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Perceived stress among medical students during the examination period: prevalence and associated factors in Afghanistan

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Abstract

Background & Objective: Perceived stress is an important concern in medical education because it may be related to students' academic performance, physical health, and psychological well-being. This study aimed to estimate the prevalence of general perceived stress measured during the examination period and to identify the academic, psychological, social, and institutional factors associated with moderate-to-high general perceived stress among male undergraduate medical students at Moraa University, Afghanistan.

Materials & Methods: A descriptive cross-sectional study was conducted among male undergraduate medical students at Moraa University, Afghanistan. Female students were not eligible because they were barred from higher education under the prevailing restrictions imposed by the de facto authorities. Of the 150 eligible male students enrolled in the active registry, 120 participants were selected using simple random sampling.

Results: Among the 120 participants, 82.5% experienced moderate-to-high general perceived stress during the examination period, including 68.3% with moderate perceived stress and 14.2% with high perceived stress. Furthermore, 61.7% of students reported feeling upset because of unexpected events. In the final multivariable logistic regression model, excessive academic workload (Adjusted Odds Ratio (AOR) = 2.45, 95% Confidence Interval (CI): 1.32–4.56; p-value (p) = 0.004), high parental or family expectations (AOR = 2.78, 95% CI: 1.51–5.11; p = 0.001), financial difficulties (AOR = 2.63, 95% CI: 1.40–4.92; p = 0.002), lack of academic mentorship (AOR = 1.94, 95% CI: 1.05–3.60; p = 0.034), and difficulty managing multiple examinations (AOR = 1.88, 95% CI: 1.01–3.49; p = 0.046) were independently associated with moderate-to-high perceived stress.

Conclusion: Moderate-to-high general perceived stress was highly prevalent among male undergraduate medical students at Moraa University when assessed during the examination period. Several academic, social, and institutional factors were independently associated with elevated perceived stress. These findings may help medical schools identify modifiable educational and institutional factors that could inform strategies to support student well-being during academically demanding periods.

Keywords: students, medical; stress, psychological; education, medical; well-being; examinations

Introduction

Medical education is widely recognized as one of the most academically demanding training programs. Throughout their education, medical students encounter sustained academic pressure, frequent examinations,

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heavy workloads, and psychological challenges that may be associated with elevated perceived stress. Previous studies have consistently documented high rates of stress, anxiety, depression, and psychological distress among medical students, underscoring the importance of promoting student well-being as an essential component of medical education rather than treating it solely as an individual concern [1, 2]. Academic workload, repeated assessments, limited institutional support, and concerns about academic achievement have also been associated with students' perceived stress [3, 4].

Perceived stress reflects the extent to which individuals evaluate situations in their lives as overwhelming, unpredictable, or difficult to manage. Among the available instruments, the 10-item Perceived Stress Scale (PSS-10) is one of the most widely used measures of general perceived stress experienced during the preceding month. Importantly, the PSS-10 was not designed to assess examination-specific stress. Consequently, when administered during an examination period, it captures students' overall perceived stress within that period rather than stress directly attributable to examinations alone [5, 6].

Factors associated with perceived stress among medical students are complex and multifactorial. Previous studies have reported associations between higher stress levels and a broad range of academic, psychological, social, institutional, and sociodemographic characteristics, including excessive academic workload, financial hardship, inadequate social support, poor sleep quality, an unfavorable learning environment, and concerns about academic performance [7–10, 11, 12]. Although several studies have reported higher stress levels among female students and students in more advanced years of study, these associations have not been observed consistently across educational settings and cultural contexts [11, 13]. Taken together, the available evidence indicates that perceived stress is associated with the interaction of individual, educational, and environmental characteristics.

Despite the growing international literature on medical student well-being, evidence from Afghanistan remains limited. This knowledge gap is particularly apparent during examination periods, when academic demands are typically intensified. Moreover, during the study period, restrictions imposed by the de facto authorities prevented female students from attending higher education, leaving only male students in the active enrollment of the Faculty of Medicine at Moraa University [14]. This unique educational context provides an important opportunity to examine perceived stress within a population that has received little attention in the published literature. To our knowledge, this is among the first studies in Afghanistan to assess general perceived stress using the PSS-10 during the examination period while simultaneously examining academic, psychological, social, and institutional correlates.

