



Article

DOI: <http://dx.doi.org/10.1590/1982-57652024v29id28284332>

Factors associated with the mental suffering of undergraduate students in São Paulo from 2017 to 2021

Fatores associados ao sofrimento mental de estudantes de graduação em São Paulo entre 2017-2021

Factores asociados al sufrimiento mental de estudiantes universitarios en São Paulo entre 2017 y 2021

Fabrizio Gobetti Leonardi - Universidade Federal de São Paulo | São Paulo | SP | Brasil. E-mail: fabricioleonardi@gmail.com | Orcid: <http://orcid.org/0000-0003-3854-5957>

Rosemarie Andreazza - Universidade Federal de São Paulo | São Paulo | SP | Brasil. E-mail: andreazza@unifesp.br | Orcid: <https://orcid.org/0000-0002-3332-2183>

Gabriela Arantes Wagner - Universidade Federal de São Paulo | São Paulo | SP | Brasil. E-mail: gabriela.wagner@unifesp.br | Orcid: <https://orcid.org/0000-0001-8053-865X>

Abstract: The mental suffering among university students impacts academic life and student retention. Especially during the COVID-19 pandemic, mental health was a sensitive topic with in university communities, prompting the development of institutional strategies. In this context, the objective of this study was to identify and compare the factors associated with the mental suffering of undergraduate students at the Federal University of São Paulo (Unifesp) in the period of 2017-2019 (pre-COVID-19 pandemic) and 2020-2021 (during the COVID-19 pandemic). This is a cross-sectional study based on the analysis of secondary data from 14,092 undergraduate students between 2017-2021, obtained by the Study Commission on the Profile of Undergraduate Students at Unifesp between 2017-2021. The data showed important associations regarding the mental health of these students, highlighting an increased likelihood of mental suffering among more vulnerable groups (people with disabilities, women, *travestis*/transgender individuals). Engaging in physical activity sporadically or regularly served as a protective factor in both analyzed periods. The findings show an increase in mental suffering among students, including the use of psychotropic drugs during the COVID-19 pandemic. It is recommended that student retention policies be developed from the moment students enter higher education, incorporating strategies aimed at students experiencing mental suffering, especially women, transgender students, people with disabilities, and workers.

Keywords: mental health; university; students.

Resumo: O sofrimento mental de universitários apresenta impacto na vida acadêmica e na permanência estudantil. Especialmente durante a pandemia de COVID-19, a saúde mental foi tema sensível nas comunidades universitárias, com vistas à construção de estratégias institucionais. Neste contexto, o objetivo deste estudo foi identificar e comparar os fatores associados ao sofrimento mental de estudantes de graduação da Universidade Federal de São Paulo (Unifesp) no período de 2017-2019 (pré-pandemia de COVID-19) e 2020-2021 (durante a pandemia de COVID-19). Trata-se de um estudo transversal, baseado na análise dos dados secundários de 14,092 estudantes de graduação no período entre 2017-2021 obtidos pela Comissão de Estudos do Perfil do Estudante de Graduação da Unifesp entre os anos de 2017-2021. Os dados demonstraram associações importantes quanto à saúde mental destes estudantes, destacando-se o aumento de chance de sofrimento mental entre grupos mais vulneráveis (PcD, mulheres, travestis/transgêneros). A realização de atividade física esporadicamente ou regularmente funcionou como fator protetor em ambos os períodos analisados. Os achados demonstram aumento do sofrimento mental de estudantes, inclusive com uso de psicofármacos durante a pandemia de COVID-19. Recomenda-se a elaboração de políticas de permanência estudantil desde o ingresso no ensino superior que contemplem estratégias voltadas para estudantes em sofrimento mental, especialmente mulheres, estudantes transgêneros, pessoas com deficiência e trabalhadores

Palavras-chave: saúde mental; universidade; estudantes.

Resumen: El sufrimiento mental de los estudiantes universitarios tiene un impacto en la vida académica y la retención estudiantil. Especialmente durante la pandemia de COVID-19, la salud mental ha sido un tema sensible en las comunidades universitarias, con el objetivo de construir estrategias institucionales. En este contexto, el objetivo de este estudio fue identificar y comparar los factores asociados al sufrimiento mental de estudiantes de pregrado de la Universidad Federal de São Paulo (Unifesp) en el período de 2017-2019 (pre-pandemia de COVID-19) y 2020-2021 (durante la pandemia de COVID-19). Se trata de un estudio transversal, basado en el análisis de datos secundarios de 14,092 estudiantes de pregrado en el período entre 2017-2021 obtenidos por la Comisión de Estudios del Perfil del Estudiante de Pregrado de la Unifesp entre los años 2017-2021. Los datos demostraron asociaciones importantes con respecto a la salud mental de estos estudiantes, destacándose el aumento de la probabilidad de sufrimiento mental entre grupos más vulnerables (personas con discapacidad, mujeres, travestis/transgêneros). La realización de actividad física esporádica o regularmente funcionó como factor protector en ambos períodos analizados. Los hallazgos muestran un aumento del sufrimiento mental de los estudiantes, incluido el uso de psicofármacos durante la pandemia de COVID-19. Se recomienda la elaboración de políticas de retención estudiantil desde el ingreso a la educación superior que incluyan estrategias para estudiantes en sufrimiento mental, especialmente mujeres, estudiantes transgénero, personas con discapacidades y trabajadores.

Palabras clave: salud mental; universidad; estudiantes.

