

Generalized Anxiety Disorder in Brazilian university students during the COVID-19 pandemic*


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Objective: this study assessed the anxiety levels of Brazilian university students during the COVID-19 pandemic. **Methodology:** the Generalized Anxiety Disorder 7-item scale was used to measure the anxiety levels of 1,837 respondents to an online research questionnaire. **Results:** the participants were mostly women aged from 18 to 27 years old, enrolled in graduate programs at public universities, living with people considered at risk for COVID-19, and earning family incomes of 1 to 3 minimum wages. More than 75% of the participants reported some level of anxiety, with 23.08% reporting severe levels, while only 24.93% experienced normal anxiety levels. The ordinal logistic regression identified that being a young woman with a low income could affect the anxiety level. Additionally, students from the field of humanities, well-informed students and those at risk for COVID-19 were significantly more likely to experience anxiety. **Conclusion:** the mental health of Brazilian university students, particularly certain groups, was affected by the COVID-19 pandemic and requires specific attention and care.

Descriptors: Coronaviruses; GAD-7; Patient Health Questionnaire; Regression Analysis; Students.

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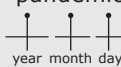

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Transtorno de ansiedade generalizada em universitários brasileiros durante a pandemia de COVID-19

Objetivo: este estudo avaliou os níveis de ansiedade de universitários brasileiros durante a pandemia de COVID-19. **Metodologia:** a escala de Transtorno de Ansiedade Generalizada de 7 itens foi usada para medir os níveis de ansiedade de 1.837 respondentes a um questionário de pesquisa *online*. **Resultados:** os participantes foram em sua maioria mulheres de 18 a 27 anos, matriculados em programas de pós-graduação em universidades públicas, morando com pessoas consideradas de risco para COVID-19, e com renda familiar de 1 a 3 salários mínimos. Mais de 75% dos participantes relataram algum nível de ansiedade, com 23,08% relatando níveis graves, enquanto apenas 24,93% apresentaram níveis normais de ansiedade. A regressão logística ordinal identificou que ser mulher jovem de baixa renda pode afetar o nível de ansiedade. Além disso, estudantes da área de humanidades, estudantes bem informados e aqueles em risco de COVID-19 eram significativamente mais propensos a sentir ansiedade. **Conclusão:** a saúde mental dos universitários brasileiros, particularmente de determinados grupos, foi afetada pela pandemia de COVID-19 e requer atenção e cuidados específicos.

Descritores: Análise de Regressão; Coronavírus; Estudantes; GAD-7; Questionário de Saúde do Paciente.

Trastorno de ansiedad generalizada en universitarios brasileños durante la pandemia de COVID-19

Objetivo: este estudio evaluó los niveles de ansiedad de los estudiantes universitarios brasileños durante la pandemia de COVID-19. **Metodología:** se utilizó la Escala de Trastorno de Ansiedad Generalizada de 7 ítems para medir los niveles de ansiedad de 1837 encuestados en un cuestionario de investigación en línea. **Resultados:** los participantes fueron en su mayoría mujeres de 18 a 27 años de edad, matriculados en programas de posgrado en universidades públicas, que viven con personas consideradas en riesgo de COVID-19, y con 1 a 3 salarios mínimos de ingreso familiar. Más del 75% de los participantes informó algún nivel de ansiedad y que el 23,08% reportó niveles severos, mientras que solo el 24,93% experimentó niveles normales de ansiedad. La regresión logística ordinal identificó que ser una mujer joven de bajos ingresos podría afectar el nivel de ansiedad. Además, los estudiantes del campo de las humanidades, los estudiantes bien informados y aquellos en riesgo de COVID-19 tuvieron significativamente más probabilidades de sufrir ansiedad. **Conclusión:** la salud mental de los estudiantes universitarios brasileños, particularmente en ciertos grupos, se vio afectada por la pandemia de COVID-19 y requiere atención y cuidados específicos.

Descriptores: Análisis de Regresión; Coronavirus; Cuestionario de Salud del Paciente; Estudiantes; GAD-7.

Introduction

The COVID-19 pandemic has caused a series of political, economic, social, family and even psychological problems throughout the world, especially in developing countries. The adoption of restrictive prevention measures, such as social isolation, and the limits placed on daily activities, has increased depression and anxiety in different populations⁽¹⁾.

