



Original Article

Exam-Related Anxiety among Medical Undergraduates at the Faculty of Medicine, University of Zawia, Libya: A Cross-Sectional Study

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Abstract

Background: Medical degree programs are internationally recognized as among the most academically rigorous forms of professional training. In this demanding environment, exam-related anxiety constitutes a substantial psychological burden, yet its magnitude among medical undergraduates in Libya has received limited empirical attention. This investigation sought to quantify examination anxiety levels among students enrolled at the Faculty of Medicine, University of Zawia, and to evaluate associations between anxiety severity and selected demographic and academic characteristics. **Methods:** This cross-sectional survey-based study was employed, utilising a 38-item, psychometrically validated questionnaire administered to students spanning all academic stages (first year through internship). Item responses were captured on a four-point Likert scale (0 = strongly disagree to 3 = strongly agree). Anxiety severity was categorised as mild, moderate, severe, or very severe based on mean per-item scores. Inferential analyses comprised the Mann-Whitney U test, the Kruskal-Wallis H test, the chi-square test, and Pearson correlation coefficients. **Result:** Two hundred and thirty-four students participated (female: 83.3%; male: 16.7%; mean age: 22.2 ± 2.3 years). The instrument exhibited excellent internal consistency (Cronbach's $\alpha = 0.931$). The cohort mean total anxiety score was 63.7 ± 22.1 out of a maximum of 114 (55.9% of the attainable maximum), corresponding to a mean per-item score of 1.68 ± 0.58 . The majority of participants (58.1%) met criteria for severe or very severe anxiety. Female students returned significantly elevated scores relative to their male counterparts (65.1 ± 21.7 versus 56.5 ± 23.0 ; $p = 0.023$). No statistically significant variation was detected across academic year ($p = 0.147$), academic standing ($p = 0.354$), or age ($r = -0.066$, $p = 0.319$). Items attracting the highest endorsement rates included sleep impairment arising from pre-examination rumination (90.2%), pervasive tension during final examination preparation (87.6%), and the desire to be relieved of examination-related distress (89.7%). **Conclusion:** This study has found that examination anxiety is highly prevalent within this cohort, with the majority of students reporting severe or very severe symptomatology. Female students are disproportionately affected. These findings underscore an urgent requirement for systematically delivered psychological support, tailored stress-management programs, and structural reforms within the curriculum.

Keywords: exam-related anxiety; medical undergraduates; psychological wellbeing; academic stress; Libya;

Introduction

Medical education occupies a distinctive position among professional training pathways, characterized by an unrelenting academic workload, irregular sleep schedules, and persistent pressure to assimilate voluminous factual content within constrained timeframes [1]. These conditions collectively generate a milieu that is disproportionately conducive to psychological disturbance, and examination anxiety represents one of the most

consistently documented sequelae of this environment. Understood as the cluster of cognitive, physiological, and behavioural responses that emerge in anticipation of, or during, evaluative situations with meaningful personal consequences, examination anxiety can exert a profound detrimental influence on both academic attainment and broader wellbeing [3].

Conceptualized initially within a transactional stress framework, test anxiety encompasses both a worry



component—comprising negative self-referential cognitions, anticipation of failure, and ruminative ideation—and an emotionality component, encompassing autonomic arousal manifestations such as tachycardia, diaphoresis, tremulousness, and gastrointestinal disturbance [4]. The literature extending from the early 1950s has established test anxiety as a phenomenon spanning educational cultures and professional disciplines, with particular salience for high-stakes assessment environments including undergraduate medical programs [5]. Epidemiological data indicate that the global point prevalence of clinically significant anxiety among medical students approximates 33.8% (95% CI: 29.2–38.7%), a figure considerably exceeding estimates for the general population of comparable age [6]. Systematic reviews have reported pooled prevalence figures ranging from 17% to 54%, depending upon the screening instrument employed and the geographic and institutional composition of the sampled population [2]. Substantive regional heterogeneity exists, with learners in sub-Saharan Africa, the Middle East, and South and East Asia consistently demonstrating higher prevalence rates than those in North America and Western Europe [6, 7]. With respect to gender, pooled estimates suggest that female medical students experience anxiety at higher rates (38.0%) than male students (27.6%), though this differential does not uniformly attain statistical significance across pooled analyses [6].

