WOSCE (Watched Objective Structured Clinical Examination) A New Paradigm in Clinical Assessment

Faisal Abdullatif Alnaser

Honorary Faculty, Department of Primary Care & Public Health, Imperial College London
President, WONCA EMR
President, Bahrain Family Physicians Association
Vic President, Gulf Association of Family Medicine
Chairman, Home Health Care Centre, Bahrain

Correspondence
Prof. Dr. Faisal Abdullatif Alnaser
PO Box 31369, Budayia
Kingdom of Bahrain
Tel: 0097339464048
Email: falatf@gmail.com

Received: February 2026. Accepted: March 2026; Published: March/April 2026.
Citation: Alnaser FA. WOSCE (Watched Objective Structured Clinical Examination) A New Paradigm in Clinical Assessment. World Family Medicine. March/April 2026; 24(2): 76-82. DOI: 10.5742/MEWFM.2026.2401033

Abstract

Introduction: The need for well-trained medical personnel is becoming increasingly urgent as healthcare systems become more complex and sophisticated. Clinical competence remains a cornerstone of medical education, notably during the last year of medical training. Assessing clinical abilities can be challenging, particularly since medical students often prioritize test preparation over gaining practical clinical experience.

Methods: The use of OSCE (Objective Structured Clinical Examination) and assessments performed directly on actual patients are the two most popular evaluation methods. OSCEs help evaluate specific clinical skills; however, they fall short in reflecting the full complexity of real-world clinical practice. Assessments involving actual patients offer a more authentic measure of clinical competence. Still, these approaches are often complicated by practical concerns, such as arranging logistics, navigating ethical considerations, and addressing legal requirements related to patient consent, confidentiality, and safety. It is a tricky balance.

Challenges: Furthermore, the increasing number of medical students complicates the usage of these instruments. As a result, there is a pressing need to create novel evaluation techniques that are both scalable and consistent with actual practice.

Proposed Approach: Trained performers, video-based evaluations, and standardized clinical scenarios should be incorporated into best practices to ensure consistency across assessments. We introduced the Watched Objective Structured Clinical Examination (WOSCE) as a complementary tool rather than a replacement to address these challenges.

Conclusion: This novel approach leverages technology and well-considered instructional design to provide a trustworthy, ethically sound, and realistic solution that aligns with the evolving landscape of modern medical education.

Keywords: Watched Objective Structured Clinical Examination (WOSCE), Competency-Based Assessment, Medical Students, OSCE, AGU, Clinical Skills assessment, Clinical Competence.

Introduction

As healthcare continues to grow in complexity, professionals must cultivate the essential skills to become competent physicians, delivering high-quality care to patients while functioning effectively within inter-professional teams.[1] The assessment of final-year medical students has been the subject of extensive research and ongoing debate, primarily because it is critical to ensure that graduates are both safe and competent in patient care upon entering clinical practice. Although medical education methods are advancing rapidly, assessing clinical competence remains a fundamental component of training. During their final year, most medical students focus their learning on what they anticipate will be included in examinations, rather than on the practical situations they will encounter upon graduation. Therefore, all clinical assessments should strive to reflect real-life scenarios.[2] Although direct clinical examinations offer this opportunity, they come with various challenges and limitations. This conventional method, which relies heavily on real patients, introduces significant logistical, practical, and ethical difficulties. The ethical and legal implications are related to four main areas: consent, confidentiality and data protection, duties and standards of care, and adverse events. [3]

Moreover, it has been reported that bedside evaluations frequently expose notable shortcomings in students' clinical skills.[4] GE Miller, in his explanation of how medical students build their skills, demonstrated that this development occurs through various stages known as Miller's pyramid. It divides the progression of clinical skills into four distinct phases. At the foundation of the pyramid lies "knows," which signifies theoretical knowledge, usually evaluated through written tests and multiple-choice questions (MCQs). The model subsequently advances through "knows how," "shows how," and ultimately "does," demonstrating the combination of knowledge and skills into actual clinical practice. However, he stressed that "no single assessment method can provide all the data required for judgment of anything so complex as the delivery of professional services by a successful physician." This assertion highlights the ongoing need for a multifaceted approach that employs diverse methods for assessment in medical education.[5]

