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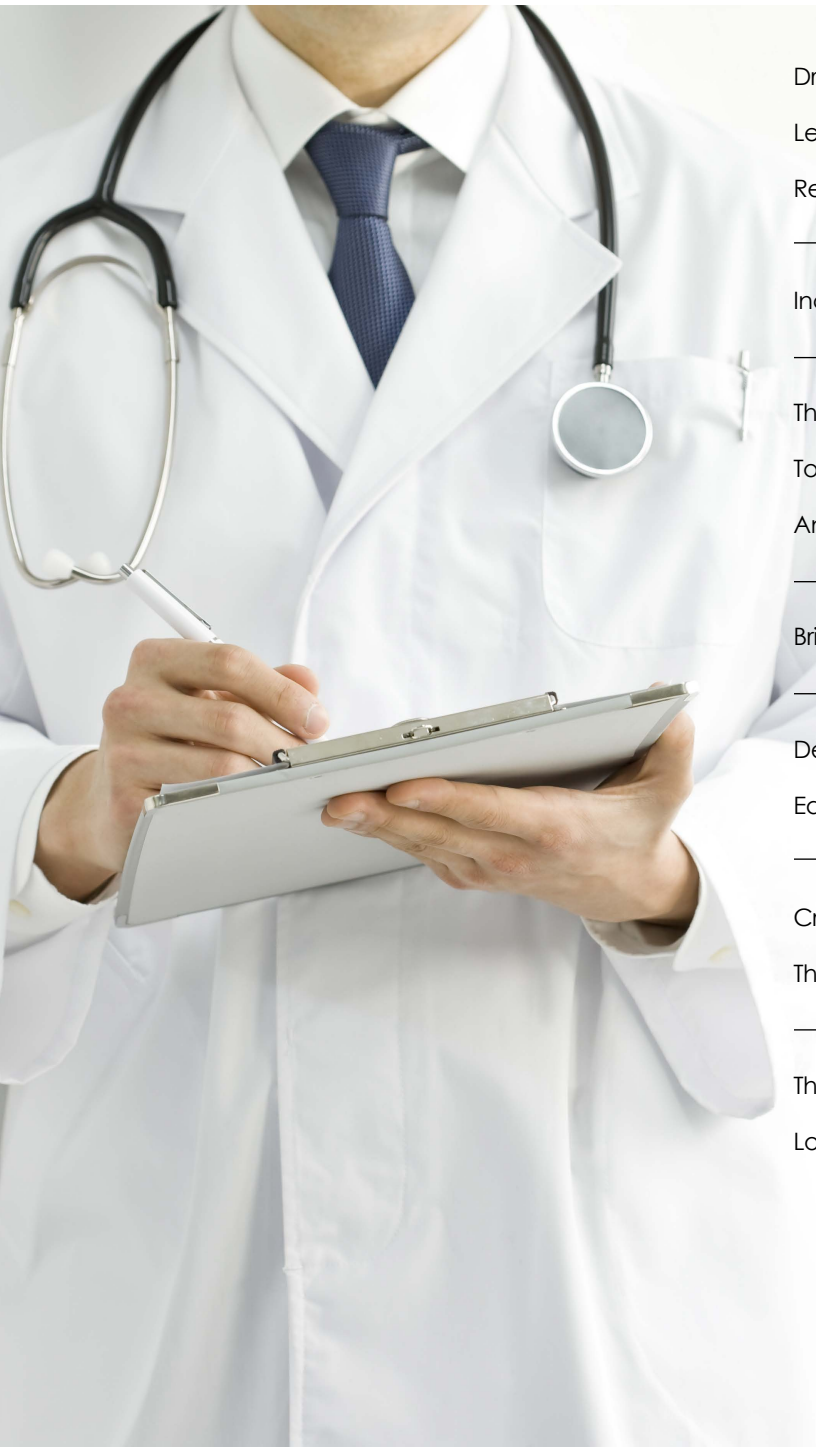

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The Objective Structured Long Examination Record (OSLER) as a Tool for Formative Assessment of Clinical Competency: Analysis of Students' Perceptions and Performance

