


Prevalence of sleep bruxism and psychological aspects of the post-pandemic period in university health students


Raíssa Wellen Celestino de Santanna¹

 0009-0005-1905-0678


Vanessa Cristina Ament Barbirato²

 0009-0005-2879-2489


Julya Helena Araújo de Avila¹

 0009-0004-8660-7213


Tafnes Pereira da Silva¹

 0009-0009-2498-9128

Silvia Amélia Scudeler Vedovello²

 0000-0002-7203-2867

Heloísa Cristina Valdrighi¹

 0000-0001-7567-1990

¹Faculdade de Odontologia de Araras, Fundação Hermínio Ometto (FHO), Araras, São Paulo, Brasil.

²Faculdade de Odontologia de Piracicaba, Universidade de Campinas (FOP-UNICAMP), Piracicaba, São Paulo, Brasil.

Correspondence:

Silvia Amélia Scudeler Vedovello
E-mail: silviavedovello@gmail.com

Received: Oct 18, 2023

Approved: Mar 12, 2024

Last revision: Aug 20, 2024

<https://creativecommons.org/licenses/by-nc/4.0/deed.en>



Abstract This study aimed to assess the prevalence of sleep bruxism and psychological aspects of post-pandemic sleep among healthcare students. This was a cross-sectional epidemiological study conducted with 322 healthcare students of both sexes who answered an online questionnaire about psychological stress, psychological health status, fear of COVID-19, anxiety about the coronavirus, and sleep bruxism. Data analysis was performed using frequency distribution according to the study variables. The results revealed that 54% of the students evaluated had sleep bruxism. During the pandemic, 47% reported contracting COVID-19, and 98% received both vaccine doses. Additionally, 30% reported feeling afraid to return to normal activities after the end of the pandemic, and 70% did not express this fear. No symptoms of generalized anxiety disorder were identified in 53% of the participants, nor were there any symptoms of depression in 54%. It was therefore concluded that university students had a high prevalence of sleep bruxism without exhibiting symptoms of anxiety disorder or depression.

Descriptors: COVID-19. Anxiety Disorders. Students, Health Occupations.

Prevalencia del bruxismo del sueño y aspectos psicológicos del periodo pospandémico en estudiantes universitarios del Área de la Salud

Resumen El objetivo de este estudio fue evaluar la prevalencia del bruxismo del sueño y aspectos psicológicos en el periodo pospandémico en estudiantes de salud. Estudio epidemiológico transversal realizado con 322 estudiantes del área de salud, de ambos sexos, que respondieron un cuestionario online sobre estrés psicológico, situación de salud psicológica, miedo al COVID-19, ansiedad ante el coronavirus y bruxismo del sueño. Para el análisis de los datos se realizó una distribución de frecuencias según las variables de estudio. Los resultados revelaron que el 54% de los estudiantes evaluados presentaban bruxismo del sueño. Durante la pandemia, el 47% reportó haber contraído COVID-19 y el 98% recibió ambas dosis de la vacuna. Además, el 30% refirió sentir miedo de retomar sus actividades normales una vez finalizada la pandemia y el 70% no expresó este miedo. No se identificaron síntomas de trastorno de ansiedad generalizada en el 53% de los participantes, ni tampoco se identificó depresión en el 54%. Se concluyó, por tanto, que los estudiantes universitarios presentaron una alta prevalencia de bruxismo del sueño, sin presentar síntomas de trastorno de ansiedad o depresión.

Descriptor: COVID-19. Trastornos de Ansiedad. Estudiantes del Área de la Salud.

Prevalência de bruxismo do sono e aspectos psicológicos do período pós-pandemia em estudantes universitários da área da saúde

Resumo O objetivo deste estudo foi avaliar a prevalência do bruxismo do sono e aspectos psicológicos do pós-pandemia nos estudantes da área da saúde. Estudo epidemiológico transversal realizado com 322 estudantes da área da saúde, de ambos os sexos, que responderam a um questionário *online* sobre estresse psicológico, situação da saúde psicológica, medo da COVID-19, ansiedade em relação ao coronavírus e bruxismo do sono. Para a análise dos dados, realizou-se a distribuição de frequência segundo as variáveis do estudo. Os resultados revelaram que 54% dos estudantes avaliados apresentaram bruxismo do sono. No decorrer da pandemia, 47% relataram ter contraído a COVID-19 e 98% receberam as duas doses da vacina. Adicionalmente, 30% relataram sentir receio em retomar às atividades normais após o término da pandemia e 70% não manifestaram esse receio. Não foram identificados sintomas de transtorno de ansiedade generalizada em 53% dos participantes, tampouco para depressão em 54%. concluiu-se, portanto, que os estudantes

universitários apresentaram uma alta prevalência de bruxismo do sono, não exibindo sintomas de transtorno de ansiedade ou depressão.

