



Severity of anxiety symptoms in postgraduate entrants during the COVID-19 pandemic

Severidade de sintomas ansiosos em ingressantes da pós-graduação durante a pandemia da COVID-19

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ABSTRACT

Objective: to assess the severity of anxiety symptoms in first-year research-focused (*stricto sensu*) postgraduate students and their associations with psychosocial and academic factors related to the COVID-19 pandemic. **Methods:** this was an analytical cross-sectional study conducted at a public university with 321 first-year research-focused postgraduate students during the COVID-19 pandemic. Data were collected via an online form. Associated factors were analyzed using multiple linear regression. **Results:** the sample presented an average anxiety score consistent with moderate anxiety. Factors such as depressive symptoms, a history of psychological violence in the past 12 months, lack of vaccination, non-compliance with social distancing, and pressure for productivity were significantly associated with increased severity of anxiety symptoms. **Conclusion:** moderate levels of anxiety symptoms in this group highlights the need for preventive strategies and targeted interventions for mental health at the very beginning of postgraduate studies. **Contributions to practice:** mental health professionals and educators should be attentive to the specific emotional demands of first-year postgraduate students, proposing initiatives that foster supportive and healthy environments, while also considering less traditional risk factors, such as academic stressors. Additionally, the findings reinforce the negative impact of COVID-19 on students' mental health. **Descriptors:** Anxiety; Education, Graduate; Students; Pandemics; COVID-19.

RESUMO

Objetivo: avaliar a severidade dos sintomas ansiosos em estudantes iniciantes na pós-graduação *stricto sensu* e suas associações com características psicossociais e acadêmicas relacionadas à pandemia da COVID-19. **Métodos:** estudo analítico e transversal, realizado em uma universidade pública com 321 estudantes iniciantes na pós-graduação *stricto sensu* durante a pandemia da COVID-19. Os dados foram coletados via formulário *on-line*. Os fatores associados foram analisados por meio de regressão linear múltipla. **Resultados:** a amostra apresentou escore médio de ansiedade condizente com ansiedade moderada. Fatores como sintomas depressivos, histórico de violência psicológica nos últimos 12 meses, não estar vacinado, não cumprimento de distanciamento social e pressão por produtividade associaram-se significativamente ao aumento da severidade dos sintomas ansiosos. **Conclusão:** níveis moderados de sintomas ansiosos desse grupo reforça a necessidade de estratégias preventivas e intervenções direcionadas à saúde mental logo no início dos estudos na pós-graduação. **Contribuições para a prática:** profissionais de saúde mental e educadores devem estar atentos às demandas emocionais específicas de ingressantes na pós-graduação, propondo ações que promovam ambientes salutaros e de apoio, com atenção também a fatores de risco menos tradicionais, como fatores acadêmicos. Além disso, reforça-se o impacto negativo da COVID-19, na saúde mental dos estudantes.

Descritores: Ansiedade; Educação de Pós-Graduação; Estudantes; Pandemias; COVID-19.

Introduction

Anxiety disorders are among the leading mental health issues in the general population, causing significant physical, cognitive, and functional impairment⁽¹⁾. They can manifest in various forms, ranging from excessive worries to panic attacks, negatively impacting an individual's well-being and daily performance⁽¹⁻²⁾. Additionally, anxiety symptoms can serve as early indicators of other mental disorders, such as depression and obsessive-compulsive disorder⁽²⁾.

These symptoms—including nervousness, restlessness, difficulty concentrating, and physical manifestations such as fatigue, headaches, and nausea⁽²⁾, are often exacerbated by academic and personal pressures experienced at this stage of schooling⁽³⁻⁵⁾.

Postgraduate students face high levels of anxiety and psychological distress, often at greater intensity than other individuals of the same age and gender^(3,5), making it a significant mental health challenge⁽³⁻⁴⁾. It is estimated that over one-third of postgraduate students experience anxiety, with prevalence rates increasing over the past two decades⁽⁴⁾.

This is particularly concerning, as anxiety may compromise both academic performance and overall well-being, increasing the risk of dropout or other mental health issues throughout their studies⁽³⁻⁵⁾.

Despite existing evidence, research on anxiety symptoms among postgraduate students remains incomplete, with important gaps yet to be addressed^(4,6). Specific contextual factors—such as those related to the academic environment and psychosocial characteristics—require further exploration, particularly regarding the initial phase of students' academic trajectories. The transition to postgraduate studies is known to be a highly stressful period, marked by uncertainty about academic demands, pressure to produce results, and the need to adapt to new research environments⁽⁷⁾. While these factors may contribute to increased anxiety, they remain poorly understood^(4,8).

