Medical Students' Perception of a Newly Implemented Objective Structured Clinical Examination (OSCE) in Orthopedic Surgery and Trauma: A Mixed-Method Study

Asser Sallam[1], Hani Atwa[2,3], Adel Abdelaziz[2] and Asmaa Abdel Nasser[2,4*]

[1]Orthopedic Surgery and Trauma Department, Faculty of Medicine, SUEZ Canal University, Ismailia, Egypt; assersallam@hotmail.com
[2]Medical Education Department, Faculty of Medicine, SUEZ Canal University, Ismailia, Egypt; adelabdelazizmed@gmail.com, dr.asmaaabdelnasser@gmail.com, doctorhani2000@yahoo.com
[3]College of Medicine and Medical Sciences, Arabian Gulf University, Manama, Kingdom of Bahrain
[4]Ibn Sina National College for Medical Studies, Jeddah, Saudi Arabia

Abstract

Introduction: Objective Structured Clinical Examination (OSCE) is a well-known, widespread method of assessment of clinical skills. It is being widely used in Egyptian medical schools. This study aimed to explore the perception of the fifth-year medical students on the attributes, quality, validity, reliability and organization of the end-of-rotation Orthopedics Surgery and Trauma OSCE held at FOM-SCU in two academic years (2017-2018 and 2018-2019). It also aimed to assess the students rating of OSCE in relation to the other available assessment methods in clinical rotations. **Material and Methods:** This is a cross-sectional mixed-method study that was conducted at Suez Canal University Hospital. A convenient sample of the fifth-year medical students, who underwent the OSCE at the end of their Orthopedic Surgery and Trauma rotation during both academic years 2017-2018 and 2018-2019 were involved (n = 254). Quantitative data were collected through a validated questionnaire consisting of 32 items. Focus group discussions of students were conducted and qualitative data were recorded, coded, and thematically analyzed. **Results:** More than half of the students (55.5%) believed that the exam was fair and covered a wide range of knowledge (63.8%) and clinical skills (72.4%). Considerable percentages of students were doubtful regarding the standardization of OSCE scores (62.6%) and whether those scores provided a true measurement of their clinical skills (65%) and more than half of them were not sure whether gender, personality, or ethnicity affected their exam scores (55.5%) and whether OSCE provides them practical and useful experience (53.5%). OSCE and portfolio were reported as the easiest method among 55.5% and 63.8% of students, respectively, and 31.1% rated MCQs as the most difficult form of assessment. Qualitative analysis identified two themes; namely: "Challenges of implementing OSCE" and "Ways to overcome identified challenges". **Conclusion:** Medical students positively perceived and provided good perception on the organization and implementation of the Orthopedics OSCE, although some of them were doubtful regarding its validity and reliability in assessing their clinical skills in Orthopedics and Trauma. The challenges regarding the OSCE can be overcome by more well-structured, practical training and orientation sessions for the examiners, students, and simulated patients.

Keywords: Clinical Skills Assessment, Competency-based Education, Orthopedics and Trauma, OSCE; Students' Perceptions

1. Introduction

The undergraduate medical education in Egypt has recently undergone a tremendous change in response to the requirements of the newly developed unified, competency- based Egyptian undergraduate medical education curriculum to be Competency-based and named "5+2". It changed the duration of study for the degree of Bachelor of Medicine and Surgery to become five study years (2 years of basic medical sciences and 3 years of clinical sciences) based on the credit

*Author for correspondence

points system in addition to two years of internship clinical training. Previously, it was a 6-year bachelor program (3 years of basic medical sciences and 3 years of clinical sciences) in addition to a mandatory 12-month training course as an internship year[1].

Competency-based education is now the typical approach of undergraduate clinical teaching[2,3]. The clinical competence is defined as a psychological construct, such as critical thinking, problem-solving and clinical reasoning, that includes aspects of cognitive, psychomotor and affective domains as described in the Miller's pyramid[4]. Being clinically competent incorporates medical knowledge, professionalism and communication skills, clinical examination skills, procedural skills and the ability to interpret the different investigation methods like radiographs and laboratory tests[5,6,7]. To guarantee proper development of clinical competences, objective assessment of such competences is very crucial.