1 Introduction

The first mental health care services for university students began in Brazilian universities in the late 1950s (Loreto, 1985). Since then, this field, which articulates clinical and care perspectives, has developed an incipient body of academic work that grew from 2000 onwards (Graner; Cerqueira, 2019; Penha; Oliveira; Mendes, 2020). Its importance stems from the impact that mental suffering has on the academic routine and in the retention of students.

The World Health Organization (WHO) recognizes this suffering, and many symptoms are known to begin before students even enter university. When left unidentified and untreated, these symptoms can lead to course dropout and often do not receive the necessary attention. However, early action and the promotion of mental health at the beginning of academic life can reduce the negative impact on students' academic and psychosocial trajectories (Auerbach *et al.*, 2016).

Mental suffering among university students has substantial evidence worldwide. Huang *et al.*, (2018); Li *et al.*, (2022), suggest that depression, anxiety, obsessive-compulsive disorder, and post-traumatic stress disorder are considered "common mental health problems" among university students, with plausible evidence for interventions for each of them. A systematic review of 64 studies from different countries showed that many university students experience symptoms of anxiety and depression associated with mental disorders. In low- and middle-income countries, around 42.5% of these students suffer from symptoms of mental disorders.

To further complicate the scenario, we acutely experienced, from 2019 onwards, the effects and consequences of the COVID-19 pandemic, especially during the period of sanitary isolation, which required a reorganization of the teaching-learning system. The pandemic significantly affected the mental health of both the general population (Hossain *et al.*, 2020), and the university population. A study conducted with information from around 706,000 university students showed that depression and anxiety increased considerably during the COVID-19 pandemic. Additionally, changes in these students' lifestyles—such as becoming more sedentary, spending more time online, and feeling lonelier—were predictors of worsening and/or developing mental disorders in this population (Buizza; Bazzoli; Ghilardi, 2022; Li *et al.*, 2021).

The challenges imposed on universities were already described in the pre-pandemic period. Establishing policies, integrating services, monitoring, and promoting mental health appear to be the best strategies to assist university students (Gaiotto *et al.*, 2021). During the COVID-19 pandemic, new studies proposed strategies for promoting mental health and preventing symptoms through psychoeducation, symptom screening, addressing needs, and promoting social interactions, including support groups (Zapata-Ospina *et al.*, 2021).

This article is part of a broader, mixed-methods research project and aims to analyze the Universidade Federal São Paulo (UNIFESP), a public Brazilian institution founded in 1933 but established as a federal university in Brazil in 1994. In 2021, the university had around 14,000 undergraduate students across various fields of knowledge on seven campuses in different regions of the state of São Paulo (Unifesp, 2021). UNIFESP is widely recognized for its academic excellence, ranking as the third-best university in the country in the “Times Higher Education 2023.” By implementing the Program to Support Restructuring and Expansion Plans of Federal Universities (REUNI), the Unified Selection System (SISU), the National Student Assistance Program (PNAES), and the Affirmative Action Law, the university has been changing the profile of its students, creating new challenges, and making it a more complex environment.

The percentage of students coming from public schools increased from 37.5% in 2003 to 60.4% in 2018. In 2010, only 0.5% of Federal Institute of Higher Education (IFES) students came from families earning up to half the Brazilian minimum wage per capita, rising to 31.9% in 2014 and 26.6% in 2018, meaning that more than a quarter of students come from families with high socioeconomic vulnerability. Moreover, according to the latest study conducted by the National Association of Directors of Federal Institutions of Higher Education (ANDIFES), 70.2% of federal university students came from families earning up to 1.5 times the minimum wage per capita. Over 15 years, affirmative actions increased the presence of Black and Brown/Mixed-race students at federal universities by 282%. A substantial increase was also seen in the number of Indigenous, *quilombola*, LGBTQIA+, and, more recently, students with disabilities. The presented results show that the adopted policies have brought a decisive impact on changing the profile of students at federal universities, bringing them closer to the heterogeneity present in Brazilian society (Fonaprace; Andifes, 2019).

Regarding the mental health of UNIFESP university students, another study indicated an increasing trend in the percentage of students who have used or are currently using psychotropic medications to address mental health issues, in the historical series since 2017. According to the report, in 2022, this number reached 21.1% of those enrolled at the institution. In addition, a survey conducted to monitor dropout rates between 2019 and 2022 indicated that mental health factors influenced the decision of 46.9% of students who dropped out, which was the primary reason for 9.8% of dropouts, second only to factors such as distance from the university, dissatisfaction with the chosen course, and financial difficulties (Unifesp, 2022).

This study aims to identify factors associated with the mental suffering and health of university students at the time of enrollment, comparing the pre-COVID-19 pandemic period (2017-2019) with the COVID-19 pandemic period (2020-2021). This will contribute to discussions on establishing mental health prevention and promotion policies, as well as facilitating the coordination between academic health areas and support and retention services in the implementation of institutional strategies.

2 Materials and Methods

2.1 Study design

This is a cross-sectional study based on the analysis of secondary data extracted by the *Comissão de Estudo do Perfil do Estudante de Graduação da Unifesp* (UNIFESP Undergraduate Student Profile Study Commission) (CEPEG) from 2017 to 2021. The data were obtained from a census survey of incoming students, conditioned on their enrollment. All information provided at the time of filling out the form is confidential, making it impossible to identify any student.

