

Objective Structured Clinical/ Practical Examinations for Physical Therapy in Higher Education: A Narrative Review

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ABSTRACT

Objective-structured clinical and practical examinations are structured clinical and practical exams that are used to evaluate the clinical skills of students of physical therapy. The purpose of the study is to review the literature regarding the application of the Objective Structured Clinical Examination and Objective Structured Practical Examination used in assessing physical therapy students in higher education institutions, and to review if these examination tools were valid, reliable, and objective tools to evaluate clinical skills for students of physical therapy. In this paper, a literature search was done to extract relevant publications from the following databases: Google Scholar, Cochrane, PubMed, Science Direct, Scopus, and the Egyptian Knowledge Bank. All papers were included if they were written in English and related to physical therapy education. The review found that Objective Structured Clinical Examinations and Objective Structured Practical Examinations were used in assessing physical therapy students in higher education institutions, and it was found that they are valid, reliable, and objective tools to evaluate clinical skills for students of physical therapy. Also, it was found that it improves satisfaction and decreases stress levels among students and examiners. In conclusion we recommended the Objective-structured clinical examinations and objective-structured practical examinations should be included in all examination procedures when assessing the clinical and psychomotor skills of students of physical therapy.

KEYWORDS: OSCE, OSPE, objective-structured clinical examination, objective-structured practical examination, and physical therapy.

1. INTRODUCTION

Physical therapy is a medical profession that provides solutions to maintain, restore, or improve movement and function. This service is provided by accredited physical therapists for people threatened by several conditions, including aging, pain, illness, disorders, injuries, or even environmental conditions [1]. The profession of physical therapy is criticized for its best practices. The best practices are evaluated on various scopes, such as administration, communication skills, education, learning, and scientific research. In order to ensure best practice, a structured assessment process was designed to examine the skills of physical therapists [2]. Evaluations are organized, systematic processes that assess whether the students meet the learning outcomes of a certain curriculum [3]. Clinical and practical evaluations are essential for medical students to ensure high-standard graduates [4].

Objective-structured clinical examination [OSCE] is a method of evaluation used to evaluate the clinical performance of college candidates on patients. Its main goal is the

assessment of competence of the “show how” according to the competency pyramid of Miller., so it evaluates the performance [5,6]. The development of clinical competence is split into four hierarchical processes according to Miller's pyramid model. "Knowledge," which is assessed through written tests and conventional multiple-choice questions (MCQs), is at the base of the pyramid. "Applying knowledge" is the next level, which is evaluated through essays, clinical problem-solving activities, and extended multiple-choice questions. "Clinical skills competency," which is evaluated through standardized patient exercises, simulations, and clinical exams, is represented by the third tier of the pyramid. "Clinical performance," which is determined by direct observation in actual clinical settings, is the final category at the top of the pyramid. The two higher tiers of the pyramid account for the behavioral components of clinical competence and involve assessments in both simulated and actual clinical settings. The lower-level processes account for the cognitive components of competence and involve assessments conducted in a classroom [5].

The OSCE is a global format to evaluate the clinical competence of medical students in an inclusive, reliable, and valid placement. Clinical efficiency is evaluated by a group of many raters on multiple stations during the examination. Therefore, it is found to be more sophisticated compared to the traditional examinations [7]. Evaluating actions that follow the clinical reasoning process, such as prognostication, management, prevention strategies, and reasoning, are essential parts of OSCE [8]. The objective structured practical examination [OSPE] is an extension of the OSCE. OSPE is a form of practical assessment that uses materials instead of patients [9,10]. The OSPE has been favored for the practical assessment of subjects through the feasibility and acceptability of implementing this method in the internal assessment [11]. OSPE has several distinct advantages. It is more objective, measuring practical skills better. Student feedback revealed that such evaluations help them progress, as they are considered both teaching and assessment tools [12].