Within the Libyan context, medical training is structured around a demanding six-year integrated curriculum in which high-stakes written examinations constitute the primary mechanism for progression. The Faculty of Medicine at the University of Zawia accommodates a substantial cohort distributed across six academic stages, culminating in an intern-doctor year. Notwithstanding the recognized centrality of psychological health to professional formation, empirical inquiry into examination-specific anxiety in Libyan medical populations remains nascent. A recent cross-sectional report from the University of Derna documented anxiety in 42.2% of students in the aftermath of catastrophic flooding, underscoring the susceptibility of this population to psychological adversity [8]; however, normative baseline data for examination anxiety in the absence of acute environmental stressors are conspicuously absent from the Libyan literature. The present study was designed to address this lacuna by systematically quantifying

examination anxiety among students at the Faculty of Medicine, University of Zawia, and by delineating its relationship with gender, academic year, academic standing, and age. The resultant data are intended to establish an empirical foundation for the design and implementation of targeted supportive interventions.

Materials and Methods

Study Design and Setting

This investigation employed a cross-sectional survey design and was conducted within the Faculty of Medicine, University of Zawia, Libya. The faculty delivers a standard integrated medical curriculum across six academic years, the final of which constitutes a supervised clinical internship. Survey data were gathered via an online platform disseminated to enrolled students throughout the academic year.

Study Population and Recruitment

All students currently registered at the Faculty of Medicine were considered eligible for inclusion irrespective of academic year, gender, or academic standing. Participant recruitment was accomplished through announcements distributed via official academic communication channels and social communication groups during the first three months of 2026. Involvement was entirely voluntary; electronic informed consent was secured at the outset of the questionnaire, and no personal identifiers were collected beyond optional student registration codes, which were reserved for prospective linkage with academic performance data. This study was approved by Biosafety and Bioethics Committee of Libyan Medical Research Center, Zawia, Libya (approval reference: NBC:018.H.24.85).

Measurement Instrument

The study employed a 38-item self-report questionnaire developed through the adaptation of Sarson's Examination Anxiety Scale [9] and contextualised for the Libyan academic setting. The instrument assessed four distinct domains of examination anxiety:

Cognitive worry: encompassing fear of failure, negative performance expectations, and catastrophic appraisal

Physiological arousal: including palpitation, tremor, diaphoresis, and headache

Behavioural manifestations, such as sleep disruption and avoidance



Situational triggers: encompassing examination announcements, waiting periods, and the distribution of examination papers

Respondents rated each item on a four-point Likert scale (0 = strongly disagree; 1 = disagree; 2 = agree; 3 = strongly agree). Supplementary demographic items captured gender, age, current academic year, and academic standing (regular progression, repetition of year, or transfer).

Scoring and Severity Classification

A composite total score was derived by summing all 38 item scores, yielding a theoretical range of 0–114. The mean per-item score (total score divided by 38) was used to classify anxiety severity into four categories: mild (≤ 0.75 ; 0–25% of maximum), moderate (0.76–1.50; 25–50%), severe (1.51–2.25; 50–75%), and very severe (> 2.25 ; 75–100%).

Statistical Analyses

All statistical procedures were conducted in IBM SPSS Statistics (Version 27.0). Frequencies, proportions, means, standard deviations and medians were used for descriptive statistics. Score distribution normality was evaluated via the Shapiro-Wilk test. Between-group comparisons for two independent samples were conducted using the Mann-

Whitney U test; for three or more groups, the Kruskal-Wallis H test was applied. Associations between categorical variables were assessed by chi-square analysis. Linear relationships between continuous variables were quantified by the Pearson correlation coefficient. Internal reliability was estimated by Cronbach's alpha. The threshold for statistical significance was set at $p < 0.05$ throughout.

