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Evaluating Undergraduate Nursing Students' Perspectives on the Effectiveness of OSCE in Assessing Infection Prevention and Control Competencies

Muhammad Rehan
rehanjarral@gmail.com
Assistant Professor, Dow University of Health Sciences, Karachi

Dr. Lim Gek Mui
gmlim@mashsa.edu.my
Dean/Association Professor, MAHSA University, Malaysia

Shahida Yaseen Khan
Shahidakhaki123@gmail.com
Sr. Nurse, Sindh Govt Karachi

Muhammad Rehan
Muhammadrehan.9101@duhs.edu.pk
Lecturer, Dow University of Health Sciences, Karachi

Misbah Khan
misbah.khan@duhs.edu.pk
Lecturer, Dow University of Health Sciences, Karachi
Corresponding Author: * Muhammad Rehan rehanjarral@gmail.com

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ABSTRACT

Background: *Infection Prevention and Control (IPC) competencies are critical for nursing practice, especially in reducing healthcare-associated infections. Traditional clinical assessments often lack standardization, prompting the adoption of the Objective Structured Clinical Examination (OSCE) as an objective, structured tool. This study aimed to evaluate undergraduate nursing students' perceptions of OSCE in assessing IPC competencies.*

Materials & Methods: *A descriptive cross-sectional study was conducted from January to March 2025 in four nursing institutes (two public, two private) in Karachi, Pakistan. The sample included 150 first-year BSN students enrolled in the IPC course, selected through purposive sampling. Data were collected using a validated 24-item structured questionnaire on a 3-point Likert scale. Ethical approval was obtained, and informed consent was secured. Descriptive statistics (mean, SD, frequencies) and the Wilcoxon Signed-Rank Test were applied using SPSS v26.*

Results: *Participants were predominantly aged 21–25 years (66.0%) and male (68.0%), with equal representation from public and private institutions. Mean perception scores ranged from 2.7 to 2.8 across OSCE domains, significantly above the neutral midpoint ($p < 0.001$). Students reported OSCE to be fair, objective, well-organized, and effective in reducing examination stress. They highlighted enhanced critical thinking, autonomous skill application, and increased motivation for learning.*

Conclusion: *Undergraduate nursing students expressed overwhelmingly positive perceptions of OSCE as an assessment tool for IPC competencies. Its structured and standardized format promotes fairness, objectivity, and engagement, suggesting OSCE's strong potential for improving competency-based nursing education in Pakistan.*

Keywords: *Undergraduate Nursing Students, OSCE, Infection Prevention, Control Competencies*

INTRODUCTION

At the practice level, nurses are meant to be competent in providing comprehensive, safe, and high-quality patient care in various healthcare environments and in different lifespan stages (Tonnessen et al., 2020). Nursing competence involves not merely the ability to apply theory into practice but also the ability to incorporate psychomotor skills, analytical thinking, and professional dispositions to promote the delivery of efficacious nursing care. Nevertheless, the assessment of clinical competence is still seen as a challenging and multifaceted task by nurse educators. Conventional evaluation tends to be somewhat subjective that can cause a feeling of subjectivity and unevenness in the determination of results (Walsh, 2007). Such degree of subjectivity, coupled with the complexity and unpredictability of clinical experiences, has resulted in ongoing concerns relative to consistent, equitable, and accurate assessment of student performance.

In answering these phenomena, there is a prevalence of a multi-methodology approach to competency assessment among scholars and educators which involves combining different assessment modalities to paint a comprehensive picture of the knowledge, skills and attitudes of students (Gawade, 2018; Marcyjanik, 2016; Nulty et al., 2011). In this sense, Objective Structured Clinical Examination (OSCE) has become the promising method of objectivity increasing of the clinical assessment and becomes very much known. The OSCE originated as a method of clinical assessment equalization in medical education Harden et al. (1975) and was initially intended to offer a form of structure and standardization to assess clinical cast in an arena where it was likely to have least impact of extraneous factors, which are implicit in the interaction with real patients. Incorporating standardized patients or simulation-based scenario, the OSCE enables specific competencies to be assessed under a controlled setting; this technique involves the comparability of conditions among all the learners (Harden & Gleeson, 1979).

The OSCE structure implies its form of circuit consisting of the stations each devoted to a particular clinical task or situation. During every station, students will be asked to identify some competencies which might be history taking, physical examination, problem-solving, communication, technical procedures, decision-making, and care management (Gawade, 2018; Marcyjanik, 2016). In detail checklists and scoring rubrics that are standardized are usually used to assess the performance, minimizing the assessor bias and enhancing inter-rater reliability (Walsh, 2007). In the long run, OSCE has been modified by nursing education programs across the globe to suit both formative and summative purposes in that, it enhances feedback and remediation with valid and reliable summative assessment (Nulty et al., 2011).