In discussing assessment, a key question frequently arises: What should assessments prioritize: knowledge, clinical skills, or professional attitude? In fact, all three elements are vital and interrelated. A skilled medical graduate should possess a solid theoretical foundation, exhibit a professional and ethical demeanor, and demonstrate proficiency in clinical skills. Each of these areas is unique and requires a customized evaluation method. Factual knowledge and students' comprehension of medical theories can be evaluated through conventional written tests, which consist of Multiple-choice questions (MCQs), essay-type questions, Modified Essay Questions (MEQs), Patient Management Problems (PMPs), and oral examinations (Vivas). Although qualities such as professionalism, personality, and ethical attitude are often challenging to measure, various assessment methods have been employed to evaluate these characteristics. These methods include ongoing faculty observations, feedback from colleagues, patients, and staff, as well as reflective portfolios.

The Clinical Skills are arguably the most critical and most challenging to assess. Historically, assessment of clinical abilities has involved direct observation of students as they interact with genuine patients. Along with their knowledge base, this approach enables evaluators to assess students' clinical abilities as well as their non-technical attributes, including communication skills that encompass empathy and behavior. Using clinical simulations or structured clinical assessments that closely duplicate real clinical scenarios is one of the best choices. However, Miller states, "Direct observation of a candidate performing a history and physical examination by a trained rater using a standardized checklist or rating scale does address the reliability issue, but it does not deal with the sampling question, which is critical if generalized conclusions about performance are to be reached".[5] In the second half of the 20th century (specifically in 1964), a new form of assessment in medical training was introduced, called the Objective Structured Clinical Examination (OSCE). This traditional tool (OSCE) has reliably assessed specific clinical competencies in a structured, station-based manner. It is a clinically based assessment designed to provide students with similar clinical experiences. [6,7,8] Later, OSCE has been widely adopted as a partial solution. It offers a standardized format for evaluating a range of clinical competencies.[9] However, it is argued that the OSCEs are designed to assess observable behaviour, rather than cognitive skills.[6] Despite their popularity, OSCEs may fall short when evaluating students in real-patient scenarios. It faces limitations in the realism of scenarios, scalability to large student groups, logistical and resource demands, and feedback. [10]

When class sizes were small, this method was effective and manageable. Students received individualized evaluations in authentic clinical contexts. However, the OSCE may not be suitable for assessing all clinical skills, [11] as students' performance in the OSCE does not necessarily align with their diagnostic reasoning skills.[12] It may fall short when evaluating students in real patient scenarios. A study has shown that even with a few hours of clinical practice students had similar clinical reasoning and communication when the OSCE was used to assess them.[13] It is well-known that traditional OSCEs require a considerable amount of time and resources. They demand a significant dedication from faculty, staff, and, importantly, actual patients. Given the increase in medical school enrolments, conducting these exams in our traditional manner is no longer viable.[14] Hence, a more systematic approach to assessing these skills in real clinical settings is needed.[4]

Alternative methods that involve interacting with actual patients have often been used to evaluate clinical skills. These methods encompass students' abilities to: implement knowledge in practical situations involving either real patients or simulated models, engage in effective communication with both patients and peers, exhibit solid clinical

reasoning and decision-making skills, carry out physical examinations and procedures with precision, consider differential diagnoses, correctly evaluate the patient's condition, and establish an appropriate management plan along with follow-up care. That being noted, this approach also does not provide equal assessment opportunities for every student, as circumstances vary from one patient to another, despite attempts to standardize the cases. Moreover, the outcomes of the examination may be influenced by a lack of uniformity among the examiners, the absence of retrospective analysis of test results, and the effects related to the specific group of examiners.

One major limitation of standard clinical exams is the availability and readiness of patients to engage. As the number of medical schools and students increases, recruiting sufficient numbers of suitable patients has become more challenging.[15] Furthermore, having multiple students conduct exams can lead to fatigue and discomfort for the patient, and certain patients have expressed sensations of being excessively exposed or treated as objects, which could result in feelings of frustration, anxiety, confusion, or possibly lead to official grievances.[16] Moreover, medical procedures are often included in evaluations without careful consideration of their actual effects on patient health and well-being.[17] This raises moral issues, particularly when the goals of education supersede the need to respect patient dignity and autonomy. Additionally, conventional examination locations, such as hospital wards and outpatient clinics, are becoming increasingly difficult to access. This is due to hospital administrations being increasingly unwilling to allocate clinical spaces for evaluation purposes because it distorts their regular working schedules.[15] Due to the substantial rise in student enrolment at various institutions, this model has become more challenging to implement. It presents logistical management difficulties, consumes considerable time, demands numerous resources, and incurs high costs. Additionally, it is often impractical due to constraints related to the availability of actual patients and staff, frequently interrupting the hospital's or health center's regular operations. This can have an impact on patients' treatment and care plans, and, most importantly, may raise ethical concerns and compromise patients' confidentiality. Numerous studies have also highlighted the occurrence of adverse incidents affecting patients during student evaluations, underscoring the need for more ethical and patient-centered approaches in clinical assessment.[3]