Descritores: COVID-19. Transtornos de Ansiedade. Estudantes de Ciências da Saúde.

INTRODUCTION

The impact of the pandemic, social policies and the measures imposed by the global situation have had economic and psychosocial consequences for individuals¹. The association between the lack of contact between people in the population, job and income insecurity, the constant dissemination of information via social media and mental illness has led to an increase in the rate of anxiety, depression, stress, insomnia and the harmful use of alcohol². These new habits can have an impact on sleep quality, leading to disorders associated with bruxism^{3,4}.

COVID-19 is a severe and infectious acute respiratory syndrome caused by the SARS-CoV-2 virus with respiratory symptoms⁵. The fear of COVID-19 can be related to the emergence of physical and/or psychological illnesses, such as "coronaphobia", which is the intensification of fear and emotional and social tension related to the virus⁶. Exaggerated information and fake news end up making human beings feel helpless and afraid, developing psychosocial problems such as hypochondriacal anxiety^{7,8}. These stressors can change habits and aggravate the symptoms of bruxism, especially in university students and health professionals, who are at the forefront of combating the disease^{9,10}.

With educational institutions closed, students have had changes in their routines, generating anxiety, altered sleep routines, stress, prostration and increased dental clenching due to the new study routine and the new difficulties encountered due to the pandemic situation¹¹.

The symptoms of anxiety include dizziness, sleep disturbances, tonic immobility, loss of appetite, nausea or abdominal discomfort and panic attacks associated with generalized anxiety disorders, as well as influencing hormonal, physiological, genetic and personality aspects, affecting certain individuals in different and more aggravating ways^{12,13}. With the increase in mental illnesses, which have a negative impact on society's life, several studies are being carried out on this subject.

In this sense, bruxism is a parafunctional habit characterized by the repetitive activity of the masticatory muscles that cause rigidity, contraction and propulsion of the mandible, leading to clenching or grinding of the teeth, with two circadian manifestations: waking bruxism and sleep bruxism¹⁴. Muscle contraction can be a behavior of the body in reaction to depression, anxiety and stress¹⁵. The signs of bruxism can be tooth wear, fatigue, tiredness and hypertrophy of the masticatory muscles¹⁴.

In view of all these factors, it is necessary to delimit new studies, especially with health students, to show the probable correlation between the psychological impacts of COVID-19 with anxiety and bruxism, and thus provide an improvement in quality of life, even in situations of vulnerability.

The aim of this study was to assess the prevalence of sleep bruxism and psychological aspects of the post-pandemic in health students.

METHOD

This was a cross-sectional epidemiological study, approved by the Ethics Committee (CAAE: 52789121.0.0000.5385). This survey was carried out with university students studying health courses between February and July 2022, using an open link to accept responses until an acceptable sample was obtained.

The online questionnaire was created on Google Forms and consisted of sociodemographic questions to investigate the age of the undergraduates (in years), gender; course (Biology, Biomedicine, Physical Education, Aesthetics, Nursing, Pharmacy, Physiotherapy, Dentistry, Medicine, Nutrition and others) and period (1st to 10th period). The volunteers were recruited using the "Snowball" technique, whereby one participant was invited to take part in the research and

encouraged other members of the population of interest - university students from health courses - to take part, who then referred new participants, and so on. The final sample consisted of 322 participants. Fear of COVID-19, participants' health, habits and addictions were assessed using specific instruments.

The COVID-19 Fear Scale (CSE-19) assessed fear of COVID-19. The instrument contains seven questions answered using a Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The answers are added together to give a total score, which can vary from 7 to 35 points. The volunteers were classified as having little fear of COVID-19 (7 to 19 points), moderate fear (20 to 26 points) and great fear of COVID-19 (> 27 points)^{16,17}. The fear scale was considered an outcome variable.

