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Factors associated with high mental health scores of university teachers during the COVID-19 pandemic

Fatores associados a altos escores de saúde mental de professores universitários durante a pandemia de COVID-19

Cremildo João Baptista[1*], Alberto Mesaque Martins[2*], Patrícia Maria Fonseca Escalda[3]

[1] Enfermeiro, Doutor em Saúde Pública. Professor Adjunto da Universidade Federal de Mato Grosso do Sul, campus Coxim (MS), Brasil; [2] Psicólogo, Doutor em Psicologia. Professor Adjunto da Universidade Federal de Mato Grosso do Sul e docente do Programa de Pós-Graduação (Mestrado) em Psicologia da UFMS, Brasil; 3 Farmacêutica, Pós-Doutorado em Saúde Coletiva. Professora Associada da Faculdade de Ceilândia da Universidade de Brasília (UnB), Brasil.

***Corresponding author:** Cremildo João Baptista – *E-mail*: cremildo.baptista@ufms.br

ABSTRACT
This work aims to present mental health indicators and identify factors associated with mental health indicators among university teachers during the COVID-19 pandemic. A cross-sectional study was carried out with data from 339 professors from four Brazilian federal universities. They answered an online questionnaire, from August to September 2021. Mental health was assessed using depression, anxiety and stress scale (DASS-21). The majority had normal scores for the three dimensions, anxiety (57.20; I.C 95%: 51.76-62.53), depression (61.10; I.C 95%: 55.63-66.24) and stress (56.64; 95% C.I.: 51.17-61.95). High scores for depression, anxiety and/or stress were associated with previous diagnosis of mental disorder, requests for work leave because of the pandemic, spending at least 12 hours alone per day, seeking but not getting medical assistance during the pandemic, and the worsening of emotional state (self-perceived) during social and physical distancing measures.

Keywords: COVID-19. Faculty. Mental Health. Universities.

RESUMO
Este trabalho tem como objetivo apresentar indicadores de saúde mental e identificar fatores associados a esses indicadores em professores universitários durante a pandemia de COVID-19. O estudo foi realizado com dados transversais de 339 professores de quatro universidades federais brasileiras, os quais responderam a um formulário online, de agosto a setembro de 2021. Os escores de saúde mental foram obtidos com auxílio da escala de depressão, ansiedade e estresse (DASS-21). A maioria apresentou escores considerados normais para as três dimensões, ansiedade (57,20; I.C 95%: 51,76-62,53), depressão (61,10; I.C 95%: 55,63-66,24) e estresse (56,64; I.C 95%: 51,17-61,95). Escores altos de depressão, ansiedade e/ou estresse estiveram associados a diagnóstico prévio de transtorno mental, afastamento do trabalho por causa da pandemia, passar pelo menos 12 horas sozinho por dia, procurar e não conseguir assistência médica durante a pandemia e autopercepção de piora no estado emocional durante o distanciamento social-físico.

Palavras-chaves: COVID-19. Docentes. Saúde Mental. Universidades.

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INTRODUCTION

Since the emergence of the first cases, the new coronavirus 2019 (COVID-19) disease has been challenging scientists, administrators, and health professionals to create preventive strategies, treatment proposals, and vaccine development and dispensation[1-3]. Despite global efforts to confront the pandemic, the world has faced new variants of the virus, which have resulted in new stages of transmission – although they seem less lethal than the previous ones[1,2] –, as well as the worldwide efforts to access vaccines, fight the spread of fake news, provide testing, and appropriate referral of identified cases [4-6].

At the beginning of the pandemic, physical and social distancing measures were implemented as the main measure to control the spread of the disease, resulting in reduced mobility, as well as the closing of establishments and restriction of activities such as commerce, education, religious institutions, and leisure and entertainment services[2,4]. The intensity of physical and social distancing varied throughout the pandemic, being more severe at times when the number of new infections and deaths was high [2].