2.1.2 Dependent variable

The dependent variable "mental suffering" was constructed based on the following variables from the research instrument: "Have you used medication for mental health treatment in the past 12 months?" (yes/no), "In the past 12 months, have you experienced persistent sadness?" (yes/no), and "In the past 12 months, have you had suicidal thoughts?" (yes/no). Based on the responses, the following categories were defined: "no suffering" for those who answered "no" to all the questions; "suffering without medication," for students who experienced suffering but were not using psychiatric medication; and "suffering with medication," for students who were experiencing suffering and had used or were using psychiatric medication in the past 12 months.

2.1.3 Independent variables

Sociodemographic and academic characteristics of the surveyed students were analyzed. These include (Gender (male, female, transgender), Race/Ethnicity (Black, Brown/Mixed-race, White, Asian), campus (Baixada Santista, Diadema, Guarulhos, Osasco, São José dos Campos, São Paulo, Zona Leste), marital status (single, married/living with partner/common-law marriage), employment status (no, yes, undeclared employment), disability (yes, no), physical activity (yes, sporadically; yes, regularly; no), whether they have children (no children, has children)).

The sociocultural vulnerability index was calculated using the methodology by (Almeida; Ernica, 2015). The new students were classified based on a social stratification model, constructed according to indicators of the family's economic situation (family's gross income) and the family's proximity to formal education (father and/or mother with a higher education degree). The index ranges from 1 to 4, as follows. a) Father and mother without higher education and earning up to three minimum wages. b) Father and mother without higher education and earning more than three minimum wages.

- c) Father and/or mother with higher education and earning up to three minimum wages. d) Father and/or mother with higher education and earning more than three minimum wages.

2.1.4 Statistical analysis

Descriptive analyses were conducted on the sociodemographic and academic characteristics, as well as the mental health suffering of students, for the pre-COVID-19 pandemic period (2017–2019) and during the COVID-19 pandemic (2020–2021). Comparisons were made using Pearson's chi-square test. All p -values < 0.05 were considered statistically significant. A multinomial logistic regression was used to analyze the association of students' mental suffering with sociodemographic and academic characteristics across the study periods. The magnitude of associations was estimated using odds ratios and their respective 95% confidence intervals. All analyses were performed using STATA17®, with a significance level of $p < 0.05$. The final model was adjusted for "type of secondary education" and "marital status."

3 Results

In total, this study analyzed data from 14,092 undergraduate students during the period from 2017 to 2020, with 8,414 of them surveyed in the pre-pandemic period (2017–2019) and 5,934 during the pandemic (2020–2021). In both periods, there was a higher prevalence of students from the following categories: female, with a higher rate of socio-cultural vulnerability, White, single, from public schools, unemployed, and without children. Regarding other individual characteristics, there was greater prevalence of non-People with Disabilities (PwD) students and those engaged in physical activities. Among the campuses, Guarulhos, Diadema, and Baixada Santista, were the most representative in terms of responses, followed by Osasco, São Paulo, São José dos Campos, and Zona Leste. Concerning mental health, the majority of students did not report persistent sadness, suicidal thoughts, or use of psychotropics. However, there was a 5.1% increase in the number of students self-reporting the use of psychotropics across the periods studied. Regarding the outcome of mental suffering, the majority of students reported no suffering, followed by those with suffering but not using psychotropics (Table 1).

Table 1- General description of participants from 2017 to 2021, (N=14,092)

	2017- 2019%(N)	2020-2021%(N)
TOTAL	58.6(8,414)	41.4(5,934)
Gender		
male	42.0(3,505)	40.7(2,401)
Female	57.8(4,819)	59.1(3,488)

Transgender/ <i>travesti</i> /other	0.2(17)	00.2(17)
Sociocultural vulnerability index*		
1	25.1(2,111)	25.0(1,486)
2	23.7(1,991)	23.8(1,413)
3	9.8(824)	09.6(575)
4	41.4(3,485)	41.4(2,460)
Race/ethnicity		
East Asian	03.8(320)	04.4(265)
White	62.2(5,238)	65.4(3,886)
Brown/Mixed-race	23.3(1,966)	21.2(1,263)
Black	08.1(685)	08.0(478)
Campus		
Baixada Santista	18.2(406)	17.7(1051)
Diadema	22.1(778)	21.2(1,263)
Guarulhos	24.0(234)	23.7(1,407)
Osasco	13.8(303)	14.7(875)
São José dos Campos	10.6(32)	10.0(598)
São Paulo	11.0	10.4(622)
Zona Leste	00(00)**	01.9(118)
Marital status		
Single	94.7(7,920)	95.6(5,688)
Married/living with partner/common-law		
marriage	4.5(376)	3.5(210)
Separated/divorced/widowed	0.8(69)	0.6(36)
Type of Secondary Education Institution		
Public school	53.6(4,489)	53.4(3,166)
Private School	46.4(3,881)	46.6(2,765)
Do you work?		
No	38.4(3,209)	37.2(2,204)
Yes	20.2(1,692)	21.7(1,285)
Empty	41.2(3,466)	41.2(2,444)
Do you present any kind of disability?		
No	97.2(8,137)	97.9(5,804)
Yes	02.7(227)	01.7(102)
Prefer not to answer/empty	00.0(0)	00.3(20)
Do you perform any kind of physical activity		
No	40.2(3,383)	38.2(2,269)
Yes, sporadically	32.0(2,697)	32.2(1,912)
Yes, regularly	27.1(2,284)	29.5(1,753)
Empty	00.5(50)	00(00)
Do you have children?		
I do not have children	96.1(8,036)	96.7(5,739)
I have children	3.9(329)	3.3(195)
Reports persistent sadness		
No	81.1(6,791)	80.9(4,803)
Yes	18.8(1,573)	19.0(1,131)
Reports suicidal thoughts		
No	92.0(7,699)	92.2(5,476)
Yes	07.9(665)	07.7(458)

Use of medication for mental health		
No	87.9(7,177)	82.8(4,919)
Yes	12.0(981)	17.1(1,15)
Suffering		
No	87.3(7,129)	84.5(5,015)
Yes, without psychotropics	10.1(828)	12.7(759)
Yes, with psychotropics	02.4(201)	02.6(160)
Age		
2017-2019	20.6	20.3

Source: the authors.

