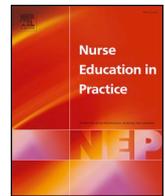




ELSEVIER

Contents lists available at ScienceDirect

Nurse Education in Practice

journal homepage: www.elsevier.com/locate/nepr

Original research

Experiences of nursing students and examiners with the Objective Structured Clinical Examination method in physical assessment education: A mixed methods study



Wegdan Bani-issa*, Muna Al Tamimi, Randa Fakhry, Hanan Al Tawil

Department of Nursing, College of Health Sciences, University of Sharjah, United Arab Emirates

ARTICLE INFO

Keywords:

Objective structured clinical exam
Mixed method study
Blended learning
Nursing undergraduate education

ABSTRACT

This study explores the experiences of undergraduate nursing students and examiners with the Objective Structured Clinical Examination (OSCE) as an evaluation of physical assessment skills. A mixed methods approach captures participants' perceptions and experiences with the OSCE. The sample consisted of 55 students enrolled in the physical assessment course and eight external examiners. Data were collected using a standardized questionnaire and focus group interviews, using semi-structured questions, recorded and transcribed for thematic analysis. Quantitative data were analyzed using SPSS software. Results indicated that participants regarded the OSCE as a valuable assessment tool that enhances in-depth learning and preparation of students for clinical practice. Participants also perceived the exam to be a stressful experience, citing the need for more time on examination stations. Recommendations for improving the OSCE process included extending preparation prior to the exam, training of simulated patients, adopting a blended learning model, and upgrading the setting of the exam. This paper supports evidence of the value of the OSCE as an appraisal of physical assessment skills in undergraduate nursing education.

1. Introduction

The American Association of Colleges of Nursing (AACN) states that the baccalaureate generalist nurse requires strong critical reasoning, clinical judgment, communication and assessment skills (American Association of Colleges of Nursing, 2008). One of the different methods used to evaluate students' skills acquisition is the Objective Structured Clinical Examination (OSCE). The OSCE is a station-based exam introduced in the mid-1970s to assess clinical competencies among medical students (Rushforth, 2007). The exam was developed as an alternative assessment method for evaluating clinical competencies which is less subjective than clinical observation and more realistic than theory exams (Goh et al., 2016). The OSCE is a form of performance-based testing used to measure candidates' specific clinical competencies (Marcyjanik and Johnson, 2016). During an OSCE, candidates are observed and evaluated by external examiners as they progress through a series of structured stations with standardized patients prepared to test specific skills like interviewing, communication, clinical judgment, and physical examination (Traynor and Galanouli, 2015).

In recent decades, educational institutions within a range of countries, including the United States (Obizoba, 2018), China (Shen et al., 2018), Australia (Massey et al., 2017), Spain (Solà et al., 2017), Indonesia (Uliyah, and Hidayat, 2017), and Singapore (Goh et al., 2016), have adopted the OSCE to assess cognitive, psychomotor, and affective abilities of students. Literature indicates that the OSCE is regarded as a feasible, reliable and valid strategy for assessing clinical skills in nursing (Selim et al., 2012; Shen et al., 2018; Traynor and Galanouli, 2015). Within undergraduate nursing education, this method has been successfully utilized to assess students' competencies in mental health (Selim et al., 2012), midwifery nursing education (Muldoon et al., 2014), pediatric nursing (Pierre et al., 2004), and the fundamentals of nursing practice in novice nursing students (Shen et al., 2018).

The department of Nursing at XXX in the United Arab Emirates (UAE) has also adopted the OSCE to assess undergraduate students' competencies in courses such as physical assessment, fundamentals of nursing, adult health nursing, mental health nursing, and critical care nursing. The aim was to prepare students for clinical practice through objective measures of their clinical skills. Although the OSCE exams have been conducted with several graduate student cohorts at the

* Corresponding author.

E-mail addresses: wbaniissa@sharjah.ac.ae, wbaniissa1@gmail.com (W. Bani-issa), maltamimi@sharjah.ac.ae (M. Al Tamimi), rfakhry@sharjah.ac.ae (R. Fakhry), altawil@sharjah.ac.ae (H.A. Tawil).

<https://doi.org/10.1016/j.nepr.2019.01.006>

Received 11 January 2018; Received in revised form 1 December 2018; Accepted 23 January 2019

1471-5953/ © 2019 Elsevier Ltd. All rights reserved.

University of XXX since 2006, no attempt has yet been made to evaluate either students' or examiners' experiences with the OSCE.

The overall aim of this study was to provide a perspective on the value of OSCE in measuring physical assessment competencies among undergraduate nursing students. Using a mixed method research design approach, the OSCE experiences of both students and external examiners in physical assessment courses are reported.

2. Methods

2.1. Study design, setting and sample

This research employed a combination of qualitative and quantitative methodologies including a questionnaire and focus group interviews. A mixed-method study is appropriate to examining a complex phenomenon which requires detailed data to create a comprehensive picture of the phenomenon (Creswell, 2013). In this study, we collected quantitative data using self-administered questionnaires followed by focus group interviews for the qualitative component (Morse, 2016).

