




ORIGINAL


The effects of the COVID-19 pandemic on the sleep of students from an African-Brazilian international cooperation university

A pandemia de COVID-19 no sono de acadêmicos de universidade de cooperação internacional afro-brasileira
La pandemia de COVID-19 en el sueño de académicos de una universidad afrobrasileña de cooperación internacional


Ana Lydia Costa Franco¹

 <https://orcid.org/0000-0002-2376-9176>


Gabriel Alves Desiderio¹

 <https://orcid.org/0000-0002-0337-5110>


Francisco Iuri da Silva Martins¹

 <https://orcid.org/0000-0003-3524-5609>


José Aurelio de Almeida Martins¹

 <https://orcid.org/0000-0002-6086-7808>

Jairo Domingos de Moraes¹

 <https://orcid.org/0000-0002-8383-7871>

Gilvan Ferreira Felipe¹

 <https://orcid.org/0000-0003-0674-4396>

¹Universidade da Integração Internacional da Lusofonia Afro-Brasileira. Redenção, Ceará, Brasil.

ABSTRACT

Objective: This research evaluated the impact of the pandemic of the SARS-CoV-2 virus on the sleep of the students of a university inland Ceará, Brazil. **Methods:** This is a quantitative analytical research, carried out in 2022 using a sociodemographic questionnaire associated with an instrument to analyze the quality of sleep. The study counted on the participation of 225 students older than 18 years who were enrolled and active in graduation courses of the Universidade da Integração Internacional da Lusofonia Afro-Brasileira (UNILAB). The questionnaire was made available by e-mail. The analysis was carried out using the relative and absolute frequencies of the variables, in addition to central tendency and dispersion measures. **Results:** The analysis of the data showed that, sleep quality before the pandemic (44.0%) was much higher than after it (25.8%). This reduction can be related with trouble sleeping or insomnia. **Conclusion:** Sleep quality became significantly reduced during the pandemic, which may also have had negative effects on student performance and productivity.

Descriptors: COVID-19. Sleep. Students.

RESUMO

Objetivo: Esta pesquisa buscou avaliar os impactos da pandemia do vírus SARS-CoV-2 no sono de acadêmicos de universidade do interior do Ceará. **Métodos:** Trata-se de pesquisa quantitativa, com abordagem analítica, realizada em 2022, por intermédio de um questionário sociodemográfico associado ao instrumento de análise da qualidade do sono. Participaram do estudo 225 estudantes maiores de 18 anos e com matrícula ativa nos cursos de graduação da Universidade da Integração Internacional da Lusofonia Afro-Brasileira (UNILAB). O questionário foi disponibilizado via e-mail. A análise foi realizada por meio de frequências absolutas e relativas das variáveis, além de medidas de tendência central e de dispersão.

Resultados: A partir da análise dos dados, percebeu-se que, quando comparado o percentual da qualidade do sono de antes da pandemia (44,0%) com aquele durante o período pandêmico (25,8%), no segundo caso houve diminuição desta boa qualidade, podendo estar relacionada à dificuldade de adormecer ou à insônia. **Conclusão:** Conclui-se que a qualidade do sono foi significativamente impactada, de modo negativo, durante a pandemia, sendo ainda possivelmente prejudicial ao desenvolvimento e rendimento acadêmico dos estudantes.

Descritores: COVID-19. Sono. Estudantes.

RESUMÉN

Objetivo: Esta investigación evaluó el impacto de la pandemia del virus SARS-CoV-2 en el sueño de estudiantes de una universidad en el interior de Ceará, Brasil. **Métodos:** Investigación cuantitativa y analítica realizada en 2022 utilizando un cuestionario sociodemográfico asociado con un instrumento para análisis de la cualidad del sueño. Los participantes fueron 225 estudiantes de 18 o más años con matrícula activa en un curso de graduación en la Universidade da Integração Internacional da Lusofonia Afro-Brasileira (UNILAB). Se envió el cuestionario a los participantes por e-mail. El análisis se hizo utilizando frecuencia absolutas y relativas de las variables, para allá de medidas de tendencia central y dispersión.

Resultados: El análisis de los datos mostró que la cualidad de sueño antes de la pandemia (44.0%) fue substancialmente mayor que después de ella (25.8%). Esa reducción puede ser relacionada con dificultades en el sueño o con el insomnio. **Conclusión:** La cualidad de sueño cayó significativamente a lo largo de la pandemia, lo que puede ter impactado negativamente en la performance y productividad de los estudiantes.

Descritores: COVID-19. Sueño. Estudiantes.

