Prevalence and factors causing test anxiety among medical students

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Abstract

Background Test anxiety (TA) is described as a set of psychological and behavioral responses that occur when a person is concerned about the possibility of unfavorable results or failing on an exam. Based on multiple studies, medical education is known for its rigorous curricula, continuous high academic demands, frequent assessments, practical instruction, and mentorship, all of which contribute to a stressful atmosphere that results in elevated rates of depression, anxiety during exams, subpar academic achievement, and a higher number of medical student dropouts. This study aimed to measure the prevalence of test anxiety and predisposing factors among students at Unaizah College of Medicine.

Results Our study revealed that 45.4% of responders reported having low anxiety, while 33.2% of them reported having moderate anxiety. A lower but statistically significant percentage (21.5%) expressed high levels of anxiety. Regarding the factors contributing to exam anxiety in medical students such as social support, it was found that the students with poor social support exhibited significant odds of severe test anxiety. Remarkably, there was a decreased likelihood of experiencing severe anxiety when studying all the night before the exam.

Conclusion Research results have the potential to impact institutional policies concerning medical students' well-being. Colleges can create supportive environments that address the factors causing test anxiety and promote mental health and academic success.

Keywords Test anxiety, Medical students, Stress, Academic performance

Background

Anxiety and its related issues have emerged as one of the most expansive fields of research over the few past decades. Recent studies have revealed that anxiety disorders exhibit the highest prevalence among population, yet it is widely spread among students [1, 2]. Educational experts assert that a moderate level of anxiety can be beneficial as it motivates students to exert more efforts. However, excessive anxiety can have disrupting disorders, one of which is test anxiety (TA). It is defined as a combination of psychological and behavioral responses that occur when there is dread or apprehension about the potential negative outcomes or failure in an exam. Furthermore, test anxiety includes unpleasant feelings and worries in situations when students believe their performance is being assessed as it affects their study habits and academic achievement adversely [2]. Accordingly, these disrupting disorders might hinder performance and impede the ability to demonstrate one's true abilities during tests [2–4]. Multiple studies have uncovered that several factors including being female, and having poor study skills, negative thoughts, distractions, insufficient studying, irregular meal times, difficulty concentrating,

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and excessive course load; experiencing peers pressure, parental pressures, and challenging test formats; studying all night before exams; worrying about previous exam results; perceiving the course load as heavy; and facing interpersonal issues are closely related to high levels of test anxiety [4–8]. Literature shows that medical education, in particular, is known for its challenging classes and constantly heavy academic workload, multiple assessments throughout the courses, hands on training, and mentoring leading to a stressful environment and thus high rates of depression, test anxiety, poor academic performance, and increased dropouts among medical students [3]. These factors often result in maladaptive behaviors that can negatively impact exam performance and long-term mental and physical well-being of medical students. Test anxiety poses a significant risk to medical students, adversely influencing their professional careers and compromising the quality of the healthcare they provide to their patients owing to their fear of failure as well as distractions [4, 8]. Moreover, literature shows that test anxiety affects medical undergraduate students more than postgraduates as the former ones experienced significantly higher levels of test anxiety in comparison to the latter. In terms of factors that contribute to reducing anxiety, master's students reported higher levels of confidence, study skills, receiving good grades, and prior knowledge acquired, as compared to undergraduate students. On the other hand, bachelor's level students tended to attribute test anxiety to factors such as lack of preparation, fear of failure, family responsibilities, professor and exam characteristics, poor time management skills, and inadequate study skills, more than master's students [9]. Evidence suggested the majority of the medical students lack the appropriate information about exam-taking and anxiety-reduction techniques, and those who know such techniques do not utilize them in real exams [10]. The tendency of students to rely on a multitude of strategies instead of a few well-chosen ones indicates potential inefficiencies that could be addressed through interventions that may involve advisor-guided discussions with students, integrating self-assessment and anxiety management strategies into test-taking courses. However, further research is necessary to explore the effectiveness of such interventions. Providing students and educators with an annotated list of evidence-based strategies would be beneficial in supporting their efforts. Importantly, medical educators should acknowledge and validate test anxiety as a genuine experience, and students would greatly benefit from receiving support from their educators [11]. There was no published data on the prevalence of test anxiety among medical students in Qassim Province. Therefore, this study aimed to determine the prevalence of test anxiety and its causative factors among students at Unaizah College of Medicine.