In the last two decades, most medical schools used conventional long and short cases as well as the traditional oral examination for clinical assessment in the clerkship years. Nowadays, huge modifications have been adopted to improve the effectiveness of these conventional methods. Over its long history that extends since 1975 Objective Structured Clinical Examination (OSCE) is still used on varying scales in different health professions education schools as a valid and reliable method of assessing clinical skills[8]. It is used in different Egyptian medical schools, especially nowadays in response to the requirements of the new Egyptian medical education curriculum[9].

OSCE is a reliable tool for performance-based assessment in a simulated and secure environment, so it is commonly used for clinical evaluation according to level 3 of Millers Pyramid of performance assessment[4]. It consists of a series of stations that examine the clinical competences of students and utilizes health problems and real-life situations that students would commonly encounter in the clinical practice after graduation[3,10]. It is objective as examiners use a standardized checklist of expected clinical skills for evaluating students. It is structured or planned, so that every student sees the same cases and is asked to perform the same tasks. Each OSCE station usually tests a different component of clinical competences, such as taking a focused medical history, conducting a focused physical examination, ordering diagnostic tests, making a diagnosis, planning a treatment, or communicating with patients.

Several health professions specialties have applied OSCE in their clinical assessment process process[1-17]. The orthopedic/trauma surgeon should have the ability to integrate and interpret information gained from various diagnostic modalities (e.g., laboratory tests and imaging studies with patient's history and musculoskeletal examination findings). According to our

search, there is a lack of literature on the evaluation of OSCE in the field of surgery and orthopedics from the students' point of view[18-19]. As OSCE exam process is exhausting for the medical students, examiners, examined personals (real or simulated patients) and organizers[19-23] it is hypothesized that positive or negative perceptions on the implementation of OSCE may distress students and consequently affect their performance. So, the students' perception is crucial for improving orthopedic OSCE exam quality[24,25].

Egyptian medical schools design their own student assessment system using different methods of formative and summative assessments and upholding other quality standards in assessment formats as recommended by the Egyptian National Authority for Quality Assurance and Accreditation in Education (NAQAAE)[9]. OSCE is now practiced in all medical schools in Egypt in response to the new regulations and bylaws added of the undergraduate medical education curriculum (5+2) recently developed and implemented[1]. In 2013 at the Faculty of Medicine, Suez Canal University (FOM-SCU), a need to start using the OSCE in assessing clinical performance arose because of its validity, reliability, and fairness[26]. Also, the Faculty administration decided to use OSCE as the main clinical skills assessment tool, in addition to portfolio assessment, for all clinical rotations at the fifth school year in the academic year 2014-2015.

This study aimed to measure the overall perception of the fifth-year medical students on the attributes, quality, validity, reliability and organization of the end-of-rotation OSCE in Orthopedic Surgery and Trauma held at FOM-SCU in two academic years 2017-2018 and 2018-2019 and to assess the students' points of view regarding different assessment methods used in Orthopedic Surgery and Trauma. Our secondary aim was to improve the quality of the OSCE to be more capable of assessing the undergraduate medical students in the field of Orthopedic Surgery and Trauma in a reproducible manner that could potentially be replicated by other programs. The results may have a positive influence on teaching with an emphasis on practical skills in the clinical specialties.

2. Materials and Methods

2.1 Context

This is a cross-sectional observational study that was conducted during two academic years 2017-2018 and 2018-2019 at the FOM-SCU. Participants were fifth-year medical students in the Orthopedic Surgery and Trauma rotation. The Orthopedic Surgery and Trauma rotation is a mandatory rotation that runs over 6 weeks in the fifth year at the FOM-SCU. The course aims to provide the students with the essential updated

knowledge, clinical skills and attitudes required from a basic doctor to manage common disorders of orthopedics and trauma. During weeks 1-5 of the rotation, the students attend a number of interactive, intensive teaching sessions and sign up for a variety of orthopedic and trauma outpatient clinics, inpatient ward rounds, emergency room shifts and attendance in the operating theatre.

2.2 Study Design

This is a mixed-method study that employed an exploratory two-phase design (quantitative data were collected first through a validated questionnaire, followed by collection of qualitative data through focus group discussions to explore in depth, explain and build upon initially collected data).