Amid growing challenges in assessing clinical skills, particularly due to the increasing number of medical students in most medical schools, and given the significant challenges in evaluating clinical skills, especially in large cohorts of students, there is an urgent need to develop and implement alternative assessment tools that are: Accurate, Reliable and valid, Sensitive enough to differentiate levels of competence, Efficient in terms of time and resource use, Capable of providing meaningful feedback, and produce a fair and a non-discriminate assessment of all the students.

Consequently, it is essential to implement appropriate evaluation techniques in undergraduate medical education that emphasize the application of diagnostic reasoning and a more systematic approach to evaluating students' clinical skills.[4] To truly close the gap in clinical skills assessment, institutions must shift toward innovative tools that retain clinical authenticity while managing large class sizes.
The Ideal solutions may include Standardized scenarios, Integration of technology (e.g., video recordings, remote evaluations), use of standardized patients or actors, and Video-based assessments for consistent and repeatable evaluations across cohorts.

For these reasons, we at the College of Medicine and Medical Sciences (CMMS) at the Arabian Gulf University (AGU) have tried several initiatives aimed at developing more sustainable and objective assessment models. These models seek to address the previously mentioned challenges while also meeting the pressing requirement to evaluate clinical competence effectively. To overcome the identified limitations, we introduced a new method: the Watched Objective Structured Clinical Examination (WOSCE), believing that this method offers an educationally practical and practically feasible solution that meets the evolving needs of medical education. [18-19]

The Watched Objective Structured Clinical Examination (WOSCE) has evolved over time through a careful, thoughtful process, beginning with its initial use by Professor Faisal Alnaser in the Department of Family and Community Medicine. Since its inception in 2003, the WOSCE has undergone several phases of testing and updates, with each group of students providing essential insights that guided continuous enhancements. It was first employed to evaluate students' clinical skills after they completed their Family Medicine clerkship in the final year of medical school.

The WOSCE is a contemporary adaptation of the OSCE, designed to align with the current needs of modern medical education. WOSCE utilizes technology, including pre-recorded or live-streamed clinical situations, to evaluate students in a regulated and uniform setting. Examiners have the capability of observing and assessing from a distance, which not only makes the process more efficient but also enhances uniformity and impartiality in evaluations.

The transition to WOSCE directly addresses the practical and moral challenges presented by conventional examinations. Firstly, there is significantly reduced pressure on patients; no longer are the same volunteers subjected to constant evaluations. Arranging schedules is simplified considerably, and the examiner's responsibilities are greatly minimized. The uniformity of scenarios ensures that all students are evaluated according to the same standards, thereby reducing inconsistencies that may arise during live examinations.

Some core features and key advantages of WOSCE include:

• Utilization of pre-recorded or live clinical scenarios minimizes the continuous dependence on actual patients.
• Simulated patients are commonly utilized, though real patients may still be employed when necessary for teaching purposes, always under supervision.
• Examiners are not required to be present in person, which allows for greater flexibility and sustainability in their participation.
• Minimizes ethical issues and patient exhaustion by decreasing the involvement of actual patients.
• Streamlines the logistics of examinations, facilitating easier scheduling and administration.
• Guarantees impartiality and thoroughness in the assessment of clinical abilities by employing standardized, high-quality situations.
• Expands effectively, accommodating the requirements of larger groups of students while maintaining its rigor and authenticity.
• Minimizes organizational complexity and decreases the number of faculty required to oversee examinations.
• Provides considerable savings in both time and money; tasks that previously required several days can now be completed in just one session.
• Preserves educational integrity by effectively replicating clinical experiences for thorough evaluation and assessment.
• Consistent exposure to every clinical situation guarantees that all students are evaluated under identical circumstances.
• Encouragement of immediate critical thinking and clinical reasoning in reaction to changing case scenarios.
• Uniform timing for all candidates, improving fairness and consistency.
• Ensuring the implementation of an unbiased evaluation process, even when assessing extensive groups of students.
• The outcome is a captivating, regulated, and uniform evaluation setting that measures essential components of clinical ability without requiring live patient engagement. [15]

