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The Objective Structured Clinical Examination as an Assessment Tool in the Bachelor's Degree Courses for Health-Care Professions: A Scoping Review

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Abstract

Introduction. The increasing complexity of healthcare requires health professionals to achieve high levels of competence. Universities are therefore called to adopt assessment methods that effectively support the development of clinical abilities. The aim is to describe the use of the Objective Structured Clinical Examination (OSCE) as an assessment method within bachelor's degree programmes in the health professions.

Methods. A literature search was carried out in PubMed/MEDLINE, Scopus, CINAHL and grey literature (December 2024–October 2025) following Joanna Briggs Institute (JBI) methodology.

Results. Nineteen studies, published between 2000 and 2025, were included from 4,926 identified records. The OSCE is reported as a valid and reliable method for assessing clinical, communicative and relational competencies, with a strong perceived educational impact across undergraduate health professions programmes. Advantages over traditional assessment methods include greater fairness, transparency and objectivity. Reported limitations, often associated with students' anxiety and stress, include inadequate planning and insufficient preparation.

Discussion. The OSCE is a reliable and fair tool for the structured assessment of clinical competencies. Students perceive it as an educational, motivating and realistic experience. Further studies are needed to explore its application in other health

professions and to document implementation processes in programmes where the OSCE is already in use.

Keywords: Assessment Methods, Clinical Skills, Education, Healthcare Professions Students, OSCE, Scoping Review

Introduction

In an increasingly complex and demanding healthcare environment, training competent healthcare professionals is important. Theoretical knowledge must be paired with proficiency in clinical skills to ensure safe and effective healthcare.

As teaching and evaluation methods continue to develop, it is essential to improve the quality of assessment (Vijayalakshmi & Revathi, 2024). Assessment plays a vital role in the learning process, helping students to acquire clinical practice competencies effectively (Al-Osaimi, 2022; Ribeiro et al., 2019).

In 1990, George Miller proposed that competence involves multiple levels: 'knowing', 'knowing how', 'showing', and 'doing', each requiring different assessment tools. For example, multiple- choice tests are effective in evaluating the 'knowing' and 'knowing how' levels but have limitations in assessing 'showing' and 'doing'.

Supporting Miller's framework, Lee et al. (2017) emphasised that 'competence' includes a range of behaviours integrating knowledge, skills, attitudes, abilities, and motivation. To be considered effective, an assessment tool must be valid, reliable, and effective. Its success also depends on the extent of learning and the degree of acceptance it receives from both educators and students (Norcini et al., 2011; Van Der Vleuten et al., 2017). Traditional assessment methods, still widely used today, present significant limitations. Their lack of structure and objectivity can compromise the fairness and accuracy of students' evaluations. Furthermore, practical skills cannot be adequately assessed through written and oral tests, as these do not involve structured, objective observation of procedures. As a result, this raises concerns about fairness and potential examiner bias.

An innovative method that addresses these limitations is the Objective Structured Clinical Examination (OSCE). First introduced in 1975 by Ronald Harden and Ian Gleeson in Scotland, the OSCE is designed to address the shortcomings of traditional assessment approaches (Bdair, 2021; Cobo-Mejía et al., 2022; Delavar et al., 2013; Divya et al., 2019; Vijayalakshmi & Revathi, 2024)

It assesses not only clinical knowledge but also procedural and practical skills (Bdair, 2021; Divya et al., 2019; Kolivand et al.,2020; Marshall & Harris, 2000), communication and decision-making skills (Castro-Yuste et al., 2020; Chabrera et al., 2023; Ribeiro et al.,2019), and clinical reasoning skills (Cobo-Mejía et al., 2022).

The OSCE consists of a series of stations simulating different clinical scenarios (Castro-Yuste et al., 2020). These stations are equipped with mannequins, 3D models, and clinical documentation.

Students are evaluated fairly and objectively by trained observers at each station using standardised assessment checklists. A signal is used to indicate when to move to the next station. The method is highly structured: each student performs the same task within a fixed timeframe (Jelly & Sharma, 2017).

Although originally developed for medical students, the OSCE has proven effective in the education and assessment of various healthcare professions. It has been well-received in the evaluation of nursing, midwifery, physiotherapy, dietetics, and imaging and radiotherapy techniques students (Alizadeh et al., 2024; Bdair, 2021; Castro-Yuste et al., 2020; Chabrera et al., 2023; Cobo-Mejía et al., 2022; Delavar et al., 2013; Divya et al., 2019; Farahat et al., 2015, 2016; Haufiku et al., 2019; Hawker & Walker, 2010; Jay, 2007; Kolivand et al., 2020; Marshall & Harris, 2000; Mitchell et al., 2009; Rennie & Main, 2006; Ribeiro et al., 2019; Vijayalakshmi & Revathi, 2024).

Despite the use of the OSCE across healthcare professions programmes (Castro-Yuste et al., 2020; Chabrera et al., 2023; Cobo-Mejía et al., 2022; Delavar et al., 2013; Kolivand et al., 2020; Ribeiro et al., 2019), evidence on how it is designed, implemented, and evaluated in undergraduate programmes remains fragmented. Most existing studies focus on single disciplines or institutional experiences, while comparative analyses across

nursing, midwifery, physiotherapy, and other healthcare professions are limited.

Therefore, a scoping review was conducted to map the existing evidence on the use of OSCEs in undergraduate healthcare professions programmes, describing how OSCEs are structured and assessed, and highlighting opportunities and gaps for future research and implementatation.

Objectives

The objectives are to explore, map, and synthesise the existing literature on the use of the OSCE as an assessment tool in healthcare professions education. This includes the students' perceptions, satisfaction, and experiences who have undergone the OSCE examination, as well as its reliability and validity compared with other assessment methods.

Methods

This review is based on the Joanna Briggs Institute (JBI) methodology for scoping reviews (Peters et al., 2020) and follows the Preferred Reporting Items for Systematic Reviews extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018).