The aim of this study was to review the literature regarding the application of Objective Structured Clinical Examination [OSCE] and Objective Structured Practical Examination [OSPE] in assessing physical therapy students in higher education institutes [HEIs]. It was hypothesized that physical therapy educators do not use OSCE or OSPE in assessing physical therapy students. It was also hypothesized that OSCE and OSPE were not valid, reliable, nor objective tools to be used to evaluate clinical skills for students of physical therapy.

2. METHODOLOGY

This narrative review was performed following the items and guidelines of the Scale for the Assessment of Narrative Review Articles [SANRA] that were explained by Baethge, Goldbeck-Wood, and Mertens [13].

2.1. Search and information sources

This literature search started on the 4th of June 2023 and was finalized on the 12th of July 2023, extracting relevant publications from the following databases: Google Scholar, Cochrane, PubMed, Science Direct, Scopus, and the and the Egyptian Knowledge Bank [EKB]. The time frame of papers was limited between January 1970 and July 2023. The following keywords were used [Table 1; Fig. 1]:

1. “Objective Structured Practical Examination” OR “Objective Structured Clinical Examination” OR “OSCE” OR “OSPE”.
2. AND “Physical Therapy” OR “Physiotherapy”.

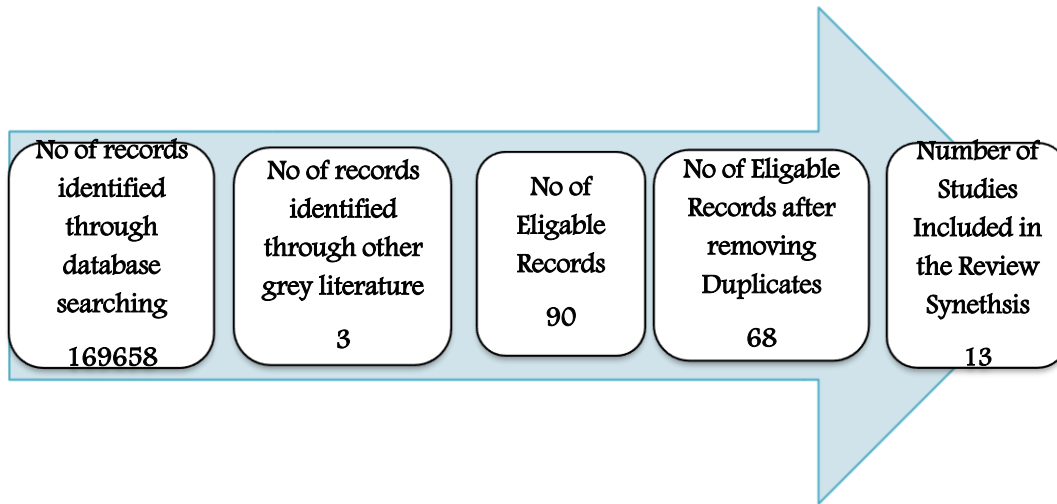


Fig. 54: Records Flow Chart

Table 6: Number of Records in Each Keyword and in each Database

Key Word	Data Bases						Total Number of Eligible Papers	Total Number after removing Duplicates	Total Number of included papers
	Google Scholar	Cochrane	Pub med	PEDro	Scopus	Egyptian Knowledge Bank [EKB]			
“Objective Structured Practical Examination” AND “Physical Therapy”	52	0	0	0	2052	38464	14	68	13
“Objective Structured Clinical Examination” AND “Physical Therapy”	1,520	8	19	3	6272	78561	28		
“OSCE” AND “Physical Therapy”	2,060	12	25	0	575	3589	37		
“OSPE” AND “Physical Therapy”	155	0	0	0	30	2081	11		
“Objective Structured Practical Examination” AND “Physiotherapy”	105	0	0	0	503	14497	16		
“Objective Structured Clinical Examination” AND “Physiotherapy”	1520	9	16	0	1393	13158	42		
“OSCE” AND “Physiotherapy”	2300	12	19	0	321	2,067	31		
“OSPE” AND “Physiotherapy”	232	0	0	0	8	87	12		

2.2. Eligibility criteria

The paper's selection was limited to the English language. The paper's selection was limited to physical therapy education. The papers were excluded if they were not concerning physical therapy education or were not written in English.

