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NURSING STUDENTS' PERCEPTION OF OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE) AS AN ASSESSMENT METHOD OF EVALUATION IN CLINICAL NURSING PRACTICE: A CROSS-SECTIONAL STUDY

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ABSTRACT:
Background: Clinical competence assessment is an important part of the training process of nurses since it enables them to gain clinical knowledge, psychomotor skills and professional self-confidence. The traditional assessment techniques have been criticized because of the subjective nature and lack of standardization. OSCE has become widely used as a competency-based structure for assessing the clinical competence of nursing students. But there could be different perceptions of OSCE by the nursing students depending on their learning process and educational environment.
Objectives: To evaluate students' perceptions of OSCE as a test tool for assessing clinical competence and to explore the relationship between socio demographic factors and students' perceptions of OSCE.
Method: A quantitative descriptive cross sectional study design was conducted amongst 300 BSc nursing students who were selected using a non-probability convenient sampling technique. A structured questionnaire was administered to collect the data. The collected data was analysed using descriptive and inferential statistics.
Results: The results of the study revealed that majority of the nursing students (64%) demonstrated a positive perception of OSCE as a method of clinical evaluation. The highest mean score was observed in the domain of effectiveness (23.75 ± 3.53, with a mean percentage of 79.17%) while limitations of OSCE received the lowest means score (10.17 ± 3.36 with a mean percentage of 50.85%). A statistically significant association was observed between age and students' perception of OSCE, whereas no significant association was found with other social demographic variables.
Conclusion: Nursing students perceive OSCE as a fair, structure and effective method of clinical evaluation, although concerns related to time allocation and examination related stress persist. Strengthening orientation, time management and feedback mechanisms may further improve its acceptability and effectiveness.

KEYWORDS: Objective Structured Clinical Examination, Perception, Nursing students, Clinical competence, Assessment.

INTRODUCTION

Education is more than just a mere assimilation of information since it develops an ability for critical thinking and decision-making as well as application of knowledge. This notion is especially applicable to nursing profession which involves both scientific knowledge and practical skills, clinical judgement and caring. Therefore, education in nursing is designed to provide both classroom learning and clinical practice experience (Terefe et al., 2022;).

Nursing care is usually provided independently and under stress, there is a direct connection between how clinical competence is assessed and outcomes. The deficiency of clinical competence has been proved to lead to adverse incidents, long-term hospital stays and lower satisfaction, while high clinical competence provides safe and quality care (Vaismoradi et al., 2020; Kim et al., 2022). Accreditation criteria like standard 4.7 of the Accreditation Commission for Education in Nursing (2015) require diverse assessment approaches that correlate with practice. In addition, literature suggests that it is not possible to use one approach for proper assessment of clinical competence (Bashir et al., 2014).

Traditional assessment format- including written test. case presentation, bedside viva examinations and logbook review largely test the competence pyramid this approach 'know' and 'knows how' levels of Miller's competence pyramid. These approaches have repeatedly been open criticised for subjectivity, dependence on examiner judgement, and limited capacity to assess psychomotor skills, communication and clinical reasoning (Nulty et al., 2011).

The Objective Structured Clinical Examination (OSCE), first proposed by Harden in 1975 and further described by Harden and his colleagues in Dundee by 1979, was created to overcome this weakness (Rushforth, 2007). Initially adopted by North American and later on by UK medical schools, OSCE is now being used globally for evaluation of clinical skills (Singh, 2008; Sloan, Donnelly, Schwartz and Strodel, 1995). In India, OSCE was introduced in medical education in late 1990s through institutions like AIIMS. OSCE has gained importance in nursing after Indian Nursing Council's Revised Regulation and Curriculum for B.Sc. nursing programme (2020, notified in 2021), where competency – based, outcome-oriented education

and structured skills assessment have been emphasized. Many nursing colleges in India have started incorporating OSCE in their internal and formative assessments.

The objective structured clinical examination involves evaluating the students at various stations in the form of time allocated periods usually ranging from 5 to 10 minutes. The examiner uses standardized checklists for evaluation of students in cognitive, affective and psychomotor domains. Standardized patients may be used in assessing history taking, professional behaviour and communication skills. The use of structured checklist and examiner training has been shown to improve the reliability and objectivity of scoring (Kolivand et al., 2020).