Results

Participant Characteristics

The final analytical sample comprised 234 students. Their demographic profile is presented in Table 1. The cohort had a mean age of 22.2 ± 2.3 years (range: 18–30; median: 22.0). Female students constituted 83.3% of participants, a figure broadly consistent with the gender composition documented in regional medical schools [10]. Representation across academic years was approximately uniform, with the first year (19.2%) and the internship cohort (17.9%) comprising the largest subgroups. The overwhelming majority of students were progressing normally through their program (91.0%), with small proportions repeating (6.8%) or having transferred from another year (2.1%).

Table 1. Demographic Profile of Study Participants (N = 234)

Characteristic	Category	N	%
Gender	Female	195	83.3
	Male	39	16.7
Academic Year	1st Year	45	19.2
	2nd Year	28	12.0
	3rd Year	41	17.5
	4th Year	41	17.5
	5th Year	37	15.8
	Internship	42	17.9
Academic Standing	Regular	213	91.0
	Repeating	16	6.8
	Transferred	5	2.1
Age Group	≤ 20 years	48	20.5
	21–22 years	97	41.5
	23–24 years	68	29.1
	25–26 years	18	7.7
	≥ 27 years	3	1.3

Instrument Reliability

The 38-item scale demonstrated excellent internal consistency, yielding a Cronbach's alpha coefficient of 0.931. This figure surpasses the conventionally accepted threshold for high reliability ($\alpha \geq 0.90$) and confirms that

the instrument provides a coherent and reproducible assessment of examination anxiety within this population.

Overall Anxiety Levels

Descriptive statistics for the total anxiety score and the corresponding severity distribution are presented in Table



2. The cohort mean total score of 63.7 ± 22.1 represented 55.9% of the attainable maximum, indicative of a moderate-to-high burden of examination anxiety. Score distribution was approximately Gaussian (Shapiro-Wilk:

$W = 0.992$, $p = 0.226$). Approximately three-fifths of the cohort (58.1%, $n = 136$) reported severe or very severe anxiety, whereas merely 6.0% ($n = 14$) were classified in the mild category.

Table 2. Summary Statistics and Anxiety Severity Classification

Measure	Value
Total score range	10 – 114 (maximum attainable: 114)
Mean total score ($\pm$ SD)	63.7 ± 22.1
Median total score	63.0
Mean per-item score ($\pm$ SD)	1.68 ± 0.58
Percentage of maximum	55.9%
Mild anxiety, n (%)	14 (6.0%)
Moderate anxiety, n (%)	84 (35.9%)
Severe anxiety, n (%)	96 (41.0%)
Very severe anxiety, n (%)	40 (17.1%)
Severe + Very severe combined, n (%)	136 (58.1%)

Demographic Correlates of Anxiety

Gender

Female participants recorded statistically significantly higher total anxiety scores than their male peers (Table 3; Mann-Whitney $U = 4681.0$, $p = 0.023$). The magnitude of

the difference was modest (effect size $r = 0.149$), corresponding to a mean differential of 8.6 points, equivalent to a 15.2% relative increment over the male mean.

Table 3. Anxiety Scores Stratified by Gender

Gender	N	Mean $\pm$ SD	Median	Range
Female	195	65.1 ± 21.7	64.0	10–114
Male	39	56.5 ± 23.0	50.0	15–105
Statistical test		Mann-Whitney $U = 4681.0$	$p = 0.023$	

Academic Year

Comparison of anxiety scores across the six academic stages revealed no statistically significant variation (Kruskal-Wallis $H = 8.170$, $p = 0.147$; Table 4).

Descriptively, third-year students reported the highest mean score (69.4 ± 21.5), whilst intern-doctors recorded the lowest (57.4 ± 22.1); these differences, however, did not attain the predetermined threshold for significance.