Methods

Participants

In this cross-sectional study, convenient sampling technique was utilized to collect data from 222 adult male or female medical students studying at Unaizah College of Medicine, Qassim, Saudi Arabia, in 2023. Medical students who provided their informed consents and were studying at Unaizah College of Medicine were included. However, those who were younger than 18 years old, not medical students, or not attending Unaizah College of Medicine and those who have already completed their MBBS or MD degree (graduates) were excluded.

Materials

Online self-administered questionnaire

A validated self-administered online questionnaire, spanning over 4 months, was used to assess the prevalence and factors causing test anxiety among students of Unaizah College of Medicine. The participants were estimated by OpenEpi web tool with a 95% confidence level and 50% prevalence. A *P*-value of < 0.05 was considered statistically significant.

The questionnaire consisted of distinct parts, and the initial section concentrated on gathering demographic information from the participants. This included gender, generation, marital status, year of study, educational qualifications of the participants' parents, and monthly income. Generation refers to whether the participant is the first in their family to pursue a career in the medical field (first-generation medical students), or they have family members who are doctors (second-generation medical students). The second section is designed to assess the prevalence of test anxiety, utilizing the Westside Test Anxiety Scale. The third section examined potential risk factors contributing to exam-related anxiety among medical students. These factors included students' lifestyles, study methods psychological concerns, and examination systems.

Westside test anxiety scale

Students were instructed to rate their responses to the 10 items of the Westside Test Anxiety Scale (WTAS) on a 5-point Likert scale, ranging from 1 (never or not at all true) to 5 (extremely or always true). The total score obtained from the scale was then divided by 10 to determine the level of test anxiety. Based on the guidelines provided by the WTAS, participants who scored below 1.9 were categorized as having low test anxiety, scores between 2.0 and 2.5 indicated normal or average test anxiety, scores between 2.5 and 2.9 indicated high normal

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test anxiety, scores between 3.0 and 3.4 indicated moderately high anxiety, scores between 3.5 and 3.9 indicated high test anxiety, and scores between 4.0 and 5.0 indicated extremely high anxiety levels.

Statistical package for the social sciences (SPSS) software

Statistical Package for the Social Sciences (SPSS) software was utilized to manage the data and analyze the results with the contribution of data analysis experts. Data was imported from an Excel file into SPSS. Descriptive analysis was performed for all study variables to determine their frequencies and percentages. Cross-tabulation and chi-square tests were used to analyze relationships between text anxiety levels and different sociodemographic characteristics. Logistic regression analysis was emploed to determine significant predictors associated with high anxiety levels among medical students. *P*-value < 0.05 was considered significant.

Procedures

The study protocol was approved by the university ethical committee. At the beginning of the questionnaire, informed consent was provided to explain the study objectives and the participant's role in the study if they agreed to volunteer to participate. As stated in the informed consent, the participant's responses were kept anonymous, and data was only used for the purposes described in the study objectives. Additionally, participants could withdraw from the study at any time.

Background information about studying medicine in Saudi Arabia

As for studying medicine in Saudi Arabia, the medical program spans a duration of 6 years and seamlessly integrates essential concepts from both basic and clinical sciences. The first 3 years are dedicated to comprehensively covering the fundamentals of medical sciences, while the remaining years focus on clinical rotations. During this phase, students venture outside the college environment and actively participate in training at hospitals or primary health care centers. Furthermore, the program adopts a hybrid approach, effectively combining student-centered and teacher-centered activities to facilitate optimal learning. However, one significant aspect that received low ratings from students is the balance between enjoyment and the stress associated with studying medicine. This issue is particularly prevalent among first-year students, indicating the necessity for further research to determine the exact sources of this stress. However, it can be reasonably inferred that the stress experienced is substantial enough to overshadow any enjoyment, underscoring the importance of incorporating healthy extracurricular activities into the curriculum.

Results

The sociodemographic profile of medical students surveyed revealed a majority of females (57.6%) compared to males (42.4%), with a split between first-generation, the first members in their family to join a medical school (38.0%), and second-generation, those whose parents are doctors (62.0%), medical students. Most students were single (97.6%), while a minimal percentage were married (1.5%) or divorced (1.0%). Academic distribution across years included the highest representation in the MD4 (19.5%), the lowest in the MD1 (16.1%), and premed (23.4%). Concerning parental education, a significant number of fathers held bachelor's degrees (46.3%), while mothers had similar educational qualifications, with 42.0% holding bachelor's degrees. Income distribution reflected that nearly a third of students earned less than 10,000 SR monthly (29.3%), followed by 24.4% earning more than 25,000 SR per month , and a relatively smaller portion falling within the other income brackets (Table 1).