The OSCE is confirmed as a valid and effective method of clinical competence assessment in an integrative manner based on the evidence found in the nursing education literature. It has been demonstrated to promote experiential learning in simulated scenarios that allow students to link theory with practice during the simulation of realistic clinical situations without compromising this information set during the real-life clinical scenario (Gawade, 2018; Nulty et al., 2011). The fact that it covers many areas of competence not only provides them with a comprehensive assessment but also equips students with the realities of the multidimensional work of clinical nurses (Marcyjanik, 2016).

To conclude, the OSCE is another major step in assessing nursing skills and overcoming the shortcomings of the subjective form of assessment. Its multi-dimensional, structured and standardized format is consistent with best practices in competency-based education as they guide nursing graduates not only to be well versed in technical skills, but also in using critical thinking and professional judgment within the varying and dynamic apposite conditions that represent the health care setting. In this way, the

view of students regarding OSCE plays a crucial role in determining the validity and usefulness of this approach to nursing education, especially in the areas where the greatest tension exists, like IPC education.

Objective Structured Clinical Examination (OSCE) has been commonly recognized as one of the powerful pedagogical tools (Gawade, 2018), which are utilized to facilitate the learning and teaching of clinical skills that are required to reach professional competence in nursing practice. Its practical format enables educators to assess what the students can carry out in regulated clinical situations- putting stress on this exact phrase, in actual exercises- what they can do, opposed to passively screening what they know. Such performance-oriented approach is especially useful when closing the theory-to-practice divide. Nevertheless, it is also important that the OSCE is objective. The absence of stringent standardization will jeopardize the examination, which is subject to inconsistency with scoring (and thus, reliability is compromised), and, therefore, the examination is not able to offer competence assessments that are accurate, fair, and replicable (Gawade, 2018).

Although the OSCE has numerous benefits it has been criticized over its operational requirements. It is a resource-demanding exercise that necessitates significant faculty input when it comes to scenario design, assessor training, prepping of standardized patients, and logistics (Obizoba, 2014). Moreover, it might be administratively time-consuming and economically expensive to conduct, especially in big nursing programs that require numerous stations and repeated sessions to cover the entire student population. Furthermore, in high-stakes assessments, including simulations and OSCEs, the concern of reliability and validity highlights the significance of using tools that have been actively tested psychometrically so that they can reliably and repeatedly measure the desired.

When teachers are asked to give assessment to a wide range of learners, the challenge of coming up with comprehensive assessment instruments is even more magnified. The clinical competence, including technical skills, clinical reasoning, communication, and professional judgment, cannot be covered comprehensively and accurately without careful planning and comprehensive evaluation frameworks (Vijayalakshmi & Revathi, 2017). This is especially critical as the issue of quality of assessment also persists in the domain of health professions education. Nonetheless, many studies have identified the OSCE as a powerful, and in most instances, vital tool to assess clinical performance in allied health professions, which offers systematic chances to learners to reflect and show their proficiency in challenging yet predictable conditions (Bhowate et al., 2014).

However, critics have also observed that, although the OSCE can reliably test discrete competencies and procedural skills, it may be less effective at assessing the highest levels of clinical competence--especially the ability to integrate complex decision and holistic patient care during rapidly changing real-life situations. In addition to this, although OSCE has been exquisitely studied in medical education, a significant research gap has been identified within the nursing literature with little empirical research examining its use, structure, and perceived effect in nurse education programs particularly in Pakistan. The use of OSCEs in the undergraduate nursing in Pakistan has grown off late in recent years. Nevertheless, it is well-documented that the effectiveness of OSCEs in examining IPC-related competencies through a student lens remains poorly studied empirically. The experiences and perception of OSCEs by learners can highlight useful information that will help in understanding how this type of assessment serves the purpose of competency development, enhances clinical preparedness, and gives insights on areas that require improvement.

With that said, this research undertaking intends to analyze the views of undergraduate nursing students regarding the usefulness of the OSCE as an assessment tool of infection prevention and control skills. In

particular, it will investigate student perceptions on objectivity and realism and the educational worth of OSCEs applied to IPC learning and the psychological and logistical difficulties they encounter. The results of this research will guide curriculum designers, nurse educators, or educational institutions on how to maximize OSCEs as an educational and evaluation strategy, especially in limited-resource settings.