A substantial body of international evidence supports value of OSCE. In Brazil, most nursing students related OSCE more favourably than professional examination for covering learning domains comprehensively (Silva et al., 2011). Studies from the Republic of Korea and Taiwan reported increase confidence, satisfaction and learning motivation following OSCE participation (Ha, 2016; Chen et al., 2021). Indian studies from Puducherry and other settings similarly report predominantly positive perception with students describing OSCE as comprehensive, time- efficient and useful for identifying areas of weakness (A. Felicia Chitra and Sri Devy, 2023; Mohandas and Ratheesh, 2020).

Assessment is widely recognized as a powerful determinant of learning behavior, and students' perceptions of assessments methods directly affect their motivation, confidence, anxiety levels, and approach to learning (Ha and Lim, 2023), and several studies indicate that OSCE- despite its structured design can provoke stress related to time pressure, performance expectation and unfamiliar stations (Emebigwine and Martin, 2023; Alamri et al., 2022). Understanding how students experience OSCE is therefore essential for educators seeking to define assessment practice, reduce unnecessary stress and ensure that evaluation genuinely supports learning and professional development.

Clinical competence is an essential component of safe nursing practice, and the educational institution is responsible for confirming the preparedness of students to function independently in practice. However, traditional practice test is susceptible to variations in examiner's expectations and present condition which may affect the consistency. Although OSCE overcomes these issues by standardization, evidence from a number of countries including Taiwan, the Republic of Korea, Egypt, Malaysia, Nigeria, Spain, Pakistan, Saudi Arabia and some Indian states clearly shows that although objectivity is increased in OSCE, the test-related anxiety cannot be ruled out owing to time constraint and constant supervision, which cause anxiety. Many of these studies, however, have been conducted in a single institute with limited sample size and have focused more on performance-based results than student experience.

However, despite the growing use of OSCE in Indian institutes with the changes in the competency-based curriculum, very little work has been done to find out the perception of nursing students regarding OSCE. This study was conducted to find out the perception of nursing students regarding OSCE as an evaluation tool in clinical nursing practice and its relationship with certain sociodemographic variables.

METHOD

Research approach and design: A quantitative, descriptive cross -sectional design was used to assess nursing students' perception of OSCE as an assessment method of evaluation in clinical nursing practice at a single point in time.

Setting and population: The study was conducted at Ramaiah Institute of Nursing Education and Research, Bengaluru among B.Sc. Nursing students who had been exposed to OSCE as part of their clinical training.

Sample and sampling technique: A total of 300 nursing students were recruited using a non-probability convenience sampling technique. The sample size was estimated using the formula $n=z^2pq/d^2$ based on previous study reporting that 75% of nursing students perceived the OSCE as fair, objective and transparent (Huldah,2024). At the 95% confidence level and 5% margin of error, the minimum require sample was 289 rounded to 300.

Inclusion criteria: Nursing students who had been exposed to OSCE during clinical training and who were available at the time of data collection. Students unwilling to participate were excluded.

Study Tool: Structured questionnaire was prepared after a detailed literature review and consultation of experts. Data collected from session A included socio demographic characteristics including age, gender, year of study, percentage of marks obtained in the recent academic examination, number of OSCEs attended by the student, and whether feedback has been provided to the students by the faculty members after OSCEs. Section B included 36 questions in five domains; OCSE attributes (11 questions), organization of OCSE (11 questions), validity and reliability (4 questions), effectiveness (6 questions) and limitations (4 questions). This section could have yielded a maximum of 36 to 180 answers. Five-point Likert scale was used to record responses (5= strongly agree to 1= strongly disagree) for positively stated questions while reverse scoring for negatively worded questions. Domain wise and overall mean scores were interpreted as very positive perception (152-180), positive perception (123-151), neutral perception (94-122), negative perception (65-93) and very negative perception (36-64).

Validity and reliability: Content validity was determined after consulting nine experts in medicine and nursing education who assessed the relevance, clarity, simplicity, and adequacy of questions; tool was modified based on their recommendations. Reliability was assessed using Cronbach's alpha and found to be 0.890.