Another crucial aspect is that mental health

studies on postgraduate students often include individuals at different stages of their programs, without adequately distinguishing first-year students from more experienced ones^(4,8-9). This distinction is essential, as the challenges faced by new students may differ significantly from those encountered by advanced students^(4,9).

Moreover, between 2020 and 2023, the world experienced the COVID-19 pandemic, which brought significant disruptions and globally heightened mental health problems, particularly anxiety disorders, which showed elevated rates across the general population throughout the pandemic⁽¹⁰⁾. Certain groups, especially those with preexisting mental health vulnerabilities, such as students, were particularly susceptible to the detrimental effects of COVID-19⁽¹¹⁾.

Thus, this study aimed to assess the severity of anxiety symptoms in first-year research-focused (*stricto sensu*) postgraduate students and their associations with psychosocial and academic factors related to the COVID-19 pandemic.

Methods

Study design and context

This was an analytical cross-sectional study on risk factors for mental health deterioration among research-focused (*stricto sensu*) postgraduate students, conducted at a federal public university in the Central-West region of Brazil between March and April 2021. The study design followed the Strengthening of Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

Population, sample and eligibility criteria

The sample consisted of 321 first-year research-focused postgraduate students, recruited from a population of 597 individuals who met the following eligibility criteria. Inclusion criteria required students

to be beginning their academic training and officially enrolled in the first semester of 2021 in any research-focused postgraduate program across the three campuses of the university where the study was conducted. Exclusion criteria included participants who did not answer the questions related to the primary outcome. However, this criterion was not applied, as there were no missing data for these variables.

For sample size estimation, a 95% confidence coefficient level and a 4% sampling error were considered, ensuring a balance between feasibility and precision in data collection—allowing for a manageable sample size without compromising estimate accuracy.

Additionally, a 50% outcome proportion was assumed due to the lack of prior data on the prevalence of the outcomes of interest in this population, based on the assessment methodologies adopted in this study. Using these parameters, the minimum required sample size was estimated at 299 participants. However, 321 students were recruited to ensure a safety margin and mitigate potential data loss effects.

Data collection

Data were collected online using a form created via Google Forms®. The access link was shared with participants through email, social media, and WhatsApp®, messages, with student contact information either provided or mediated by the postgraduate program coordinators at the university. Eligible students received an invitation letter and the survey link within the first two weeks of data collection. Those who did not respond were reminded in the third and fifth weeks. The collection phase lasted 45 days. The Informed Consent Form was made available online. After reading it, participants had to select the corresponding checkbox for “yes” to indicate their acknowledgment and agreement to participate in the study. At this stage, participants were asked to provide an email address and/or phone number, which served as a marker to identify and prevent duplicate responses.

Study variables and instruments

Anxiety symptoms were assessed using the Generalized Anxiety Disorder-7 (GAD-7) scale⁽¹²⁾, a self-administered and validated instrument for the Brazilian context⁽¹³⁾. This seven-item scale uses a four-point Likert response format, with total scores ranging from 0 to 21 points—higher scores indicate greater severity of anxiety symptoms.

To socially characterize the sample, a self-administered questionnaire developed by the study authors was used. It included questions on gender (male/female), age (in complete years), self-reported skin color (white/Black, Brown, Asian, or Indigenous), sexual orientation (heterosexual/sexual minorities), and current financial concern (yes/no). Experiences of victimization by interpersonal violence (physical, sexual, and psychological) in the past year were assessed through self-reported data using adapted questions⁽¹⁴⁾. Any report of at least one type of violence was classified as victimization.

Academic experiences were assessed using an inventory proposed in a study on suicide risk factors among postgraduate students⁽¹⁵⁾. This instrument evaluates the degree of agreement with potential postgraduate stressors, including: Quality of relationships with advisors, peers, and professors; Difficulties with scientific writing; Pressure for productivity; Engagement in paid work alongside studies; Perceived negative impact of postgraduate studies on family relationships. Additionally, the type of program (Master's/PhD) was included as a study variable.