The characteristics of participants in relation to mental suffering during the pre-pandemic and COVID-19 pandemic periods are described in Table 2. Differences were observed between the periods for the variables of gender, campus, employment, PwD status, and engagement in physical activity across both periods. Regarding gender, in the pre-pandemic period (2017–2019), there was a higher prevalence of suffering among self-declared transgender/*travesti* students. The same scenario was found during the pandemic years (2020–2021), with an approximate 7% increase in suffering with the use of psychotropics for transgender/*travesti* students.

Table 2- Description of the studied population regarding mental suffering from 2017 to 2019 and 2020 to-2021. *Comissão de Estudo do Perfil do Estudante de Graduação da Unifesp, Brazil* (N=14,092)

	2017-2019(%)			2020-2021(%)				
	No	No use of psychotrops	Use of psychotropics	p-value	No	No use of psychotrops	Use of psychotropics	p-value
Total	87.4	10.1	2.5					
Gender				<0.001				<0.001
Male	89.2	8.7	2.0		89.0	9.2	1.7	
Female	86.3	1.9	2.7		81.9	14.7	3.2	
Transgender/travesti	58.5	36.5	4.8	0.062	42.4	46.6	11.1	0.881
Vulnerability index SC								
1	88.2	9.3	2.6		84.3	13.1	2.6	
2	88.3	9.5	2.2		85.4	12.0	2.6	
3	85.1	11.1	3.8		84.7	13.2	2.1	
4	87.0	10.8	2.4		84.1	12.9	2.9	
Race/Ethnicity				0.558				0.207
East Asian	87.3	10.0	2.7		84.1	13.0	2.9	
White	87.8	10.3	1.9		83.1	14.0	2.9	

Brown/Mixed-race	87.6	1.4	2.0		85.7	11.8	2.5	
Black	89.3	8.4	2.3		87.5	12.1	0.4	
Campus				<0.001				<0.001
Baixada								
Santista	88.3	8.8	2.8		82.4	14.3	3.2	
Diadema	87.6	9.9	2.4		86.9	10.6	2.4	
Guarulhos	82.9	13.7	3.3		80.6	15.7	3.5	
Osasco	91.6	6.4	1.8		88.9	9.8	1.2	
São José dos Campos	91.1	7.2	1.6		89.9	8.3	1.6	
São Paulo	86.0	12.3	1.5		81.6	14.7	3.5	
East Zone*					77.9	20.3	1.6	
Marital status				0.831				0.269
Single	87.4	10.1	2.4		84.6	12.6	2.7	
Married/living with partner/common-law marriage	87.4	10.6	1.9		82.3	16.6	0.9	
Separated/divorced/widowed	83.5	13.4	2.9		83.3	13.8	2.7	
Type of Secondary Education Institution				0.300				0.909
Public school	87.5	10.2	2.2		84.4	12.8	2.7	
Private school	87.2	10.0	2.7		84.6	12.7	2.6	
Working				0.001				0.002
No	89.1	8.9	1.8		86.6	11.3	2.0	
Yes	86.9	10.5	2.4		84.2	12.4	3.2	
Empty	85.9	11.0	3.0		82.6	14.3	2.9	
Disability				<0.001				<0.001
No	87.7	9.9	2.3		84.7	12.6	2.6	
Yes	74.8	18.8	6.2		74.5	20.5	4.9	
Physical Activity								<0.001
No	84.3	12.2	3.4		81.1	15.6	3.2	
Yes, sporadically	88.3	9.5	2.1		85.6	11.8	2.4	
Yes, regularly	90.8	7.6	1.4		87.6	10.1	2.2	
Do you have children?				0.996				0.205
I do not have children	87.3	10.1	2.4		84.5	12.7	2.7	
I have children	87.4	10.0	2.5		83.5	15.3	1.0	

Source: the authors.

Regarding the campuses, in the pre-pandemic period, Guarulhos and São Paulo showed the highest prevalence of mental suffering without the use of psychotropics. Suffering while using psychotropics was more prevalent on the Guarulhos and Baixada Santista campuses. During the pandemic, there was an increase in the number of people experiencing suffering across all campuses, with Guarulhos and Zona Leste standing out for suffering without the use of psychotropics. Concerning employment, students who identified themselves as employed presented a higher prevalence of suffering, with or without the use of psychotropics, compared to those who did not declare working in the pre-pandemic period. This scenario was also observed during the pandemic period. As for students self-identified as PwD, about 25.1% reported to be suffering with or without use of psychotropics in the pre-pandemic period. This percentage rose to around 40.7% of students reporting some kind of suffering during the pandemic. Regarding physical activities, students who practiced them sporadically or regularly had a lower prevalence of suffering compared to those who did not engage in physical activities in both periods (Table 2).

