Medicina Clínica y Social

Med. clín. soc. 2026;10(1):e805 · e-ISSN 2521-2281 · https://doi.org/10.52379/mcs.v10.805

ORIGINAL

Check for updates

Prevalence and Predictors of Anxiety Severity Among Health Sciences Students: A Cross-Sectional Study Using the GAD-7 Scale

Prevalencia y Predictores de la Gravedad de la Ansiedad en Estudiantes Universitarios del Área de la Salud: Un Estudio Transversal Utilizando la Escala GAD-7

Vivian Kaori Segawa [1] Julia Miwa Torata Nakano [1] Israel Kanaan Blaas [1,2] João Maurício Castaldelli-Maia [1,2]

[1] Centro Universitário Faculdade de Medicina do ABC, Santo André, SP, Brazil [2] Universidade de São Paulo, Faculdade de Medicina, Departamento de Psiquiatria, São Paulo, SP, Brazil

MEDICINA CLÍNICA Y SOCIAL

ISSN 2521-2281 · en línea

HISTORY

Received 23/04/2026

Accepted 27/04/2026

Published 16/06/2026

CORRESPONDENCE

Vivian Kaori Segawa
Centro Universitário Faculdade de Medicina do ABC, Santo André, SP, Brazil
viviankaorisegawa@gmail.com

RESPONSIBLE EDITOR

Iván Barrios, PhD
Universidad Nacional de Asunción, Santa Rosa del Aguaray, Paraguay

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

FUNDING

The authors received no financial support for the research, authorship, and/or publication of this article.

ABSTRACT

Introduction: Anxiety symptoms were highly prevalent among university students, particularly those enrolled in healthcare programs, and were associated with significant academic and functional impairment. **Objective:** This study aimed to evaluate the prevalence and severity of anxiety symptoms using the GAD-7 scale and to identify associated factors among healthcare undergraduate students. **Methodology:** A cross-sectional study was conducted with 336 undergraduate students from eight healthcare programs at a Brazilian university. Data were collected through an online questionnaire including sociodemographic variables and the Generalized Anxiety Disorder-7 (GAD-7) scale. Ordinal logistic regression was performed to assess associations between anxiety severity (minimal, mild, moderate, and severe) and predictors such as age, sex, course type (Medicine vs. non-medical), and academic year. **Results:** The mean age was 22.0 years (SD = 4.6), and 70% of participants were female. Most students (75.3%) were enrolled in Medicine. The mean GAD-7 score was 8.0 (SD = 5.4). Anxiety severity was classified as minimal (27.4%), mild (38.1%), moderate (20.2%), and severe (14.3%), with 34.5% presenting moderate to severe anxiety. Female sex (OR = 2.3; $p < 0.001$) and enrollment in non-medical courses (OR = 3.2; $p < 0.001$) were significantly associated with greater anxiety severity. Increasing age was inversely associated with anxiety ($p = 0.037$). **Conclusion:** Anxiety symptoms were highly prevalent among healthcare students. Female sex and enrollment in non-medical programs were independent predictors of higher anxiety severity, while older age was associated with lower levels.

KEYWORDS anxiety · university students · GAD-7 · healthcare · mental health

RESUMEN

Introducción: Los síntomas de ansiedad fueron altamente prevalentes entre los estudiantes universitarios, particularmente los matriculados en programas de ciencias de la salud, y se asociaron con un deterioro académico y funcional significativo. **Objetivo:** Evaluar la prevalencia y gravedad de los síntomas de ansiedad mediante la escala GAD-7 e identificar los factores asociados en estudiantes universitarios de ciencias de la salud. **Metodología:** Se realizó un estudio transversal con 336 estudiantes universitarios de ocho programas de ciencias de la salud en una universidad brasileña. Los datos fueron recolectados mediante un cuestionario en línea que incluía variables sociodemográficas y la escala GAD-7. Se realizó una regresión logística ordinal para evaluar las asociaciones entre la gravedad de la ansiedad y los predictores. **Resultados:** La media de edad fue de 22,0 años (DE = 4,6) y el 70 % de los participantes eran mujeres. La mayoría de los estudiantes (75,3 %) estaban matriculados en Medicina. La puntuación media del GAD-7 fue de 8,0 (DE = 5,4). La ansiedad se clasificó como mínima (27,4 %), leve (38,1 %), moderada (20,2 %) y grave (14,3 %), con un 34,5 % presentando ansiedad moderada a grave. El sexo femenino (OR = 2,3; $p < 0,001$) y la matriculación en cursos no médicos (OR = 3,2; $p < 0,001$) se asociaron significativamente con mayor gravedad de ansiedad. **Conclusión:** Los síntomas de ansiedad fueron altamente prevalentes entre los estudiantes de ciencias de la salud. El sexo femenino y la matriculación en programas no médicos fueron predictores independientes de mayor gravedad de ansiedad, mientras que la mayor edad se asoció con niveles más bajos.

