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RESEARCH ARTICLE

OSCE RELATED ANXIETY IN ASSOCIATION WITH PERCEIVED VS ACTUAL PERFORMANCE

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Abstract

Objectives: The study investigates the impact of anxiety on medical students' performance in Objective Structured Clinical Examinations (OSCEs), focusing on the relationship between self-perceived and actual performance.

Methods: Conducted among 5th-year medical students at Taif University, the study used an online questionnaire with the PHQ-4 scale to measure anxiety and depression. The aim was to correlate these levels with students' self-assessment and actual performance in OSCEs.

Results: The study analyzed responses from 62 students. The average self-reported anxiety level was 8.95 ± 1.348 on a 10-point scale, with 64.5% of students reporting severe anxiety and depression. No significant gender differences in anxiety and depression severity were noted (p=0.308). Higher levels of anxiety and depression were reported by students who perceived their grades as lower, although this was not statistically significant (p=0.431). There was no statistically significant correlation between anxiety/depression severity and actual grades (p=0.280).

Conclusions: The study underscores the prevalent issue of anxiety among medical students and its potential influence on their self-perceived performance in critical evaluations like OSCEs. It suggests the necessity for targeted interventions to manage student anxiety, which could enhance self-assessment accuracy and overall performance.

Introduction:-

Objective structured clinical examinations (OSCEs) are a type of assessment that is used to measure the clinical competence of medical students and other health professionals. OSCEs are advantageous because they allow for the assessment of difficult-to-measure skills, such as communication, problem-solving, and decision-making. OSCEs are commonly used as summative assessments, which means that they are used to measure students' overall clinical competence at the end of a training program [1].

Health profession students often experience anxiety when taking OSCE exams. OSCE exams are high-stakes and involve real-time interaction with standardized patients. This can create a stressful environment that can lead to increased anxiety, which can prevent students from performing at their best [2]. It is important to note that anxiety levels are typically higher during OSCE exams than during other types of exams [3].

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Multiple studies have investigated the relationship between test anxiety and performance on OSCEs [4,5]. Some studies have found an association between the two [4], but the majority of studies reviewed by Martin et al. suggest that anxiety does not significantly impact students' OSCE scores [2].

OSCE can cause anxiety in students, regardless of their impact on exam performance. Educational programs should develop policies to address this issue and support the students during their academic journey. The purpose of this study is to examine the relationship between OSCE-related anxiety and students' perceived versus actual performance among medical students. Specifically, we aim to investigate the extent to which anxiety levels are related to self-perceived performance and actual performance outcomes on the OSCE. Additionally, we aim to identify potential factors contributing to OSCE anxiety, such as prior test anxiety, study techniques, and levels of confidence. Through this investigation, we hope to gain a better understanding of the ways in which anxiety impacts OSCE performance and identify strategies to help students manage anxiety levels and improve overall performance.

Methodology:-

The study was conducted on 5th year-medical-students, Taif University after finishing their Pediatric final OSCE exam. It received approval from the Research Ethics Committee of Taif University, approval number 44-341. All the students who attended the exam were eligible to participate in the study. The study used an online self-report questionnaire to collect data on students' anxiety levels and their perceptions of the OSCE. The questionnaire was divided into three sections: The first section included informed consent. The second section included demographic questions and the student's perceived performance. The last section included questions about anxiety and perceptions of the OSCE exam.

The PHQ–4, a validated 4-item self-report screening instrument for depression and anxiety, was used in Section 3 of the questionnaire. The PHQ–4 is a brief, easy-to-administer instrument that can be used in a variety of settings, including primary care, mental health, and research settings [6]. The third section of the questionnaire was adapted from previously used questionnaires that have questions related to the OSCE evaluation, quality, and students' perception of the validity and quality of OSCE exams [7]. The actual students' marks will be imported based on the student's University ID that the student gave in his/her response. The Data was transferred to the Statistical Package of Social Science Software (SPSS) program, version 29 for Statistical analysis.

Results:-

The analysis included responses from 62 students who attended the OSCE, which had 35 female and 27 male students. The mean self-reported anxiety ratings before OSCE were found to be 8.95 ± and 1.34 when rated on a 1-10 rating scale. At the same time, the mean rating was 9.26 ± 1.33 when asked if the anxiety they experienced was related to only OSCE, not to others [Table 1].