Although these measures were important to contain the spread of the disease and the consequent overcrowding of health services which led to subsequent deaths, they impacted the mental health of various social groups, resulting, for example, in increased consumption of alcoholic beverages and psychoactive substances, psychological symptoms such as sleep and eating disorders, and increased anxiety, depression, and stress[6-8]. On the other hand, the fear of contamination and death due to a new disease, unknown and feared, as well as the restrictions of social contact, required the population to reorganize their habits and routines, increasing psychic suffering, especially in economically vulnerable groups[7-9].

The educational context had also undergone abrupt transformations that required the reformulation of the working, teaching and learning processes of students, teachers and technicians in educational institutions all over the world[10,11]. Studies performed before the pandemic of COVID-19 already indicated that the university context is marked by objective and subjective overload that fosters the development of psychological symptoms[12,13]. In general, students, professors and technicians experience pressure for deadlines and academic performance, uncertainties about their professional future, which can harm the quality of life and well-being of this social sector.[12,13]. Studies highlight the compromising of teachers' mental health, marked mainly by symptoms of stress and anxiety, resulting in conditions of depression, burnout and suicide[13,14].

In Brazil, after the suspension of classes and in-person activities, some universities switched to the online mode, which required the reformulation and abrupt implementation of the new regime[15-17] that increased some feelings of uncertainty in students, teachers, and technicians as they had to take care of their health and lives during the pandemic, as well as the pressure to reorganize their work, teaching and learning processes, often without the minimum conditions required for the development of these activities[15-20].

Therefore, the prolonged pandemic of COVID-19 with the various phases of its health emergency made the university environment even more challenging, which may have increased the risk for physical and mental illness of the university community[10,16,19], while it required some understanding of the effects of the pandemic on different groups within the university community[8,10]. In a context marked by the diversity of social groups and, above all, by social inequalities, it is necessary to investigate

how the pandemic of COVID-19 and the measures of social distancing have affected the mental health of different subjects[1,3]. Such analysis has proven relevant to support the design of programs aimed at promoting mental health, thus enabling the interventions on the social determinants[18,20].

Thus, this study aims to present mental health indicators and identify factors associated with these indicators among university professors during the COVID-19 pandemic.

METHODOLOGY

DESIGN AND STUDY POPULATION

This study is part of a larger cross-sectional descriptive and exploratory research project, developed as of March 2020, amidst the physical and social distancing measures that were imposed due to the COVID-19 pandemic. Undergraduate and graduate students, technicians, and university professors who were at least 18 years old at the time of the study data collection, actively enrolled in the educational institution, and who agreed to answer the research instrument, and also registered the Informed Consent Form (ICF) were eligible for the study. Between August and September 2021, the third data collection phase of the Project was carried out including four federal universities in the Midwest of Brazil.

RECRUITMENT AND DATA COLLECTION STRATEGIES

Considering the measures of physical and social distancing, we used a web-based non-probability sampling. Those who agreed to participate responded to a self-administered online form. The first part of the form contained the characterization of the participant, questions about adherence to social/physical distancing measures, perceptions, attitudes, and difficulties regarding the pandemic. In the second part, the participants answered to the depression, anxiety and stress scale (DASS-21) validated in Brazil[21]. Consisting of 21 items, the DASS-21 is a 4-point Likert-type scale whose responses range from 0 ("does not apply to me at all") to 3 ("applies to me a lot or most of the time"). For each dimension of the scale, the answers generate a final score ranging from 0 to 42. The form was made available on the website, social networks and in the weekly newsletter of the universities taking part in the project.

OUTCOMES

The scores of each outcome (anxiety, depression, and stress) were categorized into 'Normal', 'Mild', 'Moderate', 'Severe', and 'Extremely Severe', as we adopted the cut-off points described in the DASS-21 Manual. Cronbach's alpha coefficients and the corresponding alpha standard error (ase) were: depression = 0.94 (ase = 0.005), anxiety = 0.92 (ase = 0.007), and stress = 0.93 (ase = 0.006), indicating excellent homogeneity among items. Furthermore, the correlation between the scores of the three outcomes were: depression with anxiety (r = 0.80), depression with stress (r = 0.78), and anxiety with stress (r = 0.82), showing positive and strong relationships, as presented in Figure 1.