PALABRAS CLAVE ansiedad · estudiantes universitarios · GAD-7 · ciencias de la salud · salud mental

How to cite: Kaori Segawa V, Kanaan Blaas I, Castaldelli-Maia JM . Prevalence and Predictors of Anxiety Severity Among Health Sciences Students: A Cross-Sectional Study Using the GAD-7 Scale. Med Clin Soc. 2026;10(1):e805. https://doi.org/10.52379/mcs.v10.805

Introduction

Anxiety disorders are among the most prevalent mental health conditions worldwide and represent a significant burden on individuals and healthcare systems (1). University students are particularly vulnerable to anxiety symptoms, especially those enrolled in healthcare-related programs (2,3).

Students in health sciences programs experience intense workloads, competitive academic settings, and early exposure to human suffering (3,4). These factors contribute to increased psychological distress and may negatively impact academic performance, interpersonal relationships, and overall well-being (5-10). Anxiety symptoms, when persistent, can interfere with cognitive functioning and increase the risk of burnout and substance use (11-17).

Generalized Anxiety Disorder (GAD) is characterized by excessive and uncontrollable worry, often accompanied by symptoms such as fatigue, irritability, sleep disturbances, and difficulty concentrating (7,8). In academic settings, these manifestations may significantly impair both academic and social functioning (2).

Previous studies report a high prevalence of anxiety among healthcare students, frequently exceeding that observed in the general population (1,6). Factors associated with increased anxiety include female sex, academic pressure, lack of social support, and maladaptive coping strategies (2,10). Additionally, anxiety commonly coexists with other mental health conditions such as depression and is associated with behavioral factors including impulsivity and alcohol use (11,16-18).

Despite growing recognition of this issue, there is still a lack of institution-specific data in Brazilian universities, which limits the development of targeted and evidence-based interventions (10,11). The use of validated instruments such as the Generalized Anxiety Disorder-7 (GAD-7) allows for standardized assessment and comparison across different populations (12-14).

Understanding the prevalence and predictors of anxiety among healthcare students is essential for identifying vulnerable groups and guiding mental health strategies within academic institutions (1,6). Therefore, the objective of this study is to evaluate the prevalence and severity of anxiety symptoms and to identify associated factors among healthcare university students using the GAD-7 scale.

Methodology

This was a cross-sectional, observational, and quantitative study conducted at a Brazilian university between September 2025 and January 2026.

The study population consisted of undergraduate students enrolled in healthcare-related programs. A census sampling strategy was adopted, aiming to include students from all academic years.

Inclusion criteria were: age ≥ 18 years, regular enrollment in a healthcare undergraduate program, and agreement to participate באמצעות electronic informed consent. Exclusion criteria included age < 18 years and incomplete or inconsistent questionnaire responses.

Data were collected through an anonymous, self-administered online questionnaire distributed via institutional communication channels. Participation was voluntary, and no financial or academic incentives were offered.

Age (continuous), sex (male/female), course type (Medicine vs. other healthcare programs), and academic year were collected. Anxiety severity was assessed using the Generalized Anxiety Disorder-7 (GAD-7)12-14. Scores ranged from 0 to 21 and were categorized as minimal (zero to four), mild (five to nine), moderate (ten to fourteen), and severe (fifteen to twenty-one). A cutoff ≥10 was used to define clinically significant anxiety. Evaluated using the Patient Health Questionnaire-9 (PHQ-9), with scores ≥10 indicating moderate to severe depressive symptoms (19).

Measured using the Barratt Impulsiveness Scale (BIS-11), which assesses attentional, motor, and non-planning impulsivity (20-23). Assessed using the Alcohol Use Disorders Identification Test (AUDIT), with higher scores indicating hazardous alcohol consumption (24). Descriptive statistics were used to summarize the data. Continuous variables were expressed as means and standard deviations, and categorical variables as absolute and relative frequencies.