The most commonly reported reason for anxiety in pediatric OSCE was curriculum size (82.3%), followed by high credit hours (6.5%). When we asked about the perceived grades based on their performance, about 21 (33.9%) students reported grade A, 17 (27.4%) as grade B, 11 (17.7%) as grade C and D, and only 2 (3.2%) reported grade F [Table 2].

An ultra-brief screening scale for anxiety and depression, Patient Health Questionnaire-4 (PHQ-4), was used to record the severity of anxiety and depression, where the total score ranges from 0 to 12. The mean PHQ-4 was found to be 9.09 ± 3.08. The severity of anxiety and depression was categorized as None (0-2), Mild (3-5), Moderate (6-8) and Severe (9-12). The analysis showed the severity of anxiety and depression in these students are as follows: None (1.6%), Mild (17.7%), Moderate (16.1%), and Severe (64.5%) [Figure 1]. However, no statistically significant differences were observed in the severity of anxiety and depression between the two genders (p=0.308). The severity was found to be higher among students who perceived lower grades, such as D (90.9%) and F (100%). However, there was no statistically significant association observed for this finding (p=0.431). The actual grades were reported in 33 students who gave consent to use their university ID for retrieving their actual grades, which showed the grades as follows: grade A (3.03%), grade B (33.3%), grade C (30.3%), grade D (15.15%) and grade F (18.2%). It was found that all the students who failed OSCE (grade F) showed severe anxiety and depression (p=0.280) [Table 3].

The prevalence of anxiety alone was found in 54 (87.1%) and depression in 47 (75.8%) of students. However, there was no statistically significant association observed for anxietyprevalence with gender, perceived grades, and actual grades ($p>0.05$). Similarly, depression prevalence also didn't show significant differences in gender, perceived grades, and actual grades ($p>0.05$).

The students' responses regarding the quality of performance testing in OSCE are given in Table 4. The most agreed part of the quality of the OSCE was 'wide knowledge area was covered,' followed by 'needed more time at stations,' and 'exam was intimidating .' The most disagreed quality was 'OSCE less stressful than other exams,' followed by 'students were aware of the level of information needed.

The students' responses related to OSCE evaluation are given in Table 5. The most agreed part of the OSCE evaluation was 'instructions were clear and unambiguous,' followed by 'fully aware of nature of the exam,' and the most disagreed part of the 'time at each station was adequate.'

The Relationship between the perceived quality of OSCE and actual grades is given in Table 6. It was found that students who disagreed that the 'exam was fair' got an F grade significantly higher than others who agreed to the same ($p=0.006$). Similarly, those who agreed that 'personality, ethnicity and gender will not affect OSCE score' had higher grades (A & B), and those who disagreed with this got a grade of F, which showed a statistical significance ($p=0.004$). No other quality of OSCE showed statistical significance with the actual grades ($p<0.05$).

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Discussion:-

Medical students are under constant pressure to perform at a high level, and practical exams require them to apply their knowledge and skills in real-life clinical scenarios. The fear of making a mistake or not performing well could

cause anxiety and depression among students. OSCE in medical school often has high stakes, as it can determine a student's progression through the program or eligibility for licensure. Thus, this study assessed the relationship between OSCE-related anxiety and students' perceived versus actual performance among medical students of Taif University. The findings of this study showed that the self-reported anxiety levels before OSCE were found to be very high. Research has consistently shown that higher levels of anxiety can negatively impact students' performance in OSCEs [8-10]. Anxiety can lead to increased stress, reduced concentration, and impaired clinical skills [11,12]. Studies have suggested that medical students often have a tendency to overestimate their performance in OSCEs [13,14]. This overestimation may be due to a lack of awareness of their own mistakes or an attempt to cope with anxiety by maintaining self-confidence [15]. The level of OSCE-related anxiety can vary among students. Some individuals experience significant anxiety, while others may not be as affected. Factors such as prior experience, self-efficacy, and test-taking skills can influence anxiety levels [16].

