# Efficacy of a Hands-on Training OSCE Workshop on Advanced Nursing Skills at Institute of Liver and Biliary Sciences, New Delhi, India

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**Abstract**

*Nurses are expected to achieve a specific level of clinical competence upon completion of their nursing programme. While various methods, such as bedside practical examinations exist for assessing the competence, the Objective Structured Clinical Examination (OSCE) stands out as the gold standard. It provides a comprehensive, reliable, and valid assessment by multiple examiners across different stations, evaluating various aspects of clinical competence. This study aimed to evaluate the effectiveness of OSCE in enhancing advanced nursing skills among both nursing faculty and students. Using a one-group pre-test post-test research design with a quantitative approach, a convenient sampling method was employed. A structured questionnaire consisting of 20 multiple-choice questions was utilised to assess participants' knowledge of OSCE on various advanced nursing skills stations. The one-day programmme encompassed theory and demonstrations of OSCE stations on selected procedures from gastroenterology, nephrology and oncology nursing. A paired sample t-test, revealed a significant increase in knowledge scores from pre-test to post-test (t=4.806, p = 0.000). To conclude, OSCE serves as an effective approach for teaching advanced nursing skills, highlighting the importance of sensitising and training nursing students, faculty, and clinical nurses in this methodology.*

**Key words:** OSCE, Clinical competence, Nursing skills

As per review of 10-year data, 65 percent to 76 percent of the new nurses did not meet expectations for entry level clinical judgment and found translating knowledge into theory difficult. For the degree of agreement on whether these new graduate nurses are fully prepared to provide safe and effective care in the hospital setting, 89.9 percent of the nurse educators agreed to only 10.4 percent from the nurse practitioners from the hospitals. This clearly indicates that a huge gap exists when it comes to ascertaining competency of the new nurses. It is an alarming situation for the nursing education system and there is an immediate need to train these nursing students so that they can tackle the dynamic needs of the health care industry seamlessly (Kumari & Kaur, 2017). The nurses are trained with a set of specific skills, knowledge and attitudes. This mandates to assess their competence quite objectively through a reliable and valid method. The Objective Structured Clinical Examination (OSCE) can be a better approach to assess the knowledge, psychomotor skills and affect as the conventional clinical and practical examinations as oral viva, taking up individual cases, written assignments have poor reliability and validity in terms of their practical use (Maxim & Dielman, 1987). The OSCE is an approach to students' assessment wherein their clinical competence is assessed comprehensively in a structured and consistent manner by maintaining objectivity (Byrne et al, 2008).

OSCE has been used as an effective tool to measure performance-based competence by determining the levels of skills acquired with the help of simulation. A framework for the development of clinical competence has been described by Miller (1990) who has outlined four levels of assessment of a learner i.e. Knows, knows how, shows how and does. The OSCE determines the third level showing how Miller's pyramid focuses on assessment of performance of specific skills in a controlled setting (Ahmad et al, 2009). This makes it particularly relevant and useful for the early stages of undergraduate nursing curriculum, where assessment comprises compartmentalised exercises (Miller, 2009).

In recent times, there has been a notable surge in the enrolment of students in nursing programmes. Consequently, assessing a large cohort of students within hospital settings presents added challenges, such as space constraints, patient availability, overcrowding, and disruption to hospital operations. Therefore, the OSCE, which can be conducted safely in laboratory environments

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using high-fidelity mannequins, proves invaluable. Traditional examination methods fall short in assessing critical thinking and problem-solving skills. OSCE enables the manipulation of training environments, repetition of scenarios, and easier evaluation of performances.

**Need for the study:** Nursing programmes prioritise the development of clinical competence in their students. While the objective and reliable method of OSCE is widely recognised in the medical field, its adoption within the nursing community is gaining momentum gradually. However, the preparation and implementation of OSCE among nurses in India are still in infancy stage. This study aims to provide evidence regarding the effectiveness and challenges of using OSCE for advanced nursing procedures among nursing students and nurses. The findings will inform strategies for better preparation and utilisation of OSCE as an evaluation method within the constraints of available resources.

### Review of Literature

Bartfay et al (2004) expressed that OSCEs are particularly suitable for evaluating safe practice and the application of knowledge to clinical scenarios in undergraduate curricula, especially concerning the performance of psychomotor skills. It is advisable to integrate OSCEs into the curriculum alongside other pertinent methods of student evaluation.