The research question for this scoping review arises from the authors' reflection on educational assessment methods and their interest in applying these within healthcare training settings. The research question is: *'Is the OSCE method valid and reliable in assessing students enrolled in bachelor's degree programmes in the healthcare professions, compared with traditional assessment methods?'*

The formulation of the research question was guided by the Population-Concept-Context (PCC) framework (Peters et al., 2020), as follows:

- Population: Undergraduate students in healthcare professions programmes
- Concept: Objective Structured Clinical Examination (OSCE) as an assessment method
- Context: Higher education settings within healthcare professions programmes

Table 1 illustrates the three components of the framework.

Table 1. Description of the three components that make up the PCC framework.

Population	Undergraduate students in healthcare professions programmes
Concept	Objective Structured Clinical Examination (OSCE) as an assessment method
Context	Higher education settings within healthcare professions programmes

Eligibility criteria

Studies published within the past 25 years were included to provide a comprehensive overview of the development and implementation of the OSCE in undergraduate healthcare professions programmes. Both peer-reviewed articles and grey literature were considered to capture a broad range of evidence, including emerging and non-traditional research outputs. No restrictions were applied regarding study types or country of publication. Papers in English and Italian were considered eligible.

The inclusion and exclusion criteria for each PCC component are outlined below and summarised in Table 2.

- Population: this review considered studies involving undergraduate students enrolled in healthcare professions programmes. Nursing, midwifery, physiotherapy, dietetics, imaging and radiotherapy techniques, and biomedical laboratory science students were included. Studies involved students from other healthcare professions – such as medicine, dentistry, or pharmacy – , graduates of healthcare professions, and teachers or tutors of these bachelor's degree programmes were excluded.
- Concept: this scoping review examined the use of the OSCE as a method for assessing students' clinical competencies. Studies addressing its validity, reliability, and effectiveness, including comparison with traditional assessment methods and students' lived experience, were included. The OSCE was described in relation to the number and duration of stations, the activities assessed, and the checklists used by the evaluators.
- Context: all higher education settings within healthcare professions programmes were considered. Studies exploring the use of the OSCE in resource-limited settings, during the COVID-19 pandemic, or within virtual reality

or telemedicine environments were excluded.

Non-relevant records and records not meeting the inclusion criteria were excluded.

Table 2. Description of the three components that make up the PCC framework.

Inclusion criteria	Exclusion criteria
Study published in English or Italian between 2000 (2002 for Scopus) and 2025	Studies involving students from other healthcare professions, such as medicine, dentistry, and pharmacy
Nursing, midwifery, physiotherapy, dietetics, imaging and radiotherapy techniques, and biomedical laboratory science students were included	Studies involving graduates of healthcare professions
Full text available studies	Studies involving teachers or tutors of these bachelor's degree programmes
Studies that examined the use of the OSCE as a method for assessing students' clinical competencies	Studies that investigated the use of the OSCE in resource-limited settings
Studies that described the OSCE in relation to the number and duration of stations, the activities assessed, and the checklists used by the evaluators	
Studies that examined the validity, reliability, and effectiveness of the OSCE	Studies that examined the use of the OSCE during the COVID- 19 pandemic
Studies that examined the use of the OSCE in comparison with traditional assessment methods	Studies that investigated the use of the OSCE in virtual reality or telemedicine environments
Studies that examined students' perceptions, satisfaction, and experiences	

Protocol and registration

The protocol for this scoping review was registered retrospectively on the Open Science Framework (OSF) under the DOI 10.17605/OSF.IO/FJHMT.

During the review process, several methodological refinements were introduced to better align with JBI guidance (e.g., adjustments to eligibility criteria, search strategy expansion, data extraction fields). All modifications were documented and are reported in the manuscript to ensure transparency.

Information sources

A comprehensive search was conducted across PubMed/MEDLINE, Scopus, and CINAHL (Cumulative Index to Nursing and Allied Health Literature) from December 2024 up to October 2025, following the JBI framework (Peters et al., 2020). To ensure broad evidence mapping consistent with JBI standards for scoping reviews, grey literature was also included.

The following platforms were consulted to identify unpublished, institutional, and non-indexed studies:

- Google Scholar
- OpenAIRE
- ProQuest Dissertations & Theses
- Semantic Scholar

The last database search was carried out on 19/10/2025, while the grey literature search was completed on 25/10/2025.

Search strategy

An initial search for individual keywords and MeSH terms, using the Boolean operators “OR” and “AND”, was carried out in PubMed.

The search strategy applied in Pubmed was: (nursing students [Mesh Terms] OR "physiotherapy students" OR "midwifery students" OR "dietetics students" OR "radiology technician students" OR "laboratory technician students") AND ("OSCE" OR "Objective Structured Clinical Examination") AND (clinical skills [Mesh Terms] OR medical education [Mesh Terms] OR educational measurement [Mesh Terms] OR "clinical education").

The search strategy was then adapted for use in CINAHL and Scopus: (“nursing students” OR "physiotherapy students" OR "midwifery students" OR "dietetics students" OR "radiology technician students" OR "laboratory technician students") AND ("OSCE" OR "Objective Structured Clinical Examination") AND (“clinical skills” OR “medical education” OR “educational measurement” OR "clinical education").

Applied limits included a 25-year publication window, English-language records, and full-text availability.

Where earlier coverage was constrained by Scopus indexing, the search period for that database commenced in 2002.

To ensure a more comprehensive and inclusive exploration of the topic, grey literature was included. The research sources consulted

were Google Scholar, OpenAIRE, ProQuest Dissertations & Theses, and Semantic Scholar.

The screening process was conducted in two phases. In the first phase, articles were screened by title and abstract to identify studies relevant to the review and to exclude those that were not. Based on the abstract alone, studies were categorised as included, excluded, or not assessable. The absence of any single inclusion criterion resulted in exclusion.

In the second phase, full-text screening was performed for all articles that met the inclusion criteria or could not be assessed based on the abstract alone.