The study delved into factors contributing to exam anxiety among students, revealing prevalent concerns across various domains. The examination of lifestyle and study styles highlighted that a significant proportion experienced moderate-to-low self-esteem during exams (87.3%), with the majority reporting average levels (52.2%). Social support was moderately prevalent (43.4%), but poor support affected 16.1% of students. Examination types were predominantly a mix of both oral and written formats (47.8%), with written exams slightly more common (44.4%). Anxiety levels fluctuated among students, with 33.2% experiencing increased anxiety since the year before and 36.1% reporting consistent levels. Factors exacerbating anxiety encompassed extensive course loads (94.1%), negative thoughts and self-criticism (77.1%), and inadequate time for physical activities during exams (75.6%). However, confidence building such as having a study plan (86.3%), time management (92.2%), and receiving good grades (94.6%) was reported to reduce anxiety. A notable 60.5% of participants found anxiety-reducing techniques helpful, while 82.4% believed professors' teaching methods could influence anxiety level before exams. Among those who practiced (*n* = 124) anxiety-reducing techniques, positive thinking was the most commonly utilized technique to reduce anxiety (31.5%), followed by breathing deeply (25.0%), exercise (23.4%), and entertainment (21.0%). Additionally, a portion of students disclosed diagnoses of anxiety (21.5%), depression (12.2%), social phobia (3.9%), and personality disorder (2.4%), while the majority (72.2%) reported no diagnoses (Table 2).

The Westside Test Anxiety Scale evaluated test anxiety levels among participants, revealing a varied distribution

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Table 1 Sociodemographic characteristics of the medical students

		N	%
Gender	Female	118	57.6
	Male	87	42.4
Generation	First-generation medical students	78	38.0
	Second-generation medical students	127	62.0
Marital status	Divorced	2	1.0
	Married	3	1.5
	Single	200	97.6
Year of study	Premed2	48	23.4
	MD 1	33	16.1
	MD 2	47	22.9
	MD 3	37	18.0
	MD 4	40	19.5
Father's educational qualification	No education	5	2.4
	Elementary school	8	3.9
	Middle school	10	4.9
	High school	30	14.6
	Diploma	28	13.7
	Bachelors	95	46.3
	Master	13	6.3
	Doctorate	16	7.8
Mother's educational qualification	No education	9	4.4
	Elementary school	20	9.8
	Middle school	16	7.8
	High school	27	13.2
	Diploma	30	14.6
	Bachelors	86	42.0
	Master	11	5.4
	Doctorate	6	2.9
Monthly income (in Saudi Riyals)	Less than 10,000 SR	60	29.3
	10,000 SR–14,999 SR	39	19.0
	15,000 SR–19,999 SR	37	18.0
	20,000 SR–24,999 SR	19	9.3
	More than 25,000 SR	50	24.4

across categories. A quarter of respondents reported comfortably low anxiety (25.4%), while a similar proportion fell within the normal or average range (20.0%). High normal anxiety was reported by 14.1%, with moderately high anxiety levels noted among 19.0%. A smaller portion reported high (7.3%) and extremely high (7.3%) levels of test anxiety, reflecting a spectrum from low to significantly elevated anxiety levels among the surveyed individuals (Figure 1). The participants' test anxiety scores, gauged by the Westside Test Anxiety Scale, were categorized into three main groups for enhanced representability. These groups were delineated as follows: low-test anxiety (1.0–2.5), moderate-test anxiety (2.6–3.4), and high-test anxiety (3.5–5.0) ranges. This stratification aimed to provide a clearer understanding of the distribution and intensity of test anxiety among the surveyed individuals. The analysis showed that a notable portion experienced low anxiety levels (45.4%), followed by moderate anxiety levels reported by 33.2% of respondents. A smaller yet significant proportion reported high anxiety levels (21.5%).