Table 3 describes factors associated with mental suffering among university students in both periods, considering “no suffering” as the reference category. In the pre-pandemic period (2017–2019), the following were positively associated with mental suffering without the use of psychotropics in the unadjusted model: female gender, *travestis*/transgender, students from the Diadema and Guarulhos campuses, and students who were not working upon admission. Being a PwD increased the chances of mental suffering without the use of psychotropics by about two times. In this model, physical activity was a protective factor. After adjusting the model, among those suffering without the use of psychotropics, being a transgender/*travesti* increased the chances of mental suffering with the use of psychotropics by seven times, and by 2.3 times for students from the Guarulhos campus. Notably, after adjustment, parenthood emerged as a protective factor, reducing the chances of mental suffering by about 50%, which was not found in the unadjusted model.

Table 3- Factors associated with mental suffering among university students in the periods of 2017-2019 and 2020-2021. *Comissão de Estudo do Perfil do Estudante de Graduação da Unifesp, Brazil (N=14,092)*

	2017-2019				2020-2021			
	No use of psychotropics		Use of psychotropics		No use of psychotropics		Use of psychotropics	
	UnOR1	AdOR1	UnOR2	AdOR2	UnOR1	AdOR1	UnOR2	AdOR2
Gender								
Male	1	1	1	1	1	1	1	1
Female	1.29(1.11-1.50)	1.15(0.97-1.35)	1.40(1.04-1.89)	1.13(0.82-1.55)	1.73(1.47-2.05)	1.61(1.35-1.93)	2.01(1.40-2.87)	1.86(1.27-2.71)
Transgend er/ <i>travesti</i>	6.37(3.30-12.28)	7.62(2.77-20.91)	3.67(0.85-15.83)	4.25(0.52-34.56)	10.63(5.63-20.09)	16.50(5.48-49.62)	13.38(4.77-37.55)	16.78(3.05-92.16)

Race/ethnicity								
White	1	1	1	1	1	1	1	1
Black	1.02(0.78-1.33)	0.92(0.70-1.22)	0.70(0.39-1.25)	0.65(0.36-1.18)	1.09(0.82-1.43)	1.00(0.74-1.34)	1.02(0.58-1.81)	1.02(0.56-1.82)
Brown/Mixed-race	1.03(0.87-1.23)	1.03(0.86-1.24)	0.74(0.51-1.06)	0.75(0.52-1.09)	0.86(0.57-1.28)	0.87(0.71-1.07)	0.86(0.57-1.28)	0.81(0.53-1.24)
East Asian	0.82(0.54-1.24)	0.85(0.55-1.30)	0.81(0.37-1.74)	0.97(0.44-2.12)	0.12(0.17-0.90)	0.98(0.66-1.45)	0.12(0.01-0.90)	0.13(0.01-0.99)
Campus São José dos Campos	1	1	1	1	1	1	1	1
Baixada Santista	1.25(0.91-1.71)	1.12(0.81-1.56)	1.81(0.98-3.35)	1.73(0.90-3.30)	1.87(1.33-2.62)	1.41(0.99-2.01)	2.11(1.03-4.31)	1.52(0.73-3.18)
Diadema	1.41(1.04-1.90)	1.25(0.91-1.70)	1.55(0.84-2.85)	1.47(0.77-2.77)	1.31(0.93-1.84)	0.96(0.67-1.37)	1.51(0.73-3.12)	1.13(0.54-2.37)
Guarulhos	2.07(1.55-2.76)	1.71(1.26-2.32)	2.29(1.27-4.10)	2.00(1.07-3.73)	2.10(1.52-2.90)	1.48(1.05-2.09)	2.37(1.19-4.70)	1.41(0.69-2.90)
Osasco	0.88(0.62-1.25)	0.81(0.57-1.16)	1.14(0.58-2.27)	1.10(0.54-2.24)	1.18(0.82-1.71)	1.02(0.70-1.49)	0.76(0.32-1.80)	0.60(0.25-1.45)
São Paulo	1.80(1.30-2.49)	1.70(1.21-2.38)	1.00(0.47-2.12)	1.05(0.48-2.28)	1.94(1.35-2.80)	1.50(1.03-2.19)	2.32(1.09-4.69)	1.90(0.87-4.16)
Zona Leste*					2.80(1.64-4.79)	2.17(1.25-3.75)	1.16(0.25-5.42)	0.78(0.16-3.68)
Working								
No	1	1	1	1	1	1	1	1
Yes	1.20(0.99-1.47)	1.05(0.83-1.34)	1.32(0.88-1.98)	1.28(0.81-2.06)	1.13(0.91-1.40)	0.95(0.74-1.22)	1.64(1.07-2.52)	1.51(0.55-1.18)
Non reported work	1.27(1.08-1.50)	1.26(1.06-1.51)	1.66(1.19-2.29)	1.57(1.11-2.22)	1.32(1.11-1.58)	1.26(1.04-1.52)	1.53(1.05-2.23)	1.55(1.04-2.31)
Disability								
No	1	1	1	1	1	1	1	1
Yes	2.22(1.57-3.14)	2.21(1.54-3.17)	3.12(1.77-5.48)	3.47(1.94-6.20)	1.85(1.13-3.02)	1.78(1.07-2.97)	2.09(0.83-5.24)	2.07(0.80-5.36)
Physical activity								
No	1	1	1	1	1	1	1	1
Yes, sporadically	0.74(0.62-0.87)	0.77(0.64-0.91)	0.58(0.42-0.81)	0.58(0.41-0.81)	0.71(0.60-0.85)	0.73(0.61-0.88)	0.72(0.49-1.05)	0.80(0.55-1.18)
Yes, regularly	0.57(0.47-0.69)	0.62(0.51-0.76)	0.40(0.27-0.59)	0.39(0.26-0.59)	0.59(0.49-0.72)	0.64(0.53-0.79)	0.65(0.44-0.97)	0.78(0.52-1.18)
Do you have children								
I do not have children	1	1	1	1	1	1	1	1
I have children	0.98(0.67-1.43)	0.48(0.29-0.79)	1.01(0.49-2.08)	0.62(0.25-1.55)	1.22(0.82-1.82)	0.64(0.37-1.12)	0.37(0.02-0.03)	0.29(0.06-1.43)

Source: the authors.