Table 4. Anxiety Scores by Academic Year

Academic Year	N	Mean $\pm$ SD	Median
1st Year	45	67.6 ± 22.3	72.0
2nd Year	28	61.5 ± 26.5	63.5
3rd Year	41	69.4 ± 21.5	63.0
4th Year	41	61.6 ± 20.3	61.0
5th Year	37	63.8 ± 19.7	64.0
Internship	42	57.4 ± 22.1	55.0
Kruskal-Wallis $H = 8.170$, $p = 0.147$			

Academic Standing

No significant between-group differences were detected when students were stratified by academic standing (Kruskal-Wallis $H = 2.078$, $p = 0.354$; Table 5). Although

repeating and transferred students exhibited marginally elevated mean scores, the limited sample sizes within these subgroups ($n = 16$ and $n = 5$, respectively) substantially constrained statistical power.

Table 5. Anxiety Scores by Academic Standing

Academic Standing	N	Mean $\pm$ SD	Median
Regular	213	63.1 $\pm$ 21.9	61.0
Repeating	16	69.7 $\pm$ 21.0	74.5
Transferred	5	69.8 $\pm$ 35.6	76.0
Kruskal-Wallis H = 2.078, p = 0.354			

Age

Pearson correlation analysis revealed no significant linear association between participant age and total examination anxiety score ($r = -0.066$, $p = 0.319$), indicating that anxiety burden did not vary systematically as a function of chronological age within this sample.

Item-Level Analysis

Individual questionnaire items were rank-ordered by the proportion of respondents endorsing agreement or strong agreement (score ≥ 2). The ten highest-ranking items are presented in Table 6. Anticipatory phenomena—including sleep impairment attributable to pre-examination

rumination, pervasive tension during the revision phase, and heightened distress whilst awaiting the commencement of examinations—attracted the highest endorsement rates, surpassing 80% agreement. Autonomic arousal symptoms, notably palpitation as examination dates approached, were also prominently endorsed.

Conversely, items pertaining to classroom participation—such as reading aloud, explaining clinical cases, or writing on a board during tutorials—returned mean scores below 1.0, indicating that routine pedagogical interactions were not primary anxiety sources for the majority of students.

Table 6. Ten Most Anxiety-Provoking Items Ranked by Endorsement Rate

Rank	Item Description	Mean Score	Agreement %
1	Pronounced sleep disruption the night before an examination due to anticipatory worry	2.46	90.2%
2	Pervasive desire to be free from the distress associated with examinations	2.33	89.7%
3	Persistent tension and nervousness throughout the final examination preparation period	2.37	87.6%
4	Heightened anxiety during the study session on the day preceding an examination	2.26	88.0%
5	Apprehension whilst awaiting distribution of examination papers	2.17	86.3%
6	Acceleration of heart rate as examination time approaches	2.27	85.9%
7	Concern about successfully progressing to the subsequent academic year	2.30	85.5%
8	Anxious arousal when queuing to enter the examination venue	2.09	82.9%
9	Distress when an invigilator announces the time remaining in the examination	2.10	82.1%
10	Generalised apprehension towards any examination situation	2.00	80.8%

Severity Distribution by Demographic Subgroup



Chi-square analyses indicated no statistically significant associations between categorical anxiety severity and gender ($\chi^2 = 5.175$, $p = 0.159$) or academic year ($\chi^2 = 11.705$, $p = 0.701$). Nonetheless, descriptively, the proportion of students meeting criteria for very severe anxiety was modestly higher among female participants (17.9%) than among males (12.8%).

Discussion

The present investigation documents a striking prevalence of examination anxiety among medical undergraduates at the University of Zawia, with more than half of the sampled cohort (58.1%) exhibiting symptom profiles consistent with severe or very severe anxiety. A mean total score representing 55.9% of the theoretical maximum corroborates the view that examination-related psychological distress extends considerably beyond transient, situationally normative apprehension and warrants systematic institutional recognition.