The variables related to the COVID-19 pandemic included the perceived fear of the disease, assessed using the Fear of COVID-19 Scale, adapted for Brazil⁽¹⁶⁾. Data were also collected on vaccination status (vaccinated/not vaccinated), compliance with social distancing/isolation (yes/no), concern about delays in academic activities (yes/no), self-assessment of mental health during the pandemic (worsened/did not worsen), and classification as a high-risk group for COVID-19 (yes/no).

Finally, in characterizing mental health, depressive symptoms over the past two weeks were assessed using the Patient Health Questionnaire-9 (PHQ-9), a self-administered and validated scale for the Brazilian context⁽¹⁷⁾. It consists of nine items with a four-point Likert response format, with scores ranging from 0 to 27. The higher the score, the greater the severity of depressive symptoms.

Statistical analysis

A bivariate comparative analysis was performed using the *t*-test for two independent samples to compare depressive and anxiety symptom scores across the measured psychosocial, academic, and pandemic-related variables at a dichotomous categorical level. For polytomous categorical variables, a one-way ANOVA was applied, presenting the F statistic and using Hochberg's GT2 post-hoc test to identify which groups differed from each other, considering the homogeneity of variances, tested through Levene's test. A correlational analysis was conducted using Pearson's coefficient to examine associations between outcomes and continuous variables.

For these analyses, confidence intervals (CIs) and p-value estimation were performed using bootstrapping procedures (1,000 resamplings, 95% BCa CI) to correct for deviations from normality in the sample distribution, differences in group sizes, and to obtain more reliable results⁽¹⁸⁾.

To identify associated factors, multiple linear regression was employed to assess the ability of independent variables evaluated in this study to significantly predict the severity of anxiety symptoms. For the construction of the multiple regression model, all explanatory variables with $p < 0.20$ in the bivariate analysis were tested. These variables were simultaneously introduced using the backward elimination method, with only those presenting $p < 0.05$ being retained in the final model. It is important to note that before adopting multiple linear regression modeling, the assumptions of normality of residual distribution were verified, as well as the absence of multicollineari-

ty, confirmed through a Variance Inflation Factor (VIF) < 10 , and the non-existence of residual autocorrelation, assessed via the Durbin-Watson test. Descriptive, bivariate, and multivariate statistical analyses were performed using SPSS software, version 27.0.

Ethical aspects

This study complied with national ethical guidelines for research involving human subjects, as well as the Helsinki Declaration. It was approved by the Research Ethics Committee in Health at the Federal University of Mato Grosso, under opinion No. 4,595,264/2021, with the Ethical Appreciation Submission Certificate No. 42807420.0.0000.8124.

Results

The sample of students who entered research-focused postgraduate studies in the first academic semester of 2021, during the COVID-19 pandemic, presented an average anxiety symptom score consistent with "moderate anxiety" (mean = 10.25; standard deviation = 5.79), according to standardized cutoff points for the GAD-7. It was found that 23.4% and 29.4% of first-year students exhibited moderate and severe anxiety symptoms, respectively (Table 1).

Table 1 – Descriptive analysis of anxiety symptom scores and frequencies among first-year research-focused postgraduate students (n=321). Cuiabá, MT, Brazil, 2021

Symptom classification	n (%)	Mean score ± SD	BCa CI95%*
Normal symptoms (0 – 4 points)	64 (19.9)		
Mild symptoms (5 – 9 points)	86 (26.8)	10.25±5.79	9.57 – 10.96
Moderate symptoms (10 – 14 points)	75 (23.4)		
Severe symptoms (15 – 21 points)	96 (29.9)		

*BCa 95% CI: bias-corrected and accelerated 95% confidence interval; SD: standard deviation

The comparative analysis between anxiety symptoms and social characteristics (Table 2) sho-

wed higher anxiety scores among women ($p=0.025$), sexual minorities ($p=0.017$), those reporting current financial concerns ($p=0.002$), and students who experienced sexual ($p=0.033$) and psychological violence ($p=0.001$) in the past 12 months.