All students enrolled in physical assessment courses ($n = 85$) were invited to participate as well as external examiners ($n = 8$). The department of nursing at the university offers a bachelor of science in nursing (BSN) for students with high school diploma (basic stream) and diploma-prepared nurses (AD) (bridging stream). This program was the first to offer a BSN in the UAE through collaboration with McMaster University, Canada, beginning in 1999.

2.2. Procedure

Ethical approval was obtained from the Research Ethics Committee at the principal investigator's (PI) institution. The research team approached instructors in the physical assessment course and, after having the purpose of the study explained to them, were asked to invite their enrolled students to participate in the study. An information sheet was posted on Blackboard explaining the purpose of the study, the voluntary nature of participation, confidentiality of information, and an assurance that the student's participation would have no effect on their grades. Upon completing the OSCE exam, the students who agreed to participate in the study joined the research team in a separate room to be consented and to complete the questionnaire. Consented examiners then completed the questionnaire and provided baseline information.

Participants were next invited by the research team to arrange for focus group sessions within the same week of the exam, to avoid recall bias. To capture a range of opinions and stimulate discussion among group members, researchers ensured a diversity of participants in the focus groups, which helps yield rich data (Creswell, 2013; Krueger, 2014).

2.3. Description of the OSCE procedure

Physical assessment courses are offered to nursing students in both streams and aim to teach students physical assessment skills. The purpose of the OSCE stations is to measure health history and physical assessment competencies which are covered in theory classes and practiced in weekly 3-h laboratory sessions. The OSCE comprises five stations with simulated patients are designed to measure students' physical assessment skills of major body systems – cardiovascular, abdomen, nervous, respiratory system, and head and neck – with 10 min allocated for each station. Two of the stations are static, one of which, in this study, utilized a case study to measure students' abilities to apply the Glasgow Coma Scale, and the other included images of different types of skin lesions which students are asked to identify, in writing. The reliability of the entire exam was determined using Cronbach's alpha, and its validity established with a Pearson's correlation to compare the results of the OSCE and written exam scores consisting of 80 multiple choice questions (MCQs) pertaining to the physical assessment course.

Students were provided with detailed instructions on Blackboard relating to the examination process, such as not sharing information about the exam with other examinees, timing of the exam process, signing in and out with the registration staff, obtaining the requisite equipment such as stethoscope, penlight, and reflex hammer, explaining the rationale for their actions, describing their findings to the examiners, and remaining at the examination site until all examination paperwork was collected and accounted for. In each station, a brief scenario introducing the patient's problem was given and students were directed to what was required of them at that station. In the skills stations, students were scored according to predetermined standardized checklists (carried out satisfactory/attempted/not satisfactory/not attempted) (Appendix 1: contains a nervous system checklist used in the OSCE).

Design and preparation of scenarios, station contents, and checklists was undertaken in an intensive two-month effort by two senior course instructors based on resources used in the theory class and skills labs. Checklists and scenarios were validated by matching items in the checklists to theoretical content by two other senior faculty members. One day prior to the exam, course instructors conducted a 1-h training session for external examiners on the checklists' content, grading methods, and examination procedure. Since finding persons agreeing to act as simulated patients proved difficult, and owing to the limited research budget, student volunteers from other course levels were invited to participate as simulated patients for the exam. Those students were given information and instructions for their participation and were oriented to the scenarios of each station.

2.4. Data collection tool

2.4.1. Survey questionnaire

Students' experiences with the OSCE exams were collected using a standardized questionnaire (Pierre et al., 2004) that has been widely used to assess student experience and perception of the OSCE with adequate reliability and validity indexes (Selim et al., 2012; Pierre et al., 2004, 2005).

The questionnaire consists of 32 items grouped into four sections. Section one consists of 13 items that measure the attributes of the exam, while section two assesses nursing students' evaluation of the quality of the OSCE performance in eight items. In section three, OSCE scoring and objectivity are assessed in four items, with OSCE scores being standardized to reflect a true measure of essential clinical skills. Section four invited students to reflect on OSCE organization using seven items. The students were then asked to rate the OSCE in relation to other assessment methods used in education, including multiple-choice and true/false questions, and essay (Pierre et al., 2004, 2005). For examiners, the authors developed a self-report questionnaire after a review of relevant literature (Lemon et al., 2013; Qureshi, 2013).

2.4.2. Focus groups

Interactive focus groups were arranged to capture the experiences of participants with the OSCE. A focus group is a semi-structured group interview in which members interact and exchange their opinions and views on certain experience (Creswell, 2013) in an informal discussion focusing on a particular topic or issue (Krueger and Casey, 2000). The focus group technique is commonly used in nursing education research because of its capacity to elicit spontaneous multiple perspectives, opinions and attitudes of people in an economical, fast and efficient method of data collection (Krueger and Casey, 2000).

