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Examination Stress and OSCE Performance in Basic Clinical Skills: A Study Among Medical Students

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ABSTRACT

The prevalence of stress among medical students has been reported to be 31.7% across six universities in Sudan and 58% at Andalas University. Academic stress is known to affect students' performance, including failure in the Objective Structured Clinical Examination (OSCE). This study aimed to examine the relationship between examination-related stress levels and OSCE passing outcomes in the Basic Clinical Skills (KKD) module among students of the Faculty of Medicine, Universitas Sultan Ageng Tirtayasa. This study employed an observational analytic design with a cross-sectional approach. The study participants were third- and fourth-year medical students, totaling 92. Examination stress levels were measured using the Westside Anxiety Test Scale, while OSCE passing status was obtained from secondary academic records. Bivariate analysis was conducted using the chi-square test. The most commonly reported level of examination stress was moderate (47.6%), followed by severe (37.0%) and mild (16.3%). The highest failure rate was observed in the BCS-OSCE 3 (23.9%), followed by BCS-OSCE 2 (10.9%) and BCS-OSCE 1 (7.6%). Bivariate analysis showed no significant association between examination stress levels and OSCE KKD passing status. Similarly, no significant relationship was found between daily study duration and OSCE passing outcomes.

Key Messages:

- The findings indicate that factors beyond stress levels and study duration may play a more decisive role in determining OSCE outcomes, highlighting the need for further investigation into other contributing factors.

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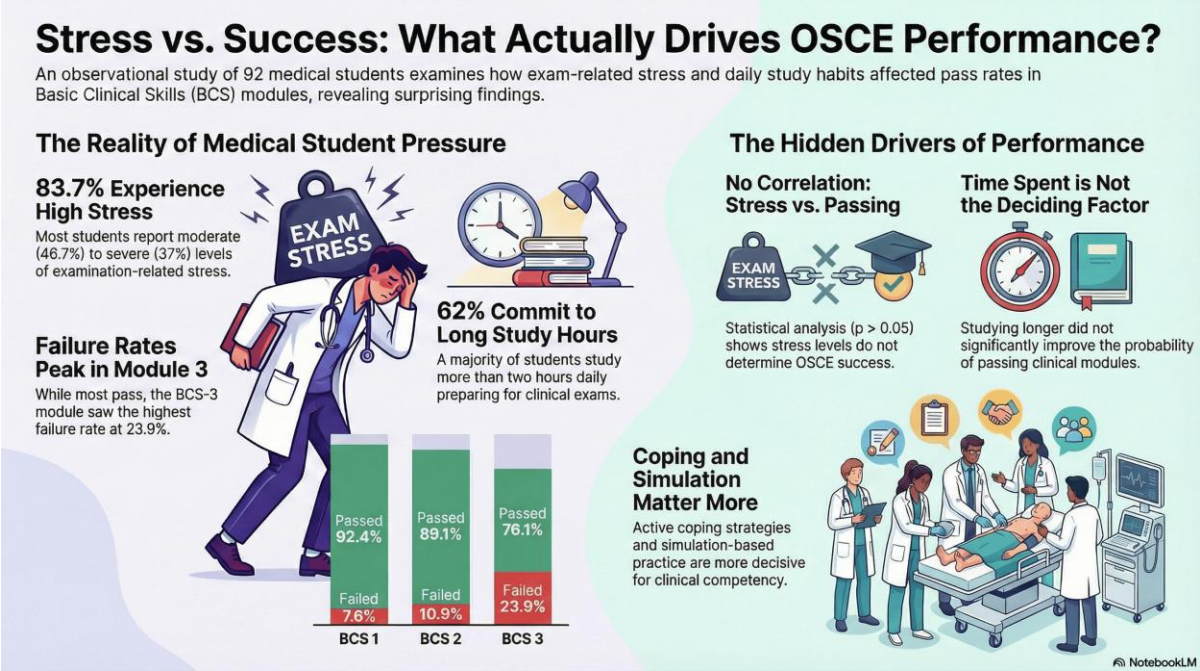
GRAPHICAL ABSTRACT



INTRODUCTION

Stress refers to experiences involving physical, mental, or emotional tension that arise in response to real or perceived stimuli (1). A study conducted in two public and six private medical schools in Bangladesh reported a stress prevalence of 54% among medical students (2). Similarly, research at Andalas University found that 48.4% of medical students experienced moderate stress levels, with academic-related stress most frequently categorized as severe (3).

The impact of stress can affect three main domains: physical, psychological, and professional functioning. Physical effects may include irritability and difficulty relaxing, while psychological consequences often involve emotional distress. From a professional or academic perspective, stress may lead to excessive preoccupation with personal thoughts and an impaired ability to concentrate (4).