The analysis of test anxiety levels based on various sociodemographic characteristics is shown in Table 3. Gender exhibited a noteworthy correlation with anxiety levels ($p = 0.003$), with females reporting higher proportions of moderate and low anxiety compared to males. However, other factors such as the generation of medical students, marital status, academic year,

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Table 2 Factors causing exam anxiety related to students' lifestyles, study styles, psychological problems, and examination system

		N	%
Self-esteem during examination periods	High	26	12.7
	Average	107	52.2
	Low	72	35.1
Social support	Good	83	40.5
	Moderate	89	43.4
	Poor	33	16.1
Exam type	Oral	16	7.8
	Written	91	44.4
	Both oral and written	98	47.8
Anxiety level	Decrease since last year	63	30.7
	Increase since last year	68	33.2
	Remains the same	74	36.1
Factors increasing the exam anxiety	Studying all night before	133	64.9
	Extensive course loads	193	94.1
	Negative thinking & self-criticism	158	77.1
	Long duration of exam	112	54.6
	Not making time for physical activities during examination periods	155	75.6
	Feeling parental pressure	80	39.0
	Frequent tests	151	73.7
	Irrational thoughts about exams & outcomes fear that you will fail	156	76.1
	Improper nutrition	120	58.5
	Unsatisfactory grades	155	75.6
	Not recalling and reviewing	160	78.0
	Not having study plan	120	58.5
	Negatively affected by interpersonal issues	132	64.4
	Not having time for leisure activities during examination period	162	79.0
	Consuming more caffeine during examination periods	104	50.7
	Suffering from peer pressure during examination periods	114	55.6
Factors reducing exam anxiety	Confidence	177	86.3
	Study plan	177	86.3
	Receiving good grades	194	94.6
	Prior information gained	180	87.8
	Time management	189	92.2
	Sufficient sleep	180	87.8
	Nonsmoker	193	94.1
	Smoked less	1	.5
	Sometimes smoked more	5	2.4
	Often smoked more	6	2.9
Do you feel anxiety-reducing techniques help you	No	81	39.5
	Yes	124	60.5
Utilized technique to reduce anxiety (*n* = 124)	Entertainment	26	21.0
	Exercise	29	23.4
	Breathing deeply	31	25.0
	Positive thinking	38	31.5
Do you think the professor's teaching methods can influence your exam anxiety?	No	36	17.6
	Yes	169	82.4

Table 2 (continued)

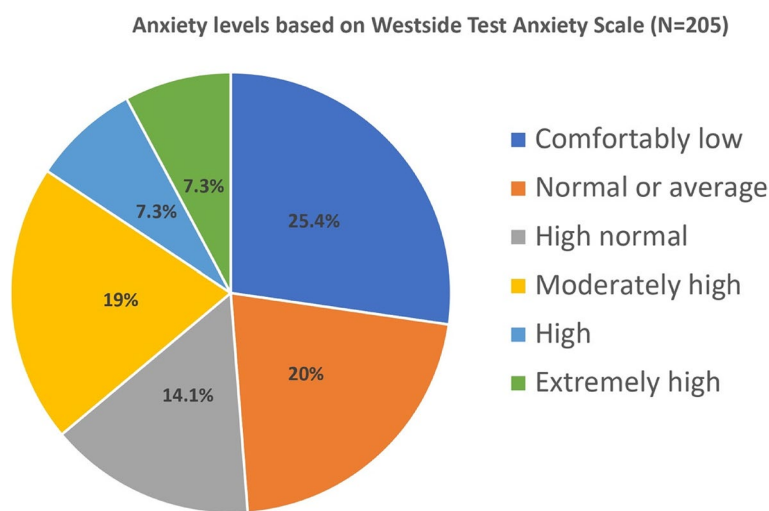|		N	%
Have you ever been diagnosed with any of the following?	Anxiety	44	21.5
	Depression	25	12.2
	Social phobia	8	3.9
	Panic attack	2	1.0
	Personality disorder	5	2.4
	None	148	72.2

Anxiety levels based on Westside Test Anxiety Scale (N=205)

- Comfortably low
- Normal or average
- High normal
- Moderately high
- High
- Extremely high

Fig. 1 Distribution of test anxiety level among medical students

fathers' and mothers' educational levels, and monthly incomes did not exhibit statistically significant associations with anxiety levels ($p > 0.05$).