Five focus groups – four with students and one with external examiners – were conducted for this study, adequate to reaching data saturation point where no new information was revealed by participants. Prior to the student focus groups, an interview guide encompassing open-ended questions driven by major sections/themes covered in the survey was prepared. Examples of these questions included, "What do you think of the organization of the exam?", "What is your opinion of the grading criteria?", and "How do you view the objectivity

of the exam?“. Group members were asked to share any ideas and assumptions about their exam experiences and to offer any suggestions for how it might be improved.

As suggested by Creswell (2013), the focus groups consisted of 8–10 students with two moderators, with 1 h allocated for each group. To ensure consistency of perception and analysis of textual and non-textual data, the same researchers moderated all groups. All focus group proceedings were audiotaped and transcribed by the principal investigator (PI).

For the examiners' focus group, of 2 h' duration, a prepared interview guide invited examiners to reflect on the positive and negative aspects of the OSCE and to suggest strategies to improve future OSCEs. To ensure rigor and trustworthiness of findings, researchers used member check and group debriefing (Lincoln and Guba, 1985). Group debriefing was conducted after each data collection point to verify the initial interpretation and concurrent data analysis. Additionally, member check, or reviewing major points with participants to ensure accuracy of interpretations (Lincoln and Guba, 1985), was performed by the PI. Further, the personal perspectives and potential biases of the researchers were explicitly declared through reflective journaling and audit trials during each phase of the research process. (Lincoln and Guba, 1985)

2.5. Data analysis

Quantitative data were analyzed using IBM SPSS statistics version 22. The scores of negatively formulated items were recoded. Statistical analysis of the Likert items was generated by calculating frequencies, means and standard deviations to describe participants' characteristics and attributes, quality, scoring, and objectivity and organization of the exam. Interviews were transcribed and, together with written observation notes, were organized and prepared for qualitative analysis. Qualitative data analysis is the process of transforming data into findings, or bringing order, structure and interpretation to the mass of collected data. To be fully immersed in the data, the PI undertook all transcribing to help generate insights about the direction, richness and saturation of data. Data collection and analysis proceeded concurrently when patterns or codes first emerged from the data.

Data were analyzed using *constant comparison analysis* as recommended in focus group research (Onwuegbuzie et al., 2009; Strauss and Corbin, 1998). The first stage of the analysis began with open coding whereby data were chunked into small units and attaching a descriptor to each of these. Subsequent grouping of these unites or codes into larger categories (axial coding) was followed by the development of larger themes through selective coding that expressed the experiences of OSCE participants (Strauss and Corbin, 1998). To ensure rigorous analysis, researchers documented and wrote extensive and detailed notes of the emergent analytical and theoretical insights, speculation or thoughts pertinent to major themes developed by consensus.

3. Results

3.1. Preliminary psychometric properties and description of the sample

Results of initial psychometric testing indicated that the OSCE had adequate reliability (Cronbach's alpha of 0.82) and validity (Pearson correlations of 0.68 $p < 0.050$) between students' scores on the OSCE and written MCQ exam. A total of 55 students agreed to be part of the study (64.7% response rate), the majority were non-Emiratis (87.3%) (Table 1). All bridging students were employed, were aged above 25 years, and the majority were female ($n = 49$, 89.1%). Bridging students had had previous experience with the OSCE during their diploma studies.

All the examiners who participated in the study were females within the age range 25–40 years. They held a minimum degree of bachelor of science in nursing, and had been previously involved in conducting OSCEs at the study site (Table 2).

Table 1
Description of students sample (N = 55).

Category	Number	%
Nationality		
Emirati	7	12.7
Others	48	87.3
Age (Years)		
Less than 25 Years	45	76.4
More than 25 Years	10	23.6
Gender		
Males	6	10.9
Females	49	89.1
Study Stream		
Basic (High School)	42	76.4
Bridging (Diploma)	13	23.6
Work Experience of Bridging Students		
> 5 Years	8	14.5
< 5 Years	5	3.6
No Experience	42	76.4
Previous OSCE Exams		
Yes (Bridging students)	13	23.6
No (Basic Students)	42	76.4
Course with Previous Experience with OSCE (Bridging Students)		
Physical Assessment	3	5.2
Fundamentals of Nursing	10	18.0

Table 2
Description of examiners sample (N = 8).

Category	Number	Percent
Age (Years)		
Less than 25 Years	1	12.5
More than 25 Years	7	87.5
Gender		
Males	0	0
Females	8	100
Highest Level of Education		
PhD in Nursing	0	0
Master's Degree in Nursing	2	25
Bachelor Degree in Nursing	4	50
Master's Degree in Other Specialty	2	25
Times involved in conducting OSCE outside the study setting		
< 5 Times	5	62.5
Not involved	3	37.5
Times involved in conducting OSCE exam at the study sites		
2015–2016	3	37.5
2013–2014	1	12.5
2012 or Earlier	4	50.0
Nursing Courses Involved in Conducting OSCE		
Physical Assessment	2	25.0
Physical Assessment and Others	4	50.0
Others	1	12.5
None	1	12.5

3.2. Quantitative results: OSCE evaluation by students

3.2.1. Attributes of the exam

Of the 13 OSCE attribute items measured, there was a consensus among students on five positive attributes: fairness of the exam (90%), exam covering a wide knowledge area (85.6%), exam well-structured and sequenced (93.7%), students' awareness of level of information needed (91%), and the OSCE highlighting areas of weaknesses (91%). Almost two thirds of the students agreed that the exam was very stressful (94%) and felt that they needed more time at each station (88%) (Table 3).

