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Stress, Anxiety, and Depression Among First-Year Students of a Public College in the Northeast, Brazil

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Abstract

Universities have sought to characterize the students' mental health considering academic and social impacts. This study used a questionnaire to assess the prevalence and severity of stress, anxiety, and depression symptoms. A convenience sample of 92 first-year students attending the Physical Therapy, Psychology, and Nutrition undergraduate programs at a public college in the Northeast, Brazil, aged between 17 and 38 (M = 20.50; SD = 3.50), participated in this study. The DASS-21 scale revealed that 48.90% experience mild or more severe symptoms in at least one of the factors, 35.90% experience stress, 26.10% depression, and 22.80% experience anxiety symptoms. Depression symptoms were the most severe. Differences were found between the programs, suggesting that the symptoms are not homogeneous across the institution. No statistically significant differences were found based on gender, and no significant correlations were found between symptoms and income, age, or the number of children. Future studies should explore which programs' characteristics influence the profile of symptoms. Practical implications are also discussed.

Keywords: mental health, stress, anxiety, depression, higher education

ESTRESSE, ANSIEDADE E DEPRESSÃO EM CALOUROS DE UMA FACULDADE PÚBLICA NO NORDESTE, BRASIL

Resumo

As instituições universitárias têm buscado caracterizar a saúde mental dos estudantes pelos impactos acadêmicos e sociais. Este estudo avaliou por meio de questionário a prevalência e a severidade de sintomas de estresse, ansiedade e depressão. Participaram 92 calouros de Fisioterapia, Psicologia e Nutrição de uma faculdade pública no Nordeste, entre 17-38 anos (*M* = 20.50; *DP* = 3.50), selecionados por conveniência. Verificou-se a partir da escala DASS-21 que 48.90% apresentam pelo menos sintomatologia leve em um dos fatores, 35.90% sofrem sintomas de estresse, 26.10% de depressão e 22.80% de ansiedade. A severidade foi maior no fator depressão. Evidenciaram-se diferenças entre cursos, sugerindo que os sintomas não se apresentam de maneira homogênea na instituição. Diferenças de gênero não foram evidenciadas estatisticamente. Não houve correlações significativas entre sintomas e renda, idade e quantidade de filhos. Estudos futuros devem explorar quais características dos cursos exercem influência no perfil sintomatológico. Implicações práticas são apresentadas.

Palavras-chave: saúde mental, estresse, ansiedade, depressão, ensino superior

ESTRÉS, ANSIEDAD Y DEPRESIÓN EN ESTUDIANTES DE PRIMER AÑO DE UNA UNIVERSIDAD PÚBLICA DEL NORESTE, BRASIL

Resumen

Las instituciones universitarias han tratado de caracterizar la salud mental de los estudiantes por los impactos académicos y sociales. Este estudio evaluó la prevalencia y la gravedad de los síntomas de estrés, ansiedad y depresión mediante un cuestionario. Noventa y dos estudiantes de primer año de Fisioterapia, Psicología y Nutrición de una universidad pública del Nordeste de Brasil, con edades comprendidas entre los 17 y los 38 años (M = 20.50; DT = 3.50), seleccionados por conveniencia. Se comprobó a partir de la escala DASS-21 que el 48.90% presentaba al menos síntomas leves en uno de los factores, el 35.90% sufría síntomas de estrés, el 26.10% de depresión y el 22.80% de ansiedad. La gravedad fue mayor en el factor depresión. Se evidenciaron diferencias entre los cursos, lo que sugiere que los síntomas no se presentan de manera homogénea en la institución. Las diferencias de género no se evidenciaron estadísticamente. No hubo correlaciones significativas entre los síntomas y los ingresos, la edad y el número de hijos. Los estudios futuros deberían explorar qué características del curso influyen en los perfiles sintomáticos. Se presentan las implicaciones prácticas.

Palabras clave: salud mental, estrés, ansiedad, depression, educación superior

Entering and staying in higher education presents students with new or intense challenges (e.g., teacher-student-classmate relationships and autonomy in the study routine and personal life). A portion of college students can successfully face such challenges, but some students cannot, being strongly affected by emotional states that lead to a painful and sickening academic experience (Lambert et al., 2018).

Higher education institutions have been increasingly concerned with students' mental health, which is essential for their well-being and satisfactory academic and institutional performance. Policies and actions were implemented based on legal frameworks that instituted the *Programa Nacional de Assistência Estudantil* [National Student Assistance Program] ([PNAES], Brazil, 2010). However, even though institutional actions are essential, some specifically address the students' mental health and are of a more "curative" nature or are intended to respond to ongoing problems rather than prevent or monitor students over time. Preventive actions are strategic to develop or (re)orient projects and programs in line with institutional demands, considering that institutions lack studies that portray the mental health conditions of college students and are also able to support policies and promote protective factors, such as the development of social skills, promoting exercise, leisure, good eating habits, and sleep hygiene (Silva et al., 2020).