Exam anxiety can be mitigated by getting enough self-efficacy, which has also been shown to mitigate the negative effects of stress on academic performance [17,18]. Social cognitive theory suggests that students' self-efficacy can be bolstered by hearing about others' actual successes in similar situations, receiving honest feedback on their performance, and taking into account their own emotional and physiological conditions [19]. The findings of this study showed that students who had severe anxiety and depression had performed comparatively poorly than those who had mild symptoms, even though there was no statistically significant association observed. In a study conducted by Zhang et al., anxiety levels among students during the examination period were assessed using the Zung self-rating anxiety scale questionnaire. The results revealed that 31% of the students experienced anxiety during this period [20]. Additionally, the study observed significantly elevated systolic blood pressure (SBP) and diastolic blood pressure (DBP) in the anxiety group compared to the group without anxiety. Furthermore, statistical analysis demonstrated a strong positive correlation between the scores representing anxiety symptoms and physical signs and the measurements of SBP, DBP, and heart rate (HR).

There are significant issues with using the OSCE as a culminating, high-stakes assessment despite its clear advantages and universal acceptability [21]. The major drawback of OSCE is the possibility that inadequate performance is not due to a lack of clinical competence but rather to non-cognitive factors. Academic achievement may not be completely explained by how well students do on the OSCE if they feel anxious about their performance in such exams. Adequate preparation and training in OSCE-specific skills, including communication, physical examination, and clinical reasoning, can help reduce anxiety and improve students' perceived and actual performance [22]. Feedback from OSCE examiners can be instrumental in helping students align their perceived and actual performance [23]. Constructive feedback can help students recognize their strengths and areas for improvement. Some research suggests that the relationship between OSCE-related anxiety and performance may change over time [24,25]. As students gain more experience and confidence, the impact of anxiety on performance may diminish. The specific context of the OSCE can influence the relationship between anxiety and performance. For example, high-stakes exams with significant consequences for progression may elicit more anxiety [26].

The findings of the study showed that about 64.5% of the students agreed that OSCE covered wide knowledge in pediatric specialty, whereas only 14.5% agreed that OSCE was less stressful than other exams. However, a study done by Brand et al. reported a contrasting finding, which showed that OSCE exams were more stressful than other written exams [26]. The constant surveillance and on-the-spot evaluation during an OSCE may increase anxiety levels, which may explain why students do better and have less anxiety during written exams [27-29]. High levels of student anxiety may also be caused by the timed, interactive nature of the OSCE [30]. Students' performance on timed tests has been proven to be inferior to that on untimed tests [31]. In this study, anxiety and depression caused by OSCE did not differ significantly between the two genders. This is surprising given the findings of multiple research showing that female students have greater anxiety about exams and grades than their male counterparts [32-34]. However, this finding has not been supported by additional studies [35,36]. These discrepancies could be due to cultural and societal variations between the studies that were done, which could affect any potential gender disparities in perceived stress.

Various interventions have been proposed to help reduce OSCE-related anxiety, including mindfulness-based stress reduction, simulation training, and test-taking strategies [37-39]. These interventions can potentially bridge the gap between perceived and actual performance. Studies have explored the coping strategies that medical students employ to manage OSCE-related anxiety. Identifying effective coping mechanisms can help students perform better and reduce anxiety [40,41]. Educational institutions and faculty have a role to play in addressing OSCE-related

anxiety. Implementing supportive learning environments and providing resources for anxiety management can make a difference.

Table 1:- Perceived anxiety related to OSCE.

	N	Mean	Std. Deviation	Minimum	Maximum
Anxiety felt in the days before the OSCE [1-10]	62	8.95	1.348	5	10
Anxiety was related to the OSCE not other causes [1-10]	62	9.26	1.330	3	10

Table 2:- Self-perceived reasons and grade for the Pediatric OSCE.

		N	%
Reason for anxiety due to the Pediatric OSCE	Curriculum size	51	82.3
	Difficulty of the material	1	1.6
	My previous experiences in OSCE	1	1.6
	The course high credit hours	4	6.5
	Others	5	8.1
Based on your performance, what do expect your mark in OSCE (OSCE only)?	A	21	33.9
	B	17	27.4
	C	11	17.7
	D	11	17.7
	F	2	3.2

Table 3:- Severity of Anxiety and depression based on gender, perceived grades, and actual grades.