In conclusion, WOSCE addresses the changing needs of medical education. It provides a practical, scalable, and ethical alternative to the conventional OSCE while maintaining the integrity and educational value of clinical skills evaluation.

Methods and Discussion

The Development of the WOSCE:

This repeated approach has led to numerous necessary improvements, as shortcomings in the assessment design have been carefully identified and addressed. Each WOSCE station is designed to assess various aspects of clinical competence, encompassing the use of medical knowledge in real-life scenarios, clinical reasoning and diagnosis development, analysis of physical examination results, planning for management, and the capacity to make immediate diagnoses based on brief clinical presentations. This thorough design guarantees that student evaluations are both challenging and applicable to the current conditions of clinical practice today.

The process of WOSCE development typically begins with the formation of a specific committee, commonly comprising four or five experienced faculty members from the Department of Family Medicine. These individuals combine their extensive clinical and educational expertise to choose the subjects that will be featured in the WOSCE exam. Each WOSCE usually includes around 15 to 20 different clinical cases. These are not selected randomly; each one is thoughtfully created through active teamwork, ensuring that every situation aligns with the essential skills anticipated at the clerkship level.

The scenarios may cover a range of competencies, including spot and differential diagnosis, Clinical reasoning, decision-making, Communication and interpersonal skills, Physical examination techniques, Selection of appropriate investigations, Formulation of treatment and management plans, Health education and counseling strategies, and planning for patient follow-up. The assessment may also include visual materials, such as X-rays, ECGs, skin conditions, or endoscopic images, which require students to demonstrate diagnostic reasoning and develop clinical management plans.

The committee established goals for each station and developed clinical scenarios that perfectly align with the desired learning outcomes. They ensure that the scenarios are educationally effective and truly represent real-world medical practice while being closely tied to the entire curriculum. The fact that the WOSCE itself is the product of a continuous discussion and iterative improvement among these experts, with the explicit objective of developing a standardized, practical, and truly effective evaluation instrument, all without the need to involve actual patients, is worth noting. The primary aim is to provide a systematic and thorough approach for determining if students are prepared for practical clinical experience.

The team collaborates effectively to identify the medical skills and professional qualities that should be evaluated and to formulate questions that are meaningful and challenging. For each station, the committee members must create questions that cover various areas, such as: how would you assess this patient, what is the probable diagnosis, what inquiries would they ask for, or how would they treat this illness?

Later, the script for each topic is carefully written, keeping its primary objectives in mind. The scenarios are then fully developed, and the simulated patients are selected and trained in a way that is believable and consistent. They must undergo extensive training, which enhances the evaluation's authenticity and instructional value, allowing them to replicate the emotional, behavioral, and clinical subtleties observed in actual medical interactions. Simulated patients facilitate the assessment of several domains, including communication abilities, the development of a differential diagnosis, the identification of acceptable investigations, and the establishment of a management approach.

To improve clinical clarity and relevance, each station's scenario is revised several times, and the evaluation rubrics are reinforced to promote fairness and objectivity. Once the performers and scenarios are prepared, the university's film crew is invited to create high-quality video footage for each scenario, which represents the unique learning objectives of the corresponding station. These are ensured by implementing the following steps:

1. Rehearsed role-playing: In a prepared video, a person (typically an actor or a member of the medical team) reads the scenario and plays the part of the patient to portray the clinical scenario.

2. Authentic clinical material: The movie is shot using actual patients displaying their illnesses or particular clinical indications, following ethical approval and confirmation of the goals.

3. Simulated doctor-patient interaction: A staged encounter is recorded between a doctor and a patient (genuine or simulated), in which the patient expresses their complaints, and the doctor responds by investigating the problem and directing the clinical reasoning process.