3.2.2. Quality of performance testing, objectivity and scoring

Most students (91%) agreed that the exam provided opportunities to learn, with (82%) expressing that the designated tasks to be performed were fair, and (87%) agreed that instructions were clear. Only (18%) felt that the time per station was adequate and (70%) thought it was not

Table 3
Evaluation of the OSCE attributes.

Question	Agree%	Neutral%	Disagree%	No Comment%
1. Exam was fair	90.9	1.8	7.3	0
2. Wide knowledge area covered	85.6	4.8	4.8	4.8
3. Needed more time at stations	87.7	9.1	1.4	1.8
4. Exams well administered	75.5	20.9	3.6	0
5. Exams very stressful	93.6	4.6	1.8	0
6. Exams well structured and sequenced	93.7	4.5	1.8	0
7. Exam minimized chance of failing	34.5	41.8	21.8	1.8
8. OSCE less stressful than other exams	12.7	19.1	66.4	1.8
9. Allowed student to compensate in some areas	41.8	45.5	10.9	1.8
10. Highlighted areas of weaknesses	90.9	5.5	3.6	0
11. Exam intimidating	25.5	11.8	62.7	0
12. Student aware of level of information needed	91	1.9	7.1	0
13. Wide range of clinical skills covered	86.4	2.7	10.9	0

adequate at all, with around (64%) agreeing that they were not fully aware of the nature of the exam. More than half of the student sample (59%) thought that the exam setting did not feel authentic (Table 4).

As for scoring and objectivity of the exam, the majority agreed that the exam was practical and provided useful experience, and that scores provided true measures of essential clinical skills (93%); 84% thought that scores were standardized, and 92% agreed that scoring was not affected by the personality of or social relations with the course instructor.

3.2.3. Organization

A few organization items were perceived positively by the students, namely announcement about the place of the exam (80%), and availability of the OCSE timetable ahead of the exam (82%). Five items were rated poorly by more than two thirds of the students, including course revision offered before the exam, the general idea of the exam as given, and cooperation of the staff during the exam (Table 5).

3.2.4. Comparison with other assessment methods

Students indicated that they learned more from the OSCE method than from other assessment methods (86%), requested greater utilization of the OSCE over other types of assessment in clinical courses (87%), and the majority perceived it to be a fair exam (89%). Nevertheless, students also observed that the OSCE is more difficult than other exam types, with only 15% nominating it as the easiest among other assessment methods (Table 6).

Table 4
Evaluation of OSCE quality of performance testing, objectivity and scoring.

Question	To great extent %	Neutral%	Not at all %
1. Fully aware of the nature of the exam	25.5	10.9	63.6
2. Tasks reflected those taught	81.8	18.2	0
3. Time at each station was adequate	18.2	11.8	70
4. Setting and context at each station felt authentic	34.5	16.4	59.1
5. Instructions were clear and unambiguous	87.3	9.1	3.6
6. Tasks asked to perform were fair	81.8	14.5	3.6
7. Sequence of stations logical and appropriate	72.7	23.6	3.6
8. Exam provided opportunities to learn Objectivity and scoring	90.9	10.1	0
9. OSCE scores provided true measure of essential clinical skills	93.7	1.8	4.5
10. OSCE scores were standardized	83.6	14.5	1.8
11. OSCE practical and useful experience	92.9	5.3	1.8
12. Personality and social relations didn't affect OSCE scores	91.8	1.8	6.4

3.3. Quantitative results: OSCE evaluation by examiners

Most examiners strongly agreed that the exam instructions were clear and that the exam briefing gave students the necessary information (88%), that they understood the marking scheme (85%), and that the exam tested the requisite knowledge to practice (83%). On the other hand, 90% expressed the view that the exam could be better organized (Table 7).

3.4. Qualitative results: evidence from focus groups

Thematic analysis of focus group transcripts generated three main themes arising from students' and examiners' experiences with the OSCE.

3.5. Results of students' focus groups

3.5.1. Major theme 1: attributes of the exam

Content analysis of the focus groups revealed that the students, in general, agreed that the exam was a positive experience, and that it was well-structured:

"The OSCE was a useful experience, rewarding and fair ... It is kind of exciting, stimulating and challenging." P2 (3)

"I liked that we had standard checklists that we were familiar with ... I like mostly the checklist of the respiratory system, it was clear and helped me to focus." P2 (1)

The participants all agreed that the time was too limited on stations, making it a stressful experience:

"I thought the OSCE was easy ... but it was a difficult one ... I thought it was a piece of cake ... but it was stressful. Putting us under stress for 10 minutes was a lot for me ... we need extra time to get used to it ... one-minute notification is a bad idea ... very little time on Glasgow Coma Scale station." P4 (4)

Almost all students felt that having "ungraded mock exams" before the actual test would be beneficial:

"It is good to have 'prova' before the real OSCE, this will improve our grade in the exam and will take off the fear and stress we had during the OSCE." P1 (4)

"We need more hands-on practice in the lab ... we did not have adequate close supervision, sometimes we were left alone ... and opened youtube on the net to learn." P3 (1)

3.5.2. Major theme 2: quality and objectivity and scoring

Most students perceived the exam to have good qualities and objectives:

Table 5
Perceptions regarding OSCE organization.