3. RESULTS

Thirteen papers were included in this narrative review. The articles were classified as OSCE or OSPE [Table 2, Fig. 2]

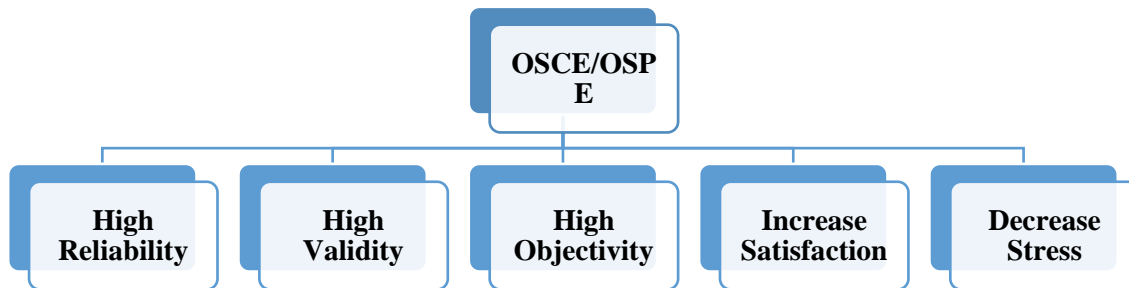


Fig. 55: Summary of the review results

Table 7: List of the included papers in the review, description & classification

Authors	Date of publication	OSCE/OSPE	No of Subjects	Course Specification	Study Design	Conclusion
Stratford et al.[14]	1990	OSCE	24 Students 8 Raters	Musculoskeletal Physical Therapy Anatomy	Randomized Cluster Study Design	This experiment offers proof that a single rater can provide a valid assessment of the student's performance when assuming the role of the simulated patient. This result would imply that a cost reduction is possible because neither a second rater nor a second simulated patient would need to be compensated separately.
Naidoo[26]	2003	OSPE	117 Students 10 Raters	Physical Therapy Courses	Qualitative Research Design	OSPE was shown to be representative and fair assessment of the student's clinical abilities, but modifications and resources must be provided to ensure that
Gorman et al.[17]	2010	OCSE/OSPE	66 Students	Neuromuscular Physical Therapy	Cross Sectional Study	Test stations were found to be reliable and valid.
Silva et al. [15]	2011	OSCE	47 students 4 raters	Pulmonary Physical Therapy	Cross sectional Study	OSCE exam has a good internal consistency and is able to evaluate aspects the traditional exam fails to evaluate.
Frantz et al.[24]	2013	OSPE	47 students 10 Raters	Physical Therapy Courses	Qualitative Research Design	Positive experience towards the objectivity of OSPE.

Swift et al.[19]	2013	OSCE	65 Students	Musculoskeletal Physical Therapy	Cross sectional Study	OSCE has good interrater reliability and poor internal consistency.
John & Deshkar[16]	2014	OSCE	24 Students	Musculoskeletal Physical Therapy	Qualitative Research Design	OSCE can be an effective learning tool besides being an assessment tool.
Dhinakaran et al.[22]	2015	OSCE	20 Students 8 Raters	Musculoskeletal Physical Therapy	Cross sectional Study	OSCE is considered a valuable standardized clinical assessment tool.
Kumar[25]	2016	OSPE	28 students	Physical Therapy Courses	Qualitative Research Design	Video OSPE was favored by students for practical exams. This can be used to increase stations, reduced examiner fatigue and compensate personals.
de la Barra-Ortiz[18]	2021	OSCE/OSPE	114 Students	Physical Agent	Cross sectional Study	The OSCE scores of the participants demonstrate their mastery of clinical skills when utilizing physical agents, as evidenced by the majority of them receiving a global passing score. Nevertheless, given that the station with the lowest mean score requires further emphasis on clinical skills for parameter interpretation.
Vitomskyi et al.[21]	2022	OSCE	46 Students 21 Raters	Physical Therapy Courses	Cross sectional Study	Certain improvements needed for the OSCE assessment forms and preparatory classes.
Obo-Mejía et al.[20]	2022	OSCE	Not Mentioned	Physical Therapy Courses	Cross sectional Study	OSCE was proved to be a suitable instrument to assess the clinical reasoning skills in physiotherapy students.
Abbaszadeh-Amirdehi[23]	2023	OSCE	43 Students	Physical Therapy Courses	Cross sectional Study	OSCE was found out to be stressful, but due to its importance in assessing clinical skills, it was recommended to improve the quality of holding the examination