The Generalized Anxiety Disorder (GAD-7) assessed psychological stress according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). It is a questionnaire made up of seven items, arranged on a 4-point time-anchored scale, where 0=not at all and 3=almost every day, with a score ranging from 0 to 21, measuring the frequency of signs and symptoms of anxiety in the last two weeks. A value equal to or greater than 10 was considered a positive indicator of signs and symptoms of anxiety disorders^{18,19}.

The Patient Health Questionnaire (PHQ-9) assessed symptoms of depression^{20,21}. It is a questionnaire made up of nine items, anchored in time on a four-point scale, where 0=not at all and 3=almost every day, with a score ranging from 0 to 27 points, assessing the frequency of signs and symptoms of depression in the last two weeks. A score greater than or equal to 10 was considered a positive indicator of depression²¹.

The Brazilian Coronavirus Anxiety Scale (CAS-BR) assesses the physiological-based symptoms that are triggered by information and thoughts related to the coronavirus, i.e. whether they felt, for example, insomnia, dizziness, shock, lack of appetite or had stomach problems when they read or heard news about the coronavirus^{22,23}. The scale is made up of five questions and uses a 5-point time-anchored scale, where 0=not at all and 4=almost every day for the last 2 weeks, assessing the frequency with which patients experienced each symptom^{22,23}, with a descriptive analysis being carried out, considering the highest percentage of each response.

Sleep bruxism was assessed using a questionnaire based on the diagnostic criteria of the American Academy of Sleep Medicine (2005)²⁴. The questionnaire refers to events in the last 6 months. Respondents were classified as suffering from active sleep bruxism if their response was positive to question 1 and/or question 2, in addition to at least one positive response to a symptom listed in question 3²⁴.

Initially, a pilot study was carried out in which participants were not included in the sample. Volunteers were then recruited using the "Snowball" technique²⁵, in which a participant was invited to take part in the research and encouraged other members of the population of interest - university students from health courses - to take part, who then referred new participants, and so on.

Descriptive and exploratory analyses were carried out on all the data and the results of the categorical variables are presented as absolute and relative frequencies.

RESULTS

The study sample consisted of 322 university students from the health sector. Figure 1 shows the study's epidemiological flowchart. The majority of the sample was made up of women (83%) aged between 21 and 25 (45%). The students practiced physical activity (55%), were not smokers (93%), consumed alcohol infrequently before the pandemic (40%) and did not use medication for depression and/or anxiety (80%) (Table 1).

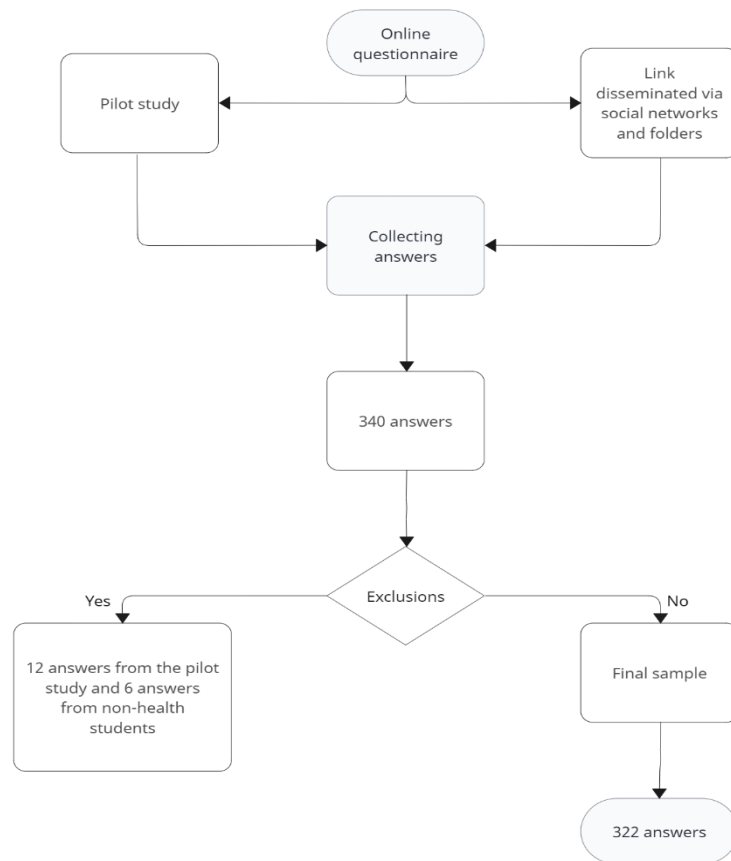


Figure 1. Sample collection flowchart.