INTRODUCTION

The COVID-19 is a disease caused by the SARS-CoV-2 virus. It is a potentially fatal threat and can generate a worrisome public health setting around the globe. As the incidence of infection increased, a common thread was found between the cases: the exposure to the market where humid animals were sold, in the city of Wuhan, China. This is the main zoonotic hypothesis regarding the origin of COVID-19. Early studies already warned about the potential virulence and the possible pandemic scenario, predicting the virus outbreak. In summation, coronavirus is one of the main pathological agents known, which can affect, especially, the immune system.⁽¹⁾

The COVID-19 virus spread quickly, its transmission mainly occurring through direct contact or through droplets in the sneezes or coughs of an individual with the infection. Therefore, the World Health Organization (WHO) classified the situation as a pandemic, and when it came to Brazil, the country created the National Contingency Plan for Human Infections (*Plano de Contingência Nacional para Infecção Humana - PCNIH*), based on the norms and recommendations from the Ministry of Health.⁽²⁾

The COVID-19 pandemic caused a lot of changes on the daily lives of people. Preventive measures were put in place as obstacles to contain the dissemination of the virus. These included: social distancing and isolation; masks use; and hand sanitation using alcohol 70%. As a result, social life changed, especially in the case of university students, who were removed from in-person activities and socialization with colleagues, professors, and friends, and had to adapt to the changes caused by the distance. Consequently, the academic formation of these students suffered a significant impact.⁽³⁾

The efforts targeted at reducing COVID-19 cases led to unpredictable levels of social isolation, which also affected university students. This led them to move with their families or with other support networks. These preventive measures affected not only national economy, but also mental health, lifestyle, and collective wellbeing, considering that interpersonal communication is essential for human life. Therefore, living in isolation can lead to several health problems, such as stress, poor diet, and less physical exercise, which has direct consequences in determining the quality of life of an individual.⁽⁴⁾

Academic activities were also impacted by the transition process into remote education. This led to a change in the students' routine. They started spending more time in front of their computers, phones, tablets, and other electronic devices, which influenced their lifestyles and made more susceptible to anxiety and depression, and sleep quality decreased in proportion with the time spent in front of the screens.⁽³⁾

According to Gomes⁽⁵⁾, sleep is a habitual physiological mechanism of the organism, which in this situation reacts less to external stimuli. In the context of the COVID-19 crisis, time of sleep, frequency with which one wakes up at night, and

According to Marelli⁽⁷⁾, sleep quality fell in a population of university students and workers in Italy, with the first being the most impacted. In this regard, it can be noted that the routine and the new habits of academic life can have a negative impact on the amount of sleep necessary to guarantee a good performance in daily life activities.

In turn, bad sleep quality can decrease productivity in one's tasks, increasing anxious and depressive symptoms. This situation is very common in the lives of students whose study routine was impacted by social isolation, which affected their mental health.⁽⁸⁾

Therefore, the objective of this research is to evaluate the effects of the COVID-19 pandemic on the sleep of students from the Universidade da Integração Internacional da Lusofonia Afro-Brasileira (UNILAB).

METHODS

This is a quantitative, analytical research. Data collection took place from March to April 2022, and was carried out through a Google Forms survey, sent by e-mail. Study participants included students from different graduation courses that were actively enrolled in the teaching institution.

The Google Form survey was tested in an attempt to find mistakes and incongruities in the system or in the survey itself that could impair an appropriate data collection.

Students whose surveys were incomplete, that is, those with one or more unanswered questions in sections to measure quality of life and sleep were excluded. These exclusion criteria were used as it was not possible to find the result of these variables, which are the sum total of the answers to the questions, in cases where any of them was unanswered. We also excluded participants who did not have access to the Internet or to devices that would allow them to fill in the data collection instruments, in addition to those who were on medical leave, or any other type of leave, during data collection.

The sample was determined through a sample calculation for a finite population, to a total of 278 participants. 225 of them were in accordance with inclusion criteria. According to the Coordination for Academic Records and Control (CRCA), UNILAB has 5,243 graduation students (population), where 5,004 are enrolled in in-person courses, and 239 are enrolled in distance education.

Therefore, the sample was selected according with the following eligibility criteria: participants older than 18 years old, enrolled and active in some graduation course (in person or distance education) at UNILAB, who agreed participating by signing the Free and Free and Informed Consent Form (FICF). We excluded post-graduation students and those whose answers in the survey were incomplete, as mentioned.

To elaborate the data collection instrument, we created a sociodemographic survey associated with

the Portuguese version of the sleep quality analysis instrument Mini Sleep Questionnaire (MSQ) ⁽⁹⁾.