On the national scene, studies have addressed the socioeconomic and cultural profile of undergraduate students from federal universities. The most recent study suggests that 83.50% of the graduating students report emotional difficulties in the last twelve months (*Fórum Nacional de Pró-Reitores de Assuntos Comunitários e Estudantis* [FONAPRACE] *& Associação Nacional dos Dirigentes das Instituições Federais de Ensino Superior* [ANDIFES], 2019). The difficulties most frequently mentioned include anxiety (63.60%), discouragement/unwillingness to work on tasks (45.60%), insomnia or significant sleep disturbances (32.70%), helplessness/despair/hopelessness (28.20%), or a feeling of loneliness (23.50%). However, these emotional difficulties have not been studied in-depth and, for this reason, are the object of this study.

Cristo et al. (2019) identified the perceived causes of mental health problems among undergraduate students, which included not being in touch with family members very frequently, being self-demanding, experiencing an oppressive/hierarchical relationship between teacher-student, and an excessive study load. Some perceived consequences included trivialization/naturalization of distress, crying spells, procrastination, learning difficulties, failing the year or not graduating on time, loneliness, depressive and anxiety disorders, alcohol use/abuse, or other illegal/legal drugs. According to Silva and Azevedo (2018), students who attempted or frequently thought about suicide reported adverse experiences in higher education, among them: intense pressure, difficulty adapting to the academic environment, and difficulties moving out of one's city of origin.

The incidence of stress, anxiety, and depression has been increasingly investigated among college students because these are recurrent symptoms that interfere with a student's life, besides their relationship with suicide attempts (Costa et al., 2020; Martins et al., 2019;

Patias et al., 2021). Academic life is permeated with challenges, pressure, deadlines, and various needs that require critical decision-making, the rhythm of which demands students to have a strong mental, physical, and behavioral ability to adapt (Vieira & Schermann, 2015). Recent systematic reviews and meta-analyses show an increase in studies addressing the mental health of undergraduate students in Brazil, especially in the last decade (Demenech et al., 2021). The authors who conducted a meta-analysis addressing 37.486 undergraduate students report a high prevalence of anxiety, depression, and suicidal behavior in college students in Brazil (37.75%, 28.51%, and 9.10%, respectively). Pacheco et al. (2017) performed a meta-analysis that addressed 18.015 Brazilian medical students and showed a high prevalence of mental health problems, including anxiety, depression, and stress (32.90%, 30.60%, and 49.90%, respectively).

Studying the incidence and repercussions of stress, anxiety, and depression in students' personal and academic lives is important because prolonged stress weakens one's body and lowers his/her defense immune system, leaving the individual vulnerable. Additionally, it is widespread among college students (Ramos et al., 2019; Vieira & Schermann, 2015) and may lead to anxiety and depression. Pacheco et al. (2017) showed the following factors associated with stress among medical students: being a woman, attending the program's first year, having a low family income, being dissatisfied with the program, and using escape and avoidance coping strategies. Regarding anxiety, there has been an increased demand for actions to diagnose the condition and promote coping strategies, such as workshops, including group activities among college students (Almeida & Soares, 2003; Ramos et al., 2019). Anxiety is expressed through cognitive manifestations (e.g., exacerbation of attention and vigilance to certain aspects of the environment, thoughts, and potential misfortunes) and physiological (e.g., hyperactivity, agitation, and rash movements) that also impair academic performance. Demenech et al. (2021) also reported some factors associated with anxiety among college students, including: being a woman, the school year (e.g., prevalence among students in the early years), not having access to psychological support, having attended or be currently attending psychological treatment, depression, taking medications, being dissatisfied with the program, having difficulties in making friends, and adapting to the city where the university is located. Pacheco et al. (2017) identified that feeling pressured by parents who are not physicians is associated with anxiety among medical students.

According to Brandtner and Bardagi (2009), depression is a common symptom among college students and is responsible for significant personal, functional, academic, and social loss (Souza et al., 2005). It is characterized by dysfunctional beliefs arising mainly from personal losses and failure experienced in interpersonal relationships and achievements, increased negative thinking and disregard for positive information about oneself, and reduced responses to external stimuli and discouragement. Demenech et al. (2021) also showed factors associated with depression among college students, like those found concerning anxiety. Not participating in social and leisure activities, low quality of life scores, and uncertainty/concern about the future are also mentioned. Pacheco et al. (2017) evidenced several associated factors, among which a

desire to change or being dissatisfied with the program, having difficulties in relationships, emotional tension or concerns and uncertainty about professional prospects, and not participating or rarely getting involved in social activities; although, these studies do not present evidence that explains differences between undergraduate programs.

Studies on stress, anxiety, and depression in higher education are intended to characterize symptoms among students in the health field (e.g., Costa et al., 2020) or simultaneously among students from various fields of knowledge attending different academic terms (Martins et al., 2019), to compare the variation of symptoms at the beginning and end of the programs (Brandtner & Bardagi, 2009) or to investigate the prevalence of symptoms in the final stages of the programs (Silva et al., 2020). However, despite these efforts, few Brazilian studies focus on the first year of the programs, when students experience many life changes (Chow & Healey, 2008; Cristo et al., 2019), not to mention the differences between programs.