The logistic regression analysis unveiled several significant predictors associated with high anxiety levels among the participants (Table 4). Gender emerged as a prominent factor, with females showing notably higher odds of experiencing high anxiety (odds ratio = 19.05, $p = 0.002$). Additionally, the participants reporting poor social support exhibited increased odds of high anxiety (odds ratio = 2.56, $p = 0.042$). Other significant predictors of heightened anxiety levels included the perception of increased anxiety since the year before (odds ratio = 5.94, $p = 0.004$) and facing frequent tests (odds ratio = 10.58, $p = 0.009$). Conversely, certain factors such as studying all night before (odds ratio = 0.10, $p = 0.046$) and a history of no psychological problems (odds ratio = 0.41, $p = 0.049$) showed lower odds associated with high anxiety.

Discussion

Understanding the prevalence of test anxiety provides crucial insight into the mental health challenges students face within a rigorous academic environment. It sheds light on the specific stressors that can influence students' well-being, affecting their academic performance and overall quality of life. To start with, there is an apparent gender disparity in reported anxiety levels, with females exhibiting higher proportions of moderate and low anxiety compared to males. Both correlation analysis and logistic regression suggest that being female significantly increases the likelihood of experiencing high anxiety levels. This aligns with existing research that often indicates higher anxiety levels among females in various contexts [12–15]. The analysis indicated that various sociodemographic factors such as generation, marital status, academic year, parental education levels, and income did not show statistically significant associations with anxiety levels. This suggests that in this study, these factors

Table 3 Relationship of text anxiety level based on different sociodemographic characteristics

			Text anxiety level				*p*-value
			Low	Moderate	High	Total	
Gender	Female	N	46	37	35	118	0.003
		%	39.0	31.4	29.7	100.0	
	Male	N	47	31	9	87	
		%	54.0	35.6	10.3	100.0	
Generation of medical students	First	N	33	24	21	78	0.328
		%	42.3	30.8	26.9	100.0	
	Second	N	60	44	23	127	
		%	47.2	34.6	18.1	100.0	
Marital status	Divorced	N	2	0	0	2	0.380
		%	100.0	0.0	0.0	100.0	
	Married	N	1	2	0	3	
		%	33.3	66.7	0.0	100.0	
	Single	N	90	66	44	200	
		%	45.0	33.0	22.0	100.0	
Academic year	Premed2	N	25	11	12	48	0.302
		%	52.1	22.9	25.0	100.0	
	MD 1	N	12	14	7	33	
		%	36.4	42.4	21.2	100.0	
	MD 2	N	24	17	6	47	
		%	51.1	36.2	12.8	100.0	
	MD 3	N	17	14	6	37	
		%	45.9	37.8	16.2	100.0	
	MD 4	N	15	12	13	40	
		%	37.5	30.0	32.5	100.0	
Academic year	Premed2	N	25	11	12	48	0.302
		%	52.1	22.9	25.0	100.0	
	MD 1	N	12	14	7	33	
		%	36.4	42.4	21.2	100.0	
	MD 2	N	24	17	6	47	
		%	51.1	36.2	12.8	100.0	
	MD 3	N	17	14	6	37	
		%	45.9	37.8	16.2	100.0	
	MD 4	N	15	12	13	40	
		%	37.5	30.0	32.5	100.0	

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Table 3 (continued)

			Text anxiety level				*p*-value
			Low	Moderate	High	Total	
Fathers educational level	No education	N	2	3	0	5	0.152
		%	40.0	60.0	0.0	100.0	
	Elementary school	N	4	1	3	8	
		%	50.0	12.5	37.5	100.0	
	Middle school	N	5	5	0	10	
		%	50.0	50.0	0.0	100.0	
	High school	N	12	11	7	30	
		%	40.0	36.7	23.3	100.0	
	Diploma	N	7	12	9	28	
		%	25.0	42.9	32.1	100.0	
	Bachelors	N	50	29	16	95	
		%	52.6	30.5	16.8	100.0	
	Master	N	8	2	3	13	
		%	61.5	15.4	23.1	100.0	
	Doctorate	N	5	5	6	16	
		%	31.3	31.3	37.5	100.0	
Mother's educational level	No education	N	6	3	0	9	0.546
		%	66.7	33.3	0.0	100.0	
	Elementary school	N	12	3	5	20	
		%	60.0	15.0	25.0	100.0	
	Middle school	N	9	5	2	16	
		%	56.3	31.3	12.5	100.0	
	High school	N	10	10	7	27	
		%	37.0	37.0	25.9	100.0	
	Diploma	N	12	8	10	30	
		%	40.0	26.7	33.3	100.0	
	Bachelors	N	37	32	17	86	
		%	43.0	37.2	19.8	100.0	
	Master	N	5	5	1	11	
		%	45.5	45.5	9.1	100.0	
	Doctorate	N	2	2	2	6	
		%	33.3	33.3	33.3	100.0	
Monthly income	Less than 10,000 SR	N	26	22	12	60	0.637
		%	43.3	36.7	20.0	100.0	
	10,000 SR–14,999 SR	N	16	13	10	39	
		%	41.0	33.3	25.6	100.0	
	15,000 SR–19,999 SR	N	14	15	8	37	
		%	37.8	40.5	21.6	100.0	
	20,000 SR–24,999 SR	N	10	7	2	19	
		%	52.6	36.8	10.5	100.0	
	More than 25,000 SR	N	27	11	12	50	
		%	54.0	22.0	24.0	100.0	

