

# Mental disorders in the pandemic: assessment of the mental health of medical students

## Transtornos mentais na pandemia: avaliação da saúde mental de estudantes de medicina

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### Resumo

Nos últimos anos houve um aumento considerável da prevalência de transtornos mentais, com destaque para estudantes de medicina. OBJETIVO: Com a pandemia do COVID-19 e as mudanças trazidas por ela, viu-se a necessidade de identificar a prevalência de sintomas de depressão e ansiedade em acadêmicos de medicina de uma universidade do Norte do Brasil durante esse período. MÉTODO: Trata-se de um estudo observacional, descritivo, do tipo transversal, realizado com 240 estudantes de medicina, durante a segunda onda da pandemia do COVID-19. Foi aplicado um questionário validado, via Google Forms para avaliar e classificar sintomas de depressão e ansiedade. Foi utilizado o teste qui-quadrado para avaliar as correlações. RESULTADOS: Foi visto que não houve associação significativa entre idade e presença de sintomas de transtorno mental e ainda, observou-se que sintomas de ansiedade e depressão foram mais relatados em alunos do primeiro, segundo e quarto ano. CONCLUSÃO: Conclui-se que os participantes da pesquisa apresentaram níveis leves de ansiedade e depressão, diferindo da maioria dos estudos científicos. Percebeu-se que houve maior prevalência de sintomas moderados a graves de ansiedade na população feminina e de depressão no sexo masculino. A idade média mais acometida foi de 23 anos, em alunos do primeiro e quarto ano.

**Palavras-chave:** transtornos mentais; educação médica; covid-19; pandemias

### Abstract

In recent years, there has been a considerable increase in the prevalence of mental disorders, especially among medical students. OBJECTIVE: With the pandemic caused by Sars-CoV-2 virus and the changes brought by it, there was a need to identify the prevalence of symptoms of depression and anxiety in medical students in a university in Northern Brazil during this period. METHODS: An observational, descriptive, cross-sectional study carried out with 240 medical

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students during the second wave of the COVID-19 pandemic. A validated questionnaire applied with Google Forms in order to assess and classify symptoms of depression and anxiety. The chi-square test was used to assess correlations. RESULTS: It was seen that there was no significant association between age and the presence of symptoms of mental disorder, and it was observed that symptoms of anxiety and depression were most reported in first, second- and fourth-year students. CONCLUSIONS: The research participants had mild levels of anxiety and depression, differing from most scientific studies. It was noticed that there was a higher prevalence of moderate to severe symptoms of anxiety in the female population and of depression in the male population. The most affected mean age was 23 years, in first- and fourth-year students. **Keywords:** mental disorders; medical education; covid-19; pandemics

## Introduction

The presence of problems associated with mental health has grown unquestionably in recent years. Symptoms of depression and anxiety have shown to be a problem of high prevalence among young students in higher education, since the entry into academic life implies a series of changes in lifestyle and in habits performed daily, making changes in daily routine have great weight in the development of psychological disorders in the first year of the course.<sup>1,2</sup>

Several studies carried out with young Brazilian university students confirm the presence of common mental disorder (CMD), which refers to the presence of depression and anxiety concomitantly, characterized by problems related to sleep, fatigue, irritability, restlessness, forgetfulness, feelings of fear, sadness, among others.<sup>3</sup> Furthermore, researches show that the majority of students affected by such symptoms are academics from courses in the health area, corresponding to a percentage that varies from about 19% to 45%.<sup>3,4</sup>

With regard to the presence of depression and anxiety in medical students compared to the general population, a significantly higher number is observed. A meta-analysis study, carried out by Puthram et al,<sup>5</sup> to assess the global prevalence of depression in medical students revealed a prevalence of 28% of depression in medical students worldwide, which differs from the general population in which this rate is 7%. In the same context, the study by Medeiros and Bittencourt<sup>6</sup> to assess the level of

anxiety in students in the health area revealed a prevalence of around 50%. It evidences the high percentage of students with emotional symptoms of common mental disorders.

The pandemic caused by the SARS-CoV-2 virus provoked intense transformations in many aspects of life around the world, including in the educational system of higher education, which, with the social isolation imposed by the need to prevent contagion, was changed to remote education.<sup>7</sup> It is noticed that, since medical students are classified as vulnerable to the development of mental disorders, in the pandemic scenario, there was a greater risk of exposure to depression and anxiety in this class of individuals.<sup>8</sup>

In this context, this study aimed to identify the prevalence of depression and anxiety in medical students at a public university in the Northern region of Brazil, relating it to gender, age group, and course stage, during the months of March and April 2021.

## Materials and Methods

This is a descriptive, observational, cross-section study carried out after the research project was approved by the Research Ethics Committee (REC) of the State University of Pará, via *Plataforma Brasil* - Opinion number: 4.459.443.