In this context, the university is not only a source of harm to mental health, but it may also intensify existing mental problems when high and diverse study demands are associated with personal demands. Hence, the university can be a place where anxiety, depression, and stress symptoms are manifested; for example, when undergraduate students experience conflicts in other spheres of life, which reflect in their studies. Therefore, the first year of a program can be very challenging, requiring educational institutions to pay attention, provide care, and monitor students. Additionally, few studies compare differences in these symptoms between programs, and most focus on medical students (Demenech et al., 2021). Studies addressing these aspects and including other programs can contribute to better characterizing damage to mental health and understanding how this phenomenon presents itself between programs, i.e., it is not homogeneous within the same institution. Thus, in addition to seeking to fill this gap, this study focused on first-year students.

Regarding sociodemographic variables such as gender, Brandtner, and Bardagi (2009) and Demenech et al. (2021) identified higher levels of both anxiety and depression among women. Pacheco et al. (2017) corroborate these findings and showed higher stress levels in women. In addition, Silva et al. (2020) found an association between being a woman and anxiety symptoms, although Martins et al. (2019) did not find such differences. Regarding the relationships between symptoms and family income, studies suggest a correlation between these variables (e.g., Silva et al., 2020), i.e., the lower the income, the more significant the symptoms. However, no consensus exists regarding the relationship between gender and income with symptoms among college students. Therefore, identifying evidence regarding differences in sociodemographic data may support a better understanding of the mental health phenomenon.

This paper presents the results of an applied study to assess the prevalence and severity of stress, anxiety, and depression symptoms among college students attending the first year at a public college in the countryside of Rio Grande do Norte, Brazil. In addition, potential differences in symptoms according to gender and program, and relationships between symptoms and sociodemographic variables were also verified to identify and understand specificities relevant to

future actions. The objective was to measure psychological distress among first-year students to support guidelines and actions favoring mental health in the institution. Therefore, a cross-sectional, quantitative, descriptive, and exploratory study was conducted (it was implemented before the Covid-19 pandemic). The method adopted here enabled addressing first-year students who seem to experience similar circumstances associated with mental health problems (e.g., school year, adapting to a new city, and family income) and verifying differences between programs. Thus, this study is believed to have theoretical and practical relevance and will enable us to investigate an aspect that is seldom addressed, i.e., whether the prevalence and severity of the symptoms addressed here differ between programs within the same institution. Additionally, the profile of symptoms of the institution's undergraduate students will be described to support interventions.

Method

Study Context

The study setting was the Health Sciences College of Trairi – Facisa, specialized in the health field, an academic unit of the Federal University of Rio Grande do Norte (UFRN), located in Santa Cruz, the countryside of the state of Rio Grande do Norte, Brazil (approximately 120 km from the capital, Natal). This study is part of a larger study addressing the mental health of undergraduate students at the Facisa/UFRN; other studies have been conducted using different methods.

Participants

This study included students from three (of the four) undergraduate programs offered by Facisa/UFRN in Santa Cruz, RN, Brazil: physical therapy, nutrition, and psychology. Since physical therapy and nutrition offer 40 slots yearly, and psychology offers 45 slots, we expected to reach up to 125 first-year students. However, it is an approximate number because some students possibly withdrew from the programs before the study was initiated, and we did not control for dropouts.

Inclusion criteria were attending the second academic term of the undergraduate program in 2019 (2nd semester) and having entered the university in the first semester of 2019. Therefore, nursing students who entered the university in the second semester had spent less time in the program than the other students and, for this reason, were not included in this study. In addition, those students who attended the second academic term but had entered the program before 2019 or did not report the year they entered the university were also excluded. A total of 118 students answered the questionnaire, but 26 did not meet the inclusion/exclusion criteria. Hence, the data of 92 participants were analyzed in this study.

Data were collected in the second semester of 2019 (November) in the pre-pandemic period. Hence, the academic calendar was taking place as planned at the time. November is when approximately 70-80% of the classes have already been completed. The reason for choosing this

period – at the end of the academic term but before it effectively ended – was because first-year students are already (almost) taking the tests and experiencing the activities required at the end of the term and situations that will probably be part of their routines throughout the program.

Instrument

A pencil-and-paper questionnaire was applied and contained the following items and measures: (1) ***Sociodemographic form*** addressing age, gender, program, the year the student entered the program, academic term, number of children, marital status, and gross family income.

(2) ***Depression, Anxiety, and Stress Scale – DASS-21, short form***. The adapted version of this scale is used in Brazil to study people of different ages and contexts, including college students (e.g., Martins et al., 2019; Patias et al., 2021). The 21-item scale is divided into three factors that assess the degree to which individuals experienced negative emotional states over the past week.

The items express both specific symptoms of depression (e.g., anhedonia, which is the loss of ability to experience pleasure and absence of positive affect) and anxiety (e.g., somatic tension and hyperactivity) in addition to nonspecific symptoms common to the two disorders (negative affects, such as depressed mood, insomnia, discomfort, and irritability). There are also stress-related items indicating tension and strain (e.g., difficulty relaxing, impatience, and agitation).