Table 1. Sample characteristics.

Variable	n	%
<i>Gender</i>		
Female	268	83.0
Male	54	17.0
<i>Age (years)</i>		
17-20	139	43.0
21-25	146	45.0
> 26	37	11.0
<i>Physical activity</i>		
Yes	177	55.0
No	145	45.0
<i>Smoker</i>		
Yes	24	7.0
No	298	93.0
<i>Alcohol consumption before the pandemic</i>		
(0) - Never	83	26.0
(1) - Infrequently	130	40.0
(2) - 2 to 4 times a month	79	25.0
(3) - 2 to 3 times a week	27	8.0
(4) - 4 or more times a week	3	1.0
<i>Alcohol consumption after the pandemic</i>		
(0) - Never	80	25.0
(1) - Infrequently	142	44.0
(2) - 2 to 4 times a month	70	22.0
(3) - 2 to 3 times a week	25	8.0
(4) - 4 or more times a week	5	2.0
<i>Use of medication for depression and/or anxiety</i>		
Yes	65	20.0
No	257	80.0

Table 2 describes the answers to the questions about COVID-19, showing as a result that most students have not been contaminated by the virus (53%) and have had two doses of the vaccine (98%). It can be seen that 70% of university students were not afraid to return to normal life after the pandemic, were afraid of a stronger wave of Sars-Cov-2 (79%) and were not afraid of the vaccine (94%).

Table 2. Descriptive analysis of answers to questions about COVID-19.

Variable	n	%
<i>Contaminated by COVID-19</i>		
Yes	150	47.0
No	172	53.0
Have you had both doses of the vaccine?		
(1) – Yes	317	98.0
(2) – No	2	1.0
(3) – Just the first dose	2	1.0
(4) – Single dose	1	-
<i>Took the third dose</i>		
Yes	231	72.0
No	91	28.0
<i>Fear of returning to normal life after the pandemic</i>		
Yes	95	30.0
No	227	70.0
<i>Fear of a stronger wave</i>		
Yes	253	79.0
No	69	21.0
<i>Fear of the vaccine</i>		
Yes	18	6.0
No	304	94.0
<i>Fear of the after-effects of illness</i>		
(1) – Yes	119	37.0
(2) – No	38	12.0
(3) – I didn't get COVID-19	165	51.0

Table 3 shows the description of the Total Scores. With regard to the COVID-19 Fear Scale (CSE-19), the students showed little fear (58%). The Generalized Anxiety Disorder (GAD-7), assessed by psychological stress, showed that 53% had negative symptoms for anxiety disorder. The Patient Health Questionnaire (PHQ-9) assessed that 54% of students had negative symptoms for depression. The bruxism questionnaire showed that 54% of the sample were bruxomaniacs.

Table 3. Descriptive analysis of the Total Scores of the Fear of COVID-19 Scale (FCV-19S).

Variable	n	%
<i>Fear Scale</i>		
Little Fear 7 - 19	188	58.0
Moderate Fear 20 - 26	104	32.0
Very Afraid > 27	30	9.0
<i>Generalized Anxiety Disorder (GAD-7)</i>		
≥10 Positive for Anxiety Disorder	150	47.0
<10 Negative for Anxiety Disorder	172	53.0
<i>Patient Health Questionnaire (PHQ-9)</i>		
≥10 Positive for Depression	147	46.0
<10 Negative for Depression	175	54.0
<i>Sleep Bruxism</i>		
(1) – Positive for Bruxism	174	54.0
(0) – Negative for Bruxism	148	46.0

Table 4 refers to the symptoms of anxiety when exposed to information about the Coronavirus, resulting in them never becoming disoriented (86%), never having difficulty falling asleep (72%), never feeling "in shock" (66%), never losing their appetite (84%) and not feeling nauseous (81%).

Table 4. Descriptive analysis of the Brazilian Coronavirus Anxiety Scale (CAS-BR).