### Sample and type of study

The study sample was composed of 240 medical students regularly enrolled at the State University of Pará. The sample was determined by means of the sample population calculation, whose formula is



contained in the Manual for the Preparation of Scientific Papers of the State University of Pará. Initially, students from the 1<sup>st</sup> to the 12<sup>th</sup> semester would have been included in the study, but due to the COVID-19 pandemic and the early graduation of last semester's students, they were not included in the study. Thus, only students from the 1<sup>st</sup> to the 11<sup>th</sup> semester participated.

### Research delimitation

The questionnaire used was the “The Hospital Anxiety and Depression Scale” developed by Zigmond, A.S. and Snaith, R.P.<sup>9</sup> in the translated and validated version by Botega et al<sup>10</sup>; it was applied online, via Google forms, with access only through institutional e-mail.

It was chosen to use the classification of the scale “The Hospital Anxiety and Depression Scale” published by Stern,<sup>11</sup> which classifies the levels of depression and anxiety into four different grades (absent; mild; moderate; severe depression/anxiety); whereas previously published scales mostly classify into only three grades (unlikely; possible; probable depression/anxiety).

### Inclusion and Exclusion Criteria

The following inclusion criteria were adopted: being enrolled in the medical course at the State University of Pará, being over 18 years old, and accepting participation in the research by signing the Free and Informed Consent Form. Therefore, medical students from the State University of Pará under 18 years old and those who refused to sign the Free and

Informed Consent Term were excluded from the research.

### Data analysis

The data were analyzed by using descriptive and inferential statistics. For correlation analysis, the chi-square test was used to assess possible association between symptoms of depression, anxiety and the variables gender, age group and course stage by adopting the maximum confidence level of  $p < 0,05$  in order to verify a significant statistic. And, for data analysis, Microsoft Excel system resources were used in a Windows 10 environment.

### Results

#### Characterization of the participants

The study assessed the presence of depression and anxiety symptoms in 240 medical students linked to the State University of Pará: 126 males (52,5%) and 114 females. In terms of age, 58 (24,16%) were between 18 and 20 years old, 150 (62,5%), between 21 and 25 years old, and 32 (13,33%), between 26 and 58 years old (**Table 1**). With regard to the total population studied, 96 students were from the basic cycle (1<sup>st</sup> to 4<sup>th</sup> semester); 95, from the clinical cycle (5<sup>th</sup> to 8<sup>th</sup> semester), and 49 students, from the internship, it means, from the 9<sup>th</sup> to the 11<sup>th</sup> semester. The smallest participation in the research was from students of the 11<sup>th</sup> semester, with 9 participating students, followed by the 10<sup>th</sup> semester, with 17 participating students, as described in the table.

Table 1 - Demographic characteristics and year of study of medical students at the State University of Pará, Belém - Pará.

Variable	Frequency	Percentage
<b>Gender</b>		
Male	126	52,5
Female	114	47,5
<b>Age</b>		
18 to 20 years old	58	24,2
21 to 25 years old	150	62,5
26 to 58 years old	32	13,3
<b>Year</b>		



1 <sup>st</sup>	47	19,6
2 <sup>nd</sup>	49	20,4
3 <sup>rd</sup>	46	19,2
4 <sup>th</sup>	49	20,4
5 <sup>th</sup> , 6 <sup>th</sup>	49	20,4

The percentages are relative to the total number of students (n=240).

Profile of participants who had depression or anxiety disorder.

From the study carried out through the application of HAD questionnaires, whose objective was to assess the presence of symptoms of depression and anxiety, it was observed that most of the students had no symptoms of anxiety (48,3%) and depression (70%). Although the mean score found for anxiety and depression was, in

general, less than half of the maximum score (21 points for depression and 21 points for anxiety), results with a score higher than 11 points were found, which indicates moderate anxiety and/or depression (24,1%), and 12,1% of the participants had severe anxiety and depression (score of 15 to 21 points). Such results can be seen in **Table 2**.

Table 2 - Classification regarding anxiety and depression (HAD questionnaire) of medical students at the State University of Pará, Belém - Pará.

Variable	Frequency	Percentage	IC95%
<b>Anxiety</b>			
Absent	116	48,3	41,9 - 54,8
Mild	60	25,0	19,8 - 31,1
Moderate	38	15,8	11,6 - 21,2
Severe	26	10,8	7,3 - 15,6
<b>Depression</b>			
Mild	168	70,0	63,7 - 75,6
Medium	49	20,4	15,6 - 26,2
Moderate	20	8,3	5,3 - 12,8
Severe	3	1,3	0,3 - 3,9

The percentages are relative to the total number of students (n=240).