Question	Excellent %	Very good %	Good %	Poor %
1. The announcement about the place of OSCE examination	80	7.3	10.9	1.8
2. The time tables of OSCE examination were available and known to student early	81.7	7.3	5.5	5.5
3. The revision done before the examination about the different types of clinical procedures	15.5	9.1	4.5	70.9
4. Gave general idea about the OSCE before exam process	14.5	7.3	2.7	75.5
5. The cooperation of the staff to answer your questions related to the organization of the examination	11.8	10	.9	77.3
6. The quality of the OSCE labs from set up and cleanliness, suitability, lighting, quietness and ventilation	4.5	5.3	4.5	85.6
7. The availability of needed equipment, simulators in good quality	8.2	3.6	3.4	84.8

Table 6
Rating of OSCE in relation to other assessment methods used in education.

Questions			
Which of the following methods is easiest?	Easy %	Undecided %	Difficult %
MCQ (Multiple Choice Questions)	74.5	18.2	7.3
Essay/SAQ (Short Answer Questions)	40.9	38.2	20.9
OSCE (Objective Structured Clinical Examination)	15	4.2	80.8
True or False	63.6	30.9	5.5
Which of the following methods is fairest?	Fair %	Undecided %	Unfair %
MCQ (Multiple Choice Questions)	74.5	18.2	7.3
Essay/SAQ (Short Answer Questions)	47.3	32.7	20
OSCE (Objective Structured Clinical Examination)	88.8	2.3	8.9
True or False	63.6	25.5	10.9
From which of the following methods do you learn most?	Learn a Lot %	Undecided%	Learn Very Little %
MCQ (Multiple Choice Questions)	46.4	32.7	10.9
Essay/SAQ (Short Answer Questions)	63.6	25.5	10.9
OSCE (Objective Structured Clinical Examination)	86.4	18.2	5.5
True or False	41.8	36.4	21.8
Which of the following methods should be used more often in the clinical program?	Used much more %	Undecided%	Used much less %
MCQ (Multiple Choice Questions)	50.9	16.4	12.7
Essay/SAQ (Short Answer Questions)	40	32.7	27.3
OSCE (Objective Structured Clinical Examination)	87.3	21.8	10.9
True or False	52.7	25.5	21.8

"It was a fair exam ... I know that I'm weak in differentiating respiratory sounds ... the exam detected my deficit ... now I need to do practice on that skill." P2 (5)

All students liked "the standard checklist" for objectivity in grading:

"I liked the checklist, it decreased bias and discrepancy in grading us ... we have different examiners that did not know us." P3 (1)

3.5.3. Major theme 3: organization

Some students thought that the exam was organized well and properly arranged:

Table 7
OSCE evaluation by examiners.

Question	Strongly Agree%	Agree %	Disagree %	Strongly Disagree %
1. The exam instructions were clear	87.5	12.5	0	0
2. I did not have my queries answered to my satisfaction	10	5	5	80
3. The exam briefing gave me the information I needed	87.5	12.5	0	0
4. I still had unanswered questions after the exam briefing	2.7	0	97.3	0
5. I understood the marking scheme	85	15	0	0
6. The exam could have been better organized	90	2	6.2	0
7. The OSCE tests the knowledge needed to practice	82.5	17.5	0	0
8. The skills needed for the course are adequately tested	37.5	62.5	0	0
9. The attitudes needed to practice are tested	37.5	50	0	12.5
10. The exam questions were clearly written	72.5	15	0	12.5

"The instructions announced on Blackboard were clear and adequate." P1 (7)

"I liked the structure of the exam, instructors told us what we have to do with the test ... stations were labeled in large font." P4 (2)

Most students commented negatively on standardized patients in the exam:

"Having our colleague students to be simulated patients was not a good idea. I got a patient that made me feel more stressed." P3 (3)

"My patient kept laughing on cardiac assessment, does not look like a real patient, it was misleading. They were not really trained ... I guess

instructors must tell them what to do and how to act." P1 (7)

"I prefer to use the Manikin instead of someone laughing and misleading me in the exam ... I was looking at their faces and trying to make sense of their gestures." P2 (4)

The set-up of the stations, "closed with curtains with limited space and crowded" P3 (3), was disappointing to all of the student participants:

"While I was in my station, I could hear the voices of students in other stations beside mine. Then I will think about the points I forgot in previous station." P1 (4)

3.6. Results of examiners' focus group

Examiners were asked to share their perceptions of the OSCE, with one commenting that,

"The OSCE was smooth ... it is the best tool for assessing skills ... good tool to cover course objectives and prepare students for practice." (Examiner 3).