Bivariate analyses were conducted using chi-square tests for categorical variables and Student's t-test or Mann–Whitney test for continuous variables, as appropriate.

Variables with $p < 0.20$ in bivariate analyses were included in the multivariate model. Ordinal logistic regression was performed to evaluate the association between independent variables and anxiety severity categories.

Odds ratios (ORs) with 95 % confidence intervals (95 % CI) were calculated. A p-value < 0.05 was considered statistically significant.

All statistical analyses were performed using Python.

This study adhered to the ethical principles of respect for persons, beneficence, and justice. The research protocol was approved by the Research Ethics Committee (CAAE 71173223.4.0000.0082) and followed the principles of the Declaration of Helsinki and CIOMS guidelines.

All participants provided electronic informed consent prior to participation. Data were collected anonymously, and no identifiable information was recorded. The data were stored in a secure and restricted digital environment accessible only to the research team.

Results

A total of 336 university students were included in the analysis. The mean age was 22.0 years (SD = 4.57), and most participants were female (70.0 %). The majority were enrolled in Medicine (75.3 %), followed by smaller proportions from other healthcare programs.

The mean GAD-7 total score was 8.04 (SD = 5.37). Regarding anxiety severity, 27.4 % of participants were classified as minimal, 38.1 % as mild, 20.2 % as moderate, and 14.3 % as severe. Overall, 34.5 % of students presented moderate to severe anxiety symptoms (GAD-7 ≥ 10).

The distribution of GAD-7 scores demonstrated a slightly right-skewed pattern, with a concentration of students in the mild to moderate range (Figure 1).