A recent study conducted by Alamri et al (2022) involved a cross-sectional survey of 160 undergraduates from a selected nursing college at Sultan Qaboos University, Muscat, Oman, aiming to gauge students' perception and attitude towards OSCE. The majority of respondents (66.3%) did not find the OSCE atmosphere pleasant, with 40.6 percent expressing a preference for alternative modes of practical examination. Additionally, 64.4 percent felt that the time allotted for the OSCE was insufficient. Data also revealed that 33.1 percent of participants found the OSCE more stressful than a full practical examination. However, some students reported improvements in communication skills and confidence in nursing abilities due to the OSCE. These findings indicate that students may not be adequately prepared for the OSCE, thus the nursing educators consider further evaluation and enhancement of the OSCE to enhance student's acceptance and appreciation of this method as a crucial form of clinical learning and assessment.

## Objectives

- To assess effectiveness of OSCE training workshop in terms of knowledge gained.
- To compare knowledge among study participants–nurses and students.
- To determine association of knowledge with the selected demographic variables.

### Hypothesis

**$H_{01}$**- There is no significant difference in pre- and post-test levels of knowledge after the OSCE training workshop among the participants and between the nurses and final year students.

**$H_{02}$**- There is no significant association between the knowledge and the selected demographic variables.

## Methods and Materials

*Study design and setting*: A one group pre-test post-test design with a quantitative research approach was adopted to conduct this one-day national hands-on practice workshop at Institute of Liver and Biliary Sciences (ILBS), New Delhi in the month of April 2024.

*Study population*: The target population was final year students/PG students and nurses. The accessible population included final year students, PG students and nurses who were employed in hospitals and nursing colleges from India. A total of 148 participants were enrolled to test the hypothesis whether the hands-on training on OSCE on advanced nursing procedures for nursing students and faculties will improve their knowledge regarding OSCE.

*Sampling method:* A convenient sampling method was used include nursing students and faculties and clinical nurses from the colleges across India. A total of 148 participants were enrolled.

*Study tool*: It was a self-developed structured tool with 20 items on multiple choice questions, each comprising four responses with one correct response to evaluate the knowledge of the participants regarding OSCE on advanced nursing procedures.

The knowledge questionnaire was validated by the three experts. The reliability of the developed tool was determined with test-retest method and was found to be 0.8. The questionnaire was filled by the participants before beginning the training programme and again after completion of the training programme.

### Development of the OSCE Blueprint for Nursing Procedures

The one-day training programme consisted of theory sessions and practical demonstrations of OSCE stations focusing on advanced nursing procedures.

For developing the systematic sampling of OSCE curriculum for this advanced nursing

workshop a team of nursing experts was constituted having practical knowledge of the prioritised needs in the liver and biliary system. Firstly, the important nursing procedures which were planned to be tested were determined. Thus, keeping the novelty of the certain diagnostic and therapeutic procedures which were conducted by nursing team in coordination with the respective technicians and treating physicians at ILBS, such as Fibro scan, Body Composition Analysis, specialised scales used in Liver Intensive Care units, management of gastrointestinal bleeding, gastrointestinal endoscopy assessment, frailty index evaluation, plasmapheresis, utilisation of biosafety cabinets for chemotherapy preparation, chemotherapy care, PICC line maintenance, and haemodialysis were decided to be included as the 11 stations for the hands on practice.

For each station, checklists and scoring sheets were meticulously prepared to guide participants through the operational aspects of the OSCE stations. The prepared checklists were validated by the team of nursing experts for their relevance, appropriateness and accuracy. All the stations were manned stations. The time duration was kept for 10 mins for each station. Each checklist consisted of the instructions to the examiner, examinee, case scenario and the scheme of scoring as 2 marks for the task performed completely, 1 mark for the task performed partially and 0 for the Not performed/performed with mistakes. The demonstration of stations and OSCE circuit was run for the participants in small groups, with each group comprising 13-14 participants, ensuring effective engagement and personalised attention during the training.

Each participant was given the opportunity to practice hands-on all the OSCE stations. They were also explained in the three theoretical sessions taken before hands-on practice about OSCE overview, OSCE components and methods of assessment and third session including orientation and sensitisation of the checklists and how the stations are created. It included a brief account of all the above 11 stations.