Variable	n	%
<i>1. I felt Dizzy and disoriented</i>		
(0) - Never	277	86.0
(1) – Rare, less than 1 or 2 days	29	9.0
(2) – Several days	14	4.0
(3) – More than 7 days	2	1.0
(4) – Almost every day for the last two weeks	-	-
<i>2. I had trouble falling asleep or staying asleep because I was thinking about COVID-19</i>		
(0) – Never	233	72.0
(1) – Rare, less than 1 or 2 days	64	20.0
(2) – Several days	22	7.0
(3) – More than 7 days	2	1.0
(4) – Almost every day for the last two weeks	1	-
<i>3. I felt paralyzed or "in Shock" when I thought about or was exposed to information about the Coronavirus</i>		
(0) - Never	212	66.0
(1) – Rare, less than 1 or 2 days	72	22.0
(2) – Several days	35	11.0
(3) – More than 7 days	3	1.0
(4) – Almost every day for the last two weeks	-	-
<i>4. I lost my appetite when I thought about or was exposed to information about the Coronavirus</i>		
(0) - Never	271	84.0
(1) – Rare, less than 1 or 2 days	36	11.0
(2) – Several days	12	4.0
(3) – More than 7 days	1	-
(4) – Almost every day for the last two weeks	2	1.0
<i>5. I felt nauseous or had stomach problems when I thought about or was exposed to information about Coronavirus</i>		
(0) - Never	260	81.0
(1) – Rare, less than 1 or 2 days	39	12.0
(2) – Several days	15	5.0
(3) – More than 7 days	6	2.0
(4) – Almost every day for the last two weeks	2	1.0

DISCUSSION

This study assessed the prevalence of sleep bruxism and the psychological aspects related to the post-pandemic period in health students. The majority of university students were women, aged between 21 and 25, who practiced physical activity, were not smokers, consumed alcohol infrequently and did not use medication for depression and/or anxiety. These traits corroborate the profiles of recent studies showing that young adult women are more likely to manifest health impacts as a result of COVID-19^{23,26}. Women are more careful with their health in terms of guidance and treatment than men⁷, which may justify the findings of this study.

Regarding the increase in alcohol consumption after the pandemic, this is relevant because young people in this age group are in situations of vulnerability, both in terms of psychological health and alcohol consumption in the face of social isolation and in comparison with other ages^{26,27}. Although there is no dependence on alcohol, there has been an increase in consumption.

Considering that health students were assessed, it was observed that this factor reflected on the attitudes of university students in terms of knowledge, since they practiced physical activity (55%) and were not smokers (93%). Thus, the pandemic did not cause a reduction in these percentages. A previous study²³ showed that the new habits imposed by the pandemic reduced physical activity and increased tobacco consumption.

With regard to COVID-19, 53% of students have not been infected by the virus and are covered by the third dose of the vaccine (72%). This is probably due to the knowledge they acquired during their undergraduate studies and their concern for their health, as this is a vulnerable group who, in the course of their activities and internships, come into contact with more people and consequently expose themselves to the risks of contamination. Vaccinated health students tend to show confidence in the benefits of the vaccine²⁸. The present study showed that 94% of the students evaluated were not afraid of the vaccine and felt more secure with patients as professionals during their activities.

Fear is an emotion that can lead individuals to have protective or negative reactions, which can lead to psychological distress and mental disorders²⁹. Studies carried out with health professionals have shown a moderate level of fear of COVID-19^{30,31}. The university students assessed in this study showed "little fear", which is due to the fact that health professionals are on the front line fighting the virus, being susceptible to contamination and adults in physiological matters can present greater symptoms and sequelae post-contamination.

As has been observed, intensified fear increases the risk of anxiety and depression, and the opposite is confirmed in the analysis of this research, in which students showed little fear in relation to COVID-19 and consequently did not indicate positive symptoms for anxiety and depression. This can be explained by the fact that a large proportion (55%) practiced physical activity, as this is associated with a better state of psychological health³².

The "new normal" that the pandemic has generated, such as social distancing and isolation, has resulted in situations that can intervene in musculoskeletal activity in relation to the emotional health of vulnerable individuals, leading to sleep bruxism, because of academic pressure, students are the most likely to get into this condition³³.

This study found sleep bruxism, which is masticatory muscle activity during sleep. The biological and psychological factors that can trigger it are alcohol consumption, prolonged social isolation, stress, fear, anxiety, depression and poor sleep quality^{33,34,35}.