Quality Assurance and Preparation for Implementation:

As part of the quality assurance process before the WOSCE is implemented, the videos undergo a comprehensive review and refinement process. Multiple rounds of review and standardization are conducted by experienced faculty family physicians and clinical educators to ensure clarity, fairness, and alignment with the intended learning outcomes. The feedback is assessed to confirm that the scenarios are educationally relevant, clinically sound, and understandable, with a focus on instruction and clarity. The external clinical examiners (those who have not been involved in creating the scenarios) take a mock examination, where they imitate the candidate, analyze the data, attempt to answer the station, and provide their comments from a clinical and evaluative perspective. With needed changes made to enhance clarity, uniformity, and alignment with educational objectives, this input is carefully considered.

A key component of the WOSCE format is standardized timing. To mirror authentic clinical practice and maintain student focus, each video scenario is intentionally brief, typically just two to three minutes. This format ensures that students receive only the most pertinent clinical information, much like a focused patient presentation in real life. These measures collectively ensure that the WOSCE is closely aligned with the core clinical competencies expected of students upon completion of their clerkship training.

With these procedures in place, WOSCE stations are ready for deployment, offering a practical and high-fidelity alternative to traditional patient-based clinical assessments.

Finally, the WOSCE stations are authorized for formal use only after this validation procedure. This rigorous preparation guarantees that each station upholds high standards for clinical relevance, educational value, and fairness. Later, the exam is scheduled for delivery in a controlled assessment setting for medical students.

Conducting the exam:

On the exam day, students are seated in the examination hall with adequate spacing between them to prevent distractions and ensure independent work. They face a large display screen where the films will be displayed. Each student is provided with a comprehensive WOSCE booklet containing a series of clinical case scenarios, specific requirements, relevant questions, and designated spaces for written responses. Then the students are given the following instructions:

- Advised to pay close attention, since the assessment incorporates video-based scenarios.
- Are notified that each video station is presented only once, without the possibility of replay.
- Writing is strictly prohibited during video playback.
- Only when a video segment concludes are students required to promptly turn to the corresponding section in their booklet and address the outlined questions.
- A bell will ring at the end of each response period, prompting students to stop writing immediately as the next station begins.
- Students are explicitly instructed not to move ahead or attempt to answer questions from other stations before viewing the relevant video, thereby preserving the sequence and authenticity of the assessment.
- No questions during the exam.
- When the exam is over, students are required to stop writing and start leaving the hall while leaving their booklets behind.

This arrangement aims to simulate an actual consultation, during which a doctor evaluates, diagnoses, and creates a treatment plan in a short period. A fair and thorough assessment of students' clinical reasoning and decision-making abilities is guaranteed by the WOSCE format, which accurately represents current medical practice and is time-efficient. The uniform layout promotes fairness and consistency by guaranteeing that all students spend the same amount of time at each station. Students complete the related questions in the booklet after viewing a film of a clinical scenario, typically within a 10-minute time frame for each section. To ensure academic integrity, the examination process is closely monitored and supervised.

Correction and marking of the WOSCE Examination:
The response booklets are collected after the test and returned to the former members of the WOSCE committee. The committee not only marks the tests but also conducts a thorough analysis of student performance, using the data to improve and customize future training sessions for incoming groups. The goal is evident: WOSCE is a tool for continuous learning and preparation rather than merely an assessment checkpoint.

Using this approach ensures that WOSCE stays current and educationally relevant. It aims to reflect the actualities of clinical practice while maintaining a consistent, extensible test format.

The most notable innovation is the reinterpretation of the examiner's role. Examiners now supervise clinical interactions remotely, either in real time or through recorded video, as an alternative to directly evaluating students in person. With this modification, logistical problems are resolved and scalability is improved without compromising the accuracy or caliber of the evaluation process. Consequently, the WOSCE is an adaptive and versatile instrument for modern medical education. The overwhelming positive feedback from the staff and students has highlighted the value of this integrated approach. These video-based scenarios are crucial for assessing students' clinical skills and ensuring that the evaluation process is thorough and accurately reflects the realities of real medical practice.