Against this background, the present study sought to estimate the prevalence of general perceived stress measured during the examination period and to identify the academic, psychological, social, and institutional factors associated with moderate-to-high perceived stress among male undergraduate medical students at Moraa University, Afghanistan.

Materials & Methods

Design and setting(s)

A descriptive cross-sectional study was conducted at the Faculty of Medicine, Moraa University, Afshar, Kabul, Afghanistan. Data were collected between 1 July and 30 September 2025.

Participants and sampling

The source population comprised all actively enrolled undergraduate medical students at the Faculty of Medicine, Moraa University, during the study period. According to the official student registry, 150 students were eligible for inclusion. Because restrictions imposed by the de facto authorities prevented women from attending higher education during the study period, the eligible sampling frame consisted exclusively of male students. Consequently, the study population included only male undergraduate medical students.

The required sample size was calculated using Cochran's formula for estimating a single population proportion, assuming a prevalence of 50%, a 95% confidence level, and a 5% margin of error. Because the total eligible population was limited to 150 students, a finite population correction was applied. The corrected sample size was 108. After allowing for an anticipated 10% non-response rate, the final required sample size was 120 participants.

A simple random sampling technique was used. The official student registry served as the sampling frame, and each eligible student was assigned a unique identification number. A computer-generated random number list was then used to select 120 participants. All selected students agreed to participate and completed the questionnaire, resulting in a response rate of 100%. No

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questionnaires were excluded because of incomplete responses. Therefore, data from all 120 participants were included in the final analysis.

Because the sampling frame included only male students, the findings are generalizable only to the eligible male undergraduate medical student population at Moraa University during the study period and should not be extrapolated to female medical students or mixed-gender student populations.

Tools/Instruments

Data were collected using a structured, self-administered questionnaire comprising three sections. The first section gathered participants' sociodemographic information, including age, sex, academic year, marital status, monthly income, and place of residence.

The second section consisted of the Perceived Stress Scale-10 (PSS-10), a validated instrument used to assess general perceived stress experienced during the previous month. Because the PSS-10 is designed to measure general perceived stress rather than examination-specific stress, the findings were interpreted as general perceived stress measured during the examination period.

The third section included 18 researcher-developed items designed to assess potential academic, psychological, social, and institutional factors associated with perceived stress. These items addressed issues such as excessive academic workload, fear of examination failure, parental or family expectations, financial difficulties, academic mentorship, counseling services, study environment, and examination management.

The researcher-developed items were evaluated for face and content validity by a panel of five experts in public health, medical education, and psychology. The experts assessed the relevance, clarity, and appropriateness of each item, resulting in a Content Validity Index (CVI) of 0.86. A pilot study involving 20 students who were not included in the final analysis was conducted to evaluate the clarity and feasibility of the questionnaire. Internal consistency reliability was acceptable, with Cronbach's alpha coefficients of 0.82 for the researcher-developed section and 0.79 for the PSS-10.

Data collection methods

Data were collected between 1 July and 30 September 2025 using a structured, self-administered questionnaire. After the study objectives had been explained, the selected students were invited to participate voluntarily. Written informed consent was obtained from all participants before data collection. The questionnaires were distributed to the selected students during the examination period and completed individually. Completed questionnaires were collected immediately after completion and reviewed for completeness. All 120 distributed questionnaires were returned with complete responses and were included in the final analysis.

Data analysis

The primary outcome was general perceived stress, assessed using the total Perceived Stress Scale-10 (PSS-10) score. Because the questionnaire was administered during the examination period, the outcome was interpreted as general perceived stress measured during that period rather than examination-specific stress.

For descriptive analysis, PSS-10 scores were categorized into low (0–13), moderate (14–26), and high (27–40) perceived stress according to commonly used interpretive categories. These categories were used solely for descriptive purposes and should not be interpreted as clinical diagnostic thresholds.