Still in the pre-pandemic period, there was an increased likelihood of suffering for females, students from the Guarulhos campus, those who did not declare employment, and PwD who used psychotropics. After adjustments, these associations persisted for students from the Guarulhos campus coming from private schools, PwD, and those who did not declare employment at the time of the interview. Regarding physical activity, both models showed a decrease in the chances of suffering with the use of psychotropics, whether for sporadic or regular physical activity (Table 3).

During the pandemic, there was an increased likelihood of suffering for females, *travestis*/transgender individuals, students from the Baixada Santista, Guarulhos, São Paulo, and Zona Leste campuses, those who were not working at the time of the interview, and PwD who did not use medication. In this model, engaging in sporadic or regular physical activity also served as a protective factor against mental suffering without the use of psychotropic drugs. After model adjustment, all variables remained associated, with the transgender/*travesti* group standing out, showing an approximate sixfold increase in the chances of suffering (Table 3).

Suffering with the use of psychotropics was higher among female and transgender/*travesti* students from the Baixada Santista, Guarulhos, and São Paulo campuses, those who were not working at the time of the interview, and PwD. The chances of suffering with the use of medications were lower for individuals of East Asian descent and those who engaged in sporadic or regular physical activities. These variables remained associated after the final model adjustment (Table 3).

4 Discussion

This is the first Brazilian study to provide a census-based description of mental suffering among university students based on information obtained during the pre-pandemic and pandemic periods in Brazil. The data revealed important associations regarding the mental health of these students, highlighting the increased likelihood of mental suffering among more vulnerable groups (students with disabilities, women, and transgender/*travesti* students). The initial hypothesis that suffering was associated with socio-cultural vulnerability, type of secondary education institution attended, and race/ethnicity was not confirmed. However, it is possible that social, cultural, and class markers may be involved transversally with mental health issues concerning the general sample population. These observations support the thesis, widely discussed in the literature but still lacking strong evidence (Rajkumar, 2020), on the negative impacts of the pandemic on the mental health of both student and general population (Kshirsagar *et al.*, 2021; Ma *et al.*, 2020; Rajkumar, 2020). Engaging in sporadic or regular physical activity and being a parent were regarded as protective factors in our research.

Although gender issues are widely discussed in the literature, especially their intersections with race and class (Davis, 2016; Gonzalez, 1983; Saffioti, 2013; Gonçalves,

2022), the probability of a relationship between the female gender and suffering, particularly during the pandemic, stands out. In the case of transgender/*travesti* individuals, the likelihood over ten times is significantly high as compared to male students during the pandemic. However, it is necessary to conduct more in-depth research on this group, as their prevalence in the population is very low. In a WHO study involving more than 13,000 students from 19 universities (Auerbach *et al.*, 2018) on mental health, the authors identified the need to develop a specific report on this group, noting “these students endorsed a range of mental disorders and experienced considerable impairments.” There are numerous setbacks and difficulties faced by trans people, including stigma and prejudice, as well as high rates of violence such as murder and suicide (Magno *et al.*, 2019; Monteiro; Brigueiro; Barbosa, 2019), which underscore the need for increased attention to this group within universities.

Regarding PwD, comparing the period before and after the pandemic, the likelihood of suffering increased by about two times among those not using medication and three times among those who were, whether in the adjusted or unadjusted models from 2017 to 2019. Notably, while disability remained a risk factor during the pandemic, the odds ratio decreased compared to the previous period for students suffering without using psychotropic drugs. This could have been slightly mitigated by the isolation and remote learning measures adopted during the pandemic. Therefore, more studies need to be conducted to analyze this phenomenon more deeply. It is worth remembering that in Brazil, the fundamental rights of PwD are enshrined in the Constitution, and public authorities are tasked with providing assistance, protection, guarantees and social integration aimed at their social inclusion and citizenship (Brasil, 2015). In other words, inclusive education should be part of the comprehensive care for these individuals, especially because there is evidence of a higher burden of mental disorders among them, requiring specialized care.

Studies published on the relationship between physical activity and health suggest that it is protective and reduces the chances of morbidity and mortality (Wang *et al.*, 2021). In our study, it proved particularly effective for those who sporadically or regularly engaged in physical activity in both periods analyzed, regarding protection for mental health. Having children also appeared to be protective for individuals not using medication in the adjusted model during the pre-pandemic period, as well as for those on medication during the pandemic period. Although for many people the fear and anxiety resulting from the public health situation may have weakened relationships and social bonds, for those with children, the emotional dimension involved may have contributed to reducing their suffering.

Finally, this study highlights the increased risk of suffering variation across university campuses. As campuses are divided by fields of knowledge, this relationship can also be considered in terms of the career/field chosen by the student, as most first-

year students do not reside in the same city as the campus where they study (Unifesp, 2022, p. 121).