Ethical consideration: Ethical clearance was obtained from the Institutional Ethics Committee (Reference no: EC-25/129-PG-RINER) for human trials prior to data collection. Formal permission was obtained from the concerned authority and written informed consent was obtained from all participants. Confidentiality and anonymity were maintained throughout.

Pilot study: A pilot study was conducted among 300 B.Sc. nursing students at Baptist College of Nursing, Bengaluru, selected through convenience sampling to assess feasibility, clarity and practicality of the tool. The pilot study findings (mean percentage of effectiveness was 79.17 which was the highest and mean percentage of limitation domain was 50.85, which was the lowest) confirm that the main study was feasible.

Data connection procedure: Data were collected over a 4-week period (1st to 31st January 2026) after obtaining formal permission. The student researcher introduced herself and explained the study purpose and obtained the informed consent before administering the questionnaire, which took approximately 30-35 minutes per participants to complete. Responses were entered into the Microsoft Excel and analysed using IBM SPSS.
Statistical analysis: Descriptive statistics (frequency, percentage, mean and standard deviation) were used to summarise social -demographic variables and perception scores. The chi-square taste was used to determine association between nursing students' perception of OSCE and selected socio-demographic variables with P <0.05 considered statistically significant.

RESULTS:
Data were obtained from 300 B.Sc. nursing students. Most participants 60 % were aged 20-25 years, 71% were female and 48% were enrolled in the 3rd year of B.Sc. nursing programme. Regarding academic characteristics 37% had obtained first class marks in their most recent academic examination ,62% had attended more than 4 OSCEs and 54% reported having received faculty feedback after an OSCE(Table1)

Table 1: Frequency and percentage distributions of subjects with regards to age, gender, course, year of study to percentage of marks obtained in the recent academic examination, number of OSCEs attended, and feedback received from faculty. (n=300)

Sl.No.	Socio-Demographic Variables	Frequency	Percentage%
1	Age in years		
	Below 20 years	119	40
	20-25 years	181	60
	26-30 years	0	0
	Above 30	0	0
2.	Gender		
	Male	87	29
	Female	213	71
3	Year of Study		
	1st year	54	18
	2nd year	101	34
	3rd year	145	48
	4th year	0	0
5	Percentage of marks obtained in the recent academic examination		
	75-100% (Distinction)	94	31
	65-74.99% (First Class)	110	37
	60-64.99% (Second Class)	48	16
	50-59.99% (Pass)	48	16
6	How many Objectives Structured Clinical Examinations (OSCEs) have you attended?		
	1-2	59	20
	3-4	54	18
	More than 4	187	62
7	Have you received any feedback from faculty after attending OSCEs?		
	Yes	163	54
	No	137	46

Perception of OSCE across domains: Table 2 presents the mean and standard deviation of perception scores across the 5-domains assessed. The effectiveness domain recorded the highest mean score of 23.75 ± 3.53 , with a mean percentage of 79.17% indicating that students strongly perceived OSCE as an effective method for evaluating clinical competencies. The OSCE attributes had a mean score of 41.51±6.29, with a mean percentage of 75.47 %, validity and reliability had a mean score of 15.06 ± 2.80 with a mean percentage of 75.30 and organization had a mean score of 41.05 ± 6.99 with a mean percentage of 74.64. The limitation domain recorded the lowest means score 10.17 ± 3.36, with a mean percentage of 50.85%, reflecting students' awareness of certain challenges associated with OSCE. Majority of nursing students, 191 (64%), had a positive perception regarding OSCE as an assessment method of evaluation in clinical nursing practice. Additionally, 33 (11%) of the students had a very positive perception, 63 (21%) had a neutral perception, 13 (4%) had a negative perception. (Table 2)

Table 2: Mean and standard deviation of nursing student's Perception Regarding OSCE as an assessment method of evaluation in clinical nursing practice (n=300)

Perception	Minimum	Maximum	Mean	Standard Deviation	Mean Percentage
OSCE Attributes	20	55	41.51	6.29	75.47
Organization of OSCE	21	55	41.05	6.99	74.64
Validity & Reliability of OSCE	4	20	15.06	2.80	75.30
Effectiveness of OSCE	12	30	23.75	3.53	79.17
Limitation of OSCE	4	20	10.17	3.36	50.85