The study selection process is illustrated in the flowchart in Figure 2, in accordance with PRISMA guidelines for scoping reviews (Tricco et al., 2018).

Selection of evidence sources

Duplicates identified across the databases were manually removed before the screening phase. During the initial screening, studies that did not address the OSCE or were not aligned with the research objectives were excluded. Articles deemed potentially relevant but not fully assessable based on the abstract were retrieved and reviewed in full.

Access to full texts not readily available was obtained through the library system of the Alma Mater Studiorum – University of Bologna. The process was conducted independently by two researchers (ES and AP). Any uncertainties arising during the study selection process were resolved with the support of a third reviewer (SQ).

The search strategy in the main databases is summarised in Table 3, together with the methodological approach of the included studies.

Table 3. Search strategies.

Database	Search Strategy	Limits	Relevant articles
PubMed	(nursing students [Mesh Terms] OR "physiotherapy students" OR "midwifery students" OR "dietetics students" OR "radiology technician students" OR "la-boratory technician students") AND ("OSCE" OR "Objective Structured Clinical Examination") AND (clinical skills [Mesh Terms] OR medical education [Mesh Terms] OR educational measurement [Mesh Terms] OR "clinical education")	Publication date: 25 years English language Full text	9
CINAHL	(“nursing students” OR “physiotherapy students” OR midwifery students” OR “dietetics students” OR “radiology technician students” OR “laboratory technician students”) AND (OSCE OR “Objective Structured Clinical Examination”) AND (“clinical skills” OR “medical education” OR “educational measurement” OR “clinical education”)	Publication date: 25 years English language Full text	5
Scopus	(“nursing students” OR “physiotherapy students” OR midwifery students” OR “dietetics students” OR “radiology technician students” OR “laboratory technician students”) AND (OSCE OR “Objective Structured Clinical Examination”) AND (“clinical skills” OR “medical education” OR “educational measurement” OR “clinical education”)	English language Full text	2

Data extraction

Data were extracted from the included articles using standardised extraction tools, as indicated in the JBI Manual of Evidence Synthesis (Peters et al., 2020) and the Preferred Reporting Items for Scoping Reviews Extension (PRISMA-ScR) (Tricco et al., 2018).

Two researchers (ES and AP) independently conducted the extraction process, and any disagreements were resolved through the intervention of a third researcher (SQ) to ensure reliability and accuracy. The standard data extraction table was piloted before the full extraction process. The JBI version was modified due to the large amount of information contained within the individual articles. Therefore, two data extraction tables were created in Microsoft Word. In Table 4, the studies were classified according to their study objective, while in Table 5, the remaining information was reported. Metadata, including author(s), year of publication, country, title, and study design, were extracted using Zotero. In the additional five columns, the PCC framework was used to organise information relating to the study

population, context, and concept. In this table, the concept refers to the study findings. Because numerous articles reported details on the OSCE structure and its comparison with traditional assessment methods, dedicated columns were added to summarise these aspects. The column on the OSCE structure was divided into two subcolumns: number of stations and duration per station. To provide a more complete description of the methodology used in each study, the data collection instrument was also specified. In the case of missing data, the unavailability of the information was indicated using the symbol (/).

Data analysis

A narrative synthesis was conducted, together with a descriptive frequency mapping based on the publication year of the included studies and their geographical context (Figure 1).

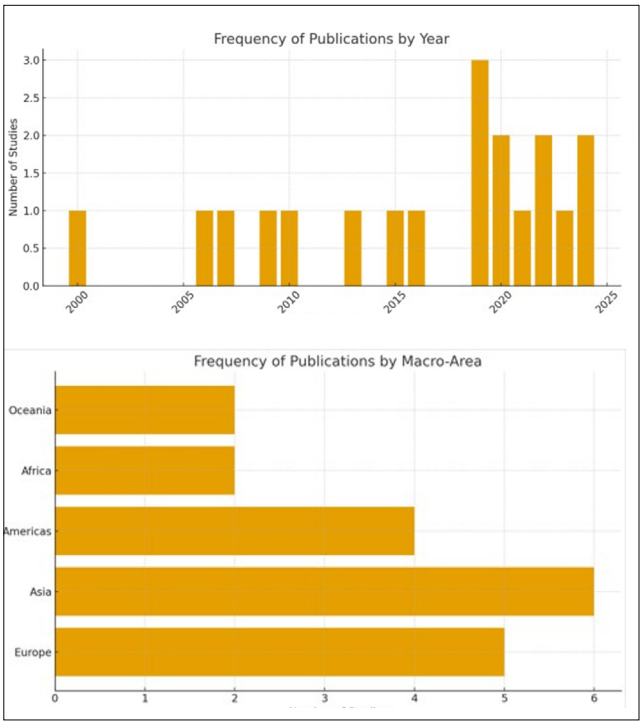

Figure 1. Publication year of included studies and geographical context of publication

The data were organised into two charting. The analytical categories were developed using a combined deductive-inductive approach. Initially, the categories were defined deductively from the review question. During data extraction, additional themes were identified inductively through the reading of the texts.

Table 4 groups the studies according to the type of outcome (OSCE vs Traditional Clinical/ Practical Examination; validity and reliability of the OSCE method; Effectiveness of the OSCE in assessing clinical competencies; Students' perceptions, satisfaction, and experiences with the OSCE.

Table 5 organises the information according to author(s), publication years, country of publication, study title, study design, population and context, data collection methods, structure of the OSCE (number of stations and duration per station), comparison with Traditional Clinical Examination (TCE), and the main concept addressed.

Critical Appraisal of Individual Sources of Evidence

Critical appraisal of individual sources of evidence, as directed by the JBI Manual for Evidence Synthesis (Peters et al., 2020) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018), has not been performed.

Results

Selection of sources of evidence

The selection process for the sources of evidence followed the PRISMA 2020 Flow Diagram (Tricco et al., 2018), as shown in Figure 2.

A total of 573 records were identified across the three databases: 141 from PubMed, 192 from CINAHL, and 240 from Scopus.