For logistic regression analysis, the outcome variable was dichotomized into low perceived stress and moderate-to-high perceived stress. The moderate and high categories were combined because only 17 participants were classified as having high perceived stress, and combining these categories improved model stability and reduced sparse-data problems.

Bivariate logistic regression analysis was initially performed to estimate Crude Odds Ratios (CORs), 95% Confidence Intervals (CIs), and p-values for each candidate variable. Variables with $p < 0.20$ in the bivariate analysis were entered into the multivariable logistic regression model using the enter method. Adjusted Odds Ratios (AORs), 95% CIs, and p-values were subsequently reported for the final model.

The candidate variables included age, academic year, marital status, place of residence, monthly income, excessive academic workload, difficulty managing multiple examinations, insufficient preparation time, lack of study materials, time management difficulty, fear of examination failure, pre-examination anxiety, lack of self-confidence, sleep difficulty, fatigue during examinations, high parental or family expectations, financial difficulties, lack of academic mentorship, lack of counseling services, lack of sports facilities, poor study environment, healthy coping strategies, and substance-use coping. Sex was not included in the regression analysis because all participants were male.

For categorical sociodemographic variables, the reference categories were first-year academic year,

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unmarried status, living with family, and monthly income below 7,000 AFN. Responses to stress-related items were dichotomized into higher exposure ("A lot" or "Somewhat") and lower exposure ("A little" or "Not at all") before regression analysis. Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test and the Cox-Snell and Nagelkerke pseudo-R^2 statistics. Multicollinearity was evaluated using variance inflation factors (VIFs), with VIF values below 5 indicating no evidence of problematic multicollinearity. Statistical significance was set at $p < 0.05$.

Results

Table 1 summarizes the sociodemographic characteristics of the study participants. All 120 participants were male because the eligible sampling frame consisted exclusively of male medical students during the study period. Most participants were first-year students (82.5%), unmarried (87.5%), and living with their families (61.7%). Approximately half (50.8%) reported a monthly income below 7,000 AFN.

Figure 1 presents the distribution of perceived stress levels based on PSS-10 scores. Overall, 82.5% of participants reported moderate-to-high perceived stress, including 68.3% with moderate perceived stress and 14.2% with high perceived stress, whereas 17.5% had low perceived stress.

Table 1. Sociodemographic characteristics of the participants (n = 120)

Variable	Category	n	%
Sex	Male	120	100.0
Academic year	First year	99	82.5
	Second year	13	10.8
	Third year	3	2.5
	Fourth year	5	4.2
Marital status	Unmarried	105	87.5
	Married	15	12.5
Residence	Living with family	74	61.7
	Rental accommodation	37	30.8
	Dormitory	9	7.5
Monthly income (AFN)	< 7,000	61	50.8
	7,000–14,000	49	40.8
	> 14,000	10	8.3

Note: Percentages may not total exactly 100.0 because of rounding.
Abbreviations: AFN, Afghan afghani; n, number of participants.

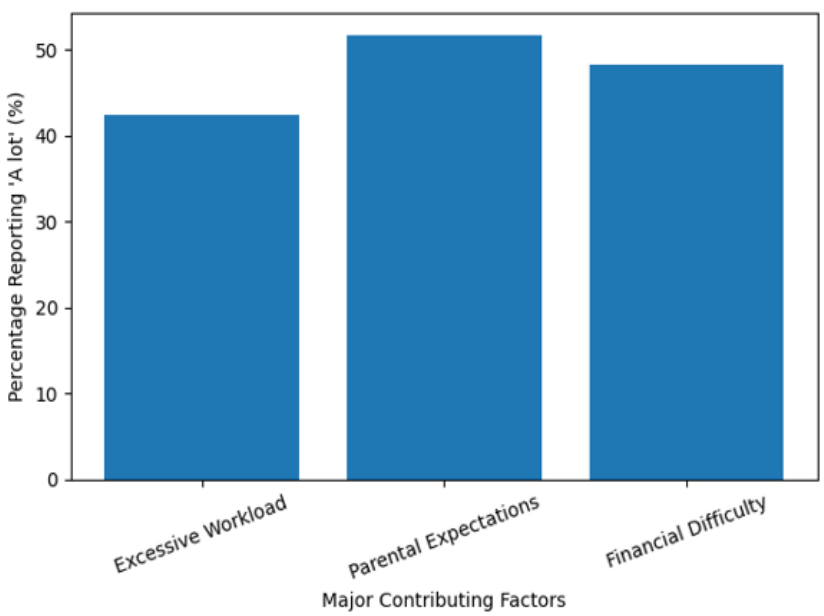

Figure 1. Distribution of perceived stress levels according to PSS-10 categories (n = 120)