Another examiner stated,

"We had good orientation about the exam from course instructors ... they answered most of our questions and queries about the exam ... they were friendly and cooperative." (Examiner 2)

One examiner who had not previously been involved in the OSCE felt that,

"Having all my questions answered made me relaxed before the exam ... I liked the use of the checklist, it helped me a lot in fair grading."

There was agreement among examiners with previous involvement in the OSCE about the organization of the exam:

"The setting of the exam was not that great ... stations were close to each other and we can hear the other stations ... the lab was crowded and busy."

Examiners also agreed that students needed more time at each station:

"I guess the time was not sufficient for most of the stations ... I was on the respiratory system station ... students had to do a lot of skills in a short time ... that was stressful for them."

All examiners agreed on the need for an "ungraded trial exam" before the actual test to minimize stress. Three examiners suggested the alternative of "video recording" so that the "the interaction will be less and students will not wait to be "prompt[ed] during the exam."

4. Discussion

The current study was undertaken to gain insight into nursing students' and examiners' experiences of the OSCE as an evaluation of physical assessment skills, using a mixed-method approach. It is the first study to investigate the OSCE experiences in UAE universities. The research results present valuable information about the conduct of the OSCE for nursing students and educators alike. Physical assessment competency is one of the major skills that registered nurses must master if they are to provide safe and effective nursing care as outlined by the AACN.

Participants perceived the OSCE process to be a worthwhile and meaningful assessment tool covering a wide range of knowledge, skill, and attitude domains. These findings are consistent with those from other studies in which the OSCE was perceived positively by stakeholders and reported to be an efficient tool to measure competencies in different nursing courses, for example, maternity (Barry et al., 2013; Faramarzi et al., 2015), psychiatry (Selim et al., 2012) and pediatric nursing (Pierre et al., 2004). Our results suggest that the clinical skills of nursing students can be evaluated in a safe, simulated and controlled

environment and that physical assessment could be added to the repertoire of nursing subjects where OSCE could be used (Aronowitz et al., 2017).

Students in our study experienced the exam as an objective test of knowledge about skills that is, to a great extent, standardized, and one that gives a true measure of their physical examination competencies, consistent with findings from other studies (Faramarzi et al., 2015; Nasiri et al., 2015; Selim et al., 2012). The utilization of standardized checklists aligned with the theoretical content and training of examiners may have contributed to increased accuracy in grading and confidence in the objectivity of the exam. However, while standardized checklists are highly content-specific and objective, global ratings allow for measuring a broader range of important skills necessary for professional practice, including communication, eye contact and language in interactions with standardized patients (Barry et al., 2013; Jones et al., 2010). Jones et al. (2010) proposed that educators establish a correlation between global ratings and the mark achieved to ensure objective assessment. The suggestion is that utilization of two assessors or examiners for each station would provide greater objectivity (Jones et al., 2010). Video recording is also reported to be a reliable testing alternative which offers the advantages of more efficient use of OSCE examiners' time, and increased fairness in grading and evaluation (Jones et al., 2010). This option might, however, pose a challenge to teaching institutions with limited financial resources allocated for the OSCE.

On the other hand, although students favored the structure of the OSCE compared to other types of exams, they reported it to be a very stressful experience. This result was expected and understandable given the limited experience of students with the OSCE format (only 23.6% had prior experience with the OSCE), and aligns with findings from other studies (Barry et al., 2013; Brosnan et al., 2006; Selim et al., 2012). In our study, students expressed a lack of awareness about the exact nature of the exam and the need for more preparation. Limited awareness and preparedness, and the unfamiliarity of the exam format could be the main reasons for students' anxiety (Massey et al., 2017). Whereas multiple choice and true/false questions are extensively used and, thus, familiar formats for assessing students' learning, the "live" nature of the OSCE is possibly perceived as comparatively difficult. Therefore, greater preparation and integration of the OSCE as an approach to assessment is recommended to contribute to decreasing students' stress levels with the exam and hence, improve their performance (Alizadeh et al., 2014; Massey et al., 2017). This might be accomplished through modifying traditional teaching and utilizing blended learning methods (Karoglu et al., 2014) that will better hone students' skills in physical assessment. Online videos can be used as exemplars or models which promote active learning as well as development of and reflection on student knowledge of physical assessment clinical skills (Massey et al., 2017).

Participants felt that the time allotted to complete the assessment was unrealistic. Similar findings were reported by Jay (2007) and Pierre et al. (2004) who discussed the potential effect on the reliability of the OSCE assessment, and on student anxiety and performance. It is suggested that instructors conduct OSCE trial runs to determine more realistic timing for the requirements of each station. Practice trials could possibly reduce students' stress and alter their perceptions of the exam's difficulty.

Furthermore, participants in this study thought that the setting and organization of the exam were poor. This finding illustrates the importance of focusing not only on outcomes, but also on the conduct of the exam. Our clinical skills laboratories are not sufficiently well designed for OSCEs because of limited laboratory space and resources. The laboratory structure in our facility needs to be revisited so that the OSCE can be conducted more effectively.