An additional 4,353 records were identified through other sources: 185 from Google Scholar, five from OpenAIRE, 23 from ProQuest Dissertations & Theses, and 4,140 from Semantic Scholar.

As illustrated in the PRISMA flow diagram, after the removal of duplicates (n = 392), 4,534 records were screened by title and abstract according to the inclusion and exclusion criteria, resulting in 78 records whose full texts were assessed for eligibility. A total of 59 records were excluded: 35 were not relevant, and 24 did not meet the inclusion criteria.

Ultimately, 19 records were included in the scoping review.

Of these 19 articles, nine came from PubMed,

five from CINAHL, two from Scopus, and three from grey literature (journal articles not indexed or from peer-reviewed journals retrieved through non- indexed archives).

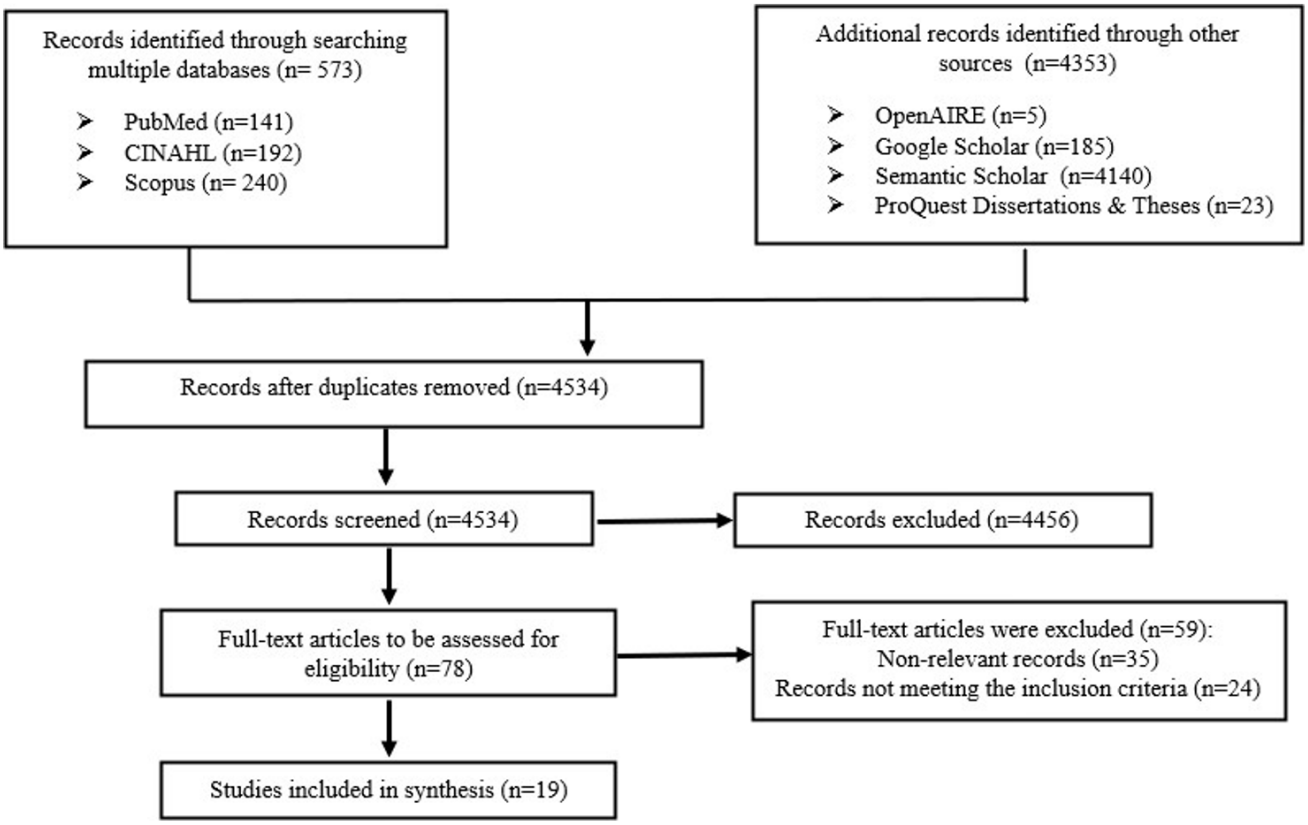

Figure 2. PRISMA flow chart.

Characteristics of Sources of Evidence

The 19 records were classified according to their study objectives, as reported in Table 4.

The table showed that most studies address more than one objective. The most frequently investigated objective concerned students' perceptions, satisfaction and experience (13/19). Objectives related to validity/reliability and clinical efficacy were moderately represented. The comparison between OSCE and traditional clinical/practical examinations appeared in five studies.

The characteristics of the included studies were presented in detail in Table 5.

- Publication year: most of the included studies were published between 2019 and 2024.
- Country of publication: the data showed five studies from Europe (two from Spain, two from the UK and one from Scotland), six from Asia (three from Iran, one from India, one from Saudi Arabia and one from Oman), four from the Americas (one from Colombia, one from Brazil and two from the USA), two from Africa (South Africa) and two from Oceania (Australia).
- Study design: seven qualitative studies that gathered and interpreted students' perceptions, satisfaction, and experiences; six quantitative observational studies (cross-sectional/correlational/descriptive) that observed and measured the OSCE method; two experimental/quasi-experimental studies that evaluated the effects of an intervention; one literature review; and three methodological/validation studies that developed instruments, scales and procedures.
- Type of students: nursing, midwifery, physiotherapy, imaging and radiotherapy techniques, and nutrition and dietetics students, with a predominance of studies involving nursing and midwifery students.
- University context: information included the

Table 4. Studies classified according to study objective.