This study showed that 54% of undergraduate health students had bruxism, but had negative symptoms for anxiety and depression, which does not corroborate the findings of a study¹⁰ which states that depression and anxiety can exacerbate bruxism. However, the sample in this study may not have psychological illnesses because most of them practice physical activity, a habit which reduces the levels of psychological illnesses³². They may also have bruxism due to the stress generated by the pandemic, long-term social isolation, fear of a stronger wave of the virus and alcohol consumption, even if infrequent.

The findings of this study showed that university students indicated reactions of never feeling uncomfortable or not being able to eat or sleep in situations that make them think about the virus. The literature shows that anxiety symptoms include loss of appetite, nausea, sleep disturbance, panic attacks and abdominal discomfort^{12,13}. The contradiction with this study may be due to the age of the group studied and the practice of physical activities, which may influence the result.

A limitation of this study was the characterization of bruxism using a questionnaire related to symptoms, which, according to current literature, is classified as possible bruxism³⁶.

CONCLUSION

The university students surveyed have a high prevalence of sleep bruxism, without symptoms of anxiety or depression.

REFERENCES

1. Mulyadi M, Tonapa SI, Luneto S, Lin WT, Lee BO. Prevalence of mental health problems and sleep disturbances in nursing students during the COVID-19 pandemic: A systematic review and meta-analysis. *Nurse Educ Pract* [Internet]. 2021;57:103228. doi: <https://doi.org/10.1016/j.nepr.2021.103228>
2. Esteves CS, Oliveira CR, Argimon ILL. Social distancing: prevalence of depressive, anxiety, and stress symptoms among Brazilian students during the COVID-19 pandemic. *Front Public Health* [Internet]. 2021;27(8):589966. doi: <https://doi.org/10.3389/fpubh.2020.589966>
3. Peixoto KO, Resende CMBM, Almeida EO, Almeida-Leite CM, Conti PCR, Barbosa GAS, Barbosa JS. Association of sleep quality and psychological aspects with reports of bruxism and TMD in Brazilian dentists during the COVID-19 pandemic. *J Appl Oral Sci* [Internet]. 2021;29:e20201089. doi: <https://doi.org/10.1590/1678-7757-2020-1089>
4. Kardeş E, Kardeş S. Google searches for bruxism, teeth grinding, and teeth clenching during the COVID-19 pandemic. *J Orofac Orthop* [Internet]. 2022;83(6):1-6. doi: <https://doi.org/10.1007/s00056-021-00315-0>
5. Campos MR, Schramm JMA, Emmerick ICM, Rodrigues JM, Avelar FG, Pimentel TG. Burden of disease from COVID-19 and its acute and chronic complications: reflections on measurement (DALYs) and prospects for the Brazilian Unified National Health System. *Cad Saude Publica* [Internet]. 2020;30;36(11):e00148920. doi: <https://doi.org/10.1590/0102311X00148920>
6. Gómez-Salgado J, Allande-Cussó R, Domínguez-Salas S, García-Iglesias JJ, Coronado-Vazquez V, Ruiz-Frutos C. Design of fear and anxiety of COVID-19 assessment tool in Spanish adult population. *Brain Sci* [Internet]. 2021;11(3):328. doi: <https://doi.org/10.3390/brainsci11030328>
7. Abad A, Silva JA, Teixeira LEPP, Antonelli-Ponti M, Bastos S, Mármora CHC, et al. Evaluation of fear and peritraumatic distress during Covid-19 pandemic in Brazil. *Adv Infect Dis* [Internet]. 2020;10(3):184-194. doi: <https://doi.org/10.4236/aid.2020.103019>
8. Ahmed O, Faisal RA, Sharker T, Lee SA, Jobe MC. Adaptation of the Bangla version of the COVID-19 anxiety scale. *Int J Ment Health Addict* [Internet]. 2020;20(1):284-295. doi: <https://doi.org/10.1007/s11469-020-00357-2>
9. Cabarkapa S, Nadjidai SE, Murgier J, Ng CH. The psychological impact of COVID-19 and other viral epidemics on frontline healthcare workers and ways to address it: a rapid systematic review. *Brain Behav Immun Health* [Internet]. 2020;8:100144. doi: <https://doi.org/10.1016/j.bbih.2020.100144>
10. Kolak V, Pavlovic M, Aleksic E, Biocanin V, Gajic M, Nikitovic A, et al. Probable bruxism and psychological issues among dental students in Serbia during the COVID-19 pandemic. *Int J Environ Res Public Health* [Internet]. 2022;19(13):7729. doi: <https://doi.org/10.3390/ijerph19137729>
11. Yalçın İ, Can N, Çalıřır ÖM, Yalçın S, Çolak B. Latent profile analysis of COVID-19 fear, depression, anxiety, stress, mindfulness, and resilience. *Curr Psychol* [Internet]. 2021;41:459-469. doi: <https://doi.org/10.1007/s12144-021-01667-x>
12. Lee SA. Coronavirus anxiety scale: A brief mental health screener for COVID-19 related anxiety. *J Death Stud* [Internet]. 2020;44(7):393-401. doi: <https://doi.org/10.1080/07481187.2020.1748481>
13. Pera A. Depressive symptoms, anxiety disorder, and suicide risk during the COVID-19 pandemic. *Front Psychol* [Internet]. 2020;11:572699. doi: <https://doi.org/10.3389/fpsyg.2020.572699>
14. Vlăduțu D, Popescu SM, Mercuț R, Ionescu M, Scriciu M, Glodeanu AD, Stănuși A, Rîcă AM, Mercuț V. Associations between bruxism, stress, and manifestations of temporomandibular disorder in young students. *Int J Environ Res Public Health* [Internet]. 2022;19(9):5415. doi: <https://doi.org/10.3390/ijerph19095415>
15. Emodi-Perlman A, Eli I. One year into the COVID-19 pandemic - temporomandibular disorders and bruxism: What we have learned and what we can do to improve our manner of treatment. *Dent Med Probl* [Internet]. 2021;58(2):215-218. doi: <https://doi.org/10.17219/dmp/132896>