The items are rated on a 4-point scale (ranging from 0 = *did not apply to me at all* to 3 = *applied to me very much, or most of the time*). The total score reflects the sum of all items, and the score by factor reflects the sum of the points obtained in the specific items in each factor. Higher scores reflect higher levels of depression, anxiety, and stress. The instrument's version adopted in this study presents validity and reliability evidence (alpha coefficient for the depression factor = 0.90; anxiety = 0.83, and stress = 0.86; Patias et al., 2016) obtained among adolescents between 12 and 18 years old. Since Machado et al. (2016) adapted the adolescent version used in this study from the adult version, and few semantic changes were needed: it was applied in this study addressing undergraduate students, considering that the target audience can easily understand the items.

The reliability of the DASS-21 version was examined in this study and showed good indexes based on Cronbach's alpha coefficient ranging from 0 to 1 (Peixoto & Ferreira-Rodrigues, 2019): depression factor = 0.89, anxiety factor = 0.81, and stress factor = 0.84. Note that the original studies of the DASS-21 were conducted with non-clinical participants (Lovibond & Lovibond, 1995), as is the case of this study. The cut-off points adopted in this study were proposed in the instrument's manual developed by Lovibond and Lovibond (2004, as cited in Vignola & Tucci, 2014). Therefore, the guidelines recommended that the scores of each factor (which vary from 0 to 21) be multiplied by two (considering that the scale adopted here is the

21-item short version and the standards were based on the 42-item full scale). Next, the scores were transformed into standardized scores (z): normal (< 0.5), mild (0.5 – 1.0), moderate (1.0 – 2.0), severe (2.0 – 3.0), and extremely severe (> 3).

Procedures

After obtaining the professors' consent and arranging a day and time, data were collected in the classrooms so that a convenience sample was used, i.e., anyone present at the time could participate. The questionnaires were applied within the same week for all the programs included in the study, considering that the DASS-21 scale assesses symptoms experienced in the previous week. A team of twelve psychology students was trained to collect data. Each classroom was visited only once, and the questionnaires were returned shortly after the application; the classrooms were not revisited, and no questionnaires were returned afterward. The training of the applicators included information about the survey, the questionnaire, the free and informed consent form, and doubts about completing these forms.

The nature of missing values in the scale (DASS-21) was investigated using Little's MCAR test, and it showed that the missing values are entirely random ($\chi^2 = 142.74$, df = 138, $p = 0.37$). The expected maximization method was then applied to estimate the participants' best responses to the missing data and then it we proceeded with data analyses. Normality tests were performed (Kolmogorov-Smirnov and Shapiro-Wilk) and showed the non-normal distribution of data (except for the stress factor – Kolmogorov-Smirnov $p = 0.20$ and Shapiro-Wilk $p = 0.10$). Nonparametric statistics were used in all inferential analyses.

Next, descriptive analyses (i.e., frequency, percentage, median, mean, and standard deviations) were performed to investigate the students' profiles and variables. After this analysis, Mann-Whitney and Kruskal-Wallis inferential tests were used to verify differences in the variables according to gender and program, respectively. Finally, Pairwise $Z/\sqrt{N}$ calculation was used to analyze the effect size. The following parameters were used in the statistically significant results: null or minimal (0.00 to 0.10), weak (0.11 to 0.29), moderate (0.30 to 0.49), and strong (0.50) (Cohen, 1988).

Additionally, Spearman's correlation was performed to verify the relationships between stress, anxiety, and depression symptoms with sociodemographic variables (i.e., age, number of children, and gross family income). The magnitude of the correlation was classified as zero, weak (0.1 to 0.3), moderate (value 0.4 to 0.6), strong (0.70 to 0.9), or perfect (1.0) (Dancey & Reidy, 2006). All guidelines concerning research with human subjects were followed, and the Ethics committee in Research at Facisa/UFRN approved the project (CAAE: 15005519.0.0000.5568). The participants signed an informed consent form and were ensured that their identities would remain confidential. Benefits to the participants include contributing to the production of scientific knowledge applied to a problem they experience concerning the mental health of undergraduate students at the educational institution, enabling us to learn about the current situation, and promoting supportive actions to favor students. Additionally, the participants

collaborated in obtaining knowledge while concomitantly reflecting upon their mental health conditions and their relationship with the educational institution.

Results

Sociodemographic characteristics

A total of 92 undergraduate students participated in this study, representing 76.70% of the target population of first-year students attending the programs addressed in this study. Of these, 33 are undergraduate psychology students (35.90% of the sample and 73.30% of all first-year students in this program), 31 are physical therapy students (33.70% of the sample and 77.50% of all first-year students in this program), and 28 are in the nutrition program (30.40% of the sample and 70.00% of all first-year students in this program).

Age ranged from 17 to 38 years old (M = 20.50; SD = 3.50), and most were women (67; 72.80%), single (88; 95.70%), and without children (89; 96.70%). The average gross family income ranged from R$ 400 to R$ 17,000 (Mdn = 2,000, Mo = 2,000, M = 2,587.09; SD = 2,665.51). Most (65.00%) were from the working class, i.e., with an income up to R$ 2,000; most do not contribute to this income (89; 96.70%). Only six students (6.50%), two from each program, are from Santa Cruz, RN, where the college is located. Therefore, the vast majority (86; 93.50%) came from other cities/states and moved there (82; 89.10%).