Table 2 – Association between anxiety symptoms and social characteristics assessed in first-year research-focused postgraduate students ($n=321$). Cuiabá, MT, Brazil, 2021

Social characteristics	n	Social characteristics		
		Mean score \pm SD	t*	p-value
Gender				
Male	88	9.11 \pm 5.83	-2.178	0.025
Female	233	10.68 \pm 5.73		
Sexual orientation				
Heterosexual	253	9.85 \pm 5.78	-2.397	0.017
Sexual minorities	68	11.74 \pm 5.63		
Skin color				
White	140	9.99 \pm 5.43	-0.716	0.464
Black, Brown, Indigenous, or Asian	181	10.45 \pm 6.06		
Current financial concern				
No	92	8.60 \pm 5.44	-3.295	0.002
Yes	229	10.92 \pm 5.80		
Victimization by physical violence				
No	264	10.20 \pm 5.83	-0.368	0.709
Yes	57	10.51 \pm 5.66		
Sexual violence victim				
No	295	10.06 \pm 5.78	-2.004	0.033
Yes	26	12.42 \pm 5.60		
Psychological violence victim				
No	174	8.51 \pm 5.93	-6.295	0.001
Yes	147	12.31 \pm 4.89		

*t statistic and p-value obtained through t-tests for independent groups; SD: standard deviation

In Table 3, several academic variables were found to be significantly associated with anxiety symptoms. Students who did not perceive a good interpersonal relationship with their advisor at the beginning of their postgraduate studies had higher anxiety symptom scores ($p=0.027$). Additionally, perceived pressure for productivity ($p<0.001$), difficulty with scientific writing ($p<0.001$), and the perception that postgraduate demands negatively affected family relationships ($p<0.001$) were also associated with higher anxiety levels. Furthermore, pessimism regarding completing the program within the designated timeframe ($p=0.028$) and lack of optimism about future

opportunities ($p=0.001$) were also linked to higher anxiety levels.

Table 3 – Association between anxiety symptoms and academic characteristics in first-year research-focused postgraduate students ($n=321$). Cuiabá, MT, Brazil, 2021

Academic characteristics	n	Social characteristics		
		Mean score \pm SD	t*/F†	p-value
Good relationship with advisor‡	299			
Agrees	279	10.16 \pm 5.82	2.687*	0.027
Does not agree	20	12.90 \pm 4.29		
Good relationship with professors‡	300			
Agrees	267	10.18 \pm 5.81	1.716*	0.079
Does not agree	33	12.00 \pm 5.26		
Good relationship with peers‡	298			
Agrees	251	10.09 \pm 5.73	-1.246*	0.243
Does not agree	47	11.23 \pm 6.13		
Pressure for productivity				
Agrees	171	11.60 \pm 5.57	11.478†	<0.001
Does not agree	99	8.26 \pm 5.57		
Not applicable	51	9.61 \pm 5.80		
Difficulty with scientific writing				
Agrees	154	12.56 \pm 5.22	27.828†	<0.001
Does not agree	87	8.43 \pm 5.46		
Not applicable	80	7.84 \pm 5.50		
Completing the program within the designated timeframe				
Agrees	293	10.07 \pm 5.86	2.261*	0.028
Does not agree	28	12.18 \pm 4.59		
Impaired family relationships				
Agrees	143	11.92 \pm 5.30	11.785†	<0.001
Does not agree	144	8.73 \pm 5.91		
Not applicable	34	9.71 \pm 5.51		
Optimism about future opportunities				
Agrees	254	9.53 \pm 5.72	4.471*	0.001
Does not agree	67	12.99 \pm 5.23		
Course				
Master's program	264	10.14 \pm 5.78	0.747*	0.474
PhD	57	10.77 \pm 5.83		

*t statistic and p-value obtained through t-tests for independent groups; †ANOVA test; ‡for these variables, the number of respondents was lower than 321; SD: standard deviation

The comparative analysis of anxiety symptom severity based on COVID-19-related characteristics revealed higher anxiety scores among students who reported not being vaccinated against the disease ($p=0.003$) and those who perceived a worsening of their mental health during the pandemic ($p=0.001$) (Table 4).

Table 4 – Association between anxiety symptoms and pandemic-related variables assessed in first-year research-focused postgraduate students (n=321). Cuiabá, MT, Brazil, 2021

Pandemic-related variables	n	Social characteristics		
		Mean score \pm SD	t*	p-value
High-risk group for COVID-19				
No	235	10.23 \pm 5.84	-0.093	0.926
Yes	86	10.30 \pm 5.68		
Vaccination status				
Vaccinated	53	8.09 \pm 5.54	-3.007	0.003
Not vaccinated	268	10.68 \pm 5.75		
Social distancing/isolation compliance				
Compliant	249	10.02 \pm 5.77	-1.362	0.178
Non-compliant	72	11.07 \pm 5.84		
Concern about delays in academic activities				
No	123	9.46 \pm 5.75	-1.953	0.058
Yes	198	10.75 \pm 5.77		
Self-assessment of mental health during the pandemic				
Did not worsen	69	7.14 \pm 5.54	-5.236	0.001
Worsened	252	11.10 \pm 5.57		

*t statistic and p-value obtained through t-tests for independent groups; SD: standard deviation

The correlation analysis between anxiety symptoms and psychosocial variables and age, measured quantitatively, showed a significant negative correlation with age ($r = -0.252$; $p < 0.001$) and positive correlations with depressive symptoms ($r = 0.786$; $p < 0.001$) and fear of COVID-19 ($r = 0.437$; $p < 0.001$), with strong and moderate magnitudes, respectively.