			Severity of Anxiety and depression				Total	P value
			Normal	Mild	Moderate	Severe		
Gender	Female	N	0	8	4	23	35	0.308
		%	0.0%	22.9%	11.4%	65.7%	100.0%	
	Male	N	1	3	6	17	27	
		%	3.7%	11.1%	22.2%	63.0%	100.0%	
Perceived graded before OSCE	A	N	0	6	2	13	21	0.431
		%	0.0%	28.6%	9.5%	61.9%	100.0%	
	B	N	1	4	4	8	17	
		%	5.9%	23.5%	23.5%	47.1%	100.0%	
	C	N	0	1	3	7	11	
		%	0.0%	9.1%	27.3%	63.6%	100.0%	
	D	N	0	0	1	10	11	
		%	0.0%	0.0%	9.1%	90.9%	100.0%	
	F	N	0	0	0	2	2	
		%	0.0%	0.0%	0.0%	100.0%	100.0%	
Actual Grade (n=33)	A	N	0	0	0	1	1	0.280
		%	0.0%	0.0%	0.0%	100.0%	100.0%	
	B	N	0	3	2	6	11	
		%	0.0%	27.3%	18.2%	54.5%	100.0%	
	C	N	1	3	1	5	10	
		%	10.0%	30.0%	10.0%	50.0%	100.0%	
	D	N	0	1	3	1	5	
		%	0.0%	20.0%	60.0%	20.0%	100.0%	
	F	N	0	0	0	6	6	
		%	0.0%	0.0%	0.0%	100.0%	100.0%	

Table 4:- Quality of performance testing (n=62).

	Agree	Disagree	Neutral
Exam was fair	29.0	29.0	41.9
Wide knowledge area was covered	64.5	6.5	29.0
Needed more time at stations	61.3	19.4	19.4
The exam was very stressful	41.9	24.2	33.9
Exam minimized chance of failing	25.8	25.8	48.4
OSCE less stressful than other exams	14.5	69.4	16.1
Allowed student to compensate in other stations	43.5	25.8	30.6
Highlighted areas of my knowledge and skill weakness	33.9	25.8	40.3
Exam was intimidating	51.6	12.9	35.5
Students were aware of level of information needed	19.4	46.8	33.9

Table 5:- OSCE evaluation (n=62).

	Agree	Disagree	Neutral
Wide range of clinical skills covered	40.3	32.3	27.4
Fully aware of nature of exam	54.8	27.4	17.7
Tasks reflected those taught	32.3	32.3	35.5
Time at each station was adequate	30.6	40.3	29.0
Setting and context at each station felt authentic	27.4	24.2	48.4
Instructions were clear and unambiguous	59.7	14.5	25.8
Tasks asked to perform were fair	41.9	29.0	29.0
Exam provided opportunities to learn	37.1	19.4	43.5