Differences in Stress, Anxiety, and Depression symptoms according to Gender and Program

The participants' descriptive statistics were initially verified for each DASS-21 factor (i.e., stress, anxiety, and depression). Table 1 shows that the participants obtained the highest mean for stress symptoms and the lowest mean for anxiety symptoms (see column Total, Participants of All Programs). Potential differences according to gender were also verified. However, although the means were higher among women in almost all factors (except for the depression factor), no statistical significance (stress factor U = 733.00, p = 0.36; anxiety factor U = 740, 50, p = 0.39; and depression factor U = 844.50, p = 0.95) was found. Both genders seem to have experienced the symptoms addressed here with similar frequency in the last week.

Table 1

Descriptive Statistics of the Scores Obtained in Each Factor by all the Participants According to Gender and Program

Factors	All participants						Physical therapy		Nutrition		Psychology	
	Total = 92		Women = 67		Men = 25		Total = 31		Total = 28		Total = 33	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Stress (0-42)	17.07	9.81	17.64	9.77	15.52	9.95	19.35	10.80	13.00	7.90	18.36	9.51
Anxiety (0-42)	12.00	9.00	12.00	10.00	10.00	8.00	13.00	11.00	8.00	6.00	13.00	9.00
Depression (0-42)	14.83	10.99	14.63	10.74	15.36	11.83	15.48	11.03	8.43	7.06	19.64	11.27

Next, the differences in the symptoms profile between the three programs were analyzed (Table 1). Descriptive statistics of the participants' answers to each program in the DASS-21 factors were verified. The stress factor presented the highest mean score in the physical therapy and nutrition programs, while the depression factor presented the highest average mean in the psychology program. The anxiety factor obtained the lowest mean score in all programs. Next, potential differences in the factors according to the programs were tested. The result of the Kruskal-Wallis test showed no statistically significant difference in the anxiety factor ($\chi^2(2) = 5.09$, $p = 0.08$). The differences between the programs were found in the stress ($\chi^2(2) = 6.93$, $p = 0.03$) and depression ($\chi^2(2) = 16.39$, $p = 0.001$) factors.

The pairwise comparison post hoc test indicated differences between the physical therapy and nutrition programs only in the stress factor ($p = 0.05$, Cohen's $d = 0.07$). Hence, physical therapy students presented a higher frequency of stress symptoms than nutrition students. Psychology did not differ from the two programs. Differences in the depression factor were found between physical therapy and nutrition ($p = 0.03$, $d = 0.08$) and between psychology and nutrition programs ($p = 0.001$, $d = 0.12$). The physical therapy and psychology programs did not differ. The result suggests that physical therapy and psychology students experienced more depression symptoms than nutrition students. All effect sizes were small.

Prevalence and Severity of Stress, Anxiety, and Depression Symptoms considering All Participants and according to Gender

As for the classification of symptoms, the results suggest that just over half of the participants (47; 51.10%) had "normal" symptoms simultaneously in the three conditions. Therefore, these students are assumed to not present psychological distress in the conditions addressed here. The analysis, according to factor (Table 2), shows that most students (64.10%) classified stress symptoms as "normal." Likewise, 73.90% and 77.20% classified depression and anxiety symptoms as "normal."

Table 2

Classification of Symptoms in all Participants and According to Gender

Factors/ Classifications		Total		Women		Men	
		N	*N* %	*N*	*N* %	*N*	*N* %
Stress	Normal	59	64.10%	41	61.20%	18	72.00%
	Mild	22	23.90%	17	25.40%	5	20.00%
	Moderate	8	8.70%	7	10.40%	1	4.00%
	Severe	3	3.30%	2	3.00%	1	4.00%
	Extremely severe	0	0.00%	0	0.00%	0	0.00%
Anxiety	Normal	71	77.20%	48	71.60%	23	92.00%
	Mild	8	8.70%	7	10.40%	1	4.00%
	Moderate	10	10.90%	10	14.90%	0	0.00%
	Severe	2	2.20%	1	1.50%	1	4.00%
	Extremely severe	1	1.10%	1	1.50%	0	0.00%
Depression	Normal	68	73.90%	52	77.60%	16	64.00%
	Mild	6	6.50%	3	4.50%	3	12.00%
	Moderate	16	17.40%	10	14.90%	6	24.00%
	Severe	2	2.20%	2	3.00%	0	0.00%
	Extremely severe	0	0.00%	0	0.00%	0	0.00%

Another portion (45; 48.90%) of students seems to have experienced some psychological distress in the last week, as they classified symptoms as "mild" or more severe in at least one of the factors. In this sense, it would be convenient to characterize the prevalence and severity of symptoms in this group and identify potential variations in these indicators according to gender. Prevalence here concerns the percentage of cases with symptoms classified as "mild" or more severe. In turn, the severity of symptoms concerns the percentage of cases in the most extreme classifications, beginning with "moderate." Of those students in psychological distress, 17.78% classified their symptoms as "mild" or more severe in the three factors simultaneously, showing potential for severe damage to mental health; 8.70% of the entire sample is in this condition.