The prevalence of anxiety tends to increase in crisis situations such as pandemics⁽²⁾. University students in particular already suffer regularly from this type of mental disorder⁽³⁻⁴⁾. During the COVID-19 pandemic, these students' psychoemotional well-being may have been affected by the temporary suspension of academic activities and access to information about the virus.

A reliable and efficient tool in the clinical and research practice that makes it possible to assess anxiety levels by providing scores is the Generalized Anxiety Disorder 7-item scale (GAD-7)⁽⁵⁾. Although there are studies using this tool in several countries^(3,6-8), in Brazil, the anxiety level among university students has not yet been measured using GAD-7. Therefore, this study aimed at evaluating the mental health of Brazilian university students during the COVID-19 pandemic.

Methodology

Study design and population

This is an observational, analytical and cross-sectional study that was conducted using a digital questionnaire in Google Forms. An invitation to participate in the survey, which included an access link, was emailed to deans and administrators of public and private universities throughout Brazil. In turn, the institutions forwarded the invitation to their respective students along with a brief presentation. All university students were eligible to participate in the survey.

Data collection

The questionnaire was divided into two parts. The first one contained sociodemographic and academic questions whereas the second included questions about anxiety from the validated GAD-7 scale^(5,9). It included seven questions, asking the participants how often they feel bothered by problems such as feeling anxious, being unable to control worries, being concerned with many things, having difficulty relaxing, being so agitated that it becomes difficult to sit down, being easily irritated and also feeling afraid that something bad might happen. The students self-assessed their anxiety-related problems for a two-week period prior to completing the questionnaire. The answers were analyzed according to a four-item Likert rating scale: Not at all (0); Several days

(1); More than half of the days (2); and Nearly every day (3). Each participant could obtain up to 21 points in the answer set and the higher the score, the higher the anxiety level. To ensure data confidentiality and reliability, the questionnaire was anonymous and was available from September 10th to November 10th, 2020.

Data analysis

To characterize the sociodemographic aspects and sources of information about COVID-19, a descriptive statistical analysis was performed. Univariate analysis (non-parametric test) was applied to verify the significant associations between the characteristics of the participants and the anxiety level reported during the COVID-19 epidemic⁽¹⁰⁾.

It is noteworthy in this study that the "anxiety" variable was addressed from the self-perception of the research participants and expressed in accordance with the GAD-7 questions. This approach consists in an estimation of the occurrence of this phenomenon in the study population. Therefore, the description of the distribution of anxiety in university students, as well as the characteristics identified as factors associated with anxiety in this research, is guided by this perspective and do not refer to diagnostic criteria for this disease.

The statistically significant variables were selected and included in the ordinal logistic regression analysis. The estimates of the association strengths were demonstrated using Odds Ratio (OR) with a 95% Confidence Interval (CI). Spearman's correlation coefficient was used to assess the stressors related to COVID-19. A two-tailed p-value < 0.05 was considered significant. The data were analyzed using the Stata 13 software.

Ethic statement

This study was approved by the Ethics Committee for Research Involving Human Beings of the Federal University of Acre (*Comitê de Ética em Pesquisa-Universidade Federal de Acre, CEP-UFAC*), under Certificate of Presentation of Ethical Appreciation (*Certificado de Apresentação de Apreciação Ética, CAAE*) 35945420.1.0000.5010, and complies with all the requirements set forth in Resolution No. 466/2012 of the National Health Council on the guidelines and regulatory standards for research involving human beings.

Results

The questionnaire was answered by 1,837 university students from all regions of the country, mostly women (65%), aged between 18 and 27 years old (78%), from public universities (90%), and attending in-person courses (96%). Approximately 84% of the

respondents live with their families and 66% do so with people considered at risk for COVID-19. Half of those interviewed had monthly family incomes of only one to three minimum wages.

Regarding the self-perceived anxiety levels assessed by GAD-7, it was observed that 75.07% of the respondents reported some level of anxiety, ranging from mild to severe, while only 24.93% of the participants reported levels considered normal (Table 1). The univariate analysis of anxiety among university

students during pandemics was significant for most variables (Table 2).