STUDIES	OBJECTIVE STUDY			
	OSCE VS Traditional Clinical/Pratical Examination	Validity and reliability of the OSCE method	Effectiveness of the OSCE in assessing clinical competencies	Students' perceptions, satisfaction, and experiences with the OSCE
Alizadeh et al., 2024		X		X
Vijayalakshmi & Revathi, 2024	X			X
Chabrera et al., 2023		X		
Andrea et al., 2022		X		
Anyanwn et al., 2022	X			X
Bdair, 2021	X			X
Castro-Yuste et al., 2020		X	X	
Kolivand et al., 2020		X		
Haufiku et al., 2019		X		X
Ribeiro et al., 2019		X	X	
Y et al., 2019	X			X
Farahat et al., 2016			X	X
Farahat et al., 2015				X
Delavar et al., 2013	X	X	X	X
J & K, 2010			X	
Mitchell et al., 2009		X		X
Jay, 2007				X
R&M, 2006				X
Marshall & Harris, 2000			X	X

year of study, whether students were assessed before or after beginning their clinical placement, and whether they had any prior experience with the OSCE.

- Data collection: methods included semi-structured interviews, rating scales on satisfaction with evaluation methods, analytical checklists and descriptive rubrics for each station, validated questionnaires, questionnaires on perceptions and opinions, performance checklists, and focus groups. For interviews and questionnaires, the duration and type of questions were specified. For rating scales and checklists, the authors, the number of items, the Likert scale, and reliability indices were provided. For focus groups, thematic analysis was reported.
- Description of the OSCE structure: number of stations, duration of each station, and activities assessed. The number of stations ranged from a minimum of three to a maximum of 17, with most studies reporting OSCEs with four or seven stations. Each station was generally allocated 10 minutes.
- Comparison with Traditional Clinical Assessment (TCE): number of hours and type of examination (written, oral, and multiple-choice tests).
- Concepts representing the study findings: such as "the students' perceptions, satisfaction and experiences", "Validity and reliability", and "Comparison with traditional methods". The titles of the results sections were derived from these categories.

Table 5. Studies classified according to study objective.

Author(s), Year, Country	Study Design	Population e Context	Data Collection	
Alizadeh et al., 2024, Maragheh, Iran	Descriptive qualitative study	2 final-year nursing students with direct OSCE experience	Semi-structured interviews (mean duration: 35–45 minutes)	
Vijayalakshmi & Revathi, 2024, Chennai, Sud India	Randomised cross-over comparative study	84 third-year nursing students (42 per group)	Rating Scale on Satisfaction of Evaluation Methods (OSCE and TPE), adapted from De Lisle (2001), 22 items, 5-point Likert scale (α = 0.93)	
Chabrera et al., 2023, Barcellona, Spagna	Pilot study for development and validation	116 first-year nursing students	Analytical checklists and descriptive rubrics for each station (Likert 0–4)	
Andrea et al., 2022, Colombia	Instrumental validation study	Physiotherapy students (number not specified) participating in the project "Simulated Practice in Physiotherapy Students for Decision Making in Clinical Skills"	Not specified	
Anyanwn et al., 2022, Anambra, Nigeria	Prospective cross-sectional quantitative study	124 fifth-year radiology students	Validated questionnaire (40 items, 7 sections, 1–4 Likert scale; α = 0.724)	
Bdair, 2021, Arabia Saudita	Descriptive cross-sectional and correlational study	429 nursing students	Questionnaire on perception and opinions by Pierre et al. (2004)	
Castro-Yuste et al., 2020, Cadice, Spagna	Methodological study based on expert consensus (Delphi method and consensus conference)	164 first-year nursing students who underwent the OSCE	Procedure conducted in three phases: selection of priority activities; development of clinical cases; definition of OSCE stations	
Kolivand et al., 2020, Kermanshah, Iran	Descriptive correlational study	32 midwifery students in the 6th semester prior to clinical placement, with no previous OSCE experience	Performance checklist with scores ranging from 0 (fail) to 4 (excellent)	
Haufiku et al., 2019, Namibia, Africa	Exploratory, descriptive, and retrospective qualitative study	20 radiography students from the 2nd, 3rd and 4th years	Four focus group discussions (FGDs) with thematic analysis based on the Lincoln & Guba (1985) model	
Ribeiro et al., 2019, Porto Alegre, Brasile	Systematic literature review	7 studies including physiotherapy students as the main participants	Two independent reviewers used the McMaster Critical Review Form (score 0–14) and classified the level of evidence according to the Oxford Centre for Evidence-Based Medicine	
Y et al., 2019, Oman, Asia	Qualitative study with a descriptive approach	39 nursing students who had already experienced an OSCE	Pierre et al.'s OSCE Evaluation Questionnaire (2004), 30 items divided into four areas (α = 0.82)	
Farahat et al., 2016, Loma Linda, California	Phenomenological qualitative study	11 students from the nutrition and dietetics programme	Three focus groups (2–6 participants each) conducted within one week after the tests; thematic analysis using Interpretative Phenomenological Analysis (IPA)	
Farahat et al., 2015, California, USA	Quasi-experimental pre-post study	37 students from the nutrition and dietetics programme	Perceived Readiness for Dietetic Practice Questionnaire (PRDP)	
Delavar et al., 2013, Babol, Iran	Comparative cross-sectional study	52 midwifery students divided into two groups: traditional exam (n=20) and OSCE (n=32)	Structured checklists (α between 0.67 and 0.86) and perception questionnaire (α = 0.81)	
J & K, 2010, Melbourne, Australia	Descriptive and observational study	32 third-year nutrition and dietetics students before starting clinical placement	Standard checklist and feedback questionnaire (5 closed-ended questions + open comments)	
Mitchell et al., 2009, Queensland, Australia	Cross-sectional descriptive study	98 nursing students from the 2nd and 3rd years	Anonymous structured post-OSCE questionnaire collecting qualitative and quantitative data	
Jay, 2007, United Kingdom	Phenomenological qualitative study	10 final-year midwifery students	Semi-structured interviews (12 open-ended questions)	
R&M, 2006, Aberdeen, Scozia	Exploratory qualitative study	9 second-year midwifery students	Focus group	
Marshall & Harris, 2000, Lancaster, United Kingdom	Exploratory qualitative study	44 third-year radiology students divided into two cohorts	Two OSCE sessions, each lasting 60 minutes	