2.3 Sampling

The study used a non-probability convenient sample of the fifth-year medical students who underwent the OSCE at the end of their Orthopedic Surgery and Trauma rotation during the academic years 2017-2018 and 2018-2019 (n = 254). A purposive sub-sample of 20 students (out of the 254 students) was selected to be included in each focus group discussions.

2.4 Data Collection Tool

A validated, self-administered questionnaire was used to collect quantitative data[12,27]. The questionnaire consisted of 32-items that were checked for vagueness and clarity by the research team and this was revealed clarity and no confusion in the questions. The students were invited to evaluate the Orthopedic Surgery and Trauma end rotation OSCE by this questionnaire. Participation was on a voluntary basis. Students evaluated different attributes of OSCE, such as the content, construction and organization. Students also rated the quality of performance and objectivity of the OSCE procedure and provided their judgment about the efficacy of OSCE as an evaluative tool for clinical skills. Then they compared OSCE with other assessment methods which they had like portfolio and other theory exams like Modified Essay Questions (MEQs), Short Answer Questions (SAQs), and Multiple-Choice Questions (MCQs).

Qualitative data were collected through 2 focus group discussions (10 students each) to get the students' in-depth feedback about the exam. A semi-structured discussion guide was used to encourage the discussions.

2.5 Organization of the Orthopedic Surgery and Trauma OSCE

Two orientation sessions have been conducted for the students to raise their awareness of the OSCE conduction. In addition, several review sessions of the commonly assessed

competences have also been conducted before the exam. The OSCE consisted of a circuit of twenty stations (7 dynamics and 13 static), in addition to 3 rest stations. Exam stations involved performance of certain focus and specific tasks, such as examination of a specific region of the musculoskeletal system, eliciting a focused history, obtaining an informed consent, performing a procedure, providing a treatment plan for a patient, interpreting radiographs and laboratory data and video and photographic materials (Figure 1). Each student starts from one stations and goes on until he/she finishes the circuit.

Patient scenarios, instructions for both student and examiner, a pre-prepared checklist and a list of pre-requisites for each station (such as radiographs, pathology slides, goniometer, measuring tape, hummer or mannequins) were prepared by Orthopedic Surgery and Trauma Department staff then organized by the OSCE team and station constructors. The OSCE exam developed based on the approved student assessment blueprint by the departmental student assessment committee and the institutional OSCE committee to guarantee a representative sampling of stations in different rotations.

All people involved in the exam arrived at the OSCE venue one hour in advance. Station's structure was checked and examiners were oriented in 10 minutes. Indicators for the direction of movement, station numbers, and timekeeping by using bell were prepared.

The OSCE was held in special Hall and finalized in six consecutive days as our students were subdivided into sex group; one group per day underwent the exam.
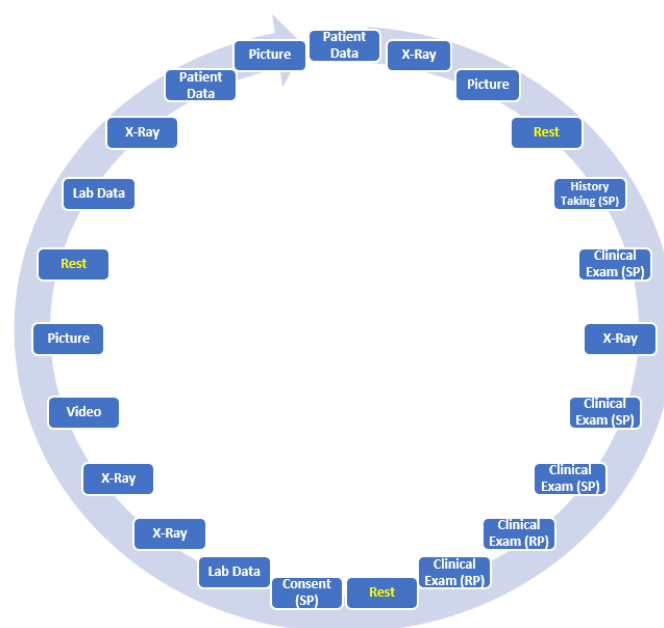

Figure 1.　OSCE Circuit. SP: Simulated Patient, RP: Real Patient.