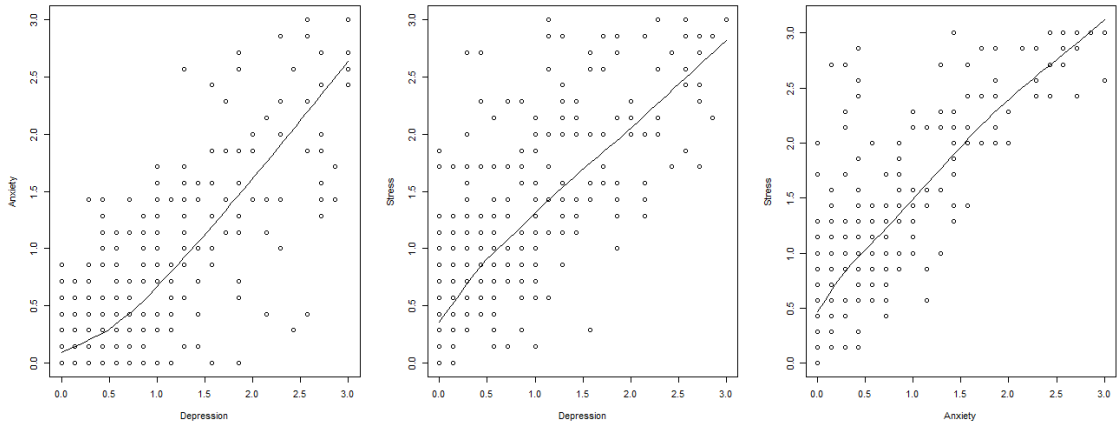

Figure 1. Correlation between the outcomes of the DASS-21 scales of a sample of university teachers during the COVID-19 pandemic, 2021.

INDEPENDENT VARIABLES

Sociodemographic characteristics, behaviors/attitudes toward the pandemic, and measures of social distancing and perceptions on measures of social distancing were obtained, as presented in Table 1.

DATA ANALYSIS

In this shortened version of the study, only the teachers' data were analyzed. The mean for age was calculated and the range was identified after analyzing the distribution by graphic visualization in histogram. For the categorical variables, percentages were calculated from the absolute values and the comparison of the percentages between categories of variables was done by the Chi-square test with a significance level of 5%. As five ordered categories of the three outcomes and the non-consistent or equal differences among the categories were presented, proportional ordinal logistic regression (polr) was used to obtain the adjusted proportional odds ratios (Adj-OR) and respective 95% confidence intervals (95% C.I) in the MASS package in R Software. Using the 'Normal' category as a reference, a bivariate exploratory analysis was performed to identify factors associated with each of the three outcomes separately. Given the number of independent variables under consideration, the Boruta algorithm was used to select statistically important variables to be included in the multivariate analysis[22]. However, some variables were removed from the models while others were inserted in accordance with the literature, regardless of the statistical results of the algorithm. The adequacy of the model was assessed by the Hosmer-Lemeshow test and Pearson's chi-square test.

ETHICAL CONSIDERATIONS

The study was approved by an National Commission on Research Ethics (CONEP). Before completing the form, the participants read and registered the Informed Consent Form (ICF) online. Participation was anonymous and confidentiality of participants' information was guaranteed.

RESULTS

The study reached a final sample of 339 professors in the four participating universities,

after excluding: duplicates, respondents under 18 years of age, those with no ties to the university (alumni, retirees, etc.), and those who did not register the ICF. The participating teachers' mean age was 43.0 years (minimum = 18, maximum = 71). The majority (65.49%) were female, self-reported white (65.78%), married or living with a partner (71.68%). About a quarter (25.07%) of the sample declared themselves to be in the risk group for severe disease by COVID-19 and 84.66% admitted fear of SARS Cov-2 infection (Table 1). Prior diagnosis of mental health disorder was reported by 30.09% and the use of psychoactive substances was reported by 57.23% of the respondents.