It is important that OSCEs give a true reflection of practical skills notwithstanding the artificial conditions associated with assessment. In our study, students pointed to variations in the approaches of examiners, another possible source of stress. As suggested by Barry et al. (2013) students need to be precisely briefed about the role of assessors

and the type of interactions they may expect during the assessment.

Students in our study were concerned about the use of mock patients, which was anticipated because our simulated patients volunteer nursing students who had received little training in how to simulate patients for the OSCE parameters. In our case, as stated, it was difficult to find actual simulated patients due to our inability to offer financial or other incentives or rewards. This might have influenced the authenticity of the setting and quality of the exam. Future OSCEs should seek feedback from standardized patients and provide them with more extensive training to ensure the validity and reliability of the exam (Bosse et al., 2015).

5. Conclusion

Our findings of the perceived value of the Objective Structured Clinical Exam in nursing education and as a measure of clinical competencies, especially in physical assessment skills were consistent with previous studies. While students and examiners felt the OSCE to be a valuable and objective method of assessment, early preparation and better organization is needed to promote its evaluative efficacy. Deploying blended learning, group role playing and video recording in instruction in physical assessment is recommended for reducing exam-related stress and improving outcomes. The restructuring of laboratory facilities for enhanced authenticity would also allow for more efficient and effective conduct of OSCEs.

Finally, this study has identified a number of areas where further exploration is warranted. A larger-scale longitudinal study is needed to establish the effectiveness of the OSCEs within nurse education programs. This study could be repeated with a larger number of students at different levels to allow for comparison and opportunities to improve the process of the OSCE. This study was intended as a summative evaluation and, owing to the constraints of time, did not provide post-examination oral feedback to the students. While researchers had hoped to videotape the OSCE process, student participants were unwilling to be part of a recording procedure.

Acknowledgements

The researchers would like to thank students and external examiners for their participation in the study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.nepr.2019.01.006>.