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Abstract:
This study aims to explore students' perceptions and performance on the use of the Objective Structured Long Examination Record (OSLER) as a formative assessment tool for evaluating clinical competencies. This study was conducted among final year medical students at Newgiza University, Egypt following the completion of Senior Clerkship Module. Students' perceptions on OSLER exam quality, assessment and organisation were collected via self-administered questionnaire. OSLER performance was assessed using a 10-item analytical checklist. A total of 110 students answered the survey. This study demonstrated students' positive attitudes towards the overall quality and organisation of the OSLER exam. Students agreed that OSLER was practical and useful (66.3%), helped in identifying their strengths and weaknesses (69.1%), covered a wide range of knowledge (59.1%), assessed a wide range of clinical skills (57.3%), and assisted in recognising teaching deficiencies (59.1%). 58.1% of students reported that the exam was stressful, while 48.2% indicated it was time-consuming. All components exhibited average OSLER scores, with mean clinical competence scores of 6.45 ± 2.56 out of 10. The implementation of OSLER in formative assessment provides opportunity for students to strengthen their clinical competencies and allows educators to identify teaching deficiencies, thereby improving learning outcomes.

Key Words:
OSLER, Clinical Competency, Students' Perceptions, Senior Clerkship, Clinical Assessment

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Introduction

Clinical clerkships facilitate undergraduates' transition from classroom-based learning to hands-on clinical practice. They involve rotations through various medical specialities, allowing students to encounter diverse clinical scenarios and patient demographics. Assessment of clinical competence ensures that medical students have the knowledge and skills needed to provide safe and effective medical care.

Formative assessment is becoming a significant assessment tool in medical education in recent years, enhancing learning through assessment during the clinical training period.[1] The goal is to identify students' strengths and weaknesses, and facilitate progress through the provision of feedback that highlights the shortfall between the students' current skill and given standards.[2] In addition to enhancing clinical competence, formative assessment serves as a valuable tool to ensure that students achieve acceptable competence levels, thereby meeting minimum safety standards and identifying incompetent doctors.[3]

Various assessment methods have been used to assess the clinical competency of medical students, such as long cases, viva voce, short cases and objective structured clinical examination (OSCE). In Egypt, and specifically at Newgiza University (NGU), the traditional long case and OSCE are the primary methods for assessing students' basic clinical competencies. However, the concerns regarding their reliability have raised questions about their acceptability as fair assessment tools. Although the OSCE is highly effective in assessing particular components of clinical competence, it does not typically facilitate the evaluation of the student's overall patient care.[4] Meanwhile, long-case examination uses a single clinical case to generalise the candidate's competence across a wide range of clinical scenarios and lack individual assessor observation as the student elicits history and examines the patient.[5-8]

The Objective Structured Long Examination Record (OSLER) is a more systematic and objective evaluation method that utilises a 10-item analytical framework to enhance the objectivity, validity, and reliability of clinical assessments.[9] The OSLER's

primary advantage is its ability to assess the candidate's holistic approach to the patient and the authenticity of the doctor-patient interaction comparable to the real-life practice of medicine. The 10-item mark sheet is a structured, non-intrusive guide that permits examiners to focus on the candidate's performance. The OSLER also ensures that all examiners evaluate the same competency characteristics, thereby promoting greater standardisation and ensuring consistency. The standardised structured clinical case evaluation system effectively identifies weaknesses and encompasses a wide range of clinical skills assessment, resulting in higher mean scores for students and an overall positive perception among students and examiners.[10]

Despite the great potential of formative assessment in medical education, studies have shown that its implementation often unsuccessful and challenging since it takes place in the context of complex clinical practice.[11] The lack of assessment and feedback has been emphasised as one of the most serious deficiencies in current medical practice.[12] Moreover, studies related to OSLER exam experiences, particularly in the Middle East are understudied. Therefore, this study attempted to integrate the OSLER into the formative assessment of final year medical students to provide them with exposure to a more systematic and holistic approach to clinical examination. The evaluation of medical students via empirical observation, such as OSLER, is a new approach. Therefore, it is imperative to investigate the perspectives of students in order to gain a deeper understanding of their viewpoints. Hence, this study aims to explore students' perceptions and performance on the use of the Objective Structured Long Examination Record (OSLER) as a formative assessment tool for evaluating clinical competencies.