Each station lasted for 6 minutes, except the 12-minute history-taking station. In order to enable students to shift from a station to the next station and also reading the instructions, a one-minute interval was given between stations. With the insertion of intentionally located 3 rest stations, to reduce student fatigue, all students ended the circuit over a 2.5 hours' period.

A standardized technique of marking was utilized and criterion-referenced interpretation was utilized to interpret student's performance in each station. The checklists items scored as 0 (Not performed or non-applicable), 1 (performed in wrong way), 2 (performed with little mistakes) or 3 (performed competently).

Content validity of each OSCE station and the used checklist was proven by review and consensus by a core group of senior orthopedic and trauma surgeons and then consultation from medical education staff in the institutional OSCE committee. Stations were designated to represent the clinical Intended Learning Outcomes (ILOs) of Orthopedic Surgery and Trauma rotation and to achieve simulation in true clinical situations. Both real and simulated patients' modalities were applied.

2.6 Statistical Analysis

Data were collected and statistically analyzed using SPSS version 23 for Windows. Data were normally distributed. Variables were described using frequencies and percentages. Pearson correlation between students' performance on the OSCE and MCQs was calculated. A p-value of less than 0.05 was considered statistically significant. The responses from open-ended questions were gathered and presented thematically.

2.7 Ethical Considerations

Ethical clearance for the study was obtained from the FOM-SCU Research and Ethics Committee. Participants' informed consent was obtained before implementing the study. They were informed about study aims, were kept updated about any changes in the research and were given the full right to refuse participating. Ethical conduct was maintained during data collection and throughout the research process. The confidentiality of the participants was maintained as the questionnaire was provided anonymously.

3. Results

All students targeted by this study have responded to the questionnaire (n = 254).

3.1 Evaluation of the OSCE Attributes (Table 1)

More than half of the students (55.5%) believed that the exam was fair. About 63.8% and 72.4% of the students agreed that the OSCE covered a wide range of clinical knowledge and skills in Orthopedic Surgery and Trauma, respectively. About 64.6% and 72% of students reported that the exam was well administered and well-structured, respectively. Half of the students (50%) were aware of the level of information required at each station and expressed that the OSCE minimized the chance of failure (47.2%). Comparably, 39% of the students agreed that the OSCE enabled them to identify the main areas of weakness in their competencies. The OSCE was intimidating for about (36.6%), but less stressful than other assessment formats to which they were previously exposed (44.9%). Only 26.8% needed more time at stations.

Table 1. Evaluation of the OSCE Attributes (n = 254)

Item	Agree	Neutral	Disagree	No response
Exam was fair	141 (55.5%)	68 (26.8%)	43 (16.9%)	2 (0.8%)
Wide knowledge area covered	162 (63.8%)	83 (32.7%)	5 (2%)	4 (1.6%)
Needed more time at stations	68 (26.8%)	97 (38.2%)	87 (34.3%)	2 (0.8%)
Exam well administered	164 (64.6%)	81 (31.9%)	7 (2.8%)	2 (0.8%)
Exam very stressful	60 (23.6%)	134 (52.8%)	56 (22%)	4 (1.6%)
Exam well-structured and sequenced	183 (72%)	67 (26.4%)	2 (0.8%)	2 (0.8%)
Exam minimized chance of failing	120 (47.2%)	109 (42.9%)	23 (9.1%)	2 (0.8%)
OSCE less stressful than other exams	114 (44.9%)	90 (35.4%)	48 (18.9%)	2 (0.8%)
Allowed student to compensate in some areas	115 (45.3%)	118 (46.5%)	19 (7.5%)	2 (0.8%)
Highlighted areas of weakness	99 (39%)	119 (46.9%)	32 (12.6%)	4 (1.6%)
Exam intimidating	93 (36.6%)	134 (52.8%)	21 (8.3%)	6 (2.4%)
Student aware of level of information needed	127 (50%)	91 (35.8%)	34 (13.4)	2 (0.8)
Wide range of clinical skills covered	184 (72.4%)	59 (23.2%)	9 (3.5)	2 (0.8)

3.2 Quality of OSCE Performance (Table 2)

Nearly half of the students (46.9%) expressed well orientation of the nature of the exam and 41.3% of them reported that the tasks reflected the content that they were taught. Also, more than half of them (51.6%) felt that the assessment tasks were fair, while only 36.6% were satisfied with the time at each station. Only one third (31.5%) felt that the context and setting indicated real-life situations in Orthopedic Surgery and Trauma and that the OSCE provided good learning opportunities (35.8%). Slightly less than half of the students were satisfied with the construction (44.5%) and sequence (42.5%) of the OSCE stations.