16. González-Olmo MJ, Delgado-Ramos B, Ortega-Martínez AR, Romero-Maroto M, Carrillo-Díaz M. Fear of COVID-19 in Madrid. Will patients avoid dental care? *Int Dent J* [Internet]. 2021;72(1):76-82. doi: <https://doi.org/10.1016/j.identj.2021.01.013>
17. Souza SLX, Laureano ICC, Cavalcanti AL. Are dental students afraid of the coronavirus? A pilot study using the fear of COVID-19 scale. *SciELO PrePrint* [Internet]. 2021;14:106. doi: <https://doi.org/10.1590/SciELOPreprints.1906>
18. Kroenke K, Spitzer RL, Williams JBW, Monahan PO, Löwe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Ann Int Med* [Internet]. 2007;146(5):317-325. doi: <https://doi.org/10.7326/0003-4819-146-5-200703060-00004>
19. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Internal Med* [Internet]. 2006;166(10):1092-1097. doi: <https://doi.org/10.1001/archinte.166.10.1092>
20. Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary care evaluation of mental disorders. Patient health questionnaire. *JAMA* [Internet]. 1999;282(18):1737-1744. doi: <https://doi.org/10.1001/jama.282.18.1737>
21. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med* [Internet]. 2001;16(9):606-613. doi: <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
22. Lee SA, Mathis AA, Jobe MC, Pappalardo EA. Clinically significant fear and anxiety of COVID-19: A psychometric examination of the coronavirus anxiety scale. *Psychiatry Res* [Internet]. 2020;290:113112. doi: <https://doi.org/10.1016/j.psychres.2020.113112>
23. Padovan-Neto FE, Lee SA, Guimarães RP, Godoy LD, Costa HB, Zerbini FLS, Fukusima SS. Brazilian adaptation of the coronavirus anxiety scale: A psychometric investigation of a measure of coronaphobia. *Omega: J. Death Dying* [Internet]. 2021;86(3):770-787. doi: <https://doi.org/10.1177/0030222821991325>
24. Winocur E, Uziel N, Lisha T, Goldsmith C, Eli I. Self-reported bruxism – associations with perceived stress, motivation for control, dental anxiety and gagging. *J Oral Rehabil* [Internet]. 2011;38(1):3-11. doi: <https://doi.org/10.1111/j.1365-2842.2010.02118.x>
25. Biernacki P, Waldorf D. Snowball sampling: Problems and techniques of chain referral sampling. *Soci Meth Res* [Internet]. 1981;10(2):141-163. doi: <https://doi.org/10.1177/004912418101000205>
26. Duarte MQ, Santo MAS, Lima CP, Giordani JP, Trentini CM. COVID-19 and the impacts on mental health a sample from Rio Grande do Sul, Brazil. *Cien Saude Colet* [Internet]. 2020;25(9):3401-3411. doi: <https://doi.org/10.1590/1413-81232020259.16472020>
27. Ahmed MZ, Ahmed O, Aibao Z, Hanbin S, Siyu L, Ahmad A. Epidemic of COVID-19 in China and associated psychological problems. *Asian J Psychiatr* [Internet]. 2020;51:102092. doi: <https://doi.org/10.1016/j.ajp.2020.102092>
28. Kelekar AK, Lucia VC, Afonso NM, Mascarenhas AK. COVID-19 vaccine acceptance and hesitancy among dental and medical students. *J Am Dent Assoc* [Internet]. 2021;152(8):596-603. doi: <https://doi.org/10.1016/j.adaj.2021.03.006>
29. Giordani RCF, Giolo SR, Muhi C, Estavela AJ, Gove JIM. Validation of the FCV-19 scale and assessment of fear of COVID-19 in the population of Mozambique, East Africa. *Psychol Res Behav Manag* [Internet]. 2021;14:345-354. doi: <https://doi.org/10.2147/PRBM.S298948>
30. Faro A, Silva LS, Santos DN, Feitosa ALM. Adaptation and validation of The Fear of COVID-19 Scale. *Health Psychology* [Internet]. 2022;39:e200121. doi: <https://doi.org/10.1590/1982-0275202239e200121>
31. Alnazly E, Khraisat OM, Al-Bashaireh AM, Bryant CL. Anxiety, depression, stress, fear and social support during COVID-19 pandemic among Jordanian healthcare workers. *PLoS One* [Internet]. 2021;16(3):0247679. doi: <https://doi.org/10.1371/journal.pone.0247679>
32. Jacob L, Tully MA, Barnett Y, Lopez-Sanchez GF, Butler L, Schuch F, et al. The relationship between physical activity and mental health in a sample of the UK public: a cross-sectional study during the implementation of COVID-19 social distancing measures. *Ment Health Phys Act* [Internet]. 2020;19:100345. doi: <https://doi.org/10.1016/j.mhpa.2020.100345>
33. Dias R, Lima R, Prado IM, Colonna A, Ferrari M, Serra-Negra JM, Manfredini D. Impact of confinement by COVID-19 in awake and sleep bruxism reported by Portuguese dental students. *J Clin Med* [Internet]. 2022;11(20):6147. doi: <https://doi.org/10.3390/jcm11206147>