Table 2 (Total column) shows that *stress* symptoms are prevalent in 35.90% of the students, most with a "mild" classification (22; 23.90%). *Anxiety* symptoms are prevalent in 22.80% of the students, most with a "moderate" classification (10; 10.90%). *Depression* symptoms are prevalent in 26.10% of the students, most with a "moderate" classification (16; 17.40%).

As for the severity of symptoms, *depression* symptoms were the most severe compared to the other factors; that is, there was a higher percentage of people under the most severe classifications, beginning with "moderate" (19.60%), followed by *anxiety* (14.20%) and *stress* symptoms (12.00%) (Table 2).

In short, stress symptoms are the most prevalent among those in distress, followed by depression and anxiety symptoms. Moreover, depression symptoms are the most severe compared to the other symptoms.

Considering all the participants, women presented a higher prevalence and severity than men in two of the three factors: stress (38.80%) and anxiety (28.40%; see Table 2). In turn, men presented the highest prevalence and severity of depression symptoms (36.00%).

Prevalence and Severity of Stress, Anxiety, and Depression Symptoms according to the Program

The analysis of prevalence and severity according to the program showed that most physical therapy students (18; 58.10%) experienced at least one symptom (classified as mild or more severe) in one or more factors. Of these, 22.22% (4) simultaneously presented some degree of severity in the three factors. In the undergraduate nutrition program, 17.90% (5) of the students experienced at least one symptom in one or more factors. Of these, 20.00% (1) presented some degree of severity in the three factors. Most (22; 66.70%) of the students in the psychology program presented at least one symptom in one or more factors. Of these, 18.18% (4) presented some degree of severity in the three factors.

Additionally, we verified the prevalence and severity of symptoms according to the program (Table 3). Table 3 shows that *stress* symptoms are prevalent in 44.40% of the students in the physical therapy program (see column 'N Total' for this program); most were classified as "mild" (9; 29, 00%). The prevalence of symptoms in the Nutrition program is 17.90% and most were classified as "mild" (4; 14.30%). Additionally, the prevalence of these symptoms in the Psychology program is 42.40%, most classified as "mild" (9; 27.30%).

The analysis of *anxiety* symptoms in the physical therapy program shows a prevalence of 35.50%, with a predominance of "moderate" symptoms (5; 16.10%). The prevalence of these symptoms in the nutrition program is 7.10%, all classified as "mild" (2), and the prevalence in the psychology program is 24.20%, most classified as "moderate" (5; 15.20%) (Table 3).

As for the depression symptoms in the physical therapy program, the prevalence is 25.80%, with a predominance of "moderate" symptoms (4; 12.90%) (Table 3). The prevalence of these symptoms in the nutrition program is 3.60%, classified as "moderate" only (1). Finally, the prevalence of these symptoms among psychology students is 45.50%, most classified as "moderate" (11; 33.30%).

Table 3

Classifications of Symptoms According to the Program

Factors/ Classifications		Physical therapy *N* Total = 31	Nutrition *N* Total = 28	Psychology *N* Total = 33
		N (%)	*N* (%)	*N* (%)
Stress	Normal	17 (54.80%)	23 (82.10%)	19 (57.60%)
	Mild	9 (29.00%)	4 (14.30%)	9 (27.30%)
	Moderate	3 (9.70%)	1 (3.60%)	4 (12.10%)
	Severe	2 (6.50%)	0 (0.00%)	1 (3.00%)
	Extremely severe	0 (0.00%)	0 (0.00%)	0 (0.00%)
Anxiety	Normal	20 (64.50%)	26 (92.90%)	25 (75.80%)
	Mild	4 (12.90%)	2 (7.10%)	2 (6.10%)
	Moderate	5 (16.10%)	0 (0.00%)	5 (15.20%)
	Severe	1 (3.20%)	0 (0.00%)	1 (3.00%)
	Extremely severe	1 (3.20%)	0 (0.00%)	0 (0.00%)
Depression	Normal	23 (74.20%)	27 (96.40%)	18 (54.50%)
	Mild	2 (6.50%)	0 (0.00%)	4 (12.10%)
	Moderate	4 (12.90%)	1 (3.60%)	11 (33.30%)
	Severe	2 (6.50%)	0 (0.00%)	0 (0.00%)
	Extremely severe	0 (0.00%)	0 (0.00%)	0 (0.00%)

As for the severity of stress and anxiety symptoms, the most severe symptoms were experienced by the physical therapy students (16.20% and 22.50%, respectively), followed by psychology (15.10% and 18.20%, respectively) and nutrition students (3.60% and 0.00%, respectively; Table 3). Depression symptoms were the most severe among those in the psychology program (33.30%), followed by physical therapy (19.40%) and nutrition programs (3.60%).

In short, compared to the other programs, physical therapy showed the highest prevalence and severity in two of the factors (stress and anxiety). On the other hand, the psychology program presents the highest prevalence and severity of depression symptoms and the second highest percentage of severe cases in the other symptoms. Finally, the nutrition program presented the lowest prevalence and severity of all the symptoms addressed here.

Relationships between Anxiety, Stress, Depression, and Sociodemographic Variables

We examined the relationships between anxiety, stress, depression symptoms, and sociodemographic variables (see Table 4).