3.3 Student Perception of Validity and Reliability Questions (Table 3)

A great percentage of the students were doubtful regarding the standardization of OSCE scores (62.6%) and whether those scores provided a true measurement of their clinical skills in Orthopedics (65%). Similarly, more than half of the students were not sure whether gender, personality, or ethnicity affected their exam scores (55.5%) and whether OSCE provides them practical and useful experience (53.5%).

3.4 Student Rating of All Assessment Formats they Experienced (Figures 2-6)

A Likert scale was adopted to evaluate the students' rating of all assessment methods they exposed to. Portfolio and OSCE were declared as the easiest to take among 63.8% and 55.5% of students, respectively, while 31.1% rated MCQs as the most difficult form of assessment (Figure 2). When comparing students' performance on OSCE (easiest form) and MCQs (most difficult form), a positive significant difference was observed ($r = 0.155$, $p = 0.01$) (Figure 3). OSCE was considered the fairest assessment format by 67.3% of students, while 30.7% of students considered portfolio as unfair (Figure 4). OSCE was considered the most useful opportunity for clinical experience and learning among 63.4% of students (Figure 5). Most students recommended giving more weight in assessment for OSCE (77.2%) followed by MCQs (64.2%) in the clinical years of the medicine program (Figure 6). Moreover, no significant difference in students' performance was detected in relation to their responses to the easiness, fairness, level of learning, and degree of use of the OSCE ($p > 0.05$).

3.5 Qualitative Data (Table 4)

Discussions in the focus groups pivoted mainly around the challenges of the newly implemented OSCE and the problems students faced during the exam. Two themes have been identified, namely: "Challenges of implementing OSCE" and "Ways to overcome identified challenges". Table 4 shows the identified themes, subthemes, and important quotes by some students.

Table 2. Quality of OSCE Performance (n = 254)

| Item	Not at all	Neutral	To a great extent
Fully aware of nature of exam	16 (6.2%)	119 (46.9%)	119 (46.9%)
Tasks reflected those taught	17 (6.7%)	132 (52%)	105 (41.3%)
Time at each station was adequate	26 (10.2%)	135 (53.2%)	93 (36.6%)
Setting and context at each station felt authentic	6 (2.4%)	168 (66.1%)	80 (31.5%)
Instructions were clear and unambiguous	16 (6.3%)	25 (49.2%)	113 (44.5%)
Tasks asked to perform were fair	22 (8.7%)	101 (39.8%)	131 (51.6%)
Sequence of stations logical and appropriate	14 (5.5%)	132 (52%)	108 (42.5%)
Exam provided opportunities to learn	40 (15.7%)	123 (48.4%)	91 (35.8%)

Table 3. Students' Perception of Validity and Reliability Questions (n = 254)

Item	Not at all	Neutral	To a great extent
OSCE exam scores provide true measure of essential clinical skills in Orthopedics	10 (3.9%)	165 (65%)	79 (31.1%)
OSCE scores are standardized	28 (11%)	159 (62.6%)	67 (26.4%)
OSCE provides me practical and useful experience	15 (5.9%)	136 (53.5%)	103 (40.6%)
Personality, ethnicity, and gender will not affect OSCE scores	32 (12.6%)	141 (55.5%)	81 (31.9%)
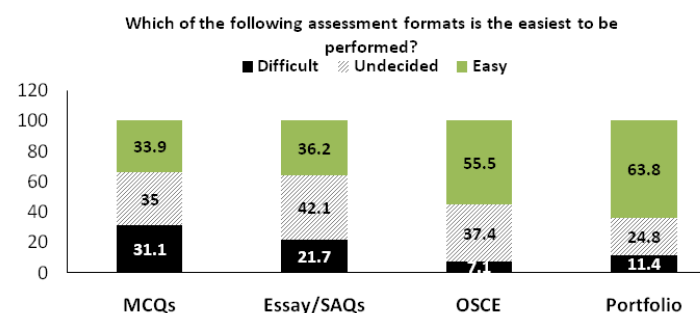
MCQs: Multiple Choice Questions, SAQs: Short Answer Questions, OSCE: Objective Structured Clinical Exam