Methods

Study Design and Sample Characteristics

A survey was conducted among 182 final-year medical students in the School of Medicine, Newgiza University, Egypt following the completion of 21 weeks of Senior Clerkship Module. The study was conducted for three months, July - September 2023. The OSLER exam in this study was part of the formative assessment; therefore, participation was voluntary.

Study Instruments

A self-administered questionnaire was developed based on specific items previously identified from the literature.[4,13] The 8-item questionnaire assessed students' perceptions on the quality, contents, organisation and assessment of the OSLER exam, as well as feedback on their clinical performance. Responses were rated using 5-point Likert scale; strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Informed consent was obtained from all participants. All components of the research tool were reviewed by two academics, and the Cronbach's Alpha coefficient showed internal consistency of 0.836, indicating good reliability.

Data Collection Methods

The questionnaire was manually distributed to the students following the completion of the OSLER examination. The OSLER exam involved one station that comprised of four sections; (i) Section 1 (15 minutes) - History taking and physical examination, (ii) Section 2 (5 minutes) - Time organization, presentation of patient history and physical examination findings, (iii) Section 3 (10 minutes) - Discussion with the examiner(s), and (iv) Section 4 (5 minutes) - Feedback from the examiner. Each student spent 30 minutes in the station and 5 minutes feedback, resulting in a total time of 35 minutes. The student was presented with a case scenario of either surgery or medicine and was given a fixed time period to perform a limited history and examination on a real patient before presenting their findings to the examiner. One examiner was assigned for each student. All examiners were briefed on OSLER assessment before the exam. Students were assessed using a standard 10-item analytical record, with a total cumulative mark of 100.

Statistical Analysis

Data analysis was carried out using IBM Statistics SPSS Version 26. Descriptive analysis was conducted, and data were presented in frequency (N), percentage (%) and mean ± SD. The Mann-Whitney U test was performed to assess the differences between two independent samples.

Results

Demographic Profile

A total of 110/182 final year medical students completed the survey; 43 (39.1%) were males, and 67 (60.9%) were females. Most students were 18 - 24 years old, 105 (95.5%), while five students were 25 or older (4.5%). The majority of the students were Egyptian, 108 (98.2%) (Table 1).

Variables	Frequency, N	Percentage, %
Age:		
18-24	105	95.5
25-30	3	2.7
>30	2	1.8
Gender:		
Male	43	39.1
Female	67	60.9
Nationality:		
Egyptian	108	98.2
Others	2	1.8
Total	110	100.0

Table 1: *Demographic Profile (N = 110).*

Students' Experiences with OSLER

The students reported a favourable experience with the OSLER examination. In particular, 73 (66.3%) students agreed and strongly agreed that the exam was practical and useful, while 66 (60%) students indicated that it motivated them to learn more about the topics covered. A total of 76 students (47.3% agreed and 21.8% strongly agreed) reported that OSLER exam helped them to identify their strengths and weaknesses. Additionally, 65 students (39.1% agreed and 20% strongly agreed) felt that OSLER exam was a lot like a real-life clinical encounter. When students were asked about the stress associated with OSLER exam, 27 (24.5%) agreed, and 37 (33.6%) strongly agreed that the exam was stressful/exhausting, while 22 (20%) agreed and 31 (28.2%) strongly agreed that exam was time consuming. Majority of students believed that additional pre-exam preparation is necessary, 92 (20.9% agreed and 62.7% strongly agreed), and more faculty training is needed to effectively conduct OSLER, 86 students (23.6% agreed and 54.5% strongly agreed). Male and female students did not exhibit any significant differences in their experiences with the OSLER exam, as indicated by the Mann-Whitney test ($p>0.05$) (Table 2).

Quality, Contents, Assessment and Organisation of OSLER Exam

Most students agreed and strongly agreed that OSLER covered a wide range of knowledge, 65 (59.1%), and assessed a wide range of clinical skills, 63 (57.3%). In terms of the exam organisation, a large majority of students agreed and strongly agreed that the exam was well structured, 63 (57.2%), the time provided was adequate, 60 (54.6%), instructions and questions were clear and unambiguous, 57 (51.8%), and the sequence of station components was logical and appropriate, 73 (66.3%). Regarding the quality of OSLER assessment, half of the students, 48 (43.6%) disagreed and strongly disagreed that the OSLER assessment criteria were standardised, while another half, 51 (46.4%) agreed and strongly agreed that the assessment criteria provide an accurate measure of fundamental clinical skills. A high number of students, 65 (59.1%) expressed agreement that OSLER is beneficial for teachers in identifying teaching deficiencies. There were no significant differences in students' perceptions of the quality, content, and organisation of the OSLER Exam between genders (Table 3).