Association between perception and socio demographic variables: A statistically significant association was observed between nursing students' perception of OSCE and age (χ^2 =9.584, p= 0.007). No significant association was found with gender (p=0.367), year of study (p=0.207), percentage of marks obtained in the recent academic examination (p= 0.200), number of OSCE attended (p= 0.638), received faculty feedback after OSCE (P=0.649) (Table 3)

Table 3. Association between nursing students' perception of OSCE and selected socio-demographic variables

Sl.No	Socio-Demographic Variables	Perception			χ^2 and Fisher Exact Value	p value
		Positive	Neutral	Negative		
1	Age					
	Below 20 years	99	19	1	χ^2 = 9.854	0.007*
	20-25 years	125	44	12		
2	Gender					
	Male	64	17	6	χ^2 = 2.002	0.367
	Female	160	46	7		
3	Year of Study					
	a) 1st year	43	10	1	Fisher Exact Value = 5.730	0.207
	b) 2nd year	81	15	5		
	c) 3rd year	100	38	7		
4	Percentage of Marks Obtained					
	a) 75-100% (Distinction)	77	16	1	Fisher Exact Value = 8.227	0.200
	b) 65-74.99% (First Class)	77	24	9		
	c) 60-64.99% (Second Class)	35	12	1		
	d) 50-59.99% (Pass)	35	11	2		
5	Number of OSCEs Attended					
	a) 1–2	47	11	1	Fisher Exact Value = 2.537	0.638
	b) 3–4	38	12	4		
	c) More than 4	139	40	8		
6	Feedback received from the faculty after OSCE					
	Yes	125	32	6	χ^2 = 0.864	0.649
	No	99	31	7		

* $p < 0.05$, statistically significant.

DISCUSSION

The OSCE is generally considered as one of the standardized methods of testing psychomotor skills, communication skills and clinical decision-making ability of nursing students. However, despite the standardized nature of the examination, nursing students are expected to experience stress, anxiety and time pressure during the process of the examination and such experience can influence not only their performance but also the way in which they perceive OSCE. Understanding the perceptions of nursing students regarding the OSCE is therefore crucial for assessing the strengths and limitations of this method of assessment and improvement of the clinical assessment.

Most of the participants in the research were between 20 and 25 years of age, female, and were studying in the 3rd year of the B.Sc. nursing program. Most of them scored first class marks on the last examination and participated in more than

4 OSCEs, receiving faculty feedback. It can be assumed that the participants were well-exposed academically and were familiar with OSCE to some degree.

Overall, 64% of students demonstrated a positive perception of OSCE, 11% had very positive perception, 21% had neutral perception and 4% had a negative perception. The effectiveness domain recorded the highest mean score of 23.75 ± 3.53 with a mean percentage of 79.17, while the limitation domain recorded the lowest mean score of 10.17± 3.36 with a mean percentage of 50.85%. This finding suggested, while students broadly view OSCE as a useful and dependable method for evaluating clinical competence, psychomotor skills and clinical judgement, they simultaneously recognise constraints particularly stress and time pressure that may affect that experiences and performances.

The OSCE attribute domain had a mean score of 41.51 ± 6.29, with a mean percentage of 75.47 %, reflecting that the students believed that OSCE was a fair, structured, and objective way of clinical examination which covered a broad range of clinical skills and also pointed out the weakness in their patient care and communication skills. It is consistent with previous studies done in Malaysia and Egypt which stated that the OSCE was transparent, unbiased, and effective in assessing clinical competence (Ahmad et al., 2025; Mahmoud, 2024) and also another study done in India from Chennai which stated that the OSCE was structured and objective and reduced examiner bias (Huldah, 2024). But comparatively low mean scores were obtained from the questionnaires of the students who felt that there should have been more time allocated to each station and also felt that there was the need for using the standardized patient as consultants mentioned in studies done in Puerto Rico and Saudi Arabia to increase learning and assessments (Rivera Vélez, 2018; Mohamed and Gonzales, 2019).