Figure 2. Student rating of assessment formats according to easiness (n = 254).
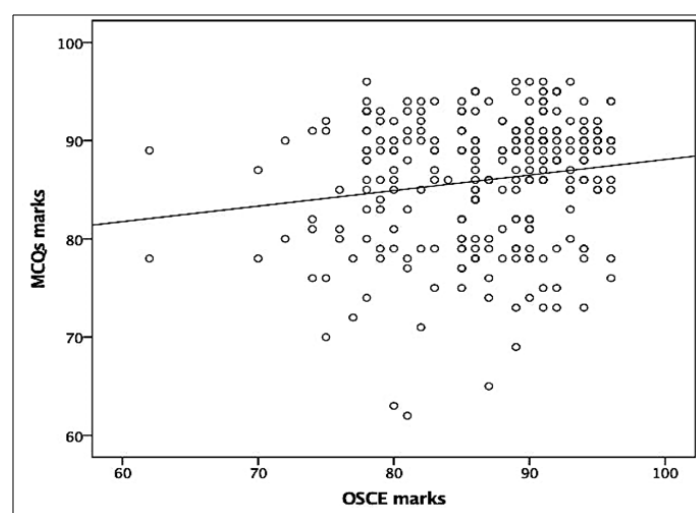
MCQs: Multiple Choice Questions, OSCE: Objective Structured Clinical Exam

Figure 3. Correlation of students' Performance on OSCE vs MCQs (r = 0.155, p = 0.01) (n = 254).
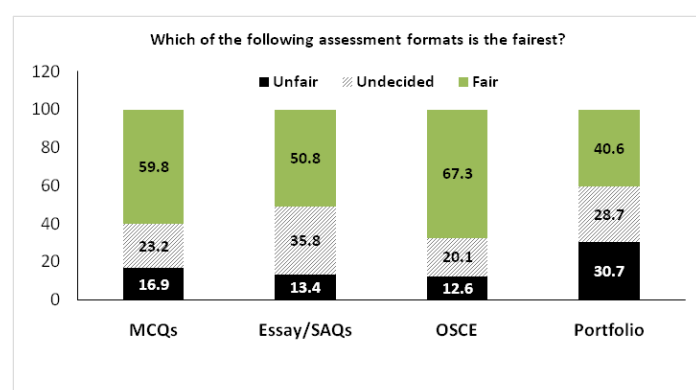

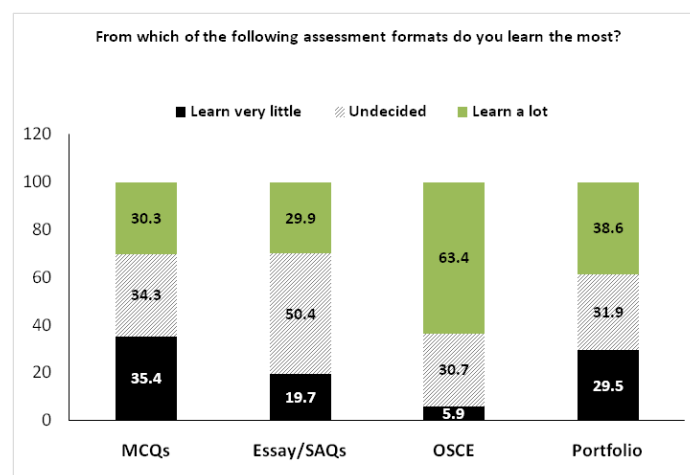**Figure 4.** Student rating of assessment formats according to fairness (n = 254).