	Structure of the OSCE		Traditional Clinical Examination (TCE)	Concept
	Number of stations (N)	Duration of stations (min)		
	/	/	/	A well-implemented OSCE enhances practical learning and professional confidence. The OSCE is a valid tool for the assessment of clinical competencies.
	17 stations	6 minutes	4 hours	OSCE showed higher student satisfaction than the Traditional Practical Examination (TPE); students recognised it as reflecting essential skills and valuable learning opportunities, although some reported stress.
	8 stations	10 minutes	/	The OSCE demonstrated strong validity and reliability, high internal consistency and inter-rater agreement, and effectively assessed communication and technical skills.
	7 stations	/	/	The OSCE proved to be a valid and reliable tool for assessing clinical reasoning in physiotherapy students.
	/	/	TCE	Most students perceived the OSCE as well organised, fair, objective, and effective in evaluating essential clinical competencies, and many preferred it to the TCE.
	/	/	Written, oral, and multiple-choice tests	The OSCE was considered a useful and practical learning experience and superior to traditional assessment methods.
	4 stations	10 minutes	/	The OSCE design based on expert consensus improved content validity and enabled simultaneous assessment of technical and communication skills.
	7 stations	5 minutes	/	The OSCE demonstrated satisfactory validity and reliability and correlated with clinical training programmes, although some stations showed weaker internal consistency.
	/	/	/	Students recognised the educational value of the OSCE for stimulating critical thinking, but highlighted the need for good planning, preparation, and feedback.
	/	/	/	The OSCE allows assessment of relational and communication skills in addition to technical competencies and evaluates aspects not measured in traditional examinations.
	4 stations	12 minutes	Written exam	Many students preferred the OSCE to written exams and considered it useful for identifying learning needs and covering a wide range of clinical skills.
	/	/	/	The OSCE was perceived as a realistic bridge to clinical practice and a valuable learning tool, particularly when combined with debriefing.
	7 stations	Variable duration depending on activity (15–40 minutes)	/	The OSCE improved students' perceived readiness for clinical placement and was considered realistic and educational by most participants.
	16 stations	6 minutes	Oral and practical exam (short and long cases)	Students showed higher satisfaction with the OSCE than with traditional exams, although some considered it stressful and requested more time and preparation.
	3 stations	20 minutes	/	The OSCE can identify students at risk of difficulties during clinical placement and was considered a fair and objective assessment method.
	Between 6 and 10 stations	Approximately 8–10 minutes	/	The OSCE promoted active preparation, critical thinking, and was perceived as a valid, realistic, fair, and standardised method of assessing clinical competence.
	/	/	/	Students perceived the OSCE as fair, relevant to clinical practice, and useful for improving understanding and retention of procedures, despite anxiety associated with the exam.
	/	/	/	The OSCE promotes deeper and more lasting learning but requires adequate preparation, organisation, and post-exam debriefing.
	/	/	/	The OSCE was positively evaluated, feasible to implement, and its scores correlated with practical modules and final academic performance.

The students' perceptions, satisfaction, and experiences

From the study results, the nursing, midwifery, physiotherapy, and imaging and radiotherapy techniques students' perceptions regarding the OSCE were that it promoted critical thinking and clinical reasoning. It was a method capable of assessing not only technical skills but also relational and communication skills (Castro-Yuste et al., 2020; Cobo-Mejía et al., 2022; Ribeiro et al., 2019).

However, its educational potential was limited by inadequate planning and preparation. The factors that contributed to a suboptimal environment included poor lighting, limited space, technical problems, background noise, excessive waiting times, insufficient station duration, and the lack of immediate feedback (Haufiku et al., 2019; Mitchell et al., 2009; Rennie & Main, 2006).

In the study by Delaver et al. (2013), 53.8% of midwifery students considered the OSCE a stressful examination due to insufficient time to complete the stations and inadequate preparation, while 40% regarded it as "fair and objective".

High levels of anxiety were also identified in the studies by Mitchell et al. (2009) and Jay (2007), although in both cases, the anxiety was considered "motivating".

Most studies identified post–exam debriefing as the phase with the greatest educational value (Farahat et al., 2015, 2016; Haufiku et al., 2019; Mitchell et al., 2009; Rennie & Main, 2006).

In contrast to these findings, the study by Marshall and Harris (2000) reported that the implementation of the OSCE in a university setting to assess the competencies of imaging and radiotherapy techniques students was feasible and did not present any substantial logistical difficulties.

In the study by Farahat et al. (2015), nutrition and dietetics students undertook a seven-station OSCE that was perceived as realistic (92%) and educational (81%). Furthermore, the results showed that the OSCE improved its clinical preparedness ($p = 0.03$) in nutritional assessment, intervention planning, diagnosis, and leadership. For these reasons, it could become an integral part of professional licensing examinations for dietitians.

Consistent with these findings, in the study by Farahat et al. (2015, 2016) and in the study by Bdair (2021), nutrition and dietetics students' perceptions were positive, as well as nursing students, regarding the usefulness of the OSCE, which facilitated the transition to clinical practice and provided genuine learning opportunities.

In contrast with the study by Farahat (2015), in the results of the study by Jay (2007), students perceived the OSCE as an artificial and not very realistic simulation.

Validity, reliability, and effectiveness of the OSCE

The studies confirmed the fairness, validity, and objectivity of the OSCE as a method for assessing clinical competencies (Alizadeh et al., 2024; Hawker & Walker, 2010; Jay, 2007; Mitchell et al., 2009; Rennie & Main, 2006).

In the study by Chabrera et al. (2023), an eight-station OSCE, with each station lasting 10 minutes and assessing technical, communication, and decision-making skills, demonstrated excellent internal consistency ($\alpha = 0.88$) and high inter-rater reliability (ICC = 0.87). The results of this study showed that 94% of nursing students rated the OSCE as "useful and realistic", and 82% reported feeling "more prepared for clinical practice".