Table 1. Key characteristics of university teachers screened for depression, anxiety and stress during the COVID-19 pandemic, August-September 2021

Characteristics	Total = 339 n (%)	p-valor
Sex		
Female	222 (65,49)	*<0.001*
Male	117 (34.51)	
Age group (median= 43, 18 - 71 years)		
18 - 29 years	9 (2.65)	
30 - 49 years	240 (70.80)	*<0.001*
50 - 71 years	90 (26.55)	
Race		
White	223 (65.78)	
Black/Pardo	102 (30.09)	*<0.001*
Indigenous/Yellow	14 (4.13)	
Marital state		
Married/With partner	243 (71.68)	*<0.001*
Single	96 (28.32)	
Children		
Yes	205 (60.47)	*<0.001*
Not	134 (39.53)	
Risk group for severe forms of CoVID-19 severe illness		
Yes	85 (25.07)	*<0.001*
Not	254 (74.93)	
Cohabits		
Family/Partner	273 (80.53)	*<0.001*
Lives alone	66 (19.47)	
Fear of infection by ARS Cov-2		
Yes	287 (84.66)	*<0.001*
Not	52 (15.34)	

Source: research data.

Numbers and proportions of teachers with different levels of depression symptoms, anxiety, and stress are presented in Tables 2 and 3. Most showed normal scores for all three dimensions of the scale, anxiety (57.20; 95% C.I.: 51.76-62.53), depression (61.10; 95% C.I.: 55.63-66.24), and stress (56.64; 95% C.I.: 51.17-61.95).

Table 2. Absolute numbers (n) and percentages (%) of different levels of depression, anxiety and stress in a sample of university teachers during the COVID-19 pandemic, August-September 2021

Outcome	Level				
	n (%) [95% C,I]				
	Normal	**Mild**	**Moderate**	**Severe**	**Extremely Severe**
Depression	194 (57.20) [51.76-62.53]	30 (8.85) [6.15-12.52]	58 (17.10) [13.34-21.64]	22 (6.49) [4.21-9.80]	35 (10.30) [7.39-14.19]
Anxiety	207 (61.10) [55.63-66.24]	17 (5.01) [3.04-8.06]	40 (11.80) [8.66-15.83]	18 (5.31) [3.27-8.41]	57 (16.80) [13.08-21.32]
Stress	192 (56.64) [51.17-61.95]	37 (10.91) [7.89-14.85]	39 (11.50) [8.40-15.50]	34 (10.03) [7.14-13.85]	37 (10.91) [7.89-14.85]

Source: research data.

Table 3. Ordinal logistic regression analysis for factors associated with levels of depression, anxiety and stress among university teachers during physical and social distancing measures amid the COVID-19 pandemic, 2021

(Continued)

Characteristic	Outcome					
	Depression	*p-valor*	**Anxiety**	*p-valor*	**Stress**	*p-valor*
Left work due to the pandemic						
Not	-				-	
Yes	7.20 (1.40 - 46.0)	*0.031*			2.93 (0.79- 11.60)	*0.112*
Hours per day alone during social distancing measures						
0 hours	-		-		-	
1 - 12 hours	1.70 (0.90 - 3.20)	*0.108*	1.89 (1.02 - 3.62)	*0.047*	1.60 (0.89 -2.97)	*0.124*
12 - 24 hours	2.60 (1.10 - 6.30)	0.026	2.20 (0.90 - 5.38)	*0.082*	1.09 (0.43 -2.68)	*0.858*
Sought but did not get medical assistance during the pandemic						
Not	-		-		-	
Yes	3.50 (1.60 - 8.10)	*0.002*	2.28 (0.99 - 5.26)	*0.050*	3.30 (1.51 - 7.25)	*0.003*
Started using alcohol and/or other psychoactive drugs during the pandemic						
Not	-		-		-	
Yes	2.00 (1.10 - 3.60)	*0.014*	2.75 (1.58 - 4.82)	*<0.001*	1.43 (0.81- 2.51)	*0.217*
Self-perceived work/teaching performance during remote social/physical distancing and teaching measures						
Didn't change	-		-		-	
Improved	0.33 (0.10 - 0.89)	0.041	0.87 (0.36 - 2.01)	0.750	0.44 (0.16 - 1.07)	*0.081*
Worsened	1.60 (0.91 - 2.70)	*0.107*	1.22 (0.71 - 2.12)	*0.469*	1.04 (0.61 - 1.77)	*0.898*