Advantages and Key Differences:
Like any assessment method, the Watched Objective Structured Clinical Examination presents both advantages and trade-offs. However, based on practical experience, the benefits of WOSCE are substantial and align closely with the evolving needs of modern medical education. The key advantages include:

1. High-Volume Assessment
WOSCE enables the simultaneous assessment of a large number of students using standardized clinical material. This greatly simplifies logistics and ensures consistent content delivery and assessment criteria across all examinees.
2. No Need for Live Patients
WOSCE does not frequently rely on actual patients, unlike traditional OSCEs or clinical exams conducted on actual patients. It is therefore a patient-friendly, non-invasive method of clinical evaluation. This prevents patients from undergoing repeated, potentially upsetting exams, especially those with sensitive or chronic conditions. Additionally, it eliminates the need for scheduling, training, and patient recruitment. It is a high-fidelity, controlled visual experience that simulates actual clinical interactions.
3. No Disruption to Clinical Services
Because all clinical scenarios are pre-recorded, WOSCE does not interfere with a hospital or health center's operations. There is no need to allocate exam space or interrupt patient care, making it a sustainable option for institutions balancing education and service delivery.
4. Time and Cost Efficiency
One of the strongest features of WOSCE is its scalability. With high-quality audiovisual equipment, over 100 students can be assessed simultaneously in a single hall, something virtually unachievable with traditional OSCEs involving real patients.
5. Typically, twenty clinical scenarios are covered in a WOSCE session, which lasts three to three and a half hours. Performing a comparable evaluation with live patients would require significantly more time, involve careful planning and a substantial staffing commitment, and place a burden on both patients and staff. WOSCE significantly reduces faculty and space demands.
6. Equity and Standardization
One of WOSCE's most critical advantages is the high level of fairness it ensures. Every candidate is exposed to the same clinical scenarios, delivered in the same manner, under the same conditions. This removes disparities in case complexity or patient behavior that may arise in traditional OSCEs, ensuring a level playing field for all students. Numerous studies have demonstrated that examiners often influence the results of OSCEs. Examiner-cohorts had a significant and repeatable impact on OSCE scores that was not explained by standard assessment psychometrics. [20] As a result, to prevent this bias, we must use multiple parallel OSCE circuits with various examiner cohorts to collectively evaluate each student's performance [21], which is not the case with WOSCE.
7. Consistency and Objectivity in Evaluation
By standardizing both the scenarios and the questions, WOSCE minimizes discrepancies. Every student is subjected to the same clinical situations, interactions, and queries. Ensuring fairness and consistency in the evaluation process increases the validity and reliability of the assessment results. [19]

Conclusion

WOSCE functions as a complementary assessment tool rather than a wholesale replacement for traditional OSCE methodologies. Each modality possesses distinct pedagogical strengths: traditional OSCEs provide authentic patient interaction and real-time clinical decision-making under uncertainty, while WOSCE enables standardized scenario delivery, scalability, and controlled assessment conditions. A blended assessment strategy incorporating both formats may optimize the evaluation of clinical competence across multiple domains, including medical knowledge application, technical skill proficiency, and professional behavior. Contextual factors, including student enrollment volume, clinical site availability, faculty resources, and technological infrastructure capacity, should guide institutional adoption decisions.

In summary, WOSCE represents a methodologically sound and resource-efficient innovation in clinical skills assessment. Beyond its pedagogical merits, the modality offers significant operational advantages, including reduced faculty time requirements for examination administration and decreased costs associated with patient recruitment and compensation. These economic considerations

merit particular attention for institutions operating under budgetary constraints or seeking to expand assessment capacity without proportional increases in resource allocation.

Limitations and Future Work:
The WOSCE has three main limitations. First, there may be inconsistent video quality, inadequate observer training, or poorly standardized scenarios. If not properly cared for, it may compromise the validity of the assessment. Second, even well-designed simulations cannot capture the full complexity of real patient encounters—the unpredictability, emotional nuance, and contextual factors that define actual clinical practice. Third, schools with limited budgets or technical capacity will struggle to implement this approach without significant investment in equipment and faculty development.

There should be more validation studies across multiple disciplines and institutions, particularly comparing WOSCE performance against traditional OSCEs and direct clinical observation. It is essential to address and clarify key questions, such as whether students and faculty find this method acceptable. What does implementation cost? Does WOSCE training translate to better patient care?