Research Objective

1. To evaluate undergraduate nursing students' perceptions of the Objective Structured Clinical Examination (OSCE) in Infection Prevention and Control using a structured 3-point Likert scale.

METHODOLOGY

Research Design

A descriptive cross-sectional design was adopted to gather data from students who had recently completed an OSCE for the IPC course.

Study Setting

The research was carried out in four nursing institutes (two public and two private) within the city of Karachi in Pakistan, which offer undergraduate programs in nursing accredited by the Pakistan Nursing Council (PNC) and affiliated with Dow University of Health Sciences Karachi.

Study Population

This study targeted fist-year first-semester, Bachelor of Science in Nursing (BSN) students who were enrolled in Infection Prevention and Control (IPC) course.

Sample Size

Sample size of this cross-sectional study was determined in the G*Power 3.1 software. This was computed using the following parameters: alpha level = 0.05, power = 0.80, and small effect size (d = 0.2) following the guidelines proposed by Cohen (1). The values were arrived at so that this study could capture even small variation in the perceptions of the students.

Using these parameters, the targeted sample size was estimated to be 150 participants. This is deemed an effective sample size that will be sufficient in the development of statistically valid conclusions about the perceptions of the undergraduate nursing student upon administration with reference to the usefulness of OSCE in determining the Infection Prevention and Control (IPC) competencies.

Sampling Technique

A purposive sampling technique was used in this study.

Sampling Criteria

The study applied specific inclusion and exclusion criteria to ensure the selection of a relevant and consistent sample of participants.

Inclusion Criteria

First-year first-semester students of BS Nursing program and currently enrolled in the Infection Prevention and Control (IPC) course at pre-determined nursing institutes in Karachi were included in this study.

Exclusion Criteria

Students, with irregular class attendance, defined as attending less than 75% of scheduled sessions, were excluded.

Data Collection Tool

The Students Perception and Satisfaction with the OSCE Exam Scale as initial designed by Elbilgahy, Eltaib, and Mohamed (2020) was utilized to determine students perception of the OSCE (28). The demographic information section was outlined by the investigators of the present study and provided gender, academic year, and the type of institution of the participants. The original form of the instrument was used with no modification and the formal permission to use the instrument was obtained prior to administration of the instrument with the developers of the tool.

It was a structured questionnaire, which was self-administered, having 23 questions in total, divided into four sections. All items were a three-point Likert Scale with the response constructed in 1 = Disagree, 2 = Neutral, 3 = Agree pairs. Out of these 23 items, five items revolved around student's opinion on the system of the examination, four items covered student's opinion about the examination process, 10 items covered opinion of students about the examination evaluation and 4 items covered opinion about the sufficiency of time given to answer questions and question opportunities.

Validity and Reliability

The instruments were content-validated by three experts in medical-surgical, pediatric, and fundamental nursing, ensuring applicability, clarity, and comprehensiveness (30). Reliability analysis using Cronbach's alpha yielded a coefficient of 0.978, indicating excellent internal consistency (29, 3), and confirming the instrument's suitability for the study.

Pilot Study

A pilot test was done using 15 students, which was a 10 percent of the entire study sample, to determine the clarity, feasibility and consistency of the study instrument and opportunities to determine the time it would take to collect data in the main study. The results of the pilot study suggested that no amendments should be made to the instrument.

Ethical Considerations

The study was approved by the Institutional Review Board of the MAHSA University, Malaysia, after a thorough research proposal was submitted, including the objectives of the research, methodology, the intervention plans, data collection tools, and consent methods. Ethical approval was obtained whereby compliance with Declaration of Helsinki and local regulations was affirmed. Approval was also sought

among the chosen nursing institutes in Karachi. There was voluntary participation, and the students received both verbal and written information regarding the study and their rights, including the right to withdraw without penalty. Informed consent was obtained prior to Data collection using a written Informed consent. The confidentiality and anonymity were taken care of by using unique coding, limiting access to the data, and safe storing the physical and electronic records. All the information will be stored within a five years period after which will be destroyed in a secure manner, in an ethical manner.

Data Collection Procedure

The study was ethically approved by the Institutional Review Board of MAHSA University, Malaysia, and the relevant institutes were provided official permission. After the Objective Structured Clinical Examination (OSCE), the eligible people were contacted and gave them a clear understanding of the purpose of the study. A self-administered questionnaire was then administered with comprehensive instructions on how to complete it. All the participants were asked to sign written informed consent prior to data collection so that the data collection process could be accepted as voluntary participation and driven by the interest in adhering to ethics.

Data Analysis

Data were analysed using SPSS v26. Descriptive statistics (mean, SD, frequencies) and inferential tests The Wilcoxon Signed-Rank Test were used.