In Table 5, the variables that remained associated with anxiety symptoms after multiple linear regression analysis are presented, showing that the final model was significant [$F(5,281) = 97.041$; $p < 0.001$; adjusted $R^2 = 0.627$], indicating that approximately 62.7% of the variance in anxiety symptom scores is explained by the set of retained variables in the model. Additionally, the model did not show residual autocorrelation (Durbin-Watson test = 2.125).

Table 5 – Multiple linear regression analysis of factors associated with the severity of anxiety symptoms in first-year research-focused postgraduate students (n=321). Cuiabá, MT, Brazil, 2021

Variables (Reference)	Unstandardized Coefficients		Standardized Coefficient	95% CI for B [‡]	t [§]	p-value	VIF [¶]
	B*	Standard Error	$\beta^†$				
Intercept	-1.029	0.711	–	-2.427 – 0.370	–	0.149	–
Depressive symptoms	0.681	0.037	0.711	0.609 – 0.753	-1.148	<0.001	1.115
Vaccination status (not vaccinated)	2.030	0.603	0.125	0.842 – 3.217	3.069	0.001	1.052
Psychological violence (yes)	1.331	0.434	0.116	0.477 – 2.184	18.646	0.002	1.104
Pressure for productivity (yes)	1.091	0.426	0.095	0.252 – 1.930	2.234	0.011	1.061
Social distancing compliance (no)	1.136	0.509	0.082	0.135 – 2.138	3.365	0.026	1.035

*Unstandardized coefficients indicate the impact of each independent variable on the dependent variable in the original scale; [†]standardized coefficients express the effects of variables in terms of standard deviations, allowing for comparisons between variables; [‡]95% confidence interval for the unstandardized coefficient; [§]Student's t-statistic obtained through multiple linear regression; [¶]variance inflation factor

Discussion

The sample in this study exhibited clinically significant anxiety symptom scores, consistent with moderate symptom intensity, along with a high prevalence of severe symptoms. The high prevalence of anxiety symptoms among postgraduate students is a well-documented issue in the literature, highlighting this group's vulnerability to mental distress^(3-4,19).

Two distinct contextual factors may explain this alarming mental health scenario. First, entering a research-focused postgraduate program—like other academic transitions—is a highly demanding process for students, particularly in terms of mental health⁽²⁰⁾. New routines, interactions, responsibilities, and academic demands, which differ from those experienced at previous educational levels, create a unique experience for developing researchers. This transi-

tion is often marked by academic stressors that students may not have previously encountered^(3-4,9). For example, some well-recognized academic stressors in research-focused postgraduate studies include: high competition for physical and financial resources, limited availability of scholarships, inadequate research infrastructure in some programs, intense pressure for productivity, concerns about entering the job market, long hours of study and research, social isolation from support networks, strict deadlines for qualifying exams and thesis/dissertation defenses, and conflicts in relationships between students and their advisors or professors^(8,21).

Adding to this wide range of potential academic stressors is the simultaneous experience of coping with COVID-19 and the unique challenges it generated, such as fear of infection and death (both personal and of loved ones); the need for isolation and social distancing; the shift to remote learning; the infodemic, among others. These factors appear to have negatively affected students' mental health increasing the severity of anxiety symptoms at the start of research-focused postgraduate studies^(4,7,9).

The multivariate analysis of the results revealed that, among the factors associated with anxiety, the severity of depressive symptoms experienced by first-year postgraduate students was the main explanatory variable in the model. It is well established in the contemporary literature that anxiety and depression often co-occur, with evidence indicating that these disorders share not only genetic and neurobiological risk factors but also psychological and environmental mechanisms that contribute to their coexistence⁽²²⁾. Dysfunctions in emotional regulation systems and the hypothalamic-pituitary-adrenal axis are common in both disorders, which may partially explain why the presence of one tends to exacerbate the symptoms of the other⁽²²⁻²³⁾. Additionally, psychosocial factors—when experienced negatively—play a crucial role in amplifying the risk of developing these mental disorders⁽²³⁾.