Table 1 - Number of students with different anxiety levels (n = 1,837)

Anxiety Level	Number (n)	Ratio (%)	Cumulative (%)
Normal	458	24.93	24.93
Mild	594	32.34	57.27
Moderate	361	19.65	76.92
Severe	424	23.08	100.00

Table 2 - Univariate analysis of college students' anxiety about the pandemic

Variables	Anxiety level				Statistics	p
	Normal	Mild	Moderate	Severe		
Gender					-9.184*	0.0000
Male	244	194	93	104		
Female	204	386	259	301		
Age group (years old)					26.752†	0.0001
18-27	326	460	302	340		
28-37	78	99	41	64		
38-47	28	22	12	16		
48-57	19	11	5	3		
>58	7	2	1	1		
Income (minimum wages)					18.659†	0.0009
<1	54	85	46	79		
1-3	207	308	175	229		
4-6	95	114	84	55		
7-9	47	45	20	31		
>10	55	42	36	30		
Region					10.267†	0.0362
North	95	103	67	107		
Northeast	313	418	250	249		
Midwest	26	33	17	33		
Southeast	10	23	16	10		
South	14	17	11	25		
Institution					2.226*	0.0260
Public	419	540	317	372		
Private	39	54	44	52		
Teaching modality					1.475†	0.4783
In-person	436	572	351	405		
Semi-in-person	2	4	2	4		
Remote learning	20	18	8	15		
Science area					27.496†	0.0001
Health	129	168	99	116		
Biology and Agrarian	25	37	24	20		
Human	145	229	152	196		
Exact	159	160	86	92		
Lives with					3.841†	0.1466
Family members	391	487	310	351		
Friends	18	38	22	30		
Alone	49	69	29	43		

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Variables	Anxiety level				Statistics	p
	Normal	Mild	Moderate	Severe		
Belongs to a risk group					-4.822*	0.0000
Yes	271	382	260	308		
No	187	212	101	116		

*Mann-Whitney test; †Kruskal-Wallis test

The univariate analysis factors that showed statistical significance were included in the ordinal logistic regression analysis (Table 3). The following risk factors for anxiety were considered: being female (OR = 2.19; 95% CI = 1.805–2.629), attending humanities courses (OR = 1.47; 95% CI = 1.175–1.839), belonging to a risk group (OR = 1.58;

95% CI = 1.316–1.897) and living in any Brazilian region, except from the Northeast, where a lower self-perception of anxiety was noticed. One of the protective factors was being over 48 years of age (OR = 0.25; 95% CI = 0.131–0.467), as well as earning more than four minimum wages (OR = 0.61; 95% CI = 0.454–0.829).

Table 3 - Ordinal logistic regression analysis of factors influencing university students' anxiety levels

Factors	Number	SE [†]	OR [†]	p [‡]	OR (95% CI) [§]
Gender					
Female	1,150 (64.43)	0.209	2.19	0.000	(1.805, 2.629)
Male	635 (35.57)	-	-	-	-
Age group (years old)					
18-27	1,428 (77.74)	-	-	-	-
28-37	282 (15.35)	0.102	0.83	0.131	(0.652, 1.057)
38-47	78 (4.25)	0.147	0.66	0.065	(0.428, 1.025)
48-57	38 (2.07)	0.080	0.25	0.000	(0.131, 0.467)
>58	11 (0.60)	0.145	0.23	0.020	(0.065, 0.795)
Income (minimum wage)					
<1	264 (14.37)	-	-	-	-
1-3	919 (50.03)	0.101	0.78	0.056	(0.603, 1.006)
4-6	348 (18.94)	0.094	0.61	0.001	(0.454, 0.829)
7-9	143 (7.78)	0.106	0.53	0.002	(0.360, 0.788)
>10	163 (8.87)	0.124	0.65	0.024	(0.449, 0.945)
Region					
Northeast	1,230 (66.96)	-	-	-	-
North	372 (20.25)	0.165	1.38	0.007	(1.094, 1.747)
Midwest	109 (5.93)	0.278	1.48	0.037	(1.024, 2.139)
Southeast	59 (3.21)	0.415	1.70	0.029	(1.055, 2.745)
South	67 (3.65)	0.452	1.80	0.018	(1.109, 2.952)
Science area					
Health	512 (27.87)	-	-	-	-
Biological and agrarian	106 (5.77)	0.203	1.02	0.920	(0.690, 1.507)
Human	722 (39.30)	0.168	1.47	0.001	(1.175, 1.839)
Exact	497 (27.05)	0.118	0.94	0.600	(0.731, 1.197)
Belongs to a risk group					
Yes	616 (33.53)	0.147	1.58	0.000	(1.316, 1.897)
No	1221 (66.47)	-	-	-	-

[†]SE = Standard Error; [‡]OR = Odds Ratio; [‡]p = p-value; [§]CI = Confidence interval; ^{||}Reference

During the research, the university students were asked about the level of information they had about the COVID-19 pandemic and whether they had any relatives or acquaintances infected by SARS-CoV-2.