It is important to note that the data analyzed in this study were collected at the time of enrollment, meaning before these students began academic activities, which does not allow for the linking of mental health with academic or teaching-learning relationships. It was on the Guarulhos campus, where humanities courses are offered, and on the Zona Leste campus, where the Geography course (also in humanities) is located, that students arrived with higher levels of suffering, with or without medication, both before and during the pandemic. On the Zona Leste campus, analysis was only possible during the pandemic period, as the campus had not been inaugurated before. On the São Paulo campus, which focuses on health sciences, and on the Baixada Santista campus, which offers health sciences courses and a marine institute, there was an increase in suffering during the pandemic. The other campuses did not show statistical significance, and none of them had a protective factor compared to the São José dos Campos campus. Thus, it can be said that students entering the university in humanities, health sciences, and marine sciences programs experienced greater suffering.

5 Final considerations

Given the need for a deeper understanding of mental health issues among undergraduates, before and after the COVID-19 pandemic, this study aimed to identify factors related to suffering in first-year students at the Universidade Federal São Paulo from 2017 to 2021. The analyses revealed greater suffering among female and transgender/*travesti* students, as well as those from the Guarulhos and Zona Leste campuses, those who reported not to be working, and PwD, both before and after the pandemic. Sporadically or regularly engaging in physical activity acted as a protective factor in both periods.

Addressing the complexity and broad debate on gender, its intersections with race and class, as well as with PwD, demand that mental health issues be examined in light of insights from other fields of knowledge, in order to enable further understanding. Additionally, students enrolled in higher education face other factors, such as academic pressures, family issues, relocation, and financial difficulties, which can increase their suffering.

It is recommended that student retention policies be developed with strategies aimed at students affected by mental health issues, such as women, transgender people, PwD, and those who work. Furthermore, it is necessary to address the specific characteristics of each university campus, as differences exist between fields of knowledge.

References

ALMEIDA, A. M. F.; ERNICA, M. Inclusão e segmentação social no Ensino Superior público no Estado de São Paulo (1990-2012). **Educação & Sociedade**, Campinas, v. 36, n. 130, p. 63-83, mar. 2015. Disponível em:

<https://www.scielo.br/j/es/a/RzZ7SRCw4Vb5XmNwbNgFLpw/abstract/?lang=pt>.

Acesso em: 29 jan. 2024.

AUERBACH, R. P. *et al.* Mental disorders among college students in the World Health Organization World Mental Health Surveys. **Psychological medicine**, Maryland, EUA, v. 46, n. 14, p. 2955-2970, 1 out. 2016. Disponível em:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5129654/>. Acesso em: 29 jan. 2024.

AUERBACH, R. P. *et al.* WHO world mental health surveys international college student project: Prevalence and distribution of mental disorders. **Journal of Abnormal Psychology**, Washington, v. 127, n. 7, p. 623-638, out. 2018. Disponível em: <https://psycnet.apa.org/record/2018-44951-001>. Acesso em: 29 jan. 2024.

BRASIL. Lei n. 13.146, de 6 de julho de 2015. Institui a Lei Brasileira de Inclusão da Pessoa com Deficiência (Estatuto da Pessoa com Deficiência). **Diário Oficial da União**, Brasília, DF, seção 1, p. 2, 7 jul. 2015. Disponível em:

http://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2015/Lei/L13146.htm. Acesso em: 02 out. 2024

BUIZZA, C.; BAZZOLI, L.; GHILARDI, A. Changes in college students mental health and lifestyle during the COVID-19 Pandemic: a systematic review of longitudinal studies.

Adolescent Research Review, Maryland, EUA, v. 7, p. 537-550, 2022. Disponível em:

<https://pmc.ncbi.nlm.nih.gov/articles/PMC9362152/>. Acesso em: 29 jan. 2024.

DAVIS, Angela. **Mulheres, raça e classe**. São Paulo: Boitempo, 2016.

FONAPRACE. **V Pesquisa Nacional de Perfil Socioeconômico e Cultural dos (as) Graduandos (as) das IFES – 2018**. Brasília: ANDIFES, 2019. Disponível em:

<https://www.andifes.org.br/?p=88796>. Acesso em: 29 jan. 2024.

GAIOTTO, E. M. G. *et al.* Resposta a necessidades em saúde mental de estudantes universitários: uma revisão rápida. **Revista de Saúde Pública**, São Paulo, v. 55, p. 114-120 dez. 2021. Disponível em: <https://www.scielo.br/j/rsp/a/3g8cn4H3vvgcsCcm8GSdRRg/?lang=pt&format=pdf>. Acesso em: 29 jan. 2024.

GONÇALVES, R. A invisibilidade das mulheres negras no ensino superior. **Poiesis: Revista de Filosofia**, São José, v. 21, n. 2, p. 1-18, 2022. Disponível em:

<https://portaldeperiodicos.animaeducacao.com.br/index.php/Poiesis/article/view/7358>. Acesso em: 01 out. 2024.

GONZALEZ, L. Racismo e sexismo na sociedade brasileira. **Ciências Sociais hoje**, Brasília, n. 2, p. 223-243, 1983.

GRANER, K. M.; CERQUEIRA, A. T. DE A. R. Revisão integrativa: sofrimento psíquico em estudantes universitários e fatores associados. **Ciência & Saúde Coletiva**, Rio de Janeiro, v. 24, n. 4, p. 1327-1346, abr. 2019. Disponível em: <https://www.scielo.br/j/csc/a/RLFrGpHpQKgkYpwXvHx3B3b/?lang=pt>. Acesso em: 29 jan. 2024.

HOSSAIN, M. M. *et al.* Epidemiology of mental health problems in COVID-19: a review. **F1000Research**, Maryland, EUA, v. 9, p. 1-16, out. 2020. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7549174/>. Acesso em: 29 jan. 2024.