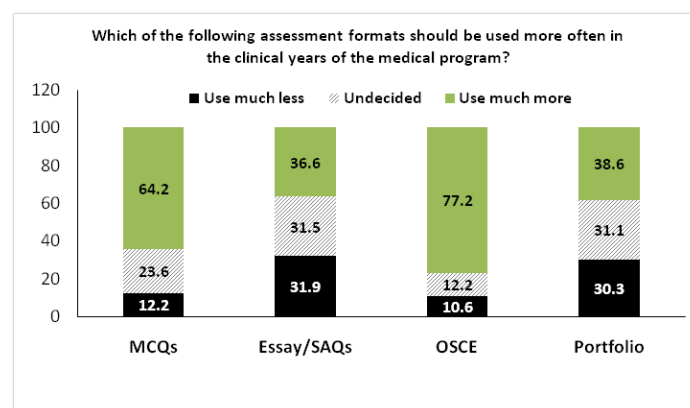**Figure 5.** Student rating of assessment formats according to the level of learning (n = 254).

Figure 6. Student rating of assessment formats according to the degree of use (n = 254).

4. Discussion

In our study, a comprehensive student response rate was achieved. The end of rotation Orthopedics' OSCE included 20 stations (7 dynamics and 13 static) and the timing of each station was 6 minutes, which exceeded the recommended in the literature to achieve a reliable and valid OSCE assessment in undergraduate medical education[28].

The fifth-year medical students' perception of Orthopedics OSCE was generally positive with the attributes, quality of performance, validity/reliability criteria and organization/settings. This is congruent with and supported by other research findings in different educational settings[12-18, 29,30,31].

Table 4. Thematic analysis of students' responses duringtwo focus group discussions (n = 20)

Themes	Subthemes	Quotes by Students
Challenges of implementing OSCE	• Time insufficiency • Vague instructions • Unclear or repeated tasks • Inadequately trained simulated patients	• *"The time allocated for the static stations was insufficient"* • *"In some stations, tasks were confusing and instructions were unclear"* • *"Some stations included inadequately trained simulated patients"* • *"I was unsatisfied with the repetition of some tasks on different exam days"*
Ways to overcome identified challenges	-	• *"The school should provide us with well-structured application that aids assesmnet process specially in OSCE"* • *"We suggested increasing the duration of stations, especially the static station, and giving more clarification on students' instructions"* • *"I think that the school must obtain feedback from the students and use that feedback for reform of subsequent implementation of exams"*

Our research results emphasized that OSCE is a suitable tool for measuring students' clinical skills performance in Orthopedic Surgery and Trauma. More than half of the students agreed that OSCE is a fair assessment tool that covered a wide range of clinical knowledge, skills and attitudes. Also, it provided them with the chance to build upon in some weak areas and minimizes their possibility of failing in clinical exams. The fairness of OSCE relies mainly on its ability to cover various clinical skills according to the course blueprint so that it will achieve the content validity as documented in different studies[12, 13, 14, 29, 30, 31].

Most of the students reported that the OSCE exam was well-administered and well-structured and they were aware of the level of information required at each station and the difficulty levels of tasks were acceptable. More than half of the students ensured the ability of the OSCE to help them recognize the main weaknesses in their clinical competencies. Also, some students expressed concerns as intimidating events and insufficient time to complete some stations especially the static stations. Similar responses have been previously reported by the students in different medical schools worldwide[29, 30, 31, 32].

The OSCE was intimidating and stressful for about one third of our students. These findings are consistent with the results of two studies conducted in clinical years of different medical schools[13,14,30]. On the other hand, some authors argued that most of the medical students agreed that the OSCE induced higher stress levels compared to other examination formats[20, 21, 22, 23, 26, 33].

Although our students were familiar with the OSCE process and were exposed to good training and practice of OSCEs, it is surprising that only about one third of the students felt that the OSCE context and setting indicated real-life situations in Orthopedic Surgery and Trauma and agreed that the OSCE provided them with good learning opportunities. Similarly, various studies emphasized that the OSCE offers a useful alternative tool for clinical learning and experience in different health professions[26,30,33]. This was explained by Khan, 2017 who questioned the validity of OSCE in clinical examinations as the characteristics of OSCEs which make them so objective, consistent, and reliable progressively enhance medical students to prepare strategically to pass the OSCE. They frequently implement a robotic 'tick box' approach, rather than use OSCEs as a method to learn clinical skills for safe competent real-life practice[34]. Khan, 2017 recommended to scale back the role of OSCEs and replace them with workplace-based[34] assessment. These concerns are also emphasized by Majumder, et al., 2019 who reported the examiners perception of OSCEs as not truly reflect competence in clinical skills[33].