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Table 4 Logistic regression for predicting risk factors of high anxiety

Independent variables	Odds ratio & confidence interval level at 95%	*p*-value
Gender = female	19.05 (5.39–30.81)	0.002
First generation medical students	1.38 (0.27–7.00)	0.039
Marital status	4.21 (1.12–9.12)	0.997
Academic year	0.55 (0.01–21.28)	0.746
Fathers' educational level	6.27 (2.12–12.13)	0.997
Mother's educational level	9.14 (3.76–16.21)	0.992
Monthly income	0.55 (0.03–10.41)	0.690
Self-esteem during examination periods = high	0.15 (0.00–9.70)	0.370
Social support = poor	2.56 (1.13–5.63)	0.042
Exam type	1.10 (0.04–2.43)	0.432
Anxiety level = increased since last year	5.94 (1.69–10.74)	0.004
Studying all night before	0.10 (0.01– 0.96)	0.046
Extensive course loads	1.00 (0.21–3.31)	0.099
Negative thinking & self-criticism	0.29 (0.01–7.78)	0.457
Long duration of exam	0.25 (0.03–2.53)	0.241
Not making time for physical activities during examination periods	2.02 (0.17–24.68)	0.581
Feeling parental pressure	0.19 (0.03–1.33)	0.094
Frequent tests	10.58 (3.29–15.47)	0.009
Irrational thoughts about exams & outcomes fear that you will fail	0.06 (0.00–3.50)	0.174
Improper nutrition	1.12 (0.20–6.27)	0.901
Unsatisfactory grades	0.07 (0.00–1.33)	0.077
Not recalling and reviewing	0.16 (0.01–2.80)	0.212
Not having study plan	0.32 (0.03–3.35)	0.339
Negatively affected by interpersonal issues	3.81 (0.44–33.41)	0.227
Not having time for leisure activities during examination period	1.37 (0.09–21.34)	0.824
Consuming more caffeine during examination periods	0.21 (0.03–1.53)	0.125
Suffering from peer pressure during examination periods	0.13 (0.01–1.56)	0.107
Confidence	0.37 (0.03–4.70)	0.445
Study plan	0.10 (0.00–3.74)	0.210
Receiving good grades	0.05 (0.00–8.79)	0.253
Prior information gained	0.33 (0.02–6.44)	0.464
Time management	2.73 (0.22–4.76)	0.193
Sufficient sleep	3.12 (0.79–5.70)	0.066
Often smoked more	0.76 (0.01–1.21)	0.991
Think that anxiety reducing technique helps to reduce anxiety	4.18 (0.54–32.48)	0.172
Think the professors teaching methods can influence anxiety	0.31 (0.02–6.59)	0.456
Diagnosed of anxiety	0.17 (0.00–9.74)	0.393
Diagnosed of depression	0.05 (0.00–1.57)	0.087
Diagnosed of social phobia	2.13 (0.12–5.15)	0.510
Experienced panic attack	1.21 (0.43–3.02)	0.512
Experienced personality disorder	0.39 (0.11–0.91)	0.911
No history of psychological problems	0.41 (0.11–0.99)	0.049

might not directly influence the reported anxiety levels among participants. However, it is important to interpret these findings cautiously due to several limitations inherent in the study. Actually, identifying the factors causing test anxiety enables the development of targeted interventions. By knowing what specific elements contribute to anxiety, educators and mental health professionals can design support programs, coping strategies, and interventions to help students manage and mitigate test anxiety effectively.