References

- Alizadeh, M., Karimi, F., Valizadeh, S., Jafarabadi, M.A., Cheraghi, P., Tanoan, A., 2014. Investigation on relationship between test anxiety and academic performance of nursing and midwifery students in Tabriz and Maragheh, Iran. *Health* 6 (21), 3055. <https://doi.org/10.4236/health.2014.621345>.
- American Association of Colleges of Nursing, 2008. *The Essentials of Baccalaureate Education for Professional Nursing Practice*. 2008. <http://www.aacnursing.org/Nursing-Education-Programs/Baccalaureate-Education>.
- Aronowitz, T., Aronowitz, S., Mardin-Small, J., Kim, B., 2017. Using objective structured clinical examination (OSCE) as education in advanced practice registered nursing education. *J. Prof. Nurs.* 33 (2), 119–125.
- Barry, M., Bradshaw, C., Noonan, M., 2013. Improving the content and face validity of OSCE assessment marking criteria on an undergraduate midwifery programme: a quality initiative. *Nurse Educ. Pract.* 13 (5), 477–480. <https://doi.org/10.1016/j.nepr.2012.11.006>.
- Bosse, H.M., Nickel, M., Huwendiek, S., Schultz, J.H., Nikendei, C., 2015. Cost-effectiveness of peer role play and standardized patients in undergraduate communication training. *BMC Med. Educ.* 15 (1), 183. <https://doi.org/10.1186/s12909-015-0468-1>.
- Brosnan, M., Evans, W., Brosnan, E., Brown, G., 2006. Implementing objective structured clinical skills evaluation (OSCE) in nurse registration programmes in a centre in Ireland: utilisation focused evaluation. *Nurse Educ. Today* 26 (2), 115–122. <https://doi.org/10.1016/j.nedt.2005.08.003>.
- Creswell, J.W., 2013. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage publications.
- Faramarzi, M., Salmalian, H., Pasha, H., Banihosseini, Z., 2015. Validity and reliability of combination of observed practice with objective structured clinical examination (OSCE) in midwifery final exam. *Ann. Res. Rev. Biol.* 5 (2), 124. http://www.journalrepository.org/media/journals/ARRB_32/2014/Sep/Faramarzi522014ARRB12775.1.pdf.
- Goh, H.S., Tang, M.L., Devi, M.K., Ng, K.C.E., Lim, L.M., 2016. Testing the psychometric properties of objective structured clinical examination (OSCE) in nursing education in Singapore. *Singapore Nurs. J.* 43 (1).
- Jay, A., 2007. Students' perceptions of the OSCE: a valid assessment tool? *Br. J. Midwifery* 15 (1), 32–37.
- Jones, A., Pegram, A., Fordham-Clarke, C., 2010. Developing and examining an objective structured clinical examination. *Nurse Educ. Today* 39 (2) 137e141. <https://doi.org/10.1016/j.nedt.2009.06.014>.
- Karoglu, A.K., Kiraz, E., Özden, M.Y., 2014. Good practice principles in an undergraduate blended course design. *Egitim ve Bilim* 39 (173).
- Krueger, R.A., 2014. *Focus Groups: A Practical Guide for Applied Research*. Sage publications.
- Krueger, R.A., Casey, M.A., 2000. *Focus Groups: A Practical Guide for Applied Researchers*, third ed. Sage, Thousand Oaks, CA.
- Lemon, T.I., Lampard, R., Shah, R.D., Stone, B.A., 2013. Re: Qureshi NS. 2013. Examiners' perceptions of the objective structured clinical examination in colposcopy. *Journal of Obstetrics and Gynaecology* 33: 188–190. *J. Obstet Gynaecol* 33 (6), 645. 645. <https://doi.org/10.3109/01443615.2013.806452>.
- Lincoln, Y.S., Guba, E.G., 1985. *Naturalistic Inquiry* Vol. 75 Sage.
- Massey, D., Byrne, J., Higgins, N., Weeks, B., Shuker, M.A., Coyne, E., Mitchell, M., Johnston, A.N., 2017. Enhancing OSCE preparedness with video exemplars in undergraduate nursing students. A mixed method study. *Nurse Educ. Today* 54, 56–61. <https://www.ncbi.nlm.nih.gov/pubmed/28477564>.
- Marcyjanik, D.L., Johnson, N.L., 2016. Use of Objective Structured Clinical Examination in a Senior Baccalaureate Nursing Course for Assessment of End-Of-Program Outcomes. file:///C:/Users/user/Downloads/2_Marcyjanik_D_p76719.1.pdf.
- Morse, J.M., 2016. *Mixed Method Design: Principles and Procedures*. Routledge.
- Muldoon, K., Biesty, L., Smith, V., 2014. 'I found the OSCE very stressful': student midwives' attitudes towards an objective structured clinical examination (OSCE). *Nurse Educ. Today* 34 (3), 468–473. <https://doi.org/10.1016/j.nedt.2013.04.022>.
- Nasiri, S., Abbaszadeh, F., Atrian, M.K., Mousavi, G., 2015. Reliability and validity of the objective structured clinical examination in the evaluation of clinical skills of midwifery students (kashan, 2014). *J. Res. Med. Sci.* 4 (2), 95–98. <file:///C:/Users/user/Downloads/3226-12947-3-PB.pdf>.
- Obizoba, C., 2018. *Mitigating the Challenges of Objective Structured Clinical Examination (OSCE) in Nursing Education: A Phenomenological Research Study*. Nurse education today.
- Onwuegbuzie, A.J., Dickinson, W.B., Leech, N.L., Zoran, A.G., 2009. A qualitative framework for collecting and analyzing data in focus group research. *Int. J. Qual. Methods* 8 (3), 1–21.
- Pierre, R.B., Wierenga, A., Barton, M., Branday, J.M., Christie, C.D., 2004. Student evaluation of an OSCE in paediatrics at the university of the west indies, Jamaica. *BMC Med. Educ.* 4 (1), 22. <https://doi.org/10.1186/1472-6920-4-22>.
- Pierre, R.B., Wierenga, A., Barton, M., Thame, K., Branday, J.M., Christie, C.D.C., 2005. Student self-assessment in a paediatric objective structured clinical examination. *W. Indian Med. J.* 54 (2), 144–148. <http://caribbean.scielo.org/pdf/wimj/v54n2/v54n2a12.pdf>.
- Qureshi, N.S., 2013. Examiners' perceptions of the objective structured clinical examination in colposcopy. *J. Obstet Gynaecol* 33 (2), 188–190. <https://doi.org/10.3109/01443615.2012.737050>.
- Rushforth, H.E., 2007. Objective structured clinical examination (OSCE): review of literature and implications for nursing education. *Nurse Educ. Today* 27 (5), 481–490. <https://doi.org/10.1016/j.nedt.2006.08.009>.
- Selim, A.A., Ramadan, F.H., El-Gueneidy, M.M., Gaafer, M.M., 2012. Using Objective Structured Clinical Examination (OSCE) in undergraduate psychiatric nursing education: is it reliable and valid? *Nurse Educ. Today* 32 (3), 283–288. <https://doi.org/10.1016/j.nedt.2011.04.006>.
- Shen, L., Zeng, H., Jin, X., Yang, J., Shang, S., Zhang, Y., 2018. An innovative evaluation in fundamental nursing curriculum for novice nursing students: an observational research. *J. Prof. Nurs.* 34 (5), 412–416. <https://doi.org/10.1016/j.profnurs.2018.05.002>.
- Solà, M., Pulpon, A.M., Morin, V., Sancho, R., Clèries, X., Fabrellas, N., 2017. Towards the implementation of OSCE in undergraduate nursing curriculum: a qualitative study. *Nurse Educ. Today* 49, 163–167.
- Strauss, A., Corbin, J., 1998. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. Sage, Thousand Oaks, CA.
- Traynor, M., Galanoui, D., 2015. Have OSCEs come of age in nursing education? *Br. J. Nurs.* 24 (7). <https://doi.org/10.12968/bjon.2015.24.7.388>.
- Uliyah, M., Hidayat, A.A.A., 2017. Objective structured clinical examination (OSCE) based teaching material development. *Adv. Sci. Lett.* 23 (12), 12521–12523.