HUANG, J. *et al.* Interventions for common mental health problems among university and college students: a systematic review and meta-analysis of randomized controlled trials. **Journal of psychiatric research**, Amesterdã, v. 107, p. 1-10, dez. 2018. Disponível em: <https://www.sciencedirect.com/science/article/abs/pii/S0022395617313626?via%3Dihub>. Acesso em: 29 jan. 2024.

KSHIRSAGAR, M. M. *et al.* Impact of Covid-19 on mental health: an overview. **Reviews on recent clinical trials**, Emirados Árabes Unidos, v. 16, n. 3, p. 227-231, jan. 2021. Disponível em: <https://www.ingentaconnect.com/content/ben/rrct/2021/00000016/00000003/art00003>. Acesso em: 29 jan. 2024.

LORETO, G. **Uma experiência de assistência psicológica e psiquiátrica a estudantes universitários**. 1985. Tese (Concurso de Professor Titular) - Universidade Federal de Pernambuco, Recife, 1985.

LI, Y. *et al.* Impact of the COVID-19 Pandemic on the mental health of college students: a systematic review and meta-analysis. **Frontiers in Psychology**, Maryland, EUA, v. 12, p. 1-14, jul. 2021. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8316976/>. Acesso em: 29 jan. 2024.

LI, W. *et al.* Prevalence and associated factors of depression and anxiety symptoms among college students: a systematic review and meta-analysis. **Journal of child psychology and psychiatry, and allied disciplines**, Londres, v. 63, n. 11, p. 1222-1230, nov. 2022. Disponível em: <https://acamh.onlinelibrary.wiley.com/doi/abs/10.1111/jcpp.13606>. Acesso em: 29 jan. 2024.

MA, Z. *et al.* Mental health problems and correlates among 746 217 college students during the coronavirus disease 2019 outbreak in China. **Epidemiology and psychiatric sciences**, Maryland, EUA, v. 29, p. 1-10, 2020. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7681173/>. Acesso em: 29 jan. 2024.

MAGNO, L. *et al.* Estigma e discriminação relacionados à identidade de gênero e à vulnerabilidade ao HIV/aids entre mulheres transgênero: revisão sistemática. **Cadernos de Saúde Pública**, Rio de Janeiro, v. 35, n. 4, e00112718, abr. 2019. Disponível em: <https://www.scielo.br/j/csp/a/8rxk9ZKGG9GWhCTXW7QBskh/>. Acesso em: 29 jan. 2024.

MONTEIRO, S.; BRIGEIRO, M.; BARBOSA, R. M. Saúde e direitos da população trans. **Cadernos de Saúde Pública**, Rio de Janeiro, v. 35, n. 4, e00047119, abr. 2019. Disponível em: <https://www.scielo.br/j/csp/a/4zwYRtVyMvVkhTKBhWbnTKz/>. Acesso em: 29 jan. 2024.

PENHA, J. R. L.; OLIVEIRA, C. C.; MENDES, A. V. S. Saúde mental do estudante universitário: revisão integrativa/ University student mental health: integrative review/ Salud mental del estudiante universitario: revisión integrativa. **Journal Health NPEPS**, Diamantino, MT, v. 5, n. 1, p. 369-395, 1 jun. 2020. Disponível em: <https://periodicos.unemat.br/index.php/jhnpeps/article/view/3549>. Acesso em: 29 jan. 2024.

RAJKUMAR, R. P. COVID-19 and mental health: A review of the existing literature. **Asian Journal of Psychiatry**, Maryland, EUA, v. 52, p. 102066, 1 ago. 2020. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7151415/>. Acesso em: 29 jan. 2024.

SAFFIOTI, Heleieth. **A mulher na sociedade de classes: mito e realidade**. São Paulo: Expressão Popular, 2013.

UNIVERSIDADE FEDERAL DE SÃO PAULO. **Relatório Integrado de Gestão**. Reitoria, 2021. Disponível em: <https://www.unifesp.br/reitoria/transparencia/tcu/69-processos-contas-anuais>. Acesso em: 28 fev. 2023.

UNIVERSIDADE FEDERAL DE SÃO PAULO. **Dados do Perfil de Estudantes Ingressantes de Graduação da Universidade Federal de São Paulo**. São Paulo: UNIFESP, PRAE, 2022. Disponível em: <https://www.unifesp.br/reitoria/prae/institucional/prae/comissoes/cepeg/documentos/perfil-geral>. Acesso em: 28 fev. 2023.

WANG, Y. *et al.* Association of Physical Activity Intensity With Mortality: A National Cohort Study of 403 681 US Adults. **JAMA internal medicine**, Maryland, EUA, v. 181,

n. 2, p. 203-211, fev. 2021. Disponível em:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7684516/>. Acesso: 29 jan. 2024

ZAPATA-OSPINA, J. P. *et al.* Mental health interventions for college and university students during the COVID-19 pandemic: a critical synthesis of the literature. **Revista colombiana de psiquiatria**, Maryland, EUA, v. 50, n. 3, p. 199-213, jul. 2021.

Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8179114/>. Acesso em: 29 jan. 2024.

Contribution of the authors

Fabrizio Gobetti Leonardi - Data collection, data analysis and writing of the text.

Rosemarie Andreazza - Project coordination, active participation in data analysis and review of the final text.

Gabriela Arantes Wagner - Project supervision, active participation in data analysis, writing and review of the final text.

Traduzido por: Tikinet

E-mail: comercial@tikinet.com.br