The organization domain also recorded a mean score of 41.05 ± 6.99 with a mean percentage of 74.64, indicating general satisfaction with station arrangement, clarity of instruction, communication of examination details and the overall conduct of the examination. The finding aligned with Mohamoud (2024), who reported that students in Egypt were similarly satisfied with the organization and clear guidance provided during OSCE. Nevertheless, comparatively lower scores were noted for items relating to revision of clinical procedures before OSCE and the adequacy of time between stations, suggesting that some students found preparation and transition between stations challenging. Comparable concerns regarding insufficient preparation time and difficulty completing tasks within allotted station times have been reported in Oman and Puerto Rico (Alamri et al., 2022; Rivera Vélez, 2018), pointing to a need for more structured practice session and adequate inter-station timing .

The validity and reliability domain recorded a pmean score of 15.06 ± 2.80 with a mean percentage of 75.30, indicating that students regarded OSCE as a standardized, objective and dependable method for assessing clinical competence and as providing valuable hands- on learning. This is consistent with the finding from Iran, where OSCE demonstrated acceptable validity and reliability for evaluating clinical competencies (Kolivand et al., 2020), and from Malaysia where most students felt that OSCE scores accurately reflected their true clinical performance (Aung and Zakaria, 2016). An Indian study similarly reported that the students perceived OSCE as an objective method that reduce subjectivity and accurately measured competence (Patil and Chaudhari, 2016).

Among all domains, effectiveness recorded the highest mean score of 23.75 ± 3.53 with a mean percentage of 79.17 indicating that students strongly perceived OSCE was helping them to identify their strengths and weaknesses enhancing clinical skills and knowledge and preparing them for real -world clinical practice. These findings are in line with studies found Republic of Korea, Puducherry and Chennai which reported improvement in clinical skills, confidence, knowledge and competence following OSCE participation (Ha and Lim, 2023; Malliga Kannan and Grace Kalaimathi, 2018) as well as studies from Kerala and Kolar reported that OSCE helped students recognise their strength and weakness and improve their confidence in performing clinical skills (Ancy et al., 2021).

The limitation domain recorded the lowest mean score of 10.17 ± 3.36 with a mean percentage of 50.85% affecting students concern regarding stress, examination related pressure. Many students felt that the limited time available at each station constraints the ability to demonstrate clinical skills confidently, and the OSCE may emphasise technical performance over more holistic aspects of patient care. Comparable concerns including stress, performance anxiety and inadequate time have been reported in the studies from Oman, Puerto Rico and South Africa (Alamri et al., 2022; Emebigwine, Linda and Martin, 2023). Similarly, studies from Saudi Arabia and Kolar found that despite generally positive views of OSCE, students considered it stressful and time pressure particularly in relation to the examination environment and preparation(Mohamed and Gonzales, 2019; Subhashini, Radha and Baby, 2018).A study in Oman further emphasised that inadequate time allocation and examiner behaviour influence students' acceptance of OSCE, even where its usefulness as an assessment method was recognised(Alamri et al., 2022). Taken together these findings suggest that while OSCE is broadly valued for the objectivity and effectiveness, addressing time allocation and the examination environment remain important for improvement students' overall experiences.

A significant association was observed between nursing students' perception of OSCE and age ($p=0.007$) suggesting that perception may vary with differences in academic exposure and familiarity with OSCE clinical experiences and familiarity with OSCE process across age groups. No significant association was observed with gender, year of study, academic performances, number of OSCE attended and feedback received after OSCE($p>0.05$). This contrast with Habibunisha et al.(2022), who reported a significant association between gender and perception of OSCE ($p=0.042$) among nursing students in Puducherry, indicating that the influence of demographic factor on perception may vary across settings. The absence of an association with feedback in the present study is also notable, given that earlier work has linked structured, immediate feedback to improve confidence, satisfaction and clinical performance during OSCE (Bahraini et al., 2021); this may reflect variation in the nature or timing of feedback provided rather than its inherent value.

Based on these findings the hypothesis that nursing students' perception of OSCE is associated with selected socio - demographic variables was supported for age but not for the remaining variables examined. Overall, the study achieved its objectives and provided evidence that nursing students generally hold a positive perception of OSCE as an assessment

method of evaluation in clinical nursing practice, while also identifies specific areas chiefly time allocation and examination related stress that warrant attention.

The study has certain limitation. It has conducted among B.Sc. nursing students at single institution which made limit the generalisability of the findings to other settings. The reliance on the self-reported responses may have introduced response bias or socially desirable answers and the time available for the study constrained the depth of data collection and analysis. The study examined only students' perception without including the views of faculty or examiners and factor such as stress levels, preparation strategies and institutional differences explored in detail, although this may also influence perception.