References

[1]-Suter E, Arndt J, Arthur N, Parboo Singh J, Taylor E, Deutschlander S. Role understanding and effective communication as core competencies for collaborative practice. J Interpr of Care. 2009;23:41–51.
[2]-Aaraas IJ, Holtedahl K, Anvik T, Bentzen N, Berg E, Fleten N, Hasvold T, Medbø A, Prydz P. Examination of final-year medical students in general practice. Scand J Prim Health Care. 2007 Dec;25(4):198-201.
[3]-Sayer M, Bowman D, Evans D, Wessier A, Wood D. Use of patients in professional medical examinations: current UK practice and the ethicolegal implications for medical education. BMJ. 2002; 324:404
[4]-Steichen O, Georgin-Lavialle S, Grateau G, Ranque B. Evaluation du savoir-faire en sémiologie clinique des étudiants en fin de deuxième cycle des études médicales [Assessment of clinical observation skills of last year medical students]. Rev Med Interne. 2015 May;36(5):312-8. French.
[5]-Miller, G E. The assessment of clinical skills/competence/performance. Academic Medicine. 65(9):p S63-7, September 1990.
[6]-Witheridge A, Ferns G, Scott-Smith W. Revisiting Miller's pyramid in medical education: the gap between traditional assessment and diagnostic reasoning. Int J Med Educ. 2019 Oct 25;10:191-192.
[7]-Vercio C, Tan G, Maxson IN, Matta Y, Cacho B, Calaguas D, Hayton A, Kim S. Stress and value: the student perspective on utilizing real vs. actor patients in objective structured clinical examinations. BMC Med Educ. 2024 Jul 15;24(1):760.
[8]-Barrows HS, Abrahamson S. The programmed patient: a technique for Appraising Student performance in clinical neurology. J Med Educ. 1964;39:802–5.
[9]-Rayyan MR. The use of objective structured clinical examination in dental education – narrative review. Front Oral Health. 2024.
[10]-Alsahafi A, Newell M, Kropmans T. A retrospective feedback analysis of OSCE performance. MedEdPublish. 2024;14:251.
[11]-Barman A. Critiques on the Objective Structured Clinical Examination. Ann Acad Med Singap. 2005;34:478–482.
[12]-Park WB, Kang SH, Myung SJ, Lee YS. Does Objective Structured Clinical Examinations score reflect the clinical reasoning ability of medical students?. Am J Med Sci. 2015;350:64–67.
[13]-Soledad AR, Catalina ZS, Scarlett VC, et al. Using the OSCE to assess medical students' communication and clinical reasoning during five years of restricted clinical practice. BMC Med Educ. 2025;25:608.
[14]-Fu Y, Zhang W, Zhang S, Hua D, Xu D, Huang H. Applying a video recording, video-based rating method in OSCEs. Med Educ Online. 2023 Dec;28(1):2187949.
15]-Newble DI. Using real patients in professional medical exams. Suggestions would make examinations with real patients impractical. BMJ. 2002 May 18;324(7347):1217
[16]-Shennan A, Jones G, Hawken J, Crawshaw S, Judah J, Senior V. et al. Fetal fibronectin test predicts delivery before 30 weeks of gestation in high risk women but increases anxiety. BJOG. 2005;112(3):293–298.
[17]-Vis JY, van Zwieten MC, Bossuyt PM, Moons KG, Dijkgraaf MG, McCaffery KJ, Mol BW, Opmeer BC. The influence of medical testing on patients' health: an overview from the gynecologists' perspective. BMC Med Inform Decis Mak. 2013 Oct 10;13:117.
[18]-Alnasir Faisal, Shabool Qassim, Hamdy Hossam. Reliability of Watched Objective Structured Clinical Examination (WOSCE) Scores in Family Medicine Clerkship. Annals of Iraqi Science. January 2008:1(1):3-9
[19]-Alnasir Faisal. The Watched Structured Clinical Examination (WASCE) as a tool of assessment. Saudi Medical Journal. 2004;25:71-74.
[20]-Yeates P, Moult A, Cope N, McCray G, Xilas E, Lovelock T, Vaughan N, Daw D, Fuller R, McKinley RKB. Measuring the Effect of Examiner Variability in a Multiple-Circuit Objective Structured Clinical Examination (OSCE). Acad Med. 2021 Aug 1;96(8):1189-1196.
[21]-Yeates P, Cope N, Hawarden A, Bradshaw H, McCray G, Homer M. Developing a video-based method to compare and adjust examiner effects in fully nested OSCEs. Med Educ. 2019 Mar; 53(3):250-263.