The severity prevalence observed here substantially surpasses the global pooled estimate of 33.8% derived from a meta-analysis encompassing 69 studies across multiple continents [6]. Several plausible explanatory mechanisms may account for this discrepancy. The high-stakes, summative examination culture prevalent in Libyan medical education, combined with consequential progression-linked failure, may amplify anticipatory distress. Furthermore, the relative paucity of institutionalised psychological support services and limited exposure to structured stress management training within the curriculum may deprive students of adaptive coping resources. These observations align with data from comparable emerging-economy contexts; for instance, a study conducted among medical undergraduates in Gujarat, India, identified moderate-to-severe test anxiety in 60.2% of respondents, attributed in part to resource constraints and intensely competitive academic environments [11].

Gender-Stratified Findings

The statistically significant elevation of examination anxiety scores in female relative to male students is consonant with an extensive body of international evidence. A systematic review and meta-analysis documented pooled anxiety prevalence estimates of 38.0% and 27.6% for female and male medical students, respectively [6]. The detection of a significant gender

difference in the present study ($p = 0.023$) may in part reflect the considerable female majority within the sample (83.3%), which augmented statistical power for between-gender comparisons.

Several explanatory frameworks have been proposed for this sex differential. Neurobiological evidence indicates that females demonstrate heightened reactivity of the hypothalamic-pituitary-adrenal axis in response to acute psychosocial stressors, which may translate to amplified subjective and somatic anxiety [12]. At the sociocultural level, gender-specific normative expectations regarding academic achievement and professional competence in Libyan society may impose an additional psychological burden on female students. These observations are corroborated by meta-analytic syntheses demonstrating consistently elevated test anxiety and associated performance consequences among women across diverse educational settings [13].

Stability of Anxiety Across Academic Stages

The absence of significant intergroup variation across academic years was an unanticipated finding, given that prior investigations have postulated distinct anxiety trajectories throughout medical training. Several studies have reported peak anxiety during pre-clinical stages, attributed to the transition from secondary education, while others have identified heightened distress in clinical years, commensurate with increasing professional responsibility and patient-care obligations [6]. The present results, by contrast, suggest that examination anxiety in this cohort may be a sustained and pervasive feature of the training environment rather than a stage-specific phenomenon.

The descriptive trend toward modestly lower anxiety in intern-doctors (mean: 57.4), whilst not statistically significant, is consistent with habituation to high-stakes assessment over time, or with a qualitative shift in the nature of evaluative encounters during clinical rotations. It is also conceivable that differential attrition, with more severely anxious students discontinuing studies in earlier years, contributes to this pattern. These interpretations remain tentative in the absence of longitudinal data.

Phenomenological Profile of Examination Anxiety

Item-level analysis provided important insight into the phenomenological structure of examination anxiety in this population. The most salient anxiety manifestations were anticipatory—notably pre-examination sleep disruption, preparation-phase tension, and apprehension during



waiting periods—rather than performance-phase cognitive interference or post-examination ruminative worry. This profile is broadly consistent with the transactional model of test anxiety, which emphasizes the sequential appraisal processes initiated well before the examination encounter itself [5].

The prominence of somatic symptoms, particularly cardiac acceleration and headache, is clinically noteworthy. Autonomic arousal can competitively tax attentional and working memory resources during the examination, thereby directly attenuating performance on cognitively demanding items [5]. This highlights the relevance of physiological self-regulation strategies as potential intervention targets alongside cognitive restructuring approaches.

Contextualisation Within the Regional Literature

The findings are broadly congruent with, though exceed, anxiety rates documented in comparable North African and Middle Eastern populations. The Derna study reported moderate-to-severe GAD-7 anxiety in 42.2% of medical students, although this cohort had recently experienced catastrophic natural disaster-related trauma and thus may not constitute a valid normative baseline [8]. The present study's finding of severe-to-very-severe examination anxiety in 58.1% of students in the absence of acute environmental adversity suggests that the structural and systemic determinants of psychological distress in Libyan medical education are themselves substantial.

Systemic contributors may include limited availability of mental health infrastructure within university settings, competitive examination systems in which failure carries significant academic and reputational consequences, and culturally mediated stigma associated with seeking psychological assistance. The latter factor has been documented in analogous professional training contexts, where concerns about intellectual inadequacy impede help-seeking behaviour [11].