RESULTS

All 150 participating undergraduate nursing students were enrolled in Semester I. Most participants (66.0%) were aged 21–25 years, while 34.0% were between 15–20 years; no students were aged above 25 years. The sample comprised more males (68.0%) than females (32.0%). The vast majority were unmarried (98.0%), and institutional representation was evenly split between government and private nursing colleges (50.0% each).

Table 1: Participant Demographic Data

Demographic Characteristics	Category	Numbers of Participants	Percentage %
Age groups (years)	15-20	51	34.0%
	21-25	99	66.0%
	26-30	0	0.0%
	31-35	0	0.0%
Gender	Male	101	67.3%
	Female	49	32.7%
Institute	Government	75	50.0%
	Private	75	50.0%
Academic Year	Semester I	150	100.0%
Marital Status	Married	01	0.7%
	Unmarried	149	99.3%

This study evaluated undergraduate nursing students' perceptions of the Objective Structured Clinical Examination (OSCE) as an assessment method within the Infection Prevention and Control (IPC) course. Data were collected using a 23-item structured questionnaire employing a 3-point Likert scale (1 = Disagree, 2 = Neutral, 3 = Agree). The Wilcoxon Signed-Rank Test compared mean scores against the

neutral midpoint to determine significance. Results demonstrated consistently positive perceptions, with mean scores ranging from 2.7 to 2.8 ($p < 0.001$). Students affirmed the clarity of instructions, fairness, organization, stress reduction, and transparency of the OSCE format. They also reported enhanced opportunities for critical thinking, autonomous skill application, and motivation for further learning. Overall, findings indicate that OSCE implementation in IPC fosters fair, objective, and engaging evaluation, supporting its effectiveness as a clinical assessment tool in nursing education.

Table 2: Participant perception about objective structure clinical examination (OSCE)

S. No	Items	Mean	Standard Deviation	p-value from Wilcoxon's signed rank test (comparing against the test
1	Instructions were adequate to understand new format of examination.	2.7	0.7	<0.001
2	Opportunity was given to seek clarification.	2.7	0.6	<0.001
3	Examination was fair (uniformity of questions and time allotted).	2.8	0.5	<0.001
4	Examination was covered all types of questions.	2.7	0.6	<0.001
5	Examination was well structured and sequenced.	2.7	0.7	<0.001
6	Examination was well organized.	2.7	0.6	<0.001
7	Examination format was more stress free than previous format.	2.7	0.6	<0.001
8	Variety of structured templates helped to maintain interest.	2.8	0.6	<0.001
9	Absence of faculty staff at exam reduce fear.	2.7	0.6	<0.001
10	This format of examination reduces the subjectivity.	2.8	0.5	<0.001
11	You are satisfied that marks reflect your level of performance.	2.8	0.6	<0.001
12	The exam in this way gives you the opportunity to work skilfully freely.	2.7	0.6	<0.001
13	The exam in this way gives more opportunity to think.	2.7	0.7	<0.001
14	The exam in this way gives less opportunity for teacher to detachedness.	2.7	0.7	<0.001
15	Result format helped you identify weak areas.	2.7	0.6	<0.001
16	Result format gave you confidence.	2.7	0.6	<0.001
17	Scoring was transparent and objective.	2.8	0.6	<0.001
18	This format reduces chance of failing.	2.8	0.6	<0.001
19	The format of OSCE offer more opportunities than the conventional format.	2.8	0.6	<0.001
20	OSCE require more time at each station.	2.8	0.6	<0.001
21	It is easy to finish in the correct time.	2.7	0.6	<0.001
22	Number of stations has been more.	2.8	0.6	<0.001
23	This experience has motivated to learn further.	2.8	0.6	<0.001
Overall perception score		**2.7**	**0.5**	**<0.001**

DISCUSSION

Assessment of clinical competence of the students is a fundamental part of teaching in nursing. The Objective Structured Clinical Examination (OSCE) provides structured assessment method, which would allow an evaluation of clinical skills in a comprehensive, consistent, and structured way. This procedure is quite objective thus reducing the bias on examiners and creates a clear distinction on the varying levels of student performances. The current study was therefore designed to assess the perception of undergraduate nursing students toward OSCE effectiveness on assessing infection prevention and control (IPC) competencies.

Turning to the perceptions of the structure of the OSCE by the students, the results of the survey conducted in the framework of the present research have suggested that the examination was perceived as properly organized by the participants. These findings align with the findings among the studies by Saeed, Al Suwayh, and Alomri (2016) which indicated that between 70% and 84% of students found the OSCE to be well administered, well structured, and logically sequenced. El Nemer and Kandeel (2009) also got similar outcomes.