When correlated with the interviewees' anxiety levels, these results showed that considering oneself well-informed had a significant correlation with the anxiety levels (Table 4).

Table 4 - Correlation analysis between the COVID-19-related stressors and university students' anxiety levels when facing the pandemic

Related stressors	Anxiety Level	
	r [*]	p [†]
Being well-informed	-0.0811	0.0005
Source of information	0.0330	0.1705
Relative or acquaintance infected with COVID-19	0.0344	0.1407

*r = Correlation coefficient; †p = p-value

Discussion

Our findings reported some anxiety level in university students during the pandemic period. Studies in different parts of the world have shown that the COVID-19 pandemic has affected the students' mental health status and academic progress^(3,11-14).

Women reported a greater self-perception of anxiety, corroborating other studies related to the pandemic^(13,15-16), as well as prior to COVID-19 and in other pandemics^(15,17). One explanation may be that women already go through potentially stressful transformative events of their own; thus, they are more inclined to worry and feel stress and pressure also associated with their gender, such as a feeling of being in the background and lacking competence, as well as other gender inequalities⁽¹⁸⁾.

The male gender was pointed out as a protective factor against anxiety and mental problems⁽¹⁹⁾. However, some studies^(3,20) have shown that gender had no significant relationship with anxiety disorders.

As for age, the young population presented certain anxiety level and, according to previous studies, most psychiatric disorders have their onset during the first years of university studies, indicating that being young is a risk factor for anxiety, which is consistent with another study conducted with a Brazilian sample⁽²¹⁻²²⁾. In a multicenter study carried out in Asia, it was found that people aged 30 years old and younger are considered at risk for some mental disorder⁽¹⁹⁾.

According to the literature, there are some factors that may increase the risk of developing mental health problems, such as female gender, lower socioeconomic status, having infected family members or acquaintances, interpersonal conflicts, frequent use of social media, less resilience and social support, whereas there is an unequal distribution of social and environmental vulnerability in the population, triggering unequally distributed psychosocial effects due to the harms generated in health crisis situations, such as pandemics^(3,23-24).

The COVID-19 pandemic has imposed impactful economic losses to many people. When we correlated the university students' income and anxiety levels, we found that lower incomes can exert an influence on the anxiety

levels. In Chinese and American college students, family income and economic stability are risk factors for anxiety disorders^(3,14). Additionally, the impact of this epidemic on global mental health is difficult to record and measure; therefore, public health emergencies can generate several psychoemotional harms in university students, such as anxiety, fear and worry, among others⁽²⁵⁾.

During outbreaks of infectious diseases, damage to mental health tends to be neglected in comparison to biological risk and treatment measures. However, this type of health problem can affect more people and continue even after the end of the epidemic. In the general population, the anxiety and stress levels in healthy individuals become high. On the other hand, existing symptoms in people with a previous history of mental health disorders worsen, increasing the risk of complications such as suicide⁽²⁶⁾.

Some limiting factors in this study are as follows: the research time, which can influence the answers collected, as there may be variations during the course of the pandemic in early or late periods. In addition, as this is an online research, it was not possible to remove bias. Furthermore, pre-existing psychiatric conditions and medical diagnoses of anxiety disorders among the participants were also not considered. The study also focused mainly on a population segment with Internet access; therefore, there may be some difference in the participation of students living in more isolated areas, where access to this kind of technology is limited.

Considering the high perception of anxiety among college students in this study, public health efforts should be integrated with institutional policies in universities to identify and monitor people in need of health care services both within and outside universities. Investments in strategies that promote mental health in this population group, such as offering cultural and sports activities in the academic community, allowing flexibility in the return to classes, expanding research and extension, as well as the guarantee of support mechanisms for students while in the universities, all adapted to the health crisis context, comprise some practical suggestions in this field.

Conclusion

It is concluded that the mental health of Brazilian university students was affected during the COVID-19 pandemic, especially in certain groups, demanding particular attention and psychological support for this population segment.

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