Items	Strongly Disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly Agree N (%)	P-value
OSLER helped me to identify my strengths and weaknesses.	8 (7.3)	5 (4.5)	21 (19.1)	52 (47.3)	24 (21.8)	0.827
OSLER was a lot like a real-life clinical encounter.	8 (7.3)	15 (13.6)	22 (20.0)	43 (39.1)	22 (20.0)	0.674
OSLER evaluated my skills fairly.	18 (16.4)	16 (14.5)	26 (23.6)	35 (31.8)	15 (13.6)	0.362
OSLER motivated me to learn more about the topics covered.	12 (10.9)	7 (6.4)	18 (16.4)	47 (42.7)	26 (23.6)	0.936
The tasks in OSLER reflect those taught.	17 (15.5)	13 (11.8)	21 (19.1)	43 (39.1)	16 (14.5)	0.876
More pre-exam preparation needed.	4 (3.6)	3 (2.7)	11 (10.0)	23 (20.9)	69 (62.7)	0.935
More faculty training is required to conduct OSLER.	4 (3.6)	8 (7.3)	12 (10.9)	26 (23.6)	60 (54.5)	0.384
OSLER exam is very stressful/exhausting.	7 (6.4)	9 (8.2)	30 (27.3)	27 (24.5)	37 (33.6)	0.977
OSLER exam is time consuming.	11 (10.0)	20 (18.2)	26 (23.6)	22 (20.0)	31 (28.2)	0.860
I was fully aware of nature of the exam.	7 (6.4)	12 (10.9)	26 (23.6)	37 (33.6)	28 (25.5)	0.980
OSLER is practical and useful experience.	11 (10.0)	3 (2.7)	30 (27.3)	46 (41.8)	20 (18.2)	0.485

Independent samples Mann-Whitney U Test showed no significant differences on students' experiences with OSLER between genders, $p>0.05$.

Table 2: Misaligned Increment in PG Pharmacology Seats (2023-2024)[10]

Items	Strongly Disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly Agree N (%)	P-value
Wide knowledge of area covered.	9 (8.2)	14 (12.7)	22 (20.0)	51 (46.4)	14 (12.7)	0.298
Exam is well structured.	11 (10.0)	10 (9.1)	26 (23.6)	48 (43.6)	15 (13.6)	0.836
Wide range of clinical skills covered.	7 (6.4)	15 (13.6)	25 (22.7)	52 (47.3)	11 (10.0)	0.678
Time provided was adequate.	15 (13.6)	14 (12.7)	21 (19.1)	40 (36.4)	20 (18.2)	0.121
Instructions/questions were clear and unambiguous.	10 (9.1)	17 (15.5)	26 (23.6)	42 (38.2)	15 (13.6)	0.980
The tasks asked to perform were fair.	16 (14.5)	16 (14.5)	23 (20.9)	45 (40.9)	10 (9.1)	0.244
Sequence of station components is logical and appropriate.	9 (8.2)	8 (7.3)	20 (18.2)	58 (52.7)	15 (13.6)	0.865
OSLER assessment criteria (rubrics) are standardized.	25 (22.7)	23 (20.9)	29 (26.4)	23 (20.9)	10 (9.1)	0.181
OSLER assessment criteria provide true measure of essential clinical skills.	13 (11.8)	12 (10.9)	34 (30.9)	41 (37.3)	10 (9.1)	0.141
Exam setting and context are fair.	14 (12.7)	22 (20.0)	28 (25.5)	37 (33.6)	9 (8.2)	0.283
OSLER exam helps teacher to identify defects in teaching.	10 (9.1)	8 (7.3)	27 (24.5)	48 (43.6)	17 (15.5)	0.572

Independent samples Mann-Whitney U Test showed no significant differences on students' perceptions between genders, $p>0.05$.