Table 4

Correlation Between DASS-21 Factors and Sociodem ographic Variables

Variables	*1*	*2*	*3*	*4*	*5*	*N*	*Median*
1. Stress Factor (0-42)	--					92	17.00
2. Anxiety Factor (0-42)	0.68**	--				92	10.00
3. Depression Factor (0-42)	0.56**	0.60**	--			92	12.00
4. Mean Gross Family Income (R$ 400 to 17,000)	-0.08	0.01	-0.03	--		80	2000.00
5. Age (17 to 38)	-0.15	-0.17	-0.18	-0.15	--	90	20.00
6. No. of children (0 to 2)	-0.02	-0.03	-0.12	0.06	0.69**	91	0.00

Note. ** $p < 0.01$ (two-tailed)

The Spearman's test showed a statistically significant positive correlation, from moderate to strong, between the DASS-21 factors (ρs between 0.56 and 0.87; p - *values* < 0.01). For example, 46% of the variance in the stress factor is explained by the variance in the anxiety factor. However, in this study, the symptoms appear unrelated to the sociodemographic variables. Another statistically significant moderate correlation was found between age and the number of children ($\rho = 0.69$, $p < 0.01$).

Discussion

In this study, we assessed the prevalence and severity of stress, anxiety, and depression symptoms, gender differences, and differences between the programs, in addition to the correlations between symptoms and sociodemographic data. First-year undergraduate students attending the end of the second academic term of three of the four undergraduate programs offered by a public college, who entered the institution in the same year, participated in this study. Most of the students in the programs are from other cities/states and present similar low socioeconomic statuses. In addition, these students experienced similar challenges (end of the academic term), were attending the same institution, and living in the same city, including transitioning in different spheres of life (educational, social, family, and personal). All these factors imply that the bonds established in their cities of origin, with friends and families, were somewhat weakened, and they needed to adapt to new circumstances (e.g., Chow & Healey, 2008; Silva et al., 2020). Hence, the prevalence and severity of these symptoms were characterized in this context of emotional vulnerability, in which students experience affective and family ruptures.

Nevertheless, most students classified their symptoms as "normal" in all the factors, suggesting that this portion of students is dealing well with the difficulties inherent to the change and vulnerability process, either because they have strength, which needs to be better characterized in other studies, or because of the institutional support provided by institutional programs implemented according to national policies (e.g., National Student Assistance Program, Brazil, 2010).

However, there are students in distress, and it is essential to characterize such a phenomenon to prevent problems and promote mental health. Note that stress symptoms (35.90%) are the most prevalent in the sample, followed by depression (26.10%) and anxiety symptoms (22.80%). The prevalence identified here is lower than that found in meta-analyses conducted in Brazil. For example, Demenech et al. (2021) identified a prevalence of 28.51% for depression and 37.75% for anxiety among college students attending varied programs and academic terms. Pacheco et al. (2017) found a prevalence of 49.90% for stress, 30.60% for depression, and 32.90% for anxiety among medical students. However, these differences should be considered cautiously because the studies adopted different instruments and cut-off points to classify symptoms (Demenech et al., 2021; Pacheco et al., 2017).

Depression symptoms were the most severe. Therefore, some students need specific institutional support to favor their mental health, promoting protective factors for such symptoms, especially those students among whom the prevalence of symptoms was identified in the three factors simultaneously (e.g., promoting social skills, exercises, leisure, the adoption of good eating habits and sleep hygiene, and providing psychological support; Silva et al., 2020).

Among the students in distress, those attending the physical therapy and psychological programs presented the worst mental health indexes; they presented the highest prevalence in all the symptoms (stress and anxiety symptoms were prevalent in the first program, and depression symptoms in the second program) and the greatest severity in all symptoms. Conversely, the nutrition program presented the best mental health indicators, with a low prevalence of symptoms. Differences between the programs were also found in other studies. For example, Silva et al. (2020) characterized different prevalence profiles concerning stress, anxiety, and depression symptoms among physical therapy, speech therapy, and occupational therapy programs during clinical internships in the last years of the programs. For instance, physical and speech therapy presented the highest prevalence of depression symptoms, while occupational therapy presented the highest prevalence of stress. This evidence suggests that institutional support through actions and policies should consider the specificities of the program in each context and the characteristics of the activities implemented in each academic term. Hence, there is possibly no symptomatic profile inherent to the programs or a static profile throughout the programs. Thus, the notion that the university is a source of distress must be considered cautiously. While there may be programs within the same institution that enhance the emergence and severity of symptoms, students from other programs either do not show symptoms or do not have them worsened.

A potential explanation for the differences between the programs addressed in this study may be associated with their structure, organization, and functioning, considering that the sociodemographic profile of the participants attending the three programs is very similar. Moreover, first-year students who entered the university in the same year, who are generally from another city, answered the questionnaires in the same week (second semester). Therefore, they experience common difficulties adapting to a new context. Future studies should explore

which specific characteristics of the programs influence the profile of symptoms (mediating and moderating variables), such as, for example, changes in the curriculum. Zuardi, Prota, and Del-Ben (2008) showed that medical school curriculum changes decreased anxiety among first-year students (e.g., courses were changed, created, or connected while more extended periods of internship training were implemented).