Levels of anxiety and stress during the Objective Structured Clinical Examination (OSCE) are generally higher than those experienced during written examinations. The OSCE is widely recognized as a highly stressful assessment format. Elevated anxiety levels can negatively affect student performance during OSCEs, as anxiety is associated with distorted information processing, reduced concentration, and impaired memory function. Increased stress and anxiety may also diminish learning motivation and focus, ultimately leading to poorer examination performance (5).

Anxiety and stress experienced during OSCEs may significantly influence student performance and contribute to examination failure (6). Previous studies have shown that students commonly experience anxiety related to the OSCE setting itself (65.5%), examiner attitudes (45.7%), and nursing or clinical skills assessments (38.3%) (7). When individuals experience examination-related anxiety, they typically exhibit a range of responses across phenomenological (thoughts and emotions), physiological (bodily reactions), and behavioral domains. These responses reflect deep concerns about potential failure or negative outcomes associated with the examination process (8).

This study aims to examine the relationship between examination-related stress levels and OSCE pass rates in the Basic Clinical Skills (BCS) module at the Faculty of Medicine, Universitas Sultan Ageng Tirtayasa. Understanding these dynamics, particularly at Universitas Sultan Ageng Tirtayasa, is critical, as localized evidence is needed to address the institution's unique academic pressures and clinical curriculum, filling a gap in the current literature on this student population. In addition, the study seeks to compare OSCE pass rates across BCS Modules 1, 2, and 3 among medical students at the same institution.

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METHODS

This study employed a cross-sectional design. The participants were third- and fourth-year medical students from the Faculty of Medicine at Universitas Sultan Ageng Tirtayasa. A total sampling technique was applied to 95 targeted students; however, three students were excluded because they did not respond to the questionnaire despite multiple follow-up attempts, resulting in a final sample of 92 participants. Data collection was conducted between February and March 2023.

Eligible participants were students who had attended all scheduled BCS training sessions and had undertaken the BCS OSCE. OSCE outcomes were obtained for BCS Modules 1, 2, and 3, with pass/fail status determined by the institutional passing threshold, set at a minimum score of 75 for all clinical skill modules. Exam-related stress levels were assessed using the Westside Anxiety Test Scale. The scoring categories were defined as follows: 1.0–1.9 (low stress), 2.0–2.5 (normal), 2.6–2.9 (high-normal stress), 3.0–3.4 (moderate-high stress), 3.5–3.9 (high stress), and 4.0–5.0 (very high stress). Daily study duration was identified as a potential confounding variable that could influence examination outcomes. Data analysis consisted of univariate analysis to describe participant characteristics and bivariate analysis using Fisher's Exact Test to examine the association between exam stress levels and OSCE outcomes.

RESULTS

A total of 92 out of 95 students completed the questionnaire, while three students did not respond despite follow-up contact. Of the 92 respondents, 46 were fourth-year students, and 46 were third-year students. All respondents met the inclusion criteria, and no participants were excluded from the analysis.

Table 1. Respondent Characteristics

Characteristics	n (%)	Mean + SD
Academic Level		
Fourth-year	46 (50%)	
Third-year	46 (50%)	
Gender		
Male	15 (16.3%)	
Female	77 (83.7%)	
Age (years)		21.01 ± 0.883

The distribution of third- and fourth-year students was equal. Female respondents predominated, accounting for 83.7% of the total sample. The mean age of participants was 21.01 ± 0.883 years.

Table 2. Distribution of Stress Levels and Daily Study Duration

Characteristics	n	%
Stress Level		
Mild	15	16.3
Moderate	43	46.7
Severe	34	37
Daily Study Duration		
<2 hours	35	35
>2 hours	57	57

For analytical purposes, stress levels were classified into three categories: mild stress (low and normal stress combined), moderate stress (high-normal and moderately high stress combined), and severe stress (high and very high stress combined). The results indicate that the most common level of stress among students facing the OSCE was moderate (46.7%), while mild stress was the least frequently reported (16.3%). Regarding study duration, 38% of respondents reported studying for less than two hours per day in preparation for the OSCE, whereas 62% reported studying for more than two hours per day.

Table 3. OSCE Passing Rates in the Basic Clinical Skills (BCS) Modules

OSCE	Failed (n (%))	Passed (n (%))
BCS 1	7 (7.6)	85 (92.4)
BCS 2	5 (10.9)	41 (89.1)
BCS 3	11 (23.9)	35 (76.1)

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The findings indicate that the highest OSCE failure rate occurred in BCS 3 (23.9%), whereas the lowest failure rate was observed in BCS 1 (7.6%).