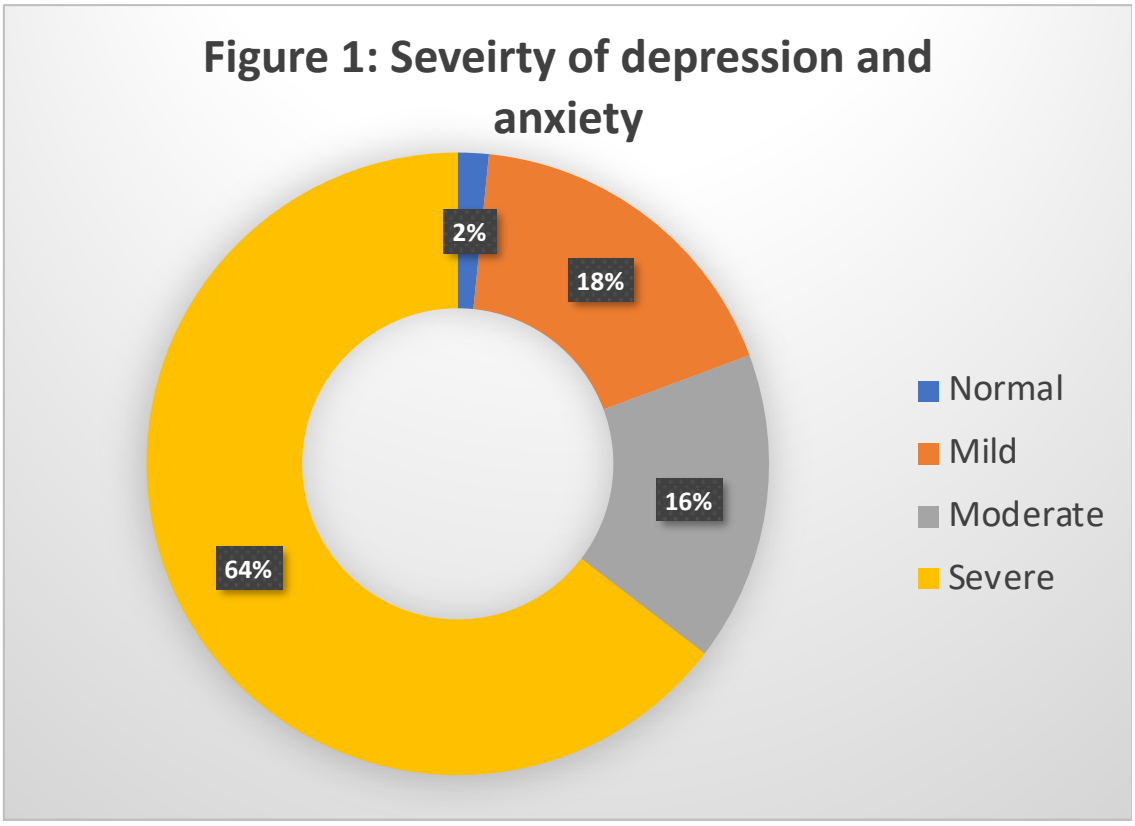

Table 6:- Relationship between perceived quality of OSCE and actual grades (n=33).

		Actual grades					P value
		A	B	C	D	F	
Exam was fair	Agree	0.0%	37.5%	50.0%	12.5%	0.0%	0.006
	Disagree	0.0%	11.1%	11.1%	11.1%	66.7%	
	Neutral	6.3%	43.8%	31.3%	18.8%	0.0%	
Wide knowledge area was covered	Agree	3.8 %	38.5%	26.9%	15.4%	15.4%	0.598
	Disagree	0.0%	0.0%	0.0%	0.0%	100.0%	
	Neutral	0.0%	16.7%	50.0%	16.7%	16.7%	
Needed more time at stations	Agree	0.0%	44.4%	27.8%	16.7%	11.1%	0.264
	Disagree	0.0%	25.0%	50.0%	12.5%	12.5%	
	Neutral	14.3 %	14.3%	14.3%	14.3%	42.9%	
The exam was very stressful	Agree	0.0%	21.4%	14.3%	28.6%	35.7%	0.056
	Disagree	14.3 %	42.9%	28.6%	0.0%	14.3%	
	Neutral	0.0%	41.7%	50.0%	8.3%	0.0%	
Exam minimized chance of failing	Agree	0.0%	40.0%	40.0%	20.0%	0.0%	0.100
	Disagree	0.0%	16.7%	16.7%	0.0%	66.7%	
	Neutral	5.9%	35.3%	29.4%	17.6%	11.8%	
OSCE less stressful than other exams	Agree	0.0%	0.0%	40.0%	40.0%	20.0%	0.180
	Disagree	4.5%	45.5%	18.2%	9.1%	22.7%	
	Neutral	0.0%	16.7%	66.7%	16.7%	0.0%	
Allowed student to compensate in other stations	Agree	0.0%	27.8%	38.9%	16.7%	16.7%	0.722
	Disagree	0.0%	33.3%	16.7%	16.7%	33.3%	
	Neutral	11.1 %	44.4%	22.2%	11.1%	11.1%	
Highlighted areas of my knowledge and skill weakness	Agree	8.3 %	41.7%	25.0%	16.7%	8.3%	0.543
	Disagree	0.0%	28.6%	28.6%	0.0%	42.9%	
	Neutral	0.0%	28.6%	35.7%	21.4%	14.3%	
Exam was intimidating	Agree	5.6 %	16.7%	27.8%	22.2%	27.8%	0.298
	Disagree	0.0%	33.3%	33.3%	0.0%	33.3%	
	Neutral	0.0%	58.3%	33.3%	8.3%	0.0%	
Students were aware of level of information needed	Agree	0.0%	22.2%	44.4%	11.1%	22.2%	0.481
	Disagree	0.0%	38.5%	15.4%	15.4%	30.8%	
	Neutral	9.1%	36.4%	36.4%	18.2%	0.0%	
Wide range of clinical skills covered	Agree	6.7 %	40.0%	26.7%	20.0%	6.7%	0.147
	Disagree	0.0%	9.1%	36.4%	9.1%	45.5%	
	Neutral	0.0%	57.1%	28.6%	14.3%	0.0%	
Fully aware of nature of exam	Agree	5.0 %	35.0%	35.0%	15.0%	10.0%	0.484
	Disagree	0.0%	42.9%	0.0%	14.3%	42.9%	
	Neutral	0.0%	16.7%	50.0%	16.7%	16.7%	
Tasks reflected those taught	Agree	0.0%	41.7%	25.0%	16.7%	16.7%	0.059
	Disagree	0.0%	44.4%	0.0%	11.1%	44.4%	
	Neutral	8.3%	16.7%	58.3%	16.7%	0.0%	
Time at each station was adequate	Agree	7.1 %	28.6%	35.7%	7.1%	21.4%	0.629
	Disagree	0.0%	33.3%	44.4%	11.1%	11.1%	
	Neutral	0.0%	40.0%	10.0%	30.0%	20.0%	