(Conclusion)

Self-rated emotional state during social/physical distancing						
Didn't change	-		-		-	
Improved	1.70 (0.40 - 7.0)	*0.443*	0.92 (0.21 - 3.37)	*0.902*	3.91 (1.01 -14.80)	*0.044*
Worsened	4.80 (2.40 - 10.0)	*<0.001*	3.62 (1.90 - 7.20)	*<0.001*	9.97 (4.79- 23.0)	*<0.001*
Previous diagnosis of mental disorders before the COVID-19 pandemic						
Not	-		-		-	
Yes	2.20 (1.30 - 3.70)	*0.002*	2.05 (1.23 - 3.40)	*0.005*	2.29 (1.38 - 3.78)	*0.001*

Source: research data.
Hosmer-Lemeshow Test:
Model to depression: χ-squared = 28.729, df = 32, p-valor = 0,6329
Model to anxiety: χ-squared = 19.894, df = 32, p-valor = 0,9531
Model to stress: χ-squared = 23.019, df = 32, p-valor = 0,8777

Symptoms of depression (high scores) were associated with taking time off from work due to the pandemic (95% C.I: 1.40 - 46.00), being alone for at least 12 hours a day (95% C.I: 1.10 - 6.30), seeking and not getting medical attention during the pandemic (95% C.I: 1.60 - 8.10), and a self-perception of worsening emotional state during social/physical distancing measures (95% C.I: 2.40 - 10.00). Participants who reported having a diagnosis of mental disorders prior to the pandemic (95% C.I: 1.30 - 3.70) were more likely to have high depression scores (95% C.I: 1.10 - 3, 60). Self-comparing to the pre-pandemic period, self-perceived improvement in work/teaching performance during the pandemic had a negative association with symptoms of depression (95% C.I: 0.10 - 0.89)

In the analyzed sample, having high anxiety scores was associated with report of starting to use psychoactive substances during the pandemic (95% C.I: 1.58 - 4.82) and with self-perception of worsening emotional state during measures of social/physical isolation (95% C.I: 1.90 - 7.20). On the other hand, signs of stress were more present in teachers who sought but did not obtain medical assistance during the pandemic (95% C.I: 1.51 - 7.25) and also in those who reported a previous diagnosis of mental disorder (95% C.I: 1.38 - 3.78). In addition, self-assessing emotional state as better (95% C.I: 1.01 -14.80) or worse (95% C.I: 4.79-23.00) during social/physical distancing measures was related to higher chances of experiencing stress symptoms.

DISCUSSION

The present study is corroborated by other findings in the national and international scientific literature that point to the negative effects of the pandemic and social/physical distancing measures on the mental health of university professors, resulting in higher frequency of depression, anxiety and stress symptoms[11,15,16,19,23,24]. This may be related to the fact that these teachers were faced with an abrupt shift from their teaching activities to the remote environment, while at the same time experiencing insecurity, fears and uncertainties related to the possibility of pandemic-related contagion and death[10,19,20,25,26].

A review of the literature showed a high prevalence of psychological symptoms among teachers at different levels of education, especially in countries with a higher concentration of COVID-19 cases[24]. In a study carried out with teachers in southern Brazil, anxiety and depression

were the most frequent mental disorders during the COVID-19 pandemic, present in 21.7% and 28.9% of teachers, respectively[25]. Another study found a high prevalence of symptoms of depression (50%), stress (47.2%) and anxiety (37.4%), especially among teachers aged 40 or older who did not have a steady partner[15]. In a group of Spanish teachers, the prevalence of these symptoms was higher among women, especially those with children[27].

In Latin America, teaching is still recognized as a female activity, which may have reflected in the predominant participation of women in this study[28,29]. However, despite the growing insertion of women in higher education, they are still responsible for household chores, such as child care and the affective support of the family which, added to the challenges of the teaching profession, configure a scenario of higher susceptibility to mental illness[11,28,29]. On the one hand, studies have found a heavier objective and subjective burden for women who had to balance remote work, childcare, household chores, and support/care for family members diagnosed with COVID-19[29-31]. On the other hand, studies indicate that social distancing has contributed to greater female vulnerability to domestic violence, an important trigger for psychological symptoms[32-34].