The findings of Castro-Yuste et al. (2020), Chabrera et al. (2023) and Ribeiro et al. (2019) highlighted that the OSCE assessed not only technical skills but also relational and communication skills. Notably, in the factor analysis conducted by Chabrera et al. (2023), communication skills obtained higher scores than the other dimensions investigated.

In the study conducted by Cobo-Mejía et al. (2022), a seven-station OSCE based on the American Physical Therapy Association (APTA) model proved to be a valid and reliable tool for measuring clinical reasoning ($\alpha = 0.98$; ICC ranging from 0.55 to 1.00) among physiotherapy students.

The results of several studies demonstrated that an OSCE was considered valid and reliable when its methodology was based on expert consensus (Castro-Yuste et al., 2020; Kolivand et al., 2020). The OSCE designed by Castro-Yuste et al. (2020) to assess nursing students was content-validated through the consensus of 31 experts. The methodology was structured

into three phases: (1) selection of priority activities; (2) development of clinical cases; (3) definition of the OSCE stations. The activities that obtained the highest expert consensus included: assessing basic physical conditions and monitoring vital signs, evaluating hygiene and skin condition, developing care plans, managing safety principles in drug administration, and administering oral medications. Based on these activities, 20 clinical cases were developed, from which an OSCE with four stations was designed, each lasting ten minutes: (1) cardiovascular assessment; (2) nursing process; (3) oral drug administration in type 2 diabetes; (4) hygiene and skin care.

The OSCE designed by Kolivand et al. (2020) assessed midwifery students and was validated by four experts, demonstrating a Cronbach's $\alpha > 0.7$ and significant internal consistency in five of the seven stations (only the communication and childbirth stations were not significantly correlated with the total exam score). Each station, lasting five minutes, was based on course topics, midwifery reference texts, and clinical skills requirements, assessed the following activities: establishing intravenous access, administering infusion therapy and measuring blood pressure, using resuscitation equipment, communicating and collecting medical history, assisting childbirth, performing episiotomy, conducting speculum and bimanual examinations, and answering visual questions on clinical cases.

The study results showed that the OSCE method enhanced practical learning and professional confidence (Hawker & Walker, 2010; Kolivand et al., 2020; Marshall & Harris, 2000). The significant correlation between OSCE scores and performance in clinical placement ($\beta = 0.66$; 95% CI: 0.46–0.86; $p < 0.0001$) allowed for the early identification of students at risk of difficulties during clinical training (Hawker & Walker, 2010).

Kolivand et al. (2020) reported a significant correlation between the OSCE and the clinical programmes on normal and abnormal labour ($r = 0.399$, $p = 0.024$) and with clinical programmes in gynaecology ($r = 0.419$, $p = 0.017$), while no correlation emerged with theoretical programmes ($r = 0.23$, $p = 0.20$).

Similarly, Marshall and Harris (2000) demonstrated positive and significant correlations (ρ between 0.5 and 0.8; $p < 0.01$) with practical clinical modules, while no correlation emerged with the theoretical module "Evaluating Imaging Techniques".

Comparison with traditional methods

In the study by Bdair (2021), the OSCE method was compared with traditional assessment methods for nursing students. The results showed a higher overall score for OSCEs (69.08 ± 9.93) compared with that obtained in multiple-choice questions (63.70 ± 10.53), oral examinations (66.44 ± 8.08), and written examinations (63.14 ± 9.09). Nevertheless, 46% of students reported concerns regarding insufficient time per station and the lack of immediate feedback.

In the study by Vijayalakshmi and Revathi (2024), a significant difference ($p < 0.001$) was found in favour of the 17-station OSCE, with each station lasting six minutes (98.26 ± 6.44), compared with a traditional practical examination (TPE) lasting four hours (89.82 ± 7.27). Furthermore, nursing students agreed on the quality of the skills assessed (85%), on the clarity of the instructions received (73%), and on the learning opportunities offered (81%). Comparable findings emerged in the study by Divya et al.(2019), in which 56% of students preferred the OSCE to a written assessment, as it was able to cover a wide range of clinical skills (77%), was considered practical and useful (62%), and offered opportunities for improvement and self-learning (67%).

In the study by Anyanwu et al. (2022), 80% of imaging and radiotherapy techniques students preferred the OSCE over the Traditional Clinical Examination (TCE) for its fairness and objectivity. Eighty- four per cent of students believed that it reduced personal or gender bias. Only one quarter of students considered the OSCE more stressful than the TCE. Most students also perceived it as well organised, clear, and valid for assessing essential clinical competencies. The main issue identified was the time allowed to complete the stations, which 75% of students considered insufficient (Cobo-Mejía et al., 2022).

In the study by Delavar et al. (2013), the OSCE (49.8 ± 18.3) achieved a higher level of satisfaction among midwifery students compared with the traditional examination (25.3 ± 18.1). It provided greater credibility ($p = 0.0001$), consistency/reliability ($p = 0.001$), improvement in educational level ($p = 0.011$), and relevance to course objectives ($p = 0.008$).

Discussion

The mapping of the data shows that the OSCE is employed in the standardised assessment of clinical competencies within undergraduate healthcare professions programmes (Castro-Yuste et al., 2020; Delavar et al., 2013; Hawker & Walker, 2010; Jay, 2007; Kolivand et al., 2020).

Across the different studies, the OSCE is described as a method that promotes reflective learning, professional confidence, and improvement in self-assessment. It is used to obtain a holistic view of the patient and to develop communication skills, clinical reasoning, decision-making autonomy, interprofessional collaboration, and motivation (Chabrera et al., 2023; Cobo-Mejía et al., 2022; Farahat et al., 2015, 2016; Marshall & Harris, 2000; Rennie & Main, 2006).

The studies report advantages of the OSCE over traditional assessment methods, highlighting elements of fairness, transparency, and objectivity (Delavar et al., 2013). According to the included studies, the OSCE is employed to assess communication and behavioural skills, which are often overlooked in traditional examinations (Ribeiro et al., 2019).