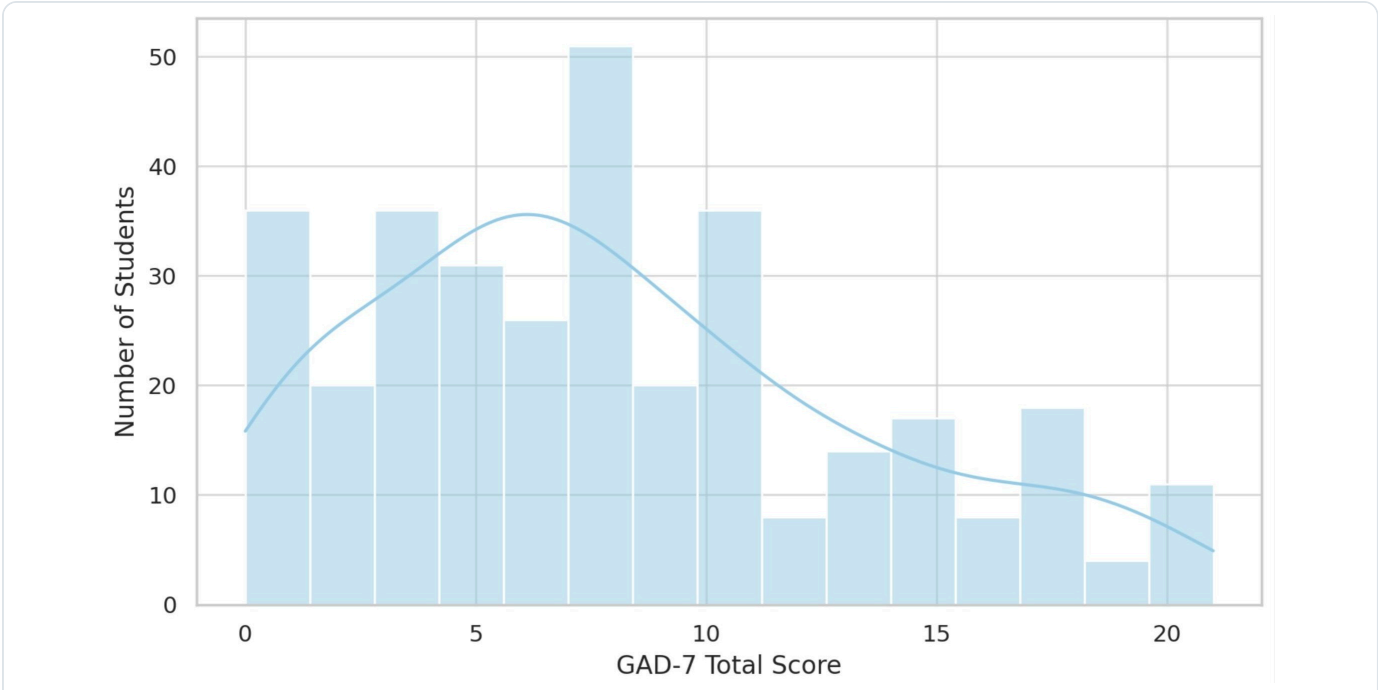

FIGURA 1
DISTRIBUTION OF GAD-7 TOTAL SCORES

When stratified by sex, female students showed a higher proportion of moderate and severe anxiety levels compared to males, while males presented a higher proportion of minimal anxiety (Figure 2).

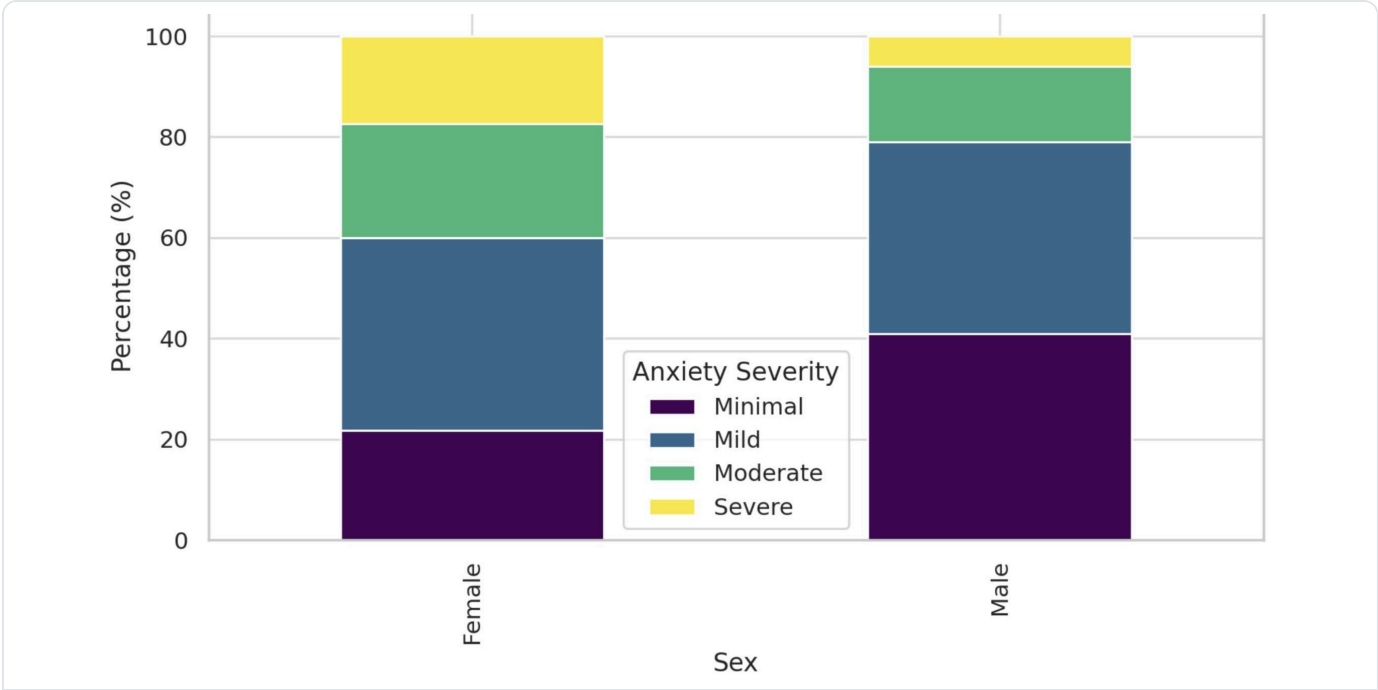

FIGURA 2
GAD-7 SEVERITY BY SEX

Across academic programs, variability in GAD-7 scores was observed. Students from non-medical programs—particularly Occupational Therapy and Psychology—tended to present higher median scores and greater dispersion, whereas medical students showed comparatively lower median scores (Figure 3).