Table 2 summarizes participants' responses to the selected PSS-10 items. The response category "sometimes" was the most frequently reported for most items. Specifically, 61.7% of students reported sometimes feeling upset because of unexpected events, 49.2% sometimes felt nervous and stressed, and 45.0% sometimes felt that difficulties were piling up beyond their ability to overcome them. **Figure 2** illustrates the distribution of the principal academic, psychological, social, and institutional factors reported by the participants. High parental/family expectations (51.7%), financial difficulties (48.3%), and excessive academic workload (42.5%) were the most frequently reported factors.

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Table 2. Distribution of responses to selected items of the Perceived Stress Scale-10 (PSS-10)

PSS-10 item	Never n (%)	Almost never n (%)	Sometimes n (%)	Fairly often n (%)	Very often n (%)
Been upset because of something that happened unexpectedly	19 (15.8)	7 (5.8)	74 (61.7)	13 (10.8)	7 (5.8)
Been unable to control the important things in your life	28 (23.3)	17 (14.2)	50 (41.7)	12 (10.0)	13 (10.8)
Felt nervous and stressed	20 (16.7)	14 (11.7)	59 (49.2)	19 (15.8)	8 (6.7)
Felt confident about your ability to handle your personal problems*	16 (13.3)	4 (3.3)	41 (34.2)	26 (21.7)	33 (27.5)
Felt that things were going your way*	20 (16.7)	12 (10.0)	52 (43.3)	22 (18.3)	14 (11.7)
Felt that difficulties were piling up so high that you could not overcome them	25 (20.8)	13 (10.8)	54 (45.0)	20 (16.7)	8 (6.7)

Note: Percentages are based on the total study sample (n = 120). The table presents selected items from the Perceived Stress Scale-10 (PSS-10). Items marked with an asterisk (*) are positively worded items that are reverse-scored when calculating the total PSS-10 score; however, responses are presented here in their original form.
Abbreviations: PSS-10, Perceived Stress Scale-10; n, number of participants.

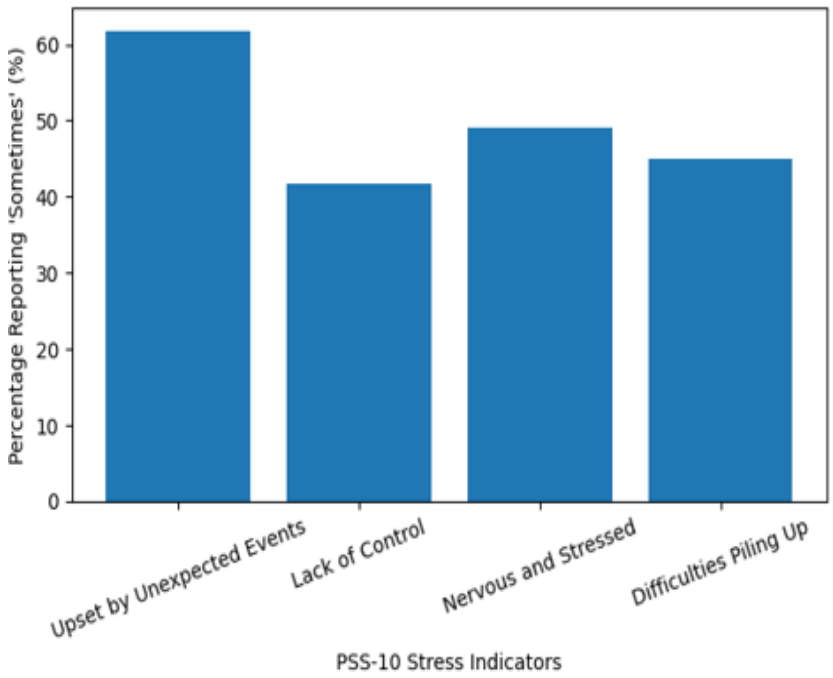

Figure 2. Major contributing factors reported at high levels among medical students (n = 120)