It is used to identify individual areas for improvement and to bring students closer to real clinical practice (Divya et al., 2019; Marshall & Harris, 2000; Ribeiro et al., 2019). The studies report a reduction in the effectiveness of the method when optimal organisation is lacking (Alizadeh et al., 2024; Castro-Yuste et al., 2020; Cobo-Mejía et al., 2022; Delavar et al., 2013; Haufiku et al., 2019; Jay, 2007; Kolivand et al., 2020; Marshall & Harris, 2000).

A recurring pattern concerns students' stress associated with insufficient time per station, perceived inadequate preparation, suboptimal environmental conditions, and lack of immediate feedback (Cobo-Mejía et al., 2022; Delavar et al., 2013; Divya et al., 2019; Farahat et al., 2015; Haufiku et al., 2019; Vijayalakshmi & Revathi, 2024).

In some studies, anxiety is described as "motivating" (Jay, 2007; Mitchell et al., 2009), whereas in others it is associated with poorer performance, in connection with the need for more accurate logistical planning and greater emotional support for students (Bdair, 2021).

From a methodological perspective, accurate OSCE design is considered essential for the validity and reliability of the instrument. Key factors include the definition of stations and the time allocated to them; the selection of the competencies to be assessed, which must be aligned with the educational objectives; progressive preparation through practical workshops, briefings, and high-fidelity simulations; the standardisation of assessment tools; and the selection of clinical cases based on faculty consensus. The studies indicate the relevance of adequate resource availability and the implementation of immediate and continuous post-exam debriefings (Farahat et al., 2015; Hawker & Walker, 2010; Jay, 2007; Kolivand et al., 2020; Marshall & Harris, 2000; Mitchell et al., 2009; Rennie & Main, 2006).

The involvement of academic and clinical experts in the design of the OSCE is associated with greater validity of the instrument. The significant correlation between OSCE performance and practical programmes is described as indicative of its capacity to assess practical skills, whereas the lack of correlation with theoretical programmes suggests the need to integrate it with other assessment methods more appropriate for theoretical content (Hawker & Walker, 2010; Kolivand et al., 2020).

Several studies report organisational and educational elements that may contribute to better OSCE implementation, including the standardisation of procedures, the training of academic staff and students, the adequacy of simulation environments, and the implementation of structured feedback systems. These aspects are described as being associated both with the reliability of the method and with the reduction of anxiety and stress (Bdair, 2021; Farahat et al., 2016; Haufiku et al., 2019; Hawker & Walker, 2010; Mitchell et al., 2009; Rennie & Main, 2006).

A further relevant gap concerns the limited application of the OSCE in certain healthcare professions. Its use in physiotherapy remains limited (Ribeiro et al., 2019); few studies have explored its use in dietetics and imaging and radiotherapy techniques programmes, and none have involved biomedical laboratory science students. Future research should investigate the feasibility of the OSCE across all healthcare professions and strengthen its methodological rigour, for which the conduct of a systematic review is recommended. The OSCE represents a widely used method for assessing clinical competencies, and its educational value is documented across various disciplines. The studies indicate the presence of logistical,

pedagogical, and emotional barriers relevant to its implementation; they also report that systemic support, adequate infrastructural resources, and continuous research activity are considered significant elements for improving the application of the method.

Limitations

The main limitation of this review lies in the fact that the protocol was registered retrospectively. Consequently, some deviations from the original plan were required, including the extension of the search period and the inclusion of grey literature sources. However, all modifications have been transparently documented and recorded on OSF through the most recent protocol updates.

Compared with the original protocol, the research period was extended from 2000 to 2025. Grey literature was included, and the inclusion and exclusion criteria were revised.

The research focused exclusively on undergraduate programmes in the selected healthcare professions: nursing, midwifery, physiotherapy, dietetics, imaging and radiotherapy techniques, and biomedical laboratory science. Accordingly, the findings do not extend to other healthcare professions or to degree programs in medicine, dentistry, or pharmacy. They also do not address the use of the OSCE method within those fields.

Moreover, the research did not involve teachers, examiners, or tutors. No studies were identified that explored the application of the OSCE method in the education of biomedical laboratory science. Only articles published in English and Italian were considered.

Educational implications

The results support the OSCE as a pedagogically valid tool that promotes structured feedback, students' reflection, and clinical reasoning. Educators should prioritise faculty training and structured students' preparation. They should also promote the integration of OSCEs within competency-based curricula. Institutions should invest in simulation resources and standardised assessment systems to ensure reliability and fairness.

The use of the OSCE enhances the quality of education by strengthening clinical safety and professionalism. Integrating the OSCE into university curricula should be encouraged, as it reinforces the connection between theory and practice.

The implementation of post-exam debriefing sessions would further enhance students' critical thinking, self-assessment, and professional development. Feedback would also help improve the design and organisation of future OSCEs.

Furthermore, extending the use of the OSCE to assess the clinical skills of practising healthcare professionals would be valuable. It would help maintain and improve clinical competencies throughout their careers.

Conclusion

This review mapped current evidence on OSCE implementation in undergraduate education for the healthcare professions, highlighting strong perceived educational value and structured skill assessment.

Although the OSCE requires careful design and planning, its effectiveness has been well established in undergraduate programmes in nursing, midwifery, physiotherapy, dietetics, and imaging and radiotherapy techniques. In these contexts, it has proven to be a valid, reliable, and fair tool for the structured and objective assessment of clinical competencies. It overcomes the limitations of written, oral, and multiple-choice tests, enables the integration of theory and practice, and helps identify learning gaps. Students perceive it as an educational, motivating, and realistic experience.

Key areas for development include standardisation, assessor preparation, validity evidence reporting, resource evaluation, and immediate and continuous debriefing sessions. Future studies should explore OSCE application across other healthcare professions and document the implementation processes in the programmes where it is already in use. They should also evaluate feasibility and outcomes through robust methodological frameworks.

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