34. Saczuk K, Lapinska B, Wawrzynkiewicz A, Witkowska A, Arbildo-Vega HI, Domarecka M, Lukomska-Szymanska M. Temporomandibular disorders, bruxism, perceived stress, and coping strategies among medical university students in times of social isolation during outbreak of COVID-19 pandemic. *Healthcare* [Internet]. 2022;10(4):740. doi: <https://doi.org/10.3390/healthcare10040740>
35. Prado IM, Perazzo MF, Abreu LG, Granville-Garcia AF, Amin M, Pordeus IA, *et al*. Possible sleep bruxism, smartphone addiction and sleep quality among Brazilian university students during COVID-19 pandemic. *Sleep Sci* [Internet]. 2022;15(2):158-167. doi: <https://doi.org/10.5935/1984-0063.20220036>
36. Lobbezoo F, Ahlberg J, Glaros AG, Kato T, Koyano K, Lavigne GJ, *et al*. Bruxism defined and graded: an international consensus. *J Oral Rehabil* [Internet]. 2013;40(1)2-4. doi: <https://doi.org/10.1111/joor.12011>

Conflict of Interest: The authors declare no conflict of interest.

Funding: Institutional Funding Program (PIC) of the Hermínio Ometto Foundation, opinion 5.106.583.

Authors' Contribution: Conception and planning of the study: RWCS, VCAM, JHAA, TPS, SASV, HCV. Data collection, analysis and interpretation: RWCS, VCAM, JHAA, TPS, SASV. Drafting or revising the manuscript: RWCS, SASV. Approval of the final version: RWCS, VCAM, JHAA, TPS, SASV, HCV. Public responsibility for the content of the article: SASV.