3.1. Objective Structured Clinical Examination

Several studies tested the reliability, validity, and objectivity of the OSCE assessment for physical therapy studies. It was found out that OSCE has high objectivity, reliability, and validity in assessing students of physical therapy. Stratford et al. evaluated the OSCE on the physical therapy assessment of a musculoskeletal case, including diagnosis, palpation, and enumeration of the anatomical structure using nine stations. The students were divided into small groups, and the physical therapy examiners were at each station. The students rotated around the stations. In each round, there are 6 students [observers], 6 patients, and 2 raters. The study showed that this OSCE design provides reliability in evaluation, ensures a high quality of unbiased assessment of the students, and solves the shortage of raters [examiners] issue [14].

Pulmonary physical therapy assessment was done in both OSCE and traditional exams for physical therapy students in Brazil. The traditional exam consists of four theoretical and one practical question. Two points were earned by the student for each correct answer, with a maximum of ten points. The student selected the practical question randomly, and the student was required to perform the requested maneuver. On the other hand, the OSCE exam was held on another day for the same students on five stations with actors respelling pulmonary cases. The studies showed that the OSCE exam had great consistency and was able to assess domains that the traditional exams failed to evaluate [15]. Physical therapy students were assessed using OSCE for physical therapy management for osteoarthritis. The study found that OSCE improved the student's interest and motivation to learn clinical skills, in addition to increasing

confidence and providing the opportunity for self-assessment[16]. Gorman et al. formed an OSCE model to assess the neuromotor practical skills of physical therapy undergraduate students. eight stations were prepared to hold OSCE, of which four were interactive patient stations. The OSCE station scores were found to be directly related to the overall grade point average (GPA), thus confirming that the OSCE is a reliable method to assess the physical therapy students' practical skills[17].

The OSCE was used to assess the course of physical agents' students in the Physical Therapy program offered at Universidad Andrés in Chile. Seven stations were prepared, of which five were patient-based. Each station tests a specific physical therapy modality and a learning outcome. The results showed a great performance by the students, especially in scenarios with a patient without any difference between male and female students[18]. Swift et al. conducted a study to evaluate the reliability of OSCE in musculoskeletal physical therapy. The OSCE was developed to assess the cognitive and psychomotor skills of the students. The OSCE was based on 7 stations with 2 case studies in order to test the clinical skills of the students. The results showed high internal reliability of the OSCE[19]. Another study was held in Bogotá and Tunja assessed the validity and reliability of the OSCE exam for physical therapy students. It was designed to assess the evaluation and management skills in cases of low back pain [6 stations]. The study revealed the high validity and reliability of the OSCE in assessing students of physical therapy[20]. A study was performed in Ukraine to evaluate the feedback post-OSCE exams for physical therapy students. The study revealed that the failure to perform a requested task is due to insufficient training and the new format of examination, which has a slightly different focus of training[21]. Another study was conducted using 15 OSCE stations to assess the clinical skills of physical therapy undergraduate students with musculoskeletal conditions. The study revealed that both students and examiners decided OSCE was a valid clinical examination and found it less stressful but more lengthy[22]. Despite the previously mentioned studies that revealed the high satisfaction of both students and examiners with OSCE, An Iranian study revealed that OSCE was found to be stressful with low satisfaction, especially towards students, yet it was found to be valid. It was suggested to modify the station's design and practice OSCE with students and examiners. Forty- three students were engaged in this study. The study was designed on evaluating students using OSCE consists of five stations, where each station has one clinical issue to evaluate, examine or treat of an assumptive patient. Each student was allowed three minutes to respond to the questions[23].