Implications for Educational Practice and Policy

The magnitude of examination anxiety documented in this investigation carries clear implications for both educational policy and student support service design:

Universal Screening: Given that a majority of students meet criteria for severe or very severe anxiety, annual institution-wide screening using brief, validated self-report instruments is warranted to facilitate early identification and timely referral.

Gender-Responsive Provision: The significantly higher anxiety burden in female students necessitates differentiated supportive provision, including gender-sensitive counselling services, peer support mechanisms, and mentorship schemes.

Pre-Examination Intervention Focus: The predominance of anticipatory anxiety phenomena suggests that interventions should be concentrated in the weeks immediately preceding major examinations. Structured programmes incorporating sleep hygiene education, relaxation training, study-schedule optimisation, and peer-facilitated support networks may be particularly efficacious.

Curricular Integration of Wellbeing Content: Evidence-based techniques—including mindfulness-based stress reduction, cognitive-behavioural approaches, and progressive muscle relaxation—have demonstrated significant reductions in test anxiety in comparable populations [14] and should be formally integrated into the medical curriculum from the first year of study.

Faculty Development: Academic staff should receive training in recognising anxiety presentations and facilitating appropriate referral, whilst also ensuring that examination-related communications are delivered in a manner that minimises unnecessary anticipatory distress.

Accessible Mental Health Infrastructure: The establishment or augmentation of dedicated, confidential student mental health services—supplemented by destigmatisation campaigns and peer-led outreach—is essential to reduce barriers to help-seeking.

Methodological Strengths and Limitations

Among the principal methodological assets of this study are its status as one of the first systematic quantitative examinations of test anxiety in a Libyan medical student cohort, the inclusion of all academic stages within a single institution, the large absolute sample size ($n = 234$), and the excellent psychometric properties of the instrument (Cronbach's $\alpha = 0.931$). The multi-dimensional structure of the questionnaire permitted granular characterisation of the anxiety experience beyond aggregate severity alone.

Conversely, some limitations constrain the scope of inference. The cross-sectional design precludes any causal attribution or characterisation of anxiety trajectories across time. Convenience sampling via institutional communication channels may have introduced self-selection bias, potentially over-representing students with heightened anxiety salience. The pronounced female



preponderance (83.3%) reflects the genuine composition of this student body but may reduce comparability with more gender-balanced cohorts elsewhere.

Directions for Future Research

Prospective longitudinal cohort studies tracking examination anxiety across successive academic years and into early professional practice would clarify whether the observed cross-sectional stability reflects a true trait-like stability or masks within-person developmental trajectories. Concurrent validation of the present questionnaire against internationally standardised anxiety measures would facilitate cross-study comparability. Qualitative and mixed-methods inquiry exploring students' subjective accounts of anxiety, coping repertoires, and help-seeking barriers would complement the quantitative picture. Randomised controlled trials evaluating institution-tailored anxiety reduction programs within this population represent a pressing research priority. Multi-site studies spanning Libyan medical institutions would illuminate the contribution of institutional and structural factors to anxiety prevalence.

Conclusion

The present cross-sectional investigation establishes that examination anxiety is highly prevalent among medical undergraduates at the Faculty of Medicine, University of Zawia, with 58.1% of students meeting criteria for severe or very severe symptomatology. Female students are disproportionately affected, returning scores significantly higher than their male peers. Item-level analysis reveals that anticipatory anxiety—particularly pre-examination sleep disturbance and preparation-phase tension—constitutes the most distressing component of the examination experience for this cohort. These findings collectively underline the imperative for institutional action encompassing systematic screening, gender-sensitive support mechanisms, evidence-based stress management training integrated within the formal curriculum, and accessible mental health infrastructure. Effectively addressing examination anxiety is indispensable not only for safeguarding student psychological wellbeing but also for cultivating the resilience and cognitive readiness required for the delivery of high-quality patient care throughout a medical career.

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