Table 3 presents the descriptive distribution of the academic, psychological, social, and institutional factors examined in this study. High parental/family expectations (51.7%), financial difficulties (48.3%), and excessive academic workload (42.5%) were the most frequently reported factors in the "A lot" category. In contrast, lack of academic mentorship, lack of counseling services, lack of sports facilities, and poor study environment were reported less frequently as major stressors. **Table 4** presents the results of the bivariate and multivariable logistic regression analyses. After adjustment for potential confounding variables, excessive academic workload (AOR = 2.45, 95% CI: 1.32–4.56; p = 0.004), high parental/family expectations (AOR = 2.78, 95% CI: 1.51–5.11; p = 0.001), financial difficulties (AOR = 2.63, 95% CI: 1.40–4.92; p = 0.002), lack of academic mentorship (AOR = 1.94, 95% CI: 1.05–3.60; p = 0.034), and difficulty managing multiple examinations (AOR = 1.88, 95% CI: 1.01–3.49; p = 0.046) remained independently associated with moderate-to-high perceived stress. Model diagnostics indicated an acceptable fit of the final multivariable logistic regression model (Hosmer–Lemeshow $\chi^2 = 6.84$, df = 8, p = 0.554). The model explained a moderate proportion of the variability in perceived stress (Cox–Snell $R^2 = 0.29$; Nagelkerke $R^2 = 0.38$). Multicollinearity was not a concern, with variance inflation factor values ranging from 1.21 to 2.47.

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Table 3. Distribution of academic, psychological, social, and institutional factors reported by the participants (n = 120)

Factor	A lot n (%)	Somewhat n (%)	A little n (%)	Not at all n (%)
Excessive academic workload	51 (42.5)	30 (25.0)	28 (23.3)	11 (9.2)
Difficulty managing multiple examinations	27 (22.5)	36 (30.0)	42 (35.0)	15 (12.5)
Insufficient preparation time	15 (12.5)	25 (20.8)	44 (36.7)	36 (30.0)
Lack of study materials	18 (15.0)	27 (22.5)	46 (38.3)	29 (24.2)
Difficulty with time management	13 (10.8)	34 (28.3)	36 (30.0)	37 (30.8)
Fear of examination failure	30 (25.0)	16 (13.3)	30 (25.0)	44 (36.7)
Pre-examination anxiety	14 (11.7)	27 (22.5)	51 (42.5)	28 (23.3)
Lack of self-confidence	16 (13.3)	13 (10.8)	25 (20.8)	66 (55.0)
Sleep difficulties	13 (10.8)	20 (16.7)	36 (30.0)	51 (42.5)
Fatigue during examinations	11 (9.2)	24 (20.0)	39 (32.5)	46 (38.3)
High parental/family expectations	62 (51.7)	25 (20.8)	24 (20.0)	9 (7.5)
Financial difficulties	58 (48.3)	28 (23.3)	25 (20.8)	9 (7.5)
Lack of academic mentorship	12 (10.0)	24 (20.0)	38 (31.7)	46 (38.3)
Lack of counseling services	18 (15.0)	21 (17.5)	37 (30.8)	44 (36.7)
Lack of sports facilities	22 (18.3)	25 (20.8)	32 (26.7)	41 (34.2)
Poor study environment	14 (11.7)	16 (13.3)	30 (25.0)	60 (50.0)
Use of healthy coping strategies	19 (15.8)	37 (30.8)	42 (35.0)	22 (18.3)
Substance use as a coping strategy	3 (2.5)	10 (8.3)	17 (14.2)	90 (75.0)

Note: Percentages are based on the total study sample (n = 120)
Abbreviations: n, number of participants.