**Ethical consideration:** Permission to conduct the workshop was given by the competent authorities of ILBS. The participants got registered and also filled an informed consent form for participating in the pre-test and post-test through google survey. The participants were free to withdraw at any time without giving reason and assured that their responses would be kept anonymous and confidential.

**Data management and statistical analysis:** The data was extracted in the excel sheets and the personal details as name, mobile number and e mail ids were excluded from the final data sheet and unique identification numbers were allotted to maintain confidentiality and anonymity of the study participants.

The data was coded for the analysis. The study's data were analysed utilising SPSS version 21.0 using descriptive and inferential analysis to assess the impact of the intervention (OSCE on advanced nursing procedures) on the participants' knowledge. Percentage was used to analyse the demographic characteristics. Knowledge scores were classified as Inadequate (<60%), Moderately adequate (60-80%), and Adequate (>80%) to characterise participants' knowledge levels at both pre-test and post-test stages. A paired t-test was utilised to determine if there was a significant increase in knowledge levels from pre-test to post-test. Mean knowledge scores were compared with demographic characteristics, with independent samples t test at 0.05 level of significance.

Out of 148 participants enrolled, more than half (53.3%) were students and the remaining 63.3 percent were nursing faculty and clinical nurses. Majority (88.5%) were in their final year of graduation or pursuing MSc Nursing (Table 1). Majority (n=130, 87.8%) were in the age group 18-40 years. Mean age of the participants was 24 years with 18 – 63 years as the range. Majority of the participants (n=105, 79.5%) were females. More than half (n=87, 58.7%) were employed or studying in private colleges and hospitals.

## Results

**Table 1: Frequency percentage distribution of study participants as per demographic variables (N=148)**

| Demographic variables | f (%) |
|---|---|
| *Age (years)* | |
| 18-40 | 130 (87.8) |
| 41-60 | 17 (11.4) |
| 61-80 | 1 (0.67) |
| *Gender* | |
| Male | 43 (29.05) |
| Female | 105 (79.9) |
| *Qualification* | |
| Graduate | 131 (88.5) |
| Post graduate | 17 (11.4) |
| *Occupation* | |
| Students | 79 (53.3) |
| Employed | 69 (46.6) |
| *Organisation* | |
| Government | 61 (41.2) |
| Private | 87 (58.7) |

**Table 2: Level of knowledge of the study participants (N=148)**

| | Pre-test | Post-test |
|---|---|---|
| Level of knowledge | f (%) | f (%) |
| Adequate (>80%) | 33 (22.2) | 84 (56.7) |
| Moderate (60% to 80%) | 47 (31.7) | 44 (29.7) |
| Inadequate (<60%) | 68 (45.9) | 20 (13.5) |

As for as the level of knowledge among the participants, same is illustrated in Table 2. Prior to the training workshop, the majority of participants (68%) showed insufficient knowledge levels, with nearly half (47%) demonstrating a moderate level of knowledge. After the training, the proportion of participants with inadequate knowledge decreased to 20 percent, while 44 percent displayed moderate knowledge. Remarkably, post-training, over four-fifths (84%) of participants exhibited adequate knowledge, contrasting with only one-third (33%) prior to the training.

**Table 3: Mean, SD, MD, t test and p value for pre-test post-test knowledge among nurses and students**

| Group | Pre-test (Mean ± SD) | Post-test (Mean ± SD) | MD | t value | p value |
|---|---|---|---|---|---|
| Students (n= 82) | 11.34±4.038 | 15.84±3.117 | 4.5 | 11.30 | 0.00* |
| Nurses (n=66) | 10.45±3.880 | 15.48±3.245 | 5.03 | 11.43 | 0.00* |

Table 3 depicts the level of knowledge among nurses and students. The t values in both the groups were found higher with a p value of 0.00 showing that there was a significant difference in pre- and post-test scores among the nurses and students at 0.05 level of significance. The OSCE workshop could improve knowledge of both the groups. Hence null hypothesis $H_{01}$ is rejected.

The paired samples t-test indicated a markedly significant rise in knowledge scores from the pre-test to the post-test ($t = 4.806$, $p = 0.000$) among all the study participants (Table 4). This substantial enhancement is attributed to the OSCE training focusing on advanced nursing skills. Hence based on the findings the hypothesis $H_{01}$ is rejected.