Setting and context at each station felt authentic	Agree	0.0%	30.0%	40.0%	20.0%	10.0%	0.824
	Disagree	0.0%	28.6%	28.6%	28.6%	14.3%	
	Neutral	6.3%	37.5%	25.0%	6.3%	25.0%	
Instructions were clear and unambiguous	Agree	4.3 %	34.8%	26.1%	17.4%	17.4%	0.909
	Disagree	0.0%	0.0%	50.0%	0.0%	50.0%	
	Neutral	0.0%	37.5%	37.5%	12.5%	12.5%	
Tasks asked to perform were fair	Agree	0.0%	26.7%	40.0%	13.3%	20.0%	0.139
	Disagree	0.0%	22.2%	11.1%	33.3%	33.3%	
	Neutral	11.1 %	55.6%	33.3%	0.0%	0.0%	
Exam provided opportunities to learn	Agree	0.0%	33.3%	33.3%	16.7%	16.7%	0.277
	Disagree	0.0%	50.0%	0.0%	0.0%	50.0%	
	Neutral	6.7%	26.7%	40.0%	20.0%	6.7%	
OSCE exam scores provide true measure of essential clinical skills	Agree	0.0%	14.3%	28.6%	14.3%	42.9%	0.215
	Disagree	5.9%	47.1%	23.5%	5.9%	17.6%	
	Neutral	0.0%	22.2%	44.4%	33.3%	0.0%	
OSCE scores are standardized	Agree	0.0%	42.9%	28.6%	14.3%	14.3%	0.469
	Disagree	0.0%	50.0%	12.5%	.0.0%	37.5%	
	Neutral	5.6%	22.2%	38.9%	22.2%	11.1%	
OSCE is practical and useful experience	Agree	7.1 %	21.4%	28.6%	21.4%	21.4%	0.771
	Disagree	0.0%	44.4%	33.3%	0.0%	22.2%	
	Neutral	0.0%	40.0%	30.0%	20.0%	10.0%	
Personality, ethnicity and gender will not affect OSCE score	Agree	6.7 %	40.0%	40.0%	0.0%	13.3%	0.004
	Disagree	0.0%	50.0%	0.0%0.0 %	10.0%	40.0%	
	Neutral	0.0%	0.0%	50.0%	50.0%	0.0%	

Limitations:

Firstly, the smaller sample size might have limited the statistical power and generalizability of the findings. With a limited number of participants, it becomes more challenging to detect meaningful relationships and draw robust conclusions. Students' responses in the online questionnaire did not always accurately reflect their true feelings or behaviors. Some students may have over-reported or under-reported their anxiety levels, leading to skewed results. The study faced limitations in measuring actual performance comprehensively, as some students chose not to give consent for the disclosure of their actual grades. This lack of data from a subset of participants potentially introduced bias and limited the ability to fully examine the relationship between perceived and actual performance. The study was limited in its ability to account for confounding factors related to anxiety and depression. While the primary focus was on OSCE-related anxiety, the presence of underlying anxiety and depression among participants could have influenced their perceived and actual performance. Failure to control for these confounding factors may have led to an incomplete understanding of the relationship between OSCE-related anxiety and performance. Future research could benefit from more comprehensive assessments of mental health and its potential impact on the study's outcomes.

Data Availability Statement:

The data supporting the findings of this study are not publicly available due to privacy and ethical considerations. However, the datasets generated and analyzed during this study are available from the corresponding author upon reasonable request.

Conflict of Interest:

The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported. This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sector.

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