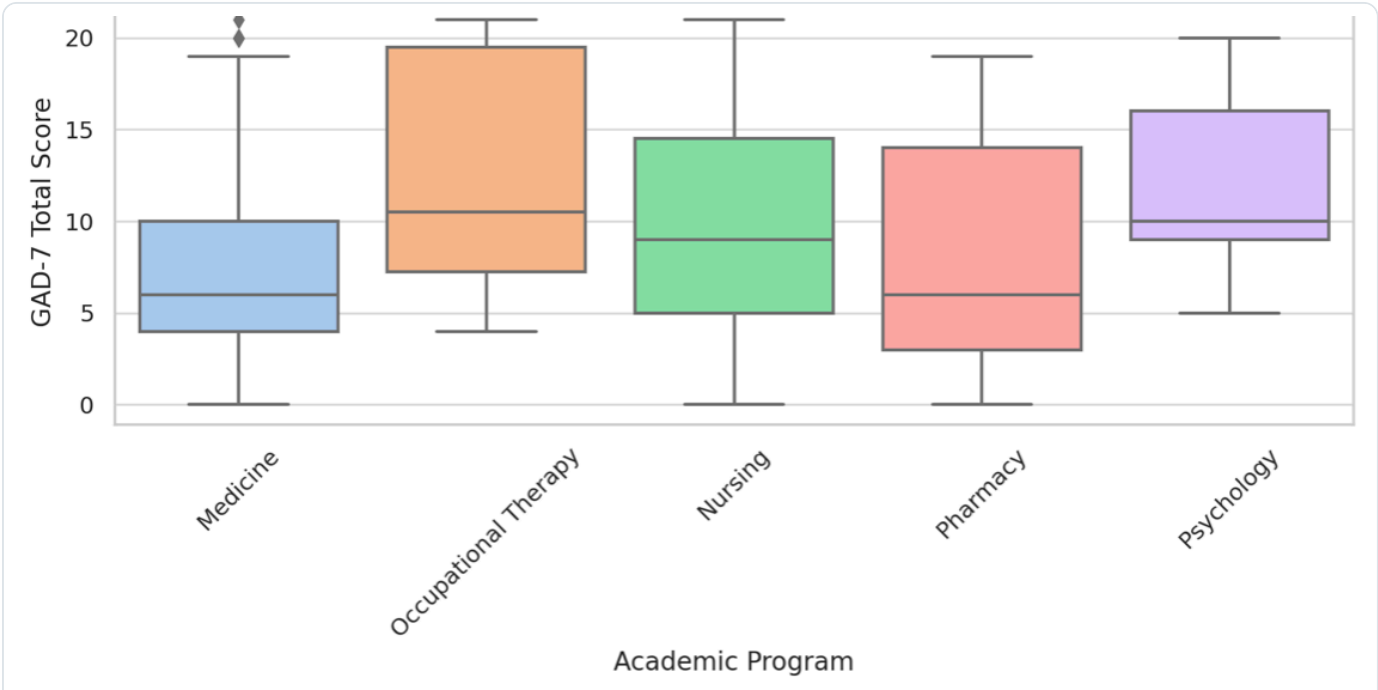

FIGURA 3
GAD-7 SCORES BY ACADEMIC PROGRAM

Regarding academic progression, mean GAD-7 scores were relatively similar across different years of study, with slightly higher values observed in final-year students. However, no statistically significant association was identified between year of study and anxiety severity (Figure 4).