Further research involving larger, multi- institutional samples would help established the broader applicability of these findings. Comparative studies examining OCCE alongside initial assessment methods, and research linking students' perception of OECE with their actual clinical performance, would also be valuable. Investigating the effect of structured interventions such as orientation programmes, simulation based training and timely feedback on perception and performance may help identify practical strategies for reducing stress without compromising objectivity. Qualitative approaches could further illuminate students' experience, challenges and expectations while incorporating the perspective of faculty and examiner would provide more complete picture of the OCCE process. Longitudinal studies tracking changes in perception and competence with repeated OSCE exposure would also be useful.

Overall, these findings support the continued use of structured objective and effective method of clinical evaluation in nursing education; while highlighting that attention to time management, student orientation, preparation support and the examination environment may further enhance its acceptability and reduce unnecessary stress among students.

CONCLUSION

The study assessed the perception of 300 B.Sc. nursing students regarding the Objective Structured Clinical Examination (OSCE) as an assessment method of evaluation in clinical nursing practice, across five domains: OSCE attributes, organization, validity and reliability effectiveness and limitation. The overall mean perception score indicated positive level of perception among nursing students. The findings indicate that OSCE is an effective and standardised method of clinical evaluation that supports objective assessment and enhances students learning experiences. At the same time targeted improvements particularly in time management, student orientation and preparation could further strengthen its acceptability and effectiveness as an assessment method in nursing education.

The findings of the study have implication for nursing practice, education, administration and research. For practice, OSCE supports development of communication, critical thinking, decision making and clinical competence among nursing students reinforcing competency-based education that ultimately contributes to patient safety and quality of care. For nursing education, the finding support the continued integration of OSCE into clinical assessment, alongside adequate student orientation, preparation session and structured feedback to strengthen curriculum planning and teaching methods. For nursing administration the findings highlight the importance of careful planning of OSCE session and adequate infrastructure and simulation facilities and ongoing faculty training in standardised OSCE procedures to ensure fairness and consistency .For nursing research, findings point to the value of comparative studies between OSCE and traditional assessment method ,further exploration of strategies to reduce examination related stress and research incorporating the perspective of faculty and examiner alongside those of students.

Based on these findings it is recommended that students receive proper orientation and practice station before OSCE, that clear written instructions be provided ,that adequate time be allocated at each station to reduce stress and support confidence ,that faculty and examiner receive training in standardized OCSE procedures to ensure fairness and objectivity and that structured feedback be routinely sought from students after OSCE to identify difficulties and guide on going improvement of the evaluation process.

REFERENCE

1. Bashir, A., Tahir, S., Khan, J.S., 2014. Objectively structured performance evaluation – A learning tool. Biomedica 30(2), 139–147.
2. Calman, L., Watson, R., Norman, I., Redfern, S., & Murrells, T. (2002). Assessing practice of student nurses: Methods, preparation of assessors and student views. Journal of Advanced Nursing, 38(5), 516–523. https://doi.org/10.1046/j.1365-2648.2002.02213.x
3. Alamri, S., Al Hashmi, I., Shruba, K., Jamaan, S., Alrahbi, Z., & Al Kaabi, T. (2022). Nursing students' perception and attitude towards objective structured clinical examination in Oman. Sultan Qaboos University Medical Journal, 22(3), 343–350. https://doi.org/10.18295/squmj.2.2022.012
4. Habibunisha, S., Kumar, P., & Devi, R. (2022). Perception of undergraduate nursing students regarding objective structured clinical examination in Puducherry. International Journal of Nursing Education, 14(2), 112–117.
5. Vijayalakshmi, K., & Revathi, S. (2017). Performance of nursing students in psychiatric nursing using Objective Structured Clinical Examination (OSCE) versus Traditional Practical Examination (TPE): A comparative approach. International Journal of Nursing Education, 7(4). https://doi.org/10.5958/2349-2996.2017.00109.4
6. Subhashini, L., Radha, M. S., & Baby, G. K. (2018). Effectiveness of OSCE in assessment of clinical competencies and perception of OSCE among nursing students. RGUHS Journal of Nursing Sciences, 8(2), 28–32.
7. Bani-Issa, W., Al Tamimi, M., Fakhry, R., & Tawil, H. A. (2019). Experiences of nursing students and examiners with the Objective Structured Clinical Examination method in physical assessment education: A mixed methods study. Nurse Education in Practice, 35, 83–89. https://doi.org/10.1016/j.nepr.2018.11.009
8. Felicia Chitra, A., & Sri Devy, S. (2023). A study to assess the perception of nursing students regarding the objective structured clinical examination (OSCE) as an evaluation method. Journal of Clinical and Health Sciences, 8(2), 101–105.