Regarding stress, the results of this study showed that students tend to consider the OSCE a less stressful examination format than the old forms. This aligns with the results of Nafee, Ahmed, and Hussien (2019), whose study showed that 89.6 percent of students in the OSCE group rated the exam less stressful than 47.6 percent of students in the old-school clinical examination group. Similarly, Saeed et al. (2019) found that although the percentage of students who recognized the OSCE as stressful exceeded 90 percent, more than half of all students did believe that it was less stressful than other forms of examinations. Dhinakaran et al. (2015) also support evidence, as they stated that all students who were involved in the study (100%) believed that the OSCE was less stressful than any other performance evaluation methodologies.

In regard to the administration of the examination, the present study identified that the students received sufficient guidelines and had chances to clarify their confusion, and this helped them grasp the OSCE format. These findings align with Saeed et al. (2019), who stated that seventy-five-point six percent (75.6) of students felt the instructions were clear and unambiguous. In the same regard, Saed and Abbas (2017) stated that 72 percent of the learners regarded the instructions as sufficient in explaining the structure and form of the OSCE. Such findings are also consistent with Skrzypek et al. (2017), in which 86.4 percent of those students registered their satisfaction with the introductory information delivered prior to the examination.

In regards to the perceptions of students in regard to the evaluation and time given to answer examination questions, the findings of this study indicated that OSCE minimized subjectivity in evaluation. This correlates with the study by Singh Chajhlana, Bhumi, Mahabhashyam, and Varaprasada (2018) whose results indicated that 80 percent of learners considered the conventional approach to assessment to be more subjective than the OSCE. Likewise, Florence (2016) arrived at a conclusion that the OSCE offers an impartial methodology of evaluating clinical competence, among which 80% of the faculty, 74% of the BSN graduates and 62.3 is represented by the Associate Degree in Nursing (ADN) graduates.

Lastly, regarding exam outcomes, the results of the current study revealed that participants felt that the OSCE minimized their chances of failing the exam. This is confirmed by Saed and Abbas (2017) who revealed that 47% of pediatric nursing students, 45 percent of obstetric nursing students, 68 percent of fundamental nursing students, and 38 percent of medical-surgical and critical care nursing students agreed that the OSCE format made the risk of failure less.

CONCLUSION

The current research revealed that the undergraduate nursing cohort who were in their first semester BSN course had an overwhelming positive attitude with regard to the effectiveness of the OSCE as the assessment tool, in the Infection Prevention and Control (IPC) course. The clarity, fairness, organization, transparency, and less examination-related stress was confirmed by participants. The assessment design was also seen to facilitate critical thinking, independent use of skills and inducement to continue learning. The results confirm available evidence of the validity of the OSCE as a valid fair method of measuring clinical competence. The OSCE, with its standardized and structured format, promises to guarantee uniformity in skills assessment, given that accuracy and adherence to procedures are crucial factors to patient safety in the context of IPC. Due to the equal participation of government and privatized institutions, these findings point towards the idea of understanding OSCE can be effectively adapted in various setting of nursing education in Pakistan. On the whole, the OSCE offers a great deal of potential in regards to the improvement in the quality of nursing education, especially in those areas that purely demand high clinical accuracy, like infection prevention and control.

RECOMMENDATION

The incorporation of OSCEs into nursing institutions should be done in a systematic way on IPC and other clinical classes so that the competency evaluation is professional. This orientation should be done before the assessment to make the students familiar with the steps, which thereby reduces their anxiety hence, increases their performance. OSCE design, station development, and standardized marking ought to be trained to faculty to ensure reliability and fairness. The implementation of OSCE should be reviewed periodically to ensure that it keeps up with the current clinical guidelines as well as student feedback so as to maintain a constant improvement of quality. There is the possibility of cooperation between the government and the replaced institutions in order to foster the best practices and make optimum use of assessment resources.

FUTURE IMPLICATION

The successful experiences of the implementation of the OSCE in IPC reveal the possibilities of expanding the practice to the context of nursing education as a whole. Further studies on its influence on the long-term retention of knowledge, providing clinical evaluations, and ensuring patient safety should be conducted in the future. Its effectiveness could also be proved based on the results of comparative studies with other assessment techniques used in traditional settings. To add, including digital or simulated-based OSCE stations can augment a higher degree of realism and flexibility especially in environments where resources are limited. The further expansion of OSCEs to other high-stakes clinical domains may serve to streamline competency assessment across the country, helping create an exceptionally talented and practice-ready nursing workforce.

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