The genders were compared with the ratings of anxiety and depression levels (**Table 3**). For example, in females, 41,2% had a low level of anxiety, while in males this proportion was 54,8%. The proportions of individuals with minimal anxiety or with some degree of anxiety (medium, moderate

or severe) did not vary significantly between genders (p=0,106). Despite this, 14,9% of women with severe anxiety and 7,1% of men were observed. Similarly, depression ratings did not vary significantly between genders.

Table 3 - Relation between gender and the classification of anxiety and depression levels among medical students at the State University of Pará, Belém - Pará.

Variable	Female (n=114)	Male (n=126)	p-value
<b>Anxiety</b>			
Minimal	47 (41,2)	69 (54,8)	0,106
Mild	31 (27,2)	29 (23,0)	
Moderate	19 (16,7)	19 (15,1)	
Severe	17 (14,9)	9 (7,1)	
<b>Depression</b>			
			0,894



Minimal	78 (68,4)	90 (71,4)
Mild	25 (21,9)	24 (19,0)
Moderate	10 (8,8)	10 (7,9)
Severe	1 (0,9)	2 (1,6)

In all cases, the chi-square was used. Variables are displayed as n (%). Percentages are relative to the column total.

The association between ages with ratings of anxiety and depression levels was also tested in order to identify whether the age groups varied significantly in relation to

these ratings. And it was observed that in no case was there a significant association (non-significant p-values, **Table 4**).

Table 4 - Relation between age group and levels of anxiety and depression in medical students at the State University of Pará, Belém - Pará.

Variable	18 to 20 years old (n=58)	21 to 25 years old (n=150)	26 to 58 years old (n=32)	p-value
<b>Anxiety</b>				0,356
Minimal	29 (50,0)	67 (44,7)	20 (62,5)	
Mild	12 (20,7)	44 (29,3)	4 (12,5)	
Moderate	9 (15,5)	23 (15,3)	6 (18,8)	
Severe	8 (13,8)	16 (10,7)	2 (6,3)	
<b>Depression</b>				0,098
Minimal	44 (75,9)	102 (68,0)	22 (68,8)	
Mild	11 (19,0)	34 (22,7)	4 (12,5)	
Moderate	3 (5,2)	13 (8,7)	4 (12,5)	
Severe	0 (0,0)	1 (0,7)	2 (6,3)	

In all cases, the chi-square was used. Variables are displayed as n (%). Percentages are relative to the column total.

Regarding the period of the course (**Table 5**), which lasts at least six years, the level of anxiety among medical students was higher reported in the first (12%) and in the fourth years (12,5%), and it was lower

reported in the third year (7,08%). In turn, depression was higher among first-year (5,83%) and second-year (7,5%) students, and was lower among fifth- and sixth-year (5,41%) medical students.

Table 5 - Relations between the stage in the course and the levels of anxiety and depression in medical students of the State University of Pará, Belém - Pará.

Anxiety	Absent (n=116)	Mild (n=60)	Moderate (n=38)	Severe (n=26)	p-value
<b>Year</b>					0,061
1 <sup>st</sup>	18 (15,5)	11 (18,3)	9 (23,7)	9 (34,6)	
2 <sup>nd</sup>	23 (19,8)	10 (16,7)	7 (18,4)	9 (34,6)	
3 <sup>rd</sup>	29 (25,0)	11 (18,3)	4 (10,5)	2 (7,7)	
4 <sup>th</sup>	19 (16,4)	18 (30,0)	10 (26,3)	2 (7,7)	
5 <sup>th</sup> ,6 <sup>th</sup>	27 (23,3)	10 (16,7)	8 (21,1)	4 (15,4)	
<b>Depression</b>	Absent (n=168)	Mild (n=49)	Moderate (n=20)	Severe (n=3)	p-value
<b>Year</b>					0,720
1 <sup>st</sup>	33 (19,6)	8 (16,3)	4 (20,0)	2 (66,7)	
2 <sup>nd</sup>	31 (18,5)	12 (24,5)	6 (30,0)	0 (0,0)	
3 <sup>rd</sup>	34 (20,2)	8 (16,3)	3 (15,0)	1 (33,3)	
4 <sup>th</sup>	34 (20,2)	12 (24,5)	3 (15,0)	0 (0,0)	





5 <sup>th</sup> , 6 <sup>th</sup>	36 (21,4)	9 (18,4)	4 (20,0)	0 (0,0)
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Percentages are relative to the column total.