9. Taala, W., Waggas, D., & Teresa, P. H. S. (2019). Utilization of Objective Structured Clinical Examination (OSCE) in ensuring clinical competence of nursing students: A case of FCMS. Open Access Library Journal, 6(3), 1–12. https://doi.org/10.4236/oalib.1105287
10. Silva, C. C. B. M., Pedrosa, R., Viveiros, M., Cunha, M. C., & Faria, C. D. C. M. (2011). Objective structured clinical evaluation as an assessment method for undergraduate chest physical therapy students: A cross-sectional study. Revista Brasileira de Fisioterapia, 15(6), 481–486. https://doi.org/10.1590/S1413-35552011005000033
11. Chabrera, C., Diago, E., & Curell, L. (2023). Development, validity and reliability of objective structured clinical examination in nursing students. SAGE Open Nursing, 9, 1–10. https://doi.org/10.1177/23779608231207217
12. Harden, R. M., Lilley, P., & Patricio, M. (2016). The definitive guide to the OSCE: The Objective Structured Clinical Examination as a performance assessment. Elsevier.
13. Kelly, M., Mitchell, M., Jeffrey, C., Henderson, A., Groves, M., Nulty, D., Glover, P., & Knight, S. (2016). OSCE best practice guidelines: Applicability for nursing simulations. Advances in Simulation, 1(10), 1–10. https://doi.org/10.1186/S41077-016-0014-1
14. Mahmoud, E. A., Al Fattah, M. A. A. H. A., & Gaber, S. (2024). Undergraduate nursing students' perception of quality of managing Objective Structured Clinical Examinations and its relation to their exam stressors and achievement. Egyptian Nursing Journal, 21(3), 244–252. https://doi.org/10.4103/enj.enj_47_24
15. Accreditation Commission for Education in Nursing. (2023). The ACEN 2023 standards and impact of accreditation on the quality of nursing education. https://www.sciencedirect.com/science/article/abs/pii/S1557308723002548
16. Nafee, H. M., Ahmed, A. E. S., & Hussien, A. M. (2019). Objective structured clinical examination versus traditional clinical examination among nursing students: A comparative approach. Journal of Nursing Education and Practice, 9(2), 42–48. https://doi.org/10.5430/jnep.v9n2p42
17. Rivera Vélez, R. del C. (2018). Perception of nursing students regarding stress and time constraints during objective structured clinical examination [Master's thesis, University of Puerto Rico Mayagüez]. UPR Mayagüez Scholarship Repository. https://scholar.uprm.edu/handle/20.500.11801/2072
18. Bashir, A., Tahir, S., & Khan, J. S. (2014). Objectively structured performance evaluation: A learning tool. Biomedica, 30(2), 139–147.
19. Rushforth, H. E. (2007). Objective structured clinical examination (OSCE): Review of literature and implications for nursing education. Nurse Education Today, 27(5), 481–490. https://doi.org/10.1016/j.nedt.2006.08.009
20. Sengul, T., Semerci, R., Güney, S., & Karakaya Çataldaş, S. (2024). Objective Structured Clinical Examination Perception Scale (OSCEPS) for health sciences students: A psychometric evaluation study. Nursing and Health Sciences, 26(4), e13188. https://doi.org/10.1111/nhs.13188
21. Chen, S.-H., Chen, S.-C., Lai, Y.-P., Chen, P.-H., & Yeh, K.-Y. (2021). The objective structured clinical examination as an assessment strategy for clinical competence in novice nursing practitioners in Taiwan. BMC Nursing, 20(1), 91. https://doi.org/10.1186/S12912-021-00608-0
22. Emebigwine, D. L. A., Linda, N. S. B., & Martin, P. (2023). Objective structured clinical examination: Do first-year nursing students perceive it to be stressful? Curationis, 46(1), e1–e8. https://doi.org/10.4102/curationis.v46i1.2339
23. Ha, E.-H. (2016). Undergraduate nursing students' subjective attitudes to curriculum for simulation-based objective structured clinical examination. Nurse Education Today, 36, 11–17. https://doi.org/10.1016/j.nedt.2015.05.018