Table 4. Factors associated with moderate-to-high perceived stress among medical students: Bivariate and multivariable logistic regression analysis (n = 120)

Variable	COR (95% CI)	p-value	AOR (95% CI)	p-value
Age (>22 years)	1.24 (0.65–2.37)	0.514	1.09 (0.54–2.20)	0.809
Academic year†	1.47 (0.76–2.83)	0.247	1.23 (0.61–2.48)	0.560
Marital status‡	—	—	—	—
Residence§	1.52 (0.79–2.91)	0.207	1.31 (0.65–2.64)	0.455
Monthly income¶	—	—	—	—
Excessive academic workload	3.12 (1.45–6.72)	0.004	**2.45 (1.32–4.56)**	**0.004**
Difficulty managing multiple examinations	2.05 (1.01–4.16)	0.048	**1.88 (1.01–3.49)**	**0.046**
Fear of examination failure	—	—	—	—
Pre-examination anxiety	—	—	—	—
Lack of self-confidence	—	—	—	—
Sleep difficulty	—	—	—	—
Fatigue during examinations	—	—	—	—
High parental/family expectations	3.41 (1.58–7.36)	0.002	**2.78 (1.51–5.11)**	**0.001**
Financial difficulties	3.25 (1.50–7.03)	0.003	**2.63 (1.40–4.92)**	**0.002**
Lack of academic mentorship	2.12 (1.01–4.46)	0.047	**1.94 (1.05–3.60)**	**0.034**
Lack of counseling services	—	—	—	—
Lack of sports facilities	—	—	—	—
Poor study environment	—	—	—	—
Healthy coping strategies	—	—	—	—
Substance-use coping	—	—	—	—

Note: Variables with $p < 0.20$ in bivariate analysis were entered into the multivariable logistic regression model. Statistical significance was set at $p < 0.05$.
— indicates variables not included in the multivariable model.
† Reference category: first-year students. ‡ Reference category: unmarried. § Reference category: living with family. ¶ Reference category: monthly income < 7,000 AFN.
Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; COR, crude odds ratio.

Discussion

The present study assessed general perceived stress among male undergraduate medical students at Moraa University during the examination period using the Perceived Stress Scale-10 (PSS-10). Overall, most participants experienced moderate perceived stress, and more than four-fifths were classified as having moderate-to-high perceived stress. Because the PSS-10 measures general perceived stress experienced during the previous month rather than examination-specific stress, these findings should be interpreted as reflecting students' overall perceived stress assessed during an academically demanding period rather than stress directly attributable to examinations alone [5, 6]. Academic demands emerged as important factors associated with elevated perceived stress. Students reporting excessive academic workload and difficulty managing multiple examinations had significantly greater odds of experiencing moderate-to-high perceived stress after adjustment for potential confounders. These findings are consistent with previous studies indicating that demanding curricula, frequent assessments, and cumulative academic responsibilities

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are closely associated with higher levels of perceived stress among medical students [4, 15]. However, because both exposure variables and perceived stress were measured simultaneously, the observed relationships should be interpreted as statistical associations rather than evidence of causality.

Family expectations were also independently associated with elevated perceived stress. Students who reported greater parental or family expectations were more likely to experience moderate-to-high perceived stress during the examination period. Similar findings have been reported in previous studies, suggesting that family expectations may constitute an important psychosocial influence on students' educational experiences, particularly in societies where academic achievement is strongly valued [10]. Nevertheless, the present study did not investigate the mechanisms through which family expectations may influence perceived stress. Consequently, no conclusions can be drawn regarding the underlying pathways, and further qualitative and longitudinal studies are warranted to explore this relationship in greater depth. Financial difficulties likewise remained significantly associated with elevated perceived stress after multivariable adjustment. Students reporting greater financial challenges demonstrated higher odds of moderate-to-high perceived stress than those with fewer financial concerns. This observation agrees with previous research showing that financial hardship may increase psychological burden among university students by adding economic uncertainty to existing academic demands [10, 12]. Although financial strain may plausibly influence students' well-being through several mechanisms, the current study was not designed to examine these pathways; therefore, the findings should be interpreted strictly as an observed association.