Table 3: *Students' Perceptions on the Quality, Content, and Organization of OSLER Exam (N = 110).*

Students' Perceptions on OSLER **Exam Performance**

The majority of the students perceived good performance in all seven components. In addition, approximately, 40 (36.4%) and 47 (42.7%) students indicated excellent performance in two particular components; History Taking and Communication Skills, respectively. It is also noteworthy to mention that 15 (13.6%) and 13 (11.8%) students expressed poor performance on the Physical Examination and Presentation components, respectively. Mann-Whitney U test indicated a statistically significant difference in the perceptions of performance in history taking ($p=0.026$), physical examination ($p=0.016$), Management ($p=0.003$) and Clinical acumen ($p=0.018$) between male and female students (Table 4).

OSLER Components	Poor N (%)	Fair N (%)	Good N (%)	Excellent N (%)	P-value
History Taking	2 (1.8)	18 (16.4)	50 (45.5)	40 (36.4)	0.026*
Physical Examination	15 (13.6)	40 (36.4)	44 (40.0)	11 (10.0)	0.016*
Presentation	13 (11.8)	36 (32.7)	48 (43.6)	13 (11.8)	0.997
Investigation	4 (3.6)	33 (30.0)	48 (43.6)	25 (22.7)	0.220
Management	8 (7.3)	42 (38.2)	45 (40.9)	15 (13.6)	0.003*
Clinical acumen	5 (4.5)	30 (27.3)	50 (45.5)	25 (22.7)	0.018*
Communication skills & professionalism	3 (2.7)	11 (10.0)	49 (44.5)	47 (42.7)	0.141

*Independent samples Mann-Whitney U Test showed significant differences between genders, $p<0.05$.

***Table 4**: Students' Perceptions on OSLER Exam Performance (N=110).*

Students' OSLER Scores

A total of 132/180 students participated in the OSLER exam. Out of 40 total marks, the mean score for the physical examination component was 23.92 ± 9.26, with a maximum score of 38 and a minimum score of 2. The history taking component recorded a mean score of 14.52 ± 3.91 out of 20, with the highest score being 20 and the lowest score being 3. Communication skills and systematic presentation were assessed in the history taking component. The mean score for the case management component was 11.31 ± 5.30 out of 20 marks. The investigations and clinical competence stations showed mean values of 6.87 ± 2.49 and 6.45 ± 2.56 out of 10 marks each, respectively (Table 5).

The overall performance on the OSLER assessment indicated that only 29 students (22%) achieved scores exceeding 81 marks, whereas 32 students (24.2%) did not pass, scoring below 50 marks. A total of 71 students, representing 53.8%, achieved scores ranging from 51 to 80.

Component Scores	Mean ± SD	Minimum	Maximum
History Taking (20 Marks)	14.52 ± 3.91	3	20
Physical Examination (40 Marks)	23.92 ± 9.26	2	38
Investigations (10 Marks)	6.87 ± 2.49	0	10
Management (20 Marks)	11.31 ± 5.30	0	20
Clinical Acumen/Competence (10 Marks)	6.45 ± 2.56	0	10

Footnote: History taking scores are inclusive of communication skills and systematic presentation.

***Table 5:** Students' OSLER Component Scores (N=132).*

Discussion

Assessment serves a deeper role, transitioning from merely assessing learning to facilitating learning. Formative assessment regulates learning through the provision of feedback. Nevertheless, a true feedback culture is not fostered within medical education. As such, formative evaluation should be central to student training, rather than just for accrediting purposes.[14] In this study, OSLER was conducted as part of the formative assessment to improve the reliability and objectivity of clinical competence evaluation. To the best of our knowledge, this is the first study that reported on quantitative findings pertaining to the experiences and perspectives of medical students in Egypt utilising OSLER.

The majority of students provided positive feedback and reported satisfaction with their overall experience regarding the OSLER examination. The students perceived that the OSLER exam encompassed a wide range of knowledge and assessed a diverse array of clinical skills comparable to those encountered in real-life clinical settings. This approach assists them in recognising their strengths and weaknesses. Previous studies demonstrated similar viewpoints, indicating that OSLER provided a valuable opportunity for knowledge acquisition.[4,13] OSLER is intended to evaluate students in a comprehensive way, thereby fostering active engagement in clinical skills practice and enhancing clinical performance. The method of assessment implemented in OSLER enables students to identify areas of less competence as broader topics are being covered.[15] Additionally, the application of OSLER in clinical postings provides immediate, specific feedback to students based on the checklist, thereby improving their learning experience.