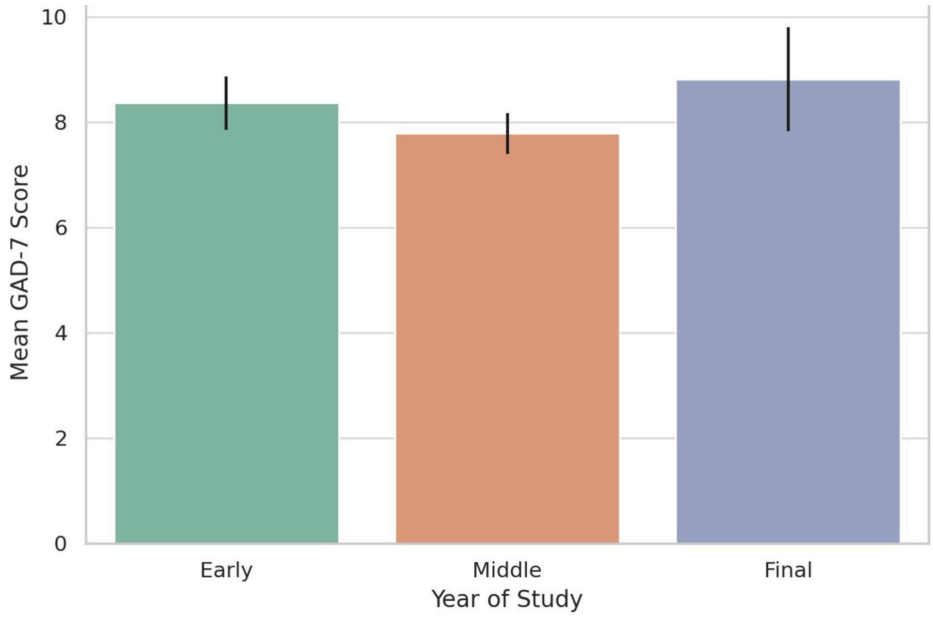

FIGURA 4
MEAN GAD-7 SCORE BY YEAR OF STUDY

In the ordinal logistic regression analysis, female sex was significantly associated with higher anxiety severity (OR = 2.30; 95 % CI: 1.47–3.59; p < 0.001). Enrollment in medical programs was associated with lower anxiety severity (OR = 0.32; 95 % CI: 0.19–0.52; p < 0.001), indicating that students from non-medical programs had higher odds of more severe anxiety.

Age was inversely associated with anxiety severity (OR = 0.95; 95 % CI: 0.90–0.99; p = 0.037). No statistically significant associations were observed for early or middle years of study. However, the category labeled as "other year group" showed a significant association with lower anxiety severity (OR = 0.14; 95 % CI: 0.02–0.85; p = 0.032).

Detailed descriptive and regression results are presented in Table 1 and Table 2.

Variable	Category	n (%) or Mean (SD)
Age (years)		22.0 (4.57)
Sex	Female	235 (70.0)
	Male	100 (29.8)
	Other	1 (0.2)
Academic Program	Medicine	253 (75.3)
	Nursing	19 (5.7)
	Pharmacy	17 (5.1)
	Psychology	17 (5.1)
	Occupational Therapy	10 (3.0)
	Nutrition	10 (3.0)
	Physical Therapy	7 (2.1)
	Biomedicine	3 (0.9)
Program Schedule	Full-time	253 (75.3)
	Evening	64 (19.0)
	Morning	16 (4.8)
	Afternoon	3 (0.9)
Current Year	1st year	83 (24.7)
	2nd year	39 (11.6)
	3rd year	136 (40.5)
	4th year	40 (11.9)
	5th year	14 (4.2)
	6th year	18 (5.4)
GAD-7 Total Score		8.04 (5.37)
GAD-7 Severity	Minimal (0–4)	92 (27.4)
	Mild (5–9)	128 (38.1)
	Moderate (10–14)	68 (20.2)
	Severe (15–21)	48 (14.3)

TABLA 1
SOCIODEMOGRAPHIC, ACADEMIC, AND ANXIETY-RELATED CHARACTERISTICS OF THE STUDY SAMPLE

Predictor	OR	95% CI	p-value
Age	0.95	0.90 – 0.99	0.037
Female sex	2.30	1.47 – 3.59	<0.001
Medical course	0.32	0.19 – 0.52	<0.001
Early years	0.52	0.23 – 1.15	0.108
Middle years	0.65	0.31 – 1.33	0.236
Other year group	0.14	0.02 – 0.85	0.032

TABLA 2
ORDINAL LOGISTIC REGRESSION ANALYSIS OF FACTORS ASSOCIATED WITH ANXIETY SEVERITY

Discusion

This study demonstrates a high prevalence of anxiety symptoms among healthcare university students, with more than one-third presenting moderate to severe levels. These findings are consistent with previous studies and reinforce the vulnerability of this population (1,3,6)

The association between female sex and increased anxiety severity is well established in the literature. Biological and psychosocial mechanisms may explain this finding, including hormonal factors and gender-related stressors.

An important finding of this study is the higher anxiety severity observed among students enrolled in non-medical programs. This may reflect differences in academic structure, professional identity, and perceived career stability. Medical programs often provide clearer professional pathways, whereas other healthcare programs may involve greater uncertainty and variability in career trajectories.

The inverse association between age and anxiety suggests that older students may have developed more effective coping strategies and emotional regulation skills over time.