Institutional support also appeared to be relevant. Lack of academic mentorship remained independently associated with moderate-to-high perceived stress after controlling for other variables. Academic mentorship may facilitate adaptation to the educational environment by providing guidance, feedback, and academic support during challenging stages of medical training. Similar observations have been reported in previous studies emphasizing the value of supportive educational environments in promoting students' psychological well-being [1, 7]. Nevertheless, the present study did not evaluate the quality or effectiveness of mentorship programs, and future intervention studies are needed to determine whether strengthening academic mentoring can reduce perceived stress among medical students.

With respect to coping behaviors, most participants reported relatively limited use of healthy coping strategies, whereas substance-use coping was uncommon. These findings provide a descriptive overview of students' reported coping patterns during the examination period. However, the study did not examine barriers to help-seeking, mental health literacy, cultural attitudes toward psychological support, or accessibility of counseling services. Accordingly, these issues should be regarded as important topics for future investigation rather than explanations supported by the present findings [13]. The PSS-10 categories of low, moderate, and high perceived stress were used exclusively for descriptive interpretation and should not be considered diagnostic thresholds. For the regression analyses, moderate and high perceived stress were combined into a single category representing elevated perceived stress. This analytical approach was selected because only a small proportion of participants were classified as having high perceived stress, and combining these categories improved the stability and interpretability of the logistic regression model while preserving a meaningful distinction between lower and higher levels of perceived stress [15]. Despite these findings, several limitations should be acknowledged. First, the cross-sectional design precludes causal inference, and because both the explanatory variables and perceived stress were measured concurrently, the temporal sequence between exposures and outcome cannot be established [1]. Second, although participants were selected using simple random sampling, the eligible sampling frame consisted exclusively of male medical students because female students were absent from the official active student registry during the study period owing to restrictions on female participation in higher education in Afghanistan [14]. Consequently, the findings cannot be generalized to female medical students or mixed-gender student populations, and potential sex-related differences in perceived stress could not be examined. Third, this was a single-center study, and the predominance of first-year students may limit the generalizability of the findings to students at other institutions or different stages of medical education. Finally, the PSS-10 measures general perceived stress experienced during the previous month rather than examination-specific stress, and the descriptive PSS-10 categories used in this study should not be interpreted as clinical diagnostic thresholds [5, 6].

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Conclusion

Moderate-to-high general perceived stress was common among male undergraduate medical students at Moraa University during the examination period. Higher perceived stress was independently associated with excessive academic workload, greater parental or family expectations, financial difficulties, limited academic mentorship, and difficulty managing multiple examinations.

These findings provide evidence that may inform educational policies and student support strategies aimed at promoting well-being in similar medical education settings. Because the study employed a cross-sectional design, the observed relationships should be interpreted as statistical associations rather than causal effects. In addition, the PSS-10 measures general perceived stress experienced over the previous month rather than examination-specific stress. Longitudinal studies and investigations using validated instruments designed to assess examination-related stress are needed to further clarify these relationships and to evaluate changes in perceived stress over time. Medical schools may consider strengthening academic mentoring systems, reviewing assessment schedules, and expanding student support services as strategies to address factors associated with perceived stress.

Ethical considerations

The study was reviewed and approved by the Research Ethics Committee of Moraa University, Afghanistan (Ethics Approval No. MU/REC/2025/058) on 1 July 2025. Written informed consent was obtained from all participants before their participation in the study. Participation was voluntary, and participants were informed of their right to participate or withdraw from the study without penalty. The confidentiality and anonymity of participants' information were maintained throughout the study, and data were handled in accordance with the approved research protocol. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and applicable institutional regulations.

Artificial intelligence utilization for article writing

No generative Artificial Intelligence (AI) tools were used in the preparation, writing, editing, or revision of this manuscript.

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Conflict of interest statement

The authors declare no conflict of interest.

Author contributions

AZA contributed to the study design and data collection. AKY led the analysis and manuscript preparation. BA contributed to data interpretation and manuscript revision. AY contributed to data interpretation and manuscript revision. All authors reviewed and approved the final manuscript.

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Data availability statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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