Most students in this survey recognised the OSLER exam as beneficial for educators in identifying teaching deficiencies. The modified OSLER serves as a tool for assessing student progress and performance during clinical clerkships.[16] This allows for the early identification of students experiencing academic challenges, enabling suitable remedial measures. Moreover, OSLER can function as a feedback tool for educators to determine the need for greater emphasis on a topic when a substantial number of students fail to perform a task or miss any particular step.[17]

When it comes to the quality of OSLER assessment, many students expressed dissatisfaction with the assessment criteria, despite the fact that they were evaluated on a standardised check list, uniform examiners in a standardised scenario, and consistent time limit for all students. We postulated that this perspective stemmed from their unfamiliarity with the OSLER exam format, in contrast to their greater experience with the OSCE. OSLER represents a rigorous assessment method wherein examiners uniformly evaluate candidates based on identical competence criteria utilising a 10-item analytical record. The validity is enhanced due to the presentation of a real-time patient problem necessitating a comprehensive response.[18] Furthermore, the examiners formalised the case's difficulty to achieve standardisation, thereby promoting a high level of standardisation that was lacking in the long case.[9,19]

In the present study, more than half of the students responded that the OSLER exam was both stressful and time-consuming. A comparable finding was reported among postgraduate students in Anaesthesiology, with 50% indicated that the OSLER exam was stressful.[18] The high prevalence of stress among medical students is rather concerning as it may influence their behaviour and affect their learning capabilities and patient care. This study suggests that insufficient practice and poor time management skills contribute to the high stress levels among students. Once students become familiar to the OSLER exam format, their stress level will reduce.

Most students asserted that faculty training is essential for efficient handling of the OSLER exam. Despite existing studies suggest that examiner training minimally affects reliability,[20] student-examiner debriefing sessions are crucial for the effective conduct of the process. Previously, it was shown that examiners' judgements were influenced by clinical practice and sociocultural factors.[21-22] Therefore, examiners were trained using standardised examinees.[23-24] A number of modifications have been suggested to enhance the reliability of the examiner's assessment which include providing examiners with lists of competencies, assessing more aspects of competence, and utilising examiner-observed student-patient interactions.[25]

This study revealed that students achieved average scores across all OSLER components including clinical acumen. The OSLER exam was conducted as part of the formative exam, which likely contributed to the students' lack of preparation. Formative assessment does not include marks/grades or contribute to summative assessment; rather, it provides feedback to enhance learner performance and identify areas of weakness. Furthermore, students lacked familiarity with the nature of OSLER exam, as this was their first encounter with it. It was observed that the OSLER scores improved significantly in the second encounter of OSLER compared to the first.[26] The vast majority of the

students in this study perceived their performance in history taking and communication skills components as exceptional. OSLER has an advantage of assessing communication skills which was not typically done in formative assessments. In contrast, OSCE does not provide sufficient time and attention to assess interpersonal skills including communication.[27] The students also perceived poor performance in the physical examination and presentation components. Incorporating OSLER into formative assessment provided students the opportunity to practise, thereby familiarising them with the method, enhancing their proficiency in weaker areas, and ultimately improving their clinical performance by the end of the course.

Study Limitations

This study was conducted within a single private institution and involved one cohort of medical students. This study requires replication on a larger scale, involving both private and public institutions to validate the findings. Given the large number of students and limited resources as the exam was conducted in a busy hospital, this study utilised one station and one examiner per student. Future examinations should increase the number of cases and employ two examiners to reduce marking bias and improve OSLER reliability and validity. Despite the challenges, this study may serve as the base for more consideration on the function of OSLER as part of the formative and summative clinical assessments.

Conclusion

This study demonstrated students' positive attitudes towards the OSLER examination, despite it being their first experience with the assessment. OSLER was perceived as an effective instrument for formative assessment that provides substantial learning opportunities for medical students. It is beneficial for monitoring students' progress and performance during clinical clerkship, as well as for reflecting on their strengths and weaknesses. Frequent clerkship evaluations are essential to maintain the standard quality of clinical performance and providing feedback can potentially enhance its formative value, as well as contribute in structuring the educational setting.

Ethical Approval

This study protocol was reviewed and approved by the Research Ethics Committee, New Giza University, Egypt (N-12-2023).

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