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The logistic regression analysis revealed several predictors significantly associated with high anxiety levels. These include poor social support, increased anxiety perception compared to the previous year, facing frequent tests, and a history of psychological problems. Participants reporting poor social support exhibited increased odds of high anxiety. This finding aligns with established research indicating that social support acts as a protective factor against anxiety [16, 17]. A strong social support network provides individuals with emotional, informational, and instrumental assistance, buffering the impact of stressors and reducing anxiety levels [18, 19]. This consistency with prior studies adds credibility to the importance of social support in anxiety management among medical students [20–22]. While the study identified a correlation between poor social support and heightened anxiety, it does not establish the direction of causality. It is plausible that individuals experiencing high anxiety may inadvertently withdraw or face challenges in seeking and maintaining social connections, leading to a perception of poor support.

Another important finding in this study was that those who perceived an increase in anxiety since the previous year were more likely to experience high anxiety. This could suggest a pattern of escalating anxiety levels among the participants and also hints at the temporal aspect of anxiety levels, suggesting that some individuals might experience a progressive increase in anxiety over time [23]. Understanding the temporal dynamics of anxiety is critical in identifying and addressing early signs of escalating anxiety, potentially allowing for timely interventions. However, it is essential to explore whether an actual increase in anxiety triggers high anxiety levels or if high anxiety leads to a heightened perception of anxiety, potentially creating a cyclical pattern that exacerbates the condition. Facing frequent tests was significantly associated with higher anxiety levels, indicating a potential stressor in the academic environment. Evidence shows that high-stakes assessments, especially when frequent, can induce performance pressure, fear of failure, and a constant need for academic achievement, contributing to heightened anxiety levels [24–26]. Surprisingly, studying all night before was associated with lower odds of high anxiety. This might be an unexpected finding and warrants further investigation. Also, it is crucial to consider the subjective perception of anxiety. Students who engage in extensive studying might perceive themselves as better prepared, potentially reducing their anxiety about the impending test or academic evaluation [27]. Additionally, students who possess effective study habits, better time management skills, or lower baseline anxiety might be more likely to stay up all night to study, contributing to the observed association [28]. Participants with

no history of psychological problems had lower odds of experiencing high anxiety. Individuals without a history of psychological problems might possess inherent resilience or coping mechanisms that render them less susceptible to experiencing high levels of anxiety [29]. This resilience could stem from adaptive coping strategies, strong support systems, or a more robust mental health foundation [30].

Strength and limitations
This study had several strengths that contributed to its robustness. Firstly, its cross-sectional design allowed for a snapshot view of anxiety levels among participants at a specific point in time, providing valuable insights into this aspect of their experience. Moreover, the inclusion of both male and female students across various academic years in medical school broadened the study's scope, offering a more comprehensive understanding of anxiety prevalence. The questionnaire's thoroughness ensured that a wide range of relevant factors influencing anxiety could be explored, enhancing the depth of the study. Lastly, the use of the Westside Test Anxiety Scale, a recognized and reliable method for evaluating anxiety levels, added credibility and accuracy to the findings.

The lack of statistically significant associations between sociodemographic factors like generation, marital status, academic year, parental education levels, and income with anxiety levels might stem from constraints within the research design. The study's sample size, potentially limited diversity within demographics, and the complexity of anxiety determinants could have obscured potential relationships. The study relied on self-reported data related to factors influencing anxiety, study patterns and history of psychological problems, which could be subject to recall bias or underreporting. Moreover, the tools used to measure anxiety and sociodemographic characteristics might not have been sufficiently sensitive or comprehensive. These limitations suggest a need for more robust methodologies, larger and more diverse samples, and a broader consideration of factors influencing anxiety levels in future research endeavors.

Conclusions
Findings from this study can influence institutional policies related to students' well-being. Colleges can develop policies or allocate resources to create supportive environments that address the factors leading to test anxiety, promoting mental health and academic success. It enriches the body of knowledge on mental health in educational settings, potentially paving the way for further studies, comparisons across institutions, and international perspectives. Highlighting the prevalence of test anxiety raises awareness among educators, students,

and parents about the challenges students face. Thus, it could promote a deeper understanding of the importance of mental health support within academic settings and encourage open discussions about coping mechanisms and seeking help when needed.

Abbreviations
TA   Test anxiety
WTAS   Westside Test Anxiety Scale

Declarations

Ethics approval and consent to participate
The study protocol was approved by the university ethical committee. Informed consent for taking part in the study was obtained from each participant.

Consent for publication
Not required.

Competing interests
The authors declare that they have no competing interests.

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