Beyond depressive symptoms, other factors

that contributed to greater anxiety severity included victimization by psychological violence, lack of vaccination, pressure for academic productivity, and non-compliance with social distancing measures. Psychological violence is not uncommon in postgraduate studies and, when it occurs, it triggers devastating effects on students' mental health⁽²⁴⁾. This subtype of interpersonal violence is among the most frequently experienced in various contexts, particularly in those with hierarchical relationships, such as in research-focused postgraduate programs. Despite being the most common form of violence, it is also the hardest to identify and has the potential to cause extreme harm to the victim, especially when prolonged over time. This contributes to increased severity of anxiety and depressive symptoms and raises the risk of suicidal behavior⁽²⁴⁻²⁵⁾.

Victimization by interpersonal violence among postgraduate students is directly associated with the prevalence of anxiety symptoms, particularly among women, individuals from sexual minorities, and international students⁽²⁶⁾. Although this relationship is recognized, there is still a significant gap in the scientific literature on the impacts of interpersonal violence on university students' mental health, particularly among research-focused postgraduate students⁽²⁴⁻²⁵⁾.

Regarding pandemic-related variables, it is well known that the period of isolation and social distancing recommendations caused significant changes in people's daily lives worldwide, negatively affecting their mental health and being linked to increased anxiety and depression disorders⁽²⁷⁾. However, in this study, contrary to what has been reported in national and international literature, students who reported not complying with social distancing exhibited greater severity of anxiety symptoms. Considering that many students were unable to maintain isolation/social distancing due to the need to continue their work activities, it is hypothesized that the fear of infection or death, given the inability to adhere to this preventive measure, may have contributed to the increase in anxiety symptoms⁽²⁸⁻²⁹⁾. Additionally, not being vaccina-

ted was also a factor associated with greater anxiety severity, suggesting that these students felt more vulnerable to the disease, and this perceived vulnerability was reflected in higher anxiety levels.

Among all the potential academic stressors identified in this study, pressure for productivity stands out as one of the main and most concerning sources of mental distress among students^(4,30). The growing and persistent demand for publications has not gone unnoticed by universities and has been characterized as one of the contemporary expressions of exploitation of academic labor⁽³⁰⁾. Although identifying an association between pressure for productivity and anxiety is highly relevant, what is particularly striking is that students already enter postgraduate programs feeling pressured, highlighting that this toxic culture negatively impacts not only those undergoing academic training, but also those who are just beginning their academic journey.

Study limitations

The cross-sectional design prevents the establishment of temporality and causality between the studied variables. Although a wide range of variables was included in this study, it was not possible to control the analyses for all social, demographic, and academic characteristics of the sample. This, combined with the observational nature of the study, increases the possibility of residual confounding. Finally, limitations related to sample size should be noted, as they may contribute to increased hypothesis errors in certain multivariate analyses.

Contributions to practice

The findings of this study highlight the need to develop preventive strategies and interventions aimed at postgraduate students' mental health, encouraging educational institutions and health care professionals to recognize the risk factors involved, such as depression, pressure for productivity, psychological

violence, and the impact of health crises, such as the COVID-19 pandemic. By exploring associations with psychosocial and academic factors, the study suggests that health professionals, including nurses, should be attentive to the specific emotional demands of this population, proposing initiatives that foster supportive and healthier environments, while also considering less traditional risk factors, such as academic stressors.

Conclusion

First-year research-focused postgraduate students exhibited anxiety symptoms consistent with moderate severity. In the analysis of associated factors, depressive symptoms, a history of psychological violence in the past 12 months, lack of vaccination, non-compliance with social distancing/isolation measures, and pressure for productivity were identified as contributing factors to increased anxiety severity among first-year students. These findings highlight the importance of academic and pandemic-related contextual factors in the manifestation of anxiety symptoms at the beginning of postgraduate education.

Authors' contributions

Conception and design or analysis and data interpretation; drafting of the manuscript or relevant critical review of the intellectual content; final approval of the version to be published and agreement to be responsible for all aspects of the manuscript relating to the accuracy or integrity of any part of the manuscript being investigated and resolved appropriately: Kogien M, Teixeira CA, Marcon SR.

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