The OSCE was considered the fairest assessment format by about 67.3% of students, followed by MCQs, essay/SAQs, then portfolio. This matches the results provided by Abouzeid E. and Abdel Nasser A. who reported a negative perceptions of clinical clerkship students on portfolio at FOM-SCU due to the major problem of copying portfolio contents among peers resulting in some students gaining marks that are not their right to gain[35]. In contrast, MCQs were considered the fairest exam form by Majumder et al. 2019[33]

Although OSCE was considered the most difficult form of assessment by Majumder, et al. 2019[6] (Azim Majumder A, et al., 2019[6]), the majority of our students seemed to favor portfolios followed by OSCE regarding the level of easiness, as both are comparably simple to perform. From the students' point of view, both contain clear and unambiguous instructions with specific tasks. The students agreed that the current portfolio was a well-organized one. This matches what was reported by Abouzeid, E. and Abdel-Nasser, A. on the presence of a well-organized portfolio with clear purpose and requirements which helped both the students and staff to overcome the workload[35]. Contrarily, the MCQs were rated as the most difficult form of assessment. This was attributed by our students to the nature

and structure of questions themselves, like flawed MCQs and MCQs that have tricky information.

In an integrative review of nine studies (Walsh M, et al., 2009[36]), OSCE scores were correlated with MCQs, SAQs, rotation evaluations and certifying examinations. The authors found, in accordance with our findings, a moderate to high correlation with certifying examinations and MCQs when the OSCE assessed areas like cognitive skills[36].

Although there are great efforts done by the OSCE team to develop high-quality OSCE stations according to the blueprint, deriving those clinical skills from tasks on OSCE marking schemes may not produce sufficiently specific areas for students to improve upon. The marking scheme for the OSCE must be decisive, structured, objectively designed, concise, focused and clearly targeting at evaluating the students' performance which distinguishes good performance from poor one[37]. Twenty-nine students reported common three technical problems in some stations, which were unclear instructions and confusing tasks, delay of some students at stations due to asking oral questions inside the stations by some examiners and occasional involvement of inadequately trained simulated patients. Likewise, some students reported that sometimes the examiners' comments were not adequately specific, or perhaps too judgmental (about the student instead of the task). Examiners were trained to provide students specific, immediate feedback about their performance strengths and the needed areas in which they could improve in the future. All these points were mentioned in previous studies about the importance of the examiner prompt feedback upon the students' observed performance not using judgmental non-specific feedback[30-32].

In our study were selected based on the attributes of being smart, flexible and able to respond promptly and appropriately to examinees' questions. Then they were well-trained and made familiar with the nature of the OSCE exam and the role given to them, which is critical to the success of the overall process. Fouad, et al., 2019[16] reported that all issues related to simulated patients can be achieved through a well-structured hands-on training on their role in different OSCE stations[26].

5. Strengths of the Study

This study is the first reported research work to evaluate the Orthopedics and Trauma OSCE at Faculty of Medicine-Suze Canal University (FOM-SCU) from the students' perspective. Also, there is a high response rate from the fifth-year medical students which reflects a valid representation of students' perception of the OSCE.

6. Limitations

The limitations of this study include its small and convenient nature of the sample that might hinder the generalization of results all over Egyptian medical schools. However, the data collection tool is a validated one which was used in previous studies. Another limitation that might have a negative influence on the generalizability is the enrollment of Suez Canal University students only. This issue could be avoided with further testing of a larger population including the other Egyptian universities.

7. Conclusions

This is the first documented research work regarding the evaluation of the Orthopedics and Trauma OSCE in Egypt. The Fifth-year medical students' concern and challenges regarding the Orthopedics and Trauma OSCE can be overcome by more well-structured practical training and orientation sessions for the faculty, students, and simulated patients. One of the important advantages of OSCE is that it eliminates subjectivity during examining medical students' clinical performance and allows all students to pass through the same tasks during their clinical assessment, which achieves more fair and valid evaluation.

8. Compliance with Ethical Standards

8.1 Conflict of Interest

The authors declare that they have no conflict of interest.

8.2 Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

8.3 Ethical Approval

The study was reviewed and approved by the local Institutional Review Board before commencement of the study.

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