The relationship between anxiety, depressive symptoms, impulsivity, and alcohol use highlights the multifactorial nature of mental health in university settings (16,17,25). These findings suggest that anxiety should be addressed within a broader framework of psychological well-being.

This study has limitations. Its cross-sectional design prevents causal inference. The use of self-reported data may introduce reporting bias, and the single-institution setting may limit generalizability.

However, the study also has strengths. It includes a relatively large sample size, incorporates multiple healthcare programs, and uses validated instruments. The use of ordinal logistic regression strengthens the robustness of the findings.

Anxiety symptoms are highly prevalent among healthcare university students. Female sex and enrollment in non-medical programs are significant predictors of increased anxiety severity, while older age is associated with lower levels.

These findings directly address the study objective and highlight the need for targeted mental health strategies in academic settings, including early screening and structured psychological support programs.

Editorial note

The opinions expressed in this article, as well as the methodological approach and results presented, are the sole responsibility of the authors. This work was reviewed and approved by external reviewers as part of the editorial process, but does not necessarily reflect the official position of the journal, its editorial committee, or its editor-in-chief.

Author contributions

VKS and JMTN contributed to the study conception and design, data collection, analysis, and manuscript drafting. IKB contributed to data collection and provided guidance during the data collection process. JMCM contributed to study supervision, coordination of the research, and critical revision of the manuscript. All authors read and approved the final version of the manuscript.

Data availability

Data are available upon request to the corresponding author. Vivian Kaori Segawa. Email: viviankaorisegawa@gmail.com

Reviewer Comments

The external reviewers, as well as their reports, are available at the following link: Dictamen 805