Table 4. Association Between Exam Stress Level and OSCE Passing Rates in BCS 1, 2, and 3

Variable	BCS -OSCE 1				BCS-OSCE 2				BCS-OSCE 3			
	Failed n (%)	Passed n (%)	OR (95 CI)	P-value	Failed n (%)	Passed n (%)	OR (95 CI)	P-value	Failed n (%)	Passed n (%)	OR (95 CI)	P-value
Stress Level												
Severe	4 (11.8)	30 (88.2)	1.778 (0.370-8.545)	0.693[F]	2 (11.1)	8 (88.9)	0.941 (0.118-7.499)	1[F]	6 (33.3)	12 (66.7)	1.4 (0.340-5.765)	0.641[C]
Moderate	3 (7)	40 (93)			2 (10.5)	17 (89.5)			5 (26.3)	14 (73.7)		
Mild	0 (0)	15 (100)	1.075 (0.991-1.167)	0.561[F]	1 (11.1)	16 (88.9)	1.063 (0.084-13.51)	1[F]	0 (0)	9 (100)	1.357 (1.037-1.776)	0.144[F]
Daily Study Duration												
≤2 hours	2 (5.7)	34 (94.3)		0.705[F]	2 (10)	18 (90)		1[F]	6 (30)	14 (70)		0.494[F]
≥2 hours	5 (8.8)	52 (91.2)			3 (11.5)	23 (88.5)			5 (19.2)	21 (76.1)		

[F] Fisher Exact Test

Statistical analysis using Fisher's Exact Test revealed no significant association ($p > 0.05$) between exam-related stress levels and OSCE passing status in BCS 1, BCS 2, or BCS 3. Descriptively, students with high stress levels had the highest proportions of OSCE failures across all modules (11.8% in BCS 1, 11.1% in BCS 2, and 33.3% in BCS 3). Regarding daily study duration, no statistically significant relationship was found with OSCE outcomes ($p > 0.05$), although students who studied more than 2 hours per day exhibited higher failure proportions in BCS 1 and BCS 2 (8.8% and 11.5%, respectively).

DISCUSSION

The present study found no significant association between examination-related stress levels or daily study duration and passing rates in the OSCE for the Basic Clinical Skills (BCS) modules 1, 2, and 3. Several limitations should be acknowledged. First, data collection was conducted a considerable time after students had completed the OSCE, which may have introduced recall bias, as participants might not have accurately remembered their psychological condition during the examination. Second, stress levels were assessed using a self-administered questionnaire; therefore, the results were influenced by individual interpretation and subjective understanding of the questionnaire items.

The findings of this study are consistent with previous research. Irawaty reported no significant relationship between stress levels and learning outcomes in the BCS module ($p = 0.054$) (9). Similarly, a study by Zhang and Rabatsky, which assessed stress using both stress symptom questionnaires and physiological indicators (blood pressure and heart rate), demonstrated no association between stress symptoms or physiological stress markers and OSCE scores (10). Sanaba et al. also found no significant relationship between anxiety levels prior to the OSCE and OSCE performance ($p = 0.970$) (11).

OSCE performance appears to be influenced by coping strategies employed by students. Irawaty showed that students who used low levels of active coping strategies had a higher risk of failing the BCS OSCE compared with those who applied more active coping approaches (9). In addition, preparation before the OSCE, such as the frequency of practice sessions or participation in clinical skills simulations, plays an important role in determining examination outcomes. This is supported by the study conducted by Dunning and Taylor, which reported that students often felt unprepared for the OSCE due to limited opportunities for simulation-based training (12).

Daily study duration was also not significantly associated with passing the BCS OSCE modules 1, 2, and 3 ($p = 0.705$, $p = 1.000$, and $p = 0.494$, respectively). Navarro et al. reported only a weak correlation between study duration and academic scores (13). The absence of a significant relationship between study

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duration and OSCE outcomes may be explained by differences in learning approaches. Preparation for the OSCE differs from that for written examinations, as the OSCE encourages self-directed learning and promotes deep learning strategies (13). Memon and Shaikh demonstrated that students who engaged in group learning and deep learning strategies achieved better outcomes in both OSCEs and written examinations compared with those who did not adopt deep learning approaches (14). Although study time remains an important factor in academic achievement, effective learning skills and appropriate study methods are considerably more influential than the amount of time spent studying alone (15).

CONCLUSION

This study found no statistically significant association between exam-related stress levels and passing outcomes for BCS-OSCE 1, 2, and 3. These findings suggest that factors beyond psychological stress and time spent studying are more decisive for clinical skill competency. It is recommended that the Faculty of Medicine evaluate and enhance clinical simulation opportunities and teaching methods to better prepare students. Future research should include more objective measures of stress and investigate the impact of specific coping mechanisms and the frequency of deliberate practice on OSCE success.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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