3.2. Objective Structured Practical Examination

Frantz et al. performed a questionnaire to assess the influence of OSPE exams on both the students and the raters. The staff members and the students were concerned about time restrictions and how they could affect the performance of the students and the objectivity of the OSPE exam. Forty-seven students participated in the OSPE, with each round having four stations. There were eight parallel stations to help save time and divide the students. This meant that although there were eight stations prepared to conduct the test for the students, each student would only round on four stations. Each of the 4 stations tested a selected practical skill, and the tests followed the rubric set by all the raters. The study concluded that the OSPE had a positive impact on test objectivity, student skill performance, and time savings[24]. Kumar formed a pilot study to assess the functionality of OSPE using video stations as a method of assessing physical therapy students from the third to the fifth level. It was revealed that the video OSPE is a reliable and accurate tool of assessment, and it also had

a positive impact on the student's satisfaction[25]. Another study by Naidoo investigated the objectivity of the OSPE practical skills assessment for 117 physical therapy students at one tertiary institution in South Africa, with only 10 raters presented. The study showed a high objectivity of the OSPE and a high ability to assess higher cognitive and practical skills compared to other methods of evaluation. However, the study revealed that some modifications, preparation, and resources should be available in the facility in order to perform a successful OSPE assessment such as presence of simulation room , using real patient , preparation of checklists and the development of multiformat examinations[26]. A study was performed to assess the objectivity of the OSPE model to assess the neuromotor practical skills of physical therapy undergraduate students. 8 stations were prepared to hold OSPE, including 4 scenario-based, written/video stations. The OSPE station scores were found to be positively proportional to the overall GPA, ensuring that the OSPE is a reliable method to assess the physical therapy students' neuromotor practical skills [17]. Physical therapy students in the Physical Agent course in Chili were assessed via OSPE in two stations out of a total of seven. One of the stations had a dummy, and the other had a mailbox. The study revealed the high objectivity of this method of assessment[18].

4. DISCUSSION

This review paper rejected the hypothesis which stated that physical therapy educators do not use OSCE or OSPE in assessing physical therapy students and also rejected the hypothesis that stated OSCE and OSPE were not valid, reliable, nor objective tools to be used to evaluate clinical skills for students of physical therapy. As physical therapy emerged as one of the health care professions, numerous political developments had a significant impact on higher education programs and initiatives. Thus, these effects also applied to physical therapy[27].

After WWI, physical therapy education and training started. At first, the education was performed in hospitals that had classrooms, and the training was under hospital supervision. Later, a physical therapy association was established, and it was responsible for the entry of physical therapy programs into universities as a form of higher education. By 1928, there were 11 accredited physical therapy programs in the USA[28]. After WWII, the US military employed physical therapists with bachelor degrees [BSc.] in order to ensure the ultimate rehabilitation service for the soldiers. By that time, physical therapy education had evolved to cope with political and economic changes in society. Transitional Doctor of Physical Therapy [tDPT] was applied in many universities, followed by an entry-level DPT in all USA universities now and in some other countries, making physical therapy one of the most desired professions[29]. This was accompanied by many political gains achieved by the American Physical Therapy Association; the most prominent was direct patient access to physical therapy[30]. As the profession developed, the education system needed standardized, valid, and reliable methods of assessment for the graduates to ensure the quality of the therapists. The importance of OSCE and OSPE as methods of evaluation is the golden key to assessing undergraduate physical therapy students. This was supported by Astek, who included the OSCE and OSPE as methods of evaluating clinical and practical skills for physical therapy students in the Physical Activity and Exercise Therapy Course at King Abdulaziz University [KAU][31].