References

1. Quek TTC, Tam WWS, Tran BX, Zhang M, Zhang Z, Ho CSH, et al. The global prevalence of anxiety among medical students: a meta-analysis. Int J Environ Res Public Health. 2019;16(15):2735. https://doi.org/10.3390/ijerph16152735
2. Shao R, He P, Ling B, Tan L, Xu L, Hou Y, et al. Prevalence of depression and anxiety and correlations between depression, anxiety, family functioning, social support and coping styles among Chinese medical students. BMC Psychol. 2020;8(1):38. https://doi.org/10.1186/s40359-020-00402-8
3. Capdevila-Gaudens P, García-Abajo JM, Flores-Funes D, García-Barbero M, García-Estañ J. Depression, anxiety, burnout and empathy among Spanish medical students. PLoS One. 2021;16(12):e0260359. https://doi.org/10.1371/journal.pone.0260359
4. Juul MV, Andersen JH, Søndergaard J, Vestergaard M. High levels of anxiety and stress in medical students and junior doctors. Dan Med J. 2022;69(11):A03220162. [URL
5. Bertani DE, Mattei G, Ferrari S, Pingani L, Galeazzi GM. Anxiety, depression and personality traits in Italian medical students. Riv Psichiatr. 2020;55(6):342-8. https://doi.org/10.1708/3503.34892
6. Piscoya-Tenorio JL, Heredia-Rioja WV, Morocho-Alburqueque N, Zeña-Ñañez S, Hernández-Yépez PJ, Díaz-Vélez C, et al. Prevalence and factors associated with anxiety and depression in Peruvian medical students. Int J Environ Res Public Health. 2023;20(4):2907. https://doi.org/10.3390/ijerph20042907
7. Mishra AK, Varma AR. A comprehensive review of the generalized anxiety disorder. Cureus. 2023;15(9):e46115. https://doi.org/10.7759/cureus.46115
8. Munir S, Takov V. Generalized anxiety disorder. In: StatPearls Treasure Island (FL): StatPearls Publishing; 2025. [URL
9. Cintra GS, Cristovão AX, Silva MVA, Japiassú LFF, Corazza AV. Prevalv™ncia de transtorno de ansiedade generalizada em estudantes de medicina: revisv£o da literatura. Arch Health Invest. 2022;11(5):832-5. https://doi.org/10.21270/archi.v11i5.6020
10. Barros GFO, Coimbra Neto JBR, Campanholo EM, Ritter GP, Silva AMTC, Almeida RJ. Fatores associados a ansiedade, depressv£o e estresse em estudantes de Medicina na pandemia da Covid-19. Rev Bras Educ Med. 2022;46(4):e135. https://doi.org/10.1590/1981-5271v46.4-20210482
11. Souza JPA, Demenech LM, Dumith SC, Neiva-Silva L. Sintomas de ansiedade generalizada entre estudantes de graduavßv£o: prevalv™ncia, fatores associados e possv≠veis consequv™ncias. J Bras Psiquiatr. 2022;71(3):193-203. [URL
12. Toussaint A, Hüsing P, Gumz A, Wingenfeld K, Härter M, Schramm E, et al. Sensitivity to change and minimal clinically important difference of the 7-item Generalized Anxiety Disorder Questionnaire (GAD-7). J Affect Disord. 2020;265:395-401. https://doi.org/10.1016/j.jad.2020.01.032
13. Camargo L, Herrera-Pino J, Shelach S, Soto-Añari M, Porto MF, Alonso M, et al. Escala de ansiedad generalizada GAD-7 en profesionales mv©dicos colombianos durante pandemia de COVID-19: validez de constructo y confiabilidad. Rev Colomb Psiquiatr. 2023;52(3):245-50. https://doi.org/10.1016/j.rcp.2021.06.003
14. Byrd-Bredbenner C, Eck K, Quick V. GAD-7, GAD-2, and GAD-mini: psychometric properties and norms of university students in the United States. Gen Hosp Psychiatry. 2021;69:61-6. https://doi.org/10.1016/j.genhosppsych.2021.01.002
15. Lin S, Chong AC, Su EH, Chen SL, Chwa WJ, Young C, et al. Medical student anxiety and depression in the COVID-19 Era: unique needs of underrepresented students. Educ Health (Abingdon). 2022;35(2):41-7. https://doi.org/10.4103/efh.efh_112_22
16. Yu Y, Yu Y, Lin Y. Anxiety and depression aggravate impulsiveness: the mediating and moderating role of cognitive flexibility. Psychol Health Med. 2020;25(1):25-36. https://doi.org/10.1080/13548506.2019.1601748
17. Evans O, Rodríguez-Borillo O, Font L, Currie PJ, Pastor R. Alcohol binge drinking and anxiety-like behavior in socialized versus isolated C57BL/6J mice. Alcohol Clin Exp Res. 2020;44(1):244-54. https://doi.org/10.1111/acer.14236
18. Wijeratne C, Johnco C, Draper B, Earl J. Doctors' reporting of mental health stigma and barriers to help-seeking. Occup Med (Lond). 2021;71(8):366-74. https://doi.org/10.1093/occmed/kqab119
19. Rahman MA, Dhira TA, Sarker AR, Mehareen J. Validity and reliability of the Patient Health Questionnaire scale (PHQ-9) among university students of Bangladesh. PLoS One. 2022;17(6):e0269634. https://doi.org/10.1371/journal.pone.0269634
20. Shangraw AM, Silvers J, Warholak T, Vadiei N. Prevalence of anxiety and depressive symptoms among pharmacy students. Am J Pharm Educ. 2021;85(2):8166. https://doi.org/10.5688/ajpe8166
21. Santander-Hernández FM, Peralta CI, Guevara-Morales MA, Díaz-Vélez C, Valladares-Garrido MJ. Smartphone overuse, depression and anxiety in medical students during the COVID-19 pandemic. PLoS One. 2022;17(8):e0273575. https://doi.org/10.1371/journal.pone.0273575
22. Reise SP, Moore TM, Sabb FW, Brown AK, London ED. The Barratt Impulsiveness Scale-11: reassessment of its structure in a community sample. Psychol Assess. 2013;25(2):631-42. https://doi.org/10.1037/a0032161
23. von Diemen L, Szobot CM, Kessler F, Pechansky F. Adaptation and construct validation of the Barratt Impulsiveness Scale (BIS 11) to Brazilian Portuguese for use in adolescents. Rev Bras Psiquiatr. 2007;29(2):153-6. https://doi.org/10.1590/S1516-44462006005000020

24. Reinert DF, Allen JP. The Alcohol Use Disorders Identification Test (AUDIT): a review of recent research. Alcohol Clin Exp Res. 2002;26(2):272-9. https://doi.org/10.1111/j.1530-0277.2002.tb02534.x

25. Chow MSC, Poon SHL, Lui KL, Chan CCY, Lam WWT. Alcohol consumption and depression among university students and their perception of alcohol use. East Asian Arch Psychiatry. 2021;31(4):87-96. https://doi.org/10.12809/eaap20108