implementation (1,11,29). In 2009 Palese conducted the study in order to determine a cost of the exam. The results show that the cost of more expensive forms of the OSCE is 145.23 € and cheaper 31.51 € per student. Regarding the economic crisis the work on reducing the cost of implementation of this exam should be continued (29).

"Feedback" (data that show the results) of the practicing nursing students and examiners who have undergone this type of clinical competence testing are extremely positive (14).

However, as with other forms of assessment of clinical competence the OSCE has certain advantages and certain disadvantages (11). Some of the major benefits include greater objectivity and less examiner biases, reduced ability to assess different students and different examiners, positive experiences of examiners and students, opportunity to test a large number of skills, possibility of "lottery luck" has been reduced to a minimum, student's motivation for learning and a high level of reliability and validity (11,15). The deficiencies cited in the literature include, first of all, stress that students are exposed to during the test, long-term preparation, high prices, demand for more staff (11,29,30).

OSCE is the well-planned and objective assessment of clinical competence of nursing students. These claims are supported by the study results and conclusions of its implementation over the last ten years, collected during this study. Although the organization of the OSCE is an expensive process, the results indicate that the achievement of educational goal tasks outweighs the costs.

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Kliničke kompetencije studenata sestrinstva i mogućnosti njihove procene pomoću objektivnog strukturisanog ispita

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SAŽETAK

Cilj Ispitati mogućnosti procene kliničkih kompetencija studenata sestrinstva koristeći objektivni strukturisani klinički ispit (OSCE).

Metode Za pronalaženje empirijskih radova o proceni kliničkih kompetencija studenata sestrinstva korišćena je elektronska baza SCOPUS. Strategija pretraživanja uključivala je primenu dve ili tri ključne reči po MeSH-u (*OSCE*, *nursing student* i *clinical competence*). Analizom su obuhvaćeni radovi na engleskom jeziku publikovani u poslednjih deset godina. Bibliografija odabranih radova takođe je korišćena za pronalaženje dodatnih empirijskih radova.

Rezultati Pregledom literature je utvrđeno da je od 1975. godine, od kada je prvi put uveden objektivni strukturisani klinički ispit, postojao sve veći interes za njegovu primenu u proceni kliničkih kompetencija studenata sestrinstva. Ovaj metod procene uključivao je direktnu procenu kliničkih veština u učionici ili u bolesničkoj sobi. Primena objektivnog strukturisanog ispita zahtevala je dobru organizaciju, pripremljene kontrolne liste, veći broj ispitivača, vreme i novac. Analizirajući efikasnost ove metode pojedini autori ukazivali su na to kako upotreba ovog metoda može dovesti do toga da se zdravstvena nega smatra jednostavnim skupom zadataka koje treba izvršiti, dok su drugi ukazivali na to kako se prilagođenom primenom ove metode mogu proceniti i druge komponente kliničke kompetencije studenata sestrinstva. Mišljenja studenata o ovom načinu ocenjivanja su različita.

Zaključak Široka upotreba OSCE-a za procenu kliničkih veština nameće i veliki broj pitanja za one koji učestvuju u njegovom planiranju, implementaciji i evaluaciji.

Ključne reči: obrazovanje medicinskih sestara, kontrolne liste veština, vežba, standardizovani pacijent, pedagoška merenja, evaluacija.