24. Kolivand, M., Esfandyari, M., & Heydarpour, S. (2020). Examining validity and reliability of objective structured clinical examination for evaluation of clinical skills of midwifery undergraduate students: A descriptive study. BMC Medical Education, 20(1), 96. https://doi.org/10.1186/s12909-020-02017-4
25. Vincent, S. C., Jacob, E., Faith, M., & others. (2022). Objective structured clinical examination versus traditional clinical examination in nursing education: A systematic review. Nurse Education Today, 109, 105218. https://doi.org/10.1016/j.nedt.2021.105218
26. Ha, E.-H., & Lim, E. (2023). The effect of objective structured clinical examinations for nursing students. PLOS ONE, 18(6), e0286787. https://doi.org/10.1371/journal.pone.0286787
27. Kannan, M., & Kalaimathi, G. (2018). Effectiveness of objective structured clinical examination (OSCE) as a method of assessment upon selected clinical components in child health nursing and to identify the perception of students regarding OSCE in selected nursing colleges, Pondicherry. International Journal of Advanced Research, 6(3), 1522–1528. https://doi.org/10.21474/IJAR01/6783
28. Mohandas, B., & Ratheesh, R. (2020). Students' perception on objective structured clinical examination. The Journal of Community Health Management, 5(2), 75–77. https://doi.org/10.18231/2394-2738.2018.0018
29. Aung, K. T., & Zakaria, A. N. A. B. (2016). Nursing students' perceptions on Objective Structured Clinical Examination (OSCE). MRIMS Journal of Health Sciences, 4(4), 220. https://doi.org/10.4103/2321-7006.188790
30. Zraick, R. I., Allen, R. M., & Johnson, S. B. (2003). The use of standardized patients to teach and test interpersonal and communication skills with students in speech-language pathology. Advances in Health Sciences Education, 8(3), 237–248. https://doi.org/10.1023/A:1026015430376
31. El-Nemer, A., Kandeel, N., & Elbatanony, M. (2015). Perception of undergraduate nursing students and stressors experience regarding Objective Structured Clinical Examination. Journal of Nursing Education and Practice, 5(8), 88–94. https://doi.org/10.5430/jnep.v5n8p88
32. Ancy, A., George, S., Jose, A., & Mathew, M. (2021). OSCE: Nursing students' perception, satisfaction and feedback. International Journal of Nursing Education and Research, 9(2), 189–193.
33. Awad, L. A., Alshamandy, S. A. A., & Abolwafa, N. F. (2017). Perception of undergraduate nursing students towards Objective Structured Clinical Examination (OSCE). IOSR Journal of Nursing and Health Science, 6(5), 52–60.

34. Sankarapandian, C., Arulappan, J., Alsenany, S., & Jayapal, S. K. (2026). Views and satisfaction of nursing students toward Objective Structured Clinical Examination and traditional clinical examination: A cross-sectional study. SAGE Open Nursing, 12, 23779608261419202. https://doi.org/10.1177/23779608261419202
35. Teng, M. L., et al. (2023). Global incidence and prevalence of non-alcoholic fatty liver disease. Clinical and Molecular Hepatology, 29(Suppl), S32–S42.
36. Wang, J., et al. (2025). Global, regional, and national burden of NAFLD in youths and young adults aged 15–39 years, 1990–2021, its attributable risk factors, and projections to 2035: A systematic analysis of the Global Burden of Disease Study 2021. Frontiers in Nutrition, 12, 1509232.
37. National Institute of Diabetes and Digestive and Kidney Diseases. (2024). Definition & facts of NAFLD & NASH. U.S. Department of Health and Human Services.
38. Cotter TG, Rinella M. Nonalcoholic fatty liver disease 2020: the state of the disease. Gastroenterology. 2020;158(7):1851–1864. doi:10.1053/j.gastro.2020.01.052