**Table 4: Mean, standard deviation, mean difference, t and p value for pre-test and post-test for the participants (N=148)**

| Group | | | | | |
|---|---|---|---|---|---|
| | Mean ± SD | MD | df | t value | p value |
| Pre-test | 55.03±19.30 | 24.88 | 147 | 4.806 | 0.000* |
| Post-test | 79.91±17.90 | | | | |

*p <0.05 significant

**Table 5: Association between knowledge and selected socio demographic variables among participants in post-test group (N=148)**

| Demographic variables | Post-Test (n=148) Mean score | F/t value | p value |
|---|---|---|---|
| *Age (years)* | | | |
| 18-40 | 15.87 | 1.45 | 0.265 |
| 41-60 | 12.57 | – | – |
| 61-80 | 1.07 | – | – |
| *Gender* | | | |
| Male | 15.67 | 1.377 | 0.256 |
| Female | 15.80 | – | – |
| *Qualification* | | | |
| Diploma | 16.00 | 1.543 | 0.206 |
| Graduate | 15.78 | – | – |
| Post graduate | 14.75 | – | – |
| *Occupation* | | | |
| Students | 15.84 | 1.760 | 0.176 |
| Employed | 15.48 | – | – |
| *Organisation* | | | |
| Government | 15.76 | 1.371 | 0.257 |
| Private | 15.63 | – | – |

Table 5 depicts the association of knowledge with the selected demographic variables. None of the variables were found to be statistically significant. Hence the $H_{02}$ is accepted.

## Discussion

As the benefits and applicability of OSCE to a larger student population are being recognised, nursing organisations are increasingly showing interest in its implementation. This study revealed that both nursing faculty and students have limited knowledge of OSCE. The workshop provided an overview of OSCE, its components, and guidance on setting up OSCE stations, allowing participants to practice within these stations. Moreover, it oriented them to setting up OSCE for advanced clinical procedures in nursing, all within a tertiary hospital setting, providing a real-time experience.

Similar findings were observed in a study by Habeeb & Banoo (2019), where the authors compared OSCE versus traditional examination methods on antenatal examination, demonstrating significantly higher average scores in OSCE. Likewise, Piryani & Piryani (2018) conducted a study on a training workshop for developing OSCE for nursing faculty in Nepal, revealing increased confidence levels among participants post-training.

However, these studies did not assess knowledge specifically related to OSCE or its content.

Further, literature on knowledge among nursing students and faculty is scanty. A recent study by Ha & Lim (2023) evaluated the effects of OSCE on core nursing skills among pre-licensure nursing students in Korea, revealing significant differences in knowledge acquisition and retention. Additionally, Elsa (2022) conducted a descriptive study assessing OSCE knowledge among nursing faculty in a College of Nursing in Kerala and found that a majority had inadequate knowledge, although no intervention was conducted to assess the effectiveness of OSCE training.

### Limitations

The study's focus was limited to assessing the impact solely on knowledge as the outcome variable and examining the association of selected demographic variables with knowledge. Its scope could have been expanded by including additional variables like practice and satisfaction for a more comprehensive analysis. The group chosen was heterogenous with inclusion of faculty and students thus chances of introduction of bias could be there. Also, only the final year and Masters students in Nursing were included in the workshop. Additionally, it was one-day study, during which various aspects of knowledge on advanced nursing procedures were assessed, which may limit the generalisability of the findings.

### Implications

OSCE stands as an objective assessment tool for appraising the clinical competence of nursing students. Notwithstanding, many nursing faculty members find themselves lacking adequate training in this domain. With the recent inclusion of OSCE into the INC syllabus as an assessment method, it becomes essential for faculty members to receive proper preparation to proficiently administer OSCE evaluations. Nursing students must be furnished with the requisite knowledge and skills to ready themselves for and navigate OSCE assessments effectively.

## Conclusion

The practical training workshop focusing on advanced nursing skills OSCE has demonstrated its effectiveness in enhancing participants' knowledge. It is imperative for all nursing faculty members to ensure that they are adequately prepared and trained for OSCE. Additionally, nursing students should be equipped with the requisite techniques to navigate an OSCE examination successfully.

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