## Discussion

About 30 to 44% of medical students have some type of Common Mental Disorder, which is commonly associated with a decrease in quality of life and the presence of psychological distress.<sup>12</sup>

Regarding the classification of disorders, this study showed that there are more students with medium anxiety and depression compared to moderate and severe levels. It corroborates the results found in a prevalence research conducted,<sup>13</sup> in which 35% of university students had mild anxiety, and 32,43% had mild to moderate depression. Another similar research also showed in its results a higher prevalence of mild depression among students.<sup>14</sup>

In the context of the pandemic and the social isolation, the educational system has been forced to adopt measures such as remote teaching and hybrid teaching (face-to-face classes with students divided into smaller groups in addition to classes in the virtual environment). In this sense, although remote teaching has been better accepted than expected by medical students around the world, the change has generated impacts with regard to the psychological state of individuals.<sup>7</sup>

These findings are justified by the fact that academics are exposed to the interruption of the course, and consequently to the delay in the continuity of professional training, added to the restriction of social interaction, adaptation to the online format of classes and the afflictions inherent in the pandemic scenario.<sup>8</sup>

Furthermore, it was observed that medical and nursing students who worked during the pandemic suffered a negative and significant impact on mental well-being due to exposure to losses and difficult working

conditions, such as the shortage of Personal Protective Equipment. Since, in Brazil, medical students, including final-year students, had their practices in outpatient clinics and hospitals suspended, with a return only in the second semester of 2020, a choice left to the Higher Education Institutions, the interns who kept their practice activities reported work overload.<sup>15</sup>

Regarding gender, it could be noticed that 58% of the female population presented anxiety symptoms at medium to severe level. While in the male population, the proportion was 45,2%. In relation to depression, the proportions did not vary significantly between the genders, although a prevalence of 31,6% was observed in the female population, and 28,5% in the male population. During the pandemic, being female, among others, were identified as risk factors for mental illness, since, in the study, the prevalence of psychological distress was significantly higher in this group.<sup>16</sup>

Regarding the age group, anxiety and depression were more mentioned in the ages between 21 and 25 years old. However, it was found that 6,3% of students aged between 26 and 58 years old had severe depression. In a study that observed the prevalence of psychological problems associated with social isolation during the COVID-19 pandemic, the results revealed that young people aged between 21 to 40 years old are in a more vulnerable position with regard to mental health disorders during the pandemic.<sup>17</sup>

It has already been shown that 21,95 is the average age at which students have anxiety and depression, and this data has been associated with the broad reach that young people have to information and social media.<sup>18</sup> Unlike the aforementioned results, in Leão et al., the research findings pointed to a higher average of anxiety in the



responses of the group of students under 20 years old.<sup>14</sup>

The results of the present study are worrying, since, according to World Health Organization (WHO) data, psychiatric disorders in the population aged 15 to 29 years old are risk factors for suicidal ideation, which is characterized as the second leading cause of death among young people in this age group.<sup>19</sup>

About the relation between anxiety and depression and course period, the current results are in accordance with a study conducted before the pandemic, which reveal that most university students point to the initial period as the most difficult. Therefore, it is the period with the highest rates of anxiety and depression among students considering that it is the time of contact with unknown content added to a totally different environment from what they had been experiencing before.<sup>20,21</sup>

In contrast, the third and the fourth year of the course were the moments of medical graduation that lead to higher levels of anxiety. This fact may be related to content overload, increased number of subjects and workload, as well as proximity to the beginning from internship.<sup>22</sup>

Fifth- and sixth-year students had the lowest incidence of elevated levels of anxiety and depression, which corroborates part of the literature within the context of the COVID-19 pandemic, according to which the internship, despite having a higher exposure to the disease, continued with university activities, social interactions and no delay in the course. This fact may explain the lower scores on the depression and anxiety scales.<sup>14</sup>

However, other studies point out that the prevalence of both anxiety and depression showed high values in the last cycle, the internship. This can be explained by the uncertainty about the effects of the pandemic: a) greater concern of students in

relation to their own education; b) possibility of finding the labor market unfavorable; c) enrollment in future medical residency programs.<sup>21,23</sup>

University students constitute a particularly vulnerable group to develop mental health problems in view of the challenges commonly associated with the transition to adult life and the frequent economic and material difficulties.

This study presented, as research limiting factors, the absence of questioning about the previous diagnosis of anxiety or depression and the grouping of students aged between 26 and 58 years old due to the limited presence of individuals in this age group. Both factors can interfere with the interpretation of results.

## Conclusion

The results obtained from the study applied to medical students at a public university during the second wave of the COVID-19 pandemic showed the presence of mild levels of anxiety and depression, differing from most scientific studies, which show the rise of such diseases, as well as the worsening quality of life among this population in Brazil. It is worth mentioning that, in the scenario of this research, students had access to the psychological support service for medical students through digital resources, an initiative created to provide psychological assistance to students. Furthermore, such results can also be explained by the greater knowledge that the medical student has about health care. With regard to the profile of students, there was a prevalence of medium to severe levels of anxiety and depression among females. On the other hand, there is a prevalence of severe depression in the male population aged between 21 and 25 years. In relation to the period of the course, a higher prevalence was observed between the first and the fourth year. The data point to the

effectiveness and importance of integrative practices for students of health  
maintaining psychological assistance sciences.  
services and educational actions in

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