This study corroborates other investigations that identified that people who experienced social distancing alone had a higher frequency of psychological symptoms. These people, in addition to having fewer in-person interpersonal interactions, were more frequently faced with uncertainties related to social support in case of illness and the guaranteed access to health care[23,27].

Furthermore, in the context of interpersonal relationships, the measures of social distancing decreased the time that Brazilian university professors dedicated to leisure and face-to-face social interactions, which may have contributed to the emergence of worse emotional states[35]. Among Israeli teachers, a high prevalence of feelings of loneliness was observed, which were positively associated with depression and negatively associated with resilience[23].

The literature reports increased alcohol and other drug use in university communities during social distancing[19,20,36-38]. In the present study, the use of psychoactive substances was associated with a higher presence of symptoms of depression and anxiety among teachers, suggesting that alcohol and other drugs had been used to cope with the challenges imposed by the pandemic[35,37].

It is worth noting that globally, before the pandemic, the university population already showed high prevalence rates of symptoms of depression, anxiety and stress[12,19,20,40]. Thus, university communities suffered with the damages to their mental health and quality of life that were associated with social distancing[19,40] , for this reason, poor self-assessment of emotional state during measures of social distancing was associated with the presence of symptoms of depression, anxiety, and stress[19,20,40,41].

However, other factors related to the determination of psychological suffering in the midst of the pandemic must be considered[3,4]. For example, in the present study, teachers who sought medical attention during quarantine period, but did not get it, presented a higher prevalence of stress. It is worth mentioning that the present study was carried out during the peak of the pandemic, a period marked by uncertainties, fears, and the news of shortage of beds in hospitals and shortage of health professionals to provide care to the sick[1].

During the first phases of the pandemic, there was insecurity in the population, which contributed to feelings of fear and stress symptoms[6,40]. In Brazil, surveys identified the population's distrust in the way the administrators and the government dealt with the pandemic while fake news was disseminated, intensifying even more the scenario of fear and uncertainty

about the guarantee of healthcare and the possibility of survival[20].

Finally, the results of the present investigation are validated by other studies that indicate the need to build programs aimed at promoting university professors' mental health[20,42]. A systematic review developed by Santiago et al.[42] reveals the importance and effectiveness of mental health promotion programs aimed at faculty members, students, and technicians, including actions ranging from health education to interventions that act on social factors, such as the guarantee of access to health services, identification of people in situations of social vulnerability, and access to subsidies to face financial and food insecurity, among others.

As this was a cross-sectional study, it does not suggest any directionality between the outcomes and the factors associated with the outcomes. The results need to be interpreted with caution given the conventional nature of the sample and given the fact that other unmeasured factors may have affected the mental health of the participants. The e-Epidemiology during the pandemic was an important tool for several studies that shed light on several epidemiological issues regarding the pandemic and other aspects. The present study using web-based data reached participants at the four universities who responded to a self-administered questionnaire, which may have provided more reliable answers given the absence and influence of the interviewer.

CONCLUSIONS

The results of the present study point to the effects of the COVID-19 pandemic and social distancing measures on university professors' mental health. The results suggest that the negative effects of the pandemic and social distancing measures resulted in higher frequency of symptoms of depression, anxiety, and stress in university faculty. Some of the strategies for coping with the adversities imposed by the pandemic may have been the use of psychoactive substances, alcohol beverages and other drugs, during the pandemic. Factors such as denied access to needed medical assistance during the pandemic and the previous diagnosis of mental disorder were related to mental illness and require effective short-term interventions.

Different factors may have impaired the mental health of university professors during the COVID-19 pandemic, although these findings require further research and preventive measures to relieve the onset and/or worsening of these symptoms. Therefore, it is necessary to build mental health promotion strategies aimed at university professors, which take into consideration the singularities of this group, such as specialized reception and assistance to professors who have previous psychological diagnosis and/or who have little social support as they experience the pandemic.

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