4.1. Objective Structured Clinical Examination

The OSCE was found to be an objective and reliable method of assessment for physical therapy students' clinical skills. This findings was supported by Siddiqui, who found out that OSCE is a valuable assessment tool for medical sciences that can evaluate certain skills that cannot be assessed by any other measure[32]. Also, this review result was confirmed by Alsenany and Amer Al Saif, who revealed that the OSCE method was found to be very useful to detect the students' practical abilities. The stations can be designed to evaluate different performance skills and knowledge[33]. Using OSCE as a method of assessment for physical therapy students was supported by Dharmayat and Metgud, who declared that OSCE is a reliable tool for assessing the practical skills of the students rather than emphasizing only cognitive and theoretical information[34]. The physical therapy license exam in Canada validated the OSCE as a standard method for assessment to gain the license. There, a positive relationship was found between the scores of the OSCE of the license exam and the GPA of the university graduates[35]. This can support the idea that using OSCE in assessing undergrad students will enhance their chances of passing the license exam. The OSCE was found to be a reliable method for assessing practical skills with satisfaction and less stress. These results were supported by Ferreira et al., who found out that the physical therapy students find OSCE meaningful and not related to the students' exam anxiety[36]. Our results that confirmed the reliability, objectivity, and validity of OSCE for physical therapy students' assessments were confirmed by a Barman study that revealed that OSCE is a reliable, objective, and valid tool for medical students' assessments, but its only drawback is the resources[37]. The results were also supported by the Carracio & Englander study, which revealed the high reliability and validity of OSCE assessments for medical students[38].

The current review results are also supported by McGaghie et al.'s findings that encourage using OSCE in assessing the clinical performance of medical students[39]. This was also supported by Rushforth's review, which highlighted the usage of OSCE in assessing the clinical skills of allied health sciences[40]. The review showed high satisfaction with OSCE from both the students and the examiners. These results are supported by Amiri and Nickbakht, who found high satisfaction levels of OSCE among medical students and examiners[41]. The results match the findings of Abbas and Ahmed, who revealed the reliability and feasibility of OSCE in assessing the clinical skills of students of medical backgrounds[42]. The results showed the importance of preparation and practice for OSCE exams in order to make the students and examiners more familiar with the procedure, leading to a less stressful experience during the assessment. This was supported by Brown, who mentioned that good preparation and training on the OSCE will help students cope easily[43]. On the contrary, a systematic review by Ribeiro et al. showed weak evidence of the usage of OSCE in physical therapy exams, depending on reviewing seven articles[44]. On the other hand, a study at the University of Almajmaah showed that the medical students reflect low satisfaction levels with the OSCE method, regardless of the clarity of the OSCE procedures and steps[45]. Smith & McManus suggested that a hybrid method between the traditional practical exam and the OSCE [the Integrated Anatomy Practical Paper [IAPP]] during anatomy course evaluation would provide higher levels of evaluation, and it was found to be reliable and practical to administer[46].

4.2. Objective Structured Practical Examination

The OSPE is a multiple-station examination that is designed to test a particular learning outcome. It assesses the higher cognitive functions and psychomotor skills of the students.

Each station is an installment that describes a clinical case study where particular questions are formulated to assess the objectives[47]. This review revealed the importance of applying the OSPE as an assessment for physical therapy students. This was supported by Dharmayat and Metgud, who recommended it for assessing higher cognitive and psychomotor skills[34]. The current review results showed higher levels of satisfaction during the OSPE assessment. This result is supported by Olivier et al., who revealed that OSPE increases the student's satisfaction during assessment[48].

5. CONCLUSION

We concluded that objective structured clinical examinations [OSCE] and objective structured practical examinations [OSPE] are both reliable, valid, and objective methods that can be used to assess the practical and clinical abilities and skills of undergraduate physical therapy students in higher institutions and universities.

6. RECOMMENDATIONS

1. We recommend an expansion of OSCE and OSPE methods in assessing physical therapy students.
2. Assess the reliability, validity, and objectivity of OSCE and OSPE in physical therapy higher education systems.
3. Formulate a unified model of OSCE and OSPE examinations for practice prior to the license exam.

Conflict of interest

The authors declare no conflict of interest.

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