Regarding gender, no differences were found in the sample regarding the scores of symptoms. Other studies addressing college students also found no differences in these symptoms according to gender (e.g., Martins et al., 2019). However, there is no consensus regarding these findings. For example, Brandtner and Bardagi (2009) identified higher levels of anxiety and depression among women, and Silva et al. (2020) found an association between being a woman and anxiety symptoms. These findings suggest that a survey may be needed before planning and implementing gender-specific interventions to identify potential gender-based differences and the profile of symptoms that characterize such differences. For example, studies suggest that being homosexual or bisexual is one of the factors associated with suicidal behavior among undergraduate students (Demenech et al., 2021).

The relationship between anxiety, depression, and stress symptoms with sociodemographic variables was also analyzed. Positive relationships were found between anxiety, stress, and depression symptoms, suggesting that these symptoms may coexist. However, no relationships were found between these symptoms and family income. Therefore, having a higher or lower income was unrelated to decreased or increased symptoms, corroborating other studies (e.g., Silva et al., 2020). Additionally, no relationship was found between symptoms and the age or number of children; i.e., having more children was unrelated to increased stress symptoms.

Such a lack of evidence regarding a relationship between symptoms and the demographic data addressed here does not mean that sex, income, age, and the number of children are not important variables in general or for some individuals. Such influence may not have been identified given the (low) number of participants, low variability, or the method used. On the other hand, this absence of correlation supports the explanation that differences in the profile of symptoms between programs are possibly associated with how the programs function and are structured and organized.

Future studies can better explore these relationships with sociodemographic data in this new scenario of the Covid-19 pandemic (considering, for instance, the interruption in face-to-face classes since 2020 and the implementation of online classes to contain the spread of the coronavirus). The pandemic changed domestic dynamics and impacted income, commuting, and time spent in university environments. Studies have been published to help understand the impact of the pandemic on the mental health of college students and the coping strategies adopted during this challenging time (see Patias et al., 2021).

This study presents some limitations. For instance, it focused on the individual dimension, assessing anxiety, depression, and stress symptoms. However, the mental health phenomenon is quite dynamic, as other dynamic dimensions, such as social, economic, political, cultural, and

environmental, influence it. Additionally, DASS-21 is a screening tool and does not diagnose the presence of a mood disorder. Hence, it provides indications that can be studied in-depth (e.g., psychological diagnosis). The data collection procedure adopted here (only one visit in each first-year class) may have resulted in important losses due to the absence of some students in the classroom on the day that data were collected, either because they temporarily suspended the program or dropped out of the program. Although many participants were addressed in each class (above 70.00%), the results cannot be generalized to first-year students of the programs addressed here. The prevalence may be overestimated, considering the small sample and the use of a screening instrument (see Demenech et al., 2021; Pacheco et al., 2017). Finally, the cross-sectional design adopted in this study does not allow us to answer some critical questions that arise from the results. For example, to what extent is the profile of symptoms found here inherent to each class' characteristics, academic term, the moment within the academic term, or a specific program? Longitudinal studies monitoring one or more classes from different programs over the semesters may fill this gap and indicate when (if so) the program starts to be a problem and harm the students' mental health. However, this cross-sectional study allowed characterizing students at a point in time and conveyed warning news suggesting the need for measures to be taken in the short term.

Some practical implications for mental health interventions can be listed. The solutions to the mental health problem are complex and broad, requiring not focusing on the "problem student" only or on psychology but considering the system from a holistic perspective, as it can either make students sick or promote well-being. Hence, the programs should discuss the profiles of symptoms in the light of their specificities at different levels: a) at the program's level (e.g., the organization, structure, and implementation of the pedagogical project, teacher-student and student-student relationships); b) at the level of the academic unit where the student is inserted (e.g., problems and opportunities other programs may have); and c) at the level of the city where the academic unit is located (e.g., urban and sociocultural infrastructure and health equipment available). The product of all these factors must be transformed into valuable actions for the university community, the management of the academic unit, programs' coordinators, faculty, psychology services, and the students themselves so that they can think and develop (together) actions at the short/medium terms, and perennial long-term policies. The objective is to promote, protect, and/or restore the health of college students.

Specifically, psychologists from educational institutions and psychology services, together with professionals from other fields, can collaborate and catalyze actions in favor of students, according to program and/or by gender, when applicable, such as mental health observatories, (integrated) extension projects to assist and provide emotion regulation education (e.g., Ramos et al., 2019). Professors can develop research and internship actions, such as studying the perceptions of the university community on mental health (Cristo et al., 2019), profiles of symptoms, and conduct interventions and assess their impact. Program coordinators can exchange information and collectively determine what to do, promoting partnerships (e.g.,

seminars to share experiences regarding the practices adopted in other programs that achieve better mental health indexes). These possibilities become even more critical in a context where resources in higher education are scarce, and there is pressure imposed by high demands of online activities experienced by some students, as well as the precariousness of (semi) face-to-face classes for another portion of students during the still ongoing Covid-19 pandemic.

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