Sociodemographic data included questions about: age, sex, marital status, nationality, color/ethnicity, religion, family status, number of children, occupation, scholarship or financial aid, smoking, drinking, and physical activity.

The MSQ had 10 questions with information about sleep before, and during the COVID-19 pandemic, such as: difficulty falling asleep, waking up too early, hypnotic medication use, falling asleep during the day, feeling tired upon waking up in the morning, snoring, mid-sleep awakenings, headaches on awakening, excessive daytime sleepiness, and excessive movement during sleep.

During the development of data collection, participants of the study were given one month to answer the instrument, so we could attend to the dates required by the Research Ethics Committee.

To evaluate sleep quality, respondents were presented seven possible answers (never, very rarely, rarely, sometimes, often, very often, and always). The total score could vary from 10 to 70, and the higher the score, the worse the sleep quality.

Later, research data were input in Microsoft Excel® and the statistical package IBM - SPSS 22.0 was used for data analysis. A descriptive analysis was carried out using the absolute and relative frequencies of the variables, in addition to central tendency and dispersion measures. Comparative analyses (association) were carried out using analytical statistics.

The analysis of data considered the specificities from the university context, such as nationality, distance teaching conditions, and potential for social, economic, or cultural vulnerability, to reduce potential analysis bias in the data collected.

The study was approved by the Research Ethics Committee (CEP) at UNILAB under opinion 5.228.129 and Certificate of Submission for Ethical Appreciation 52903821.3.0000.5576. In addition, it followed all recommendations from Resolution 466/12 from the National Council of Health, and ensured the confidentiality of participant data. Participants received information about the study through the Free and Informed Consent Form (FICF) and gave their consent for participation.

RESULTS

The study included 225 participants, most of whom were single (88.9%), female (56.9%), and Brazilian (68.8%). Most participants reported being unemployed (87.6%) and receiving no scholarships or financial support from the institution (54.7%). The great majority of research participants did not smoke (92.9%), did not consume alcohol (63.1%), and practiced physical activities (60%).

Most students in the sample had good sleep quality before the pandemic (44%), although many reported severe trouble sleeping (39.6%) according with the MSQ, as Table I shows.

Table 1. Sleep quality before the COVID-19 pandemic. Redenção, Ceará, Brazil, 2022.

Sleep quality	n	%
Good sleep quality	99	44.0
Mild difficulty sleeping	17	7.6
Moderate difficulty sleeping	20	8.9
Severe difficulty sleeping	89	39.6
Total	225	100.0

Source: authors (2022).

In turn, Table II, representative of the evaluation of sleep quality during the pandemic, show that good sleep quality decreased (25.8%), and the percentage of students with severe difficulty sleeping increased (66.7%), that is, more than half the sample.

Table 2. Sleep quality during the COVID-19 pandemic. Redenção, Ceará, Brazil, 2022.

Sleep quality	n	%
Good sleep quality	58	25.8
Mild difficulty sleeping	11	4.9
Moderate difficulty sleeping	6	2.7
Severe difficulty sleeping	150	66.7
Total	225	100.0

Source: authors (2022).

Table III shows the sleep quality before and during the pandemic, according with the ten questions that form the MSQ. Regarding the questions of the instrument, it can be noted that, during the pandemic, sleep quality decreased, which is demonstrated by the fact that values found during the pandemic are worse than those indicating the period before it.

Table 3. Sleep quality before and after the COVID-19 pandemic. Redenção, Ceará, Brazil, 2022.

Questions	Never		Very rarely		Rarely		Sometimes		Often		Very often		Always	
	%bef	%dur	%bef	%dur	%bef	%dur	%bef	%dur	%bef	%dur	%bef	%dur	%bef	%dur
1. Difficulty falling asleep	21.8	12.4	21.3	11.6	12.4	12.4	16.0	13.3	10.2	9.3	10.2	20.4	8.4	20.9
2. Waking up too early	29.8	21.3	25.8	11.6	7.6	12.9	12.4	15.1	11.6	11.6	6.2	10.2	7.1	17.8
3. Hypnotic medication use	80.4	70.7	5.3	7.1	1.3	3.1	4.0	6.2	3.6	4.0	2.2	3.6	3.6	5.8
4. Falling asleep during the day	31.1	26.7	18.2	19.1	10.7	12.4	12.9	17.3	10.7	9.8	10.2	7.6	6.7	7.6
5. Feeling tired upon waking up in the morning	19.1	13.3	20.4	8.0	15.1	9.8	13.3	14.2	9.8	11.6	5.8	16.4	16.9	27.1
6. Snoring	53.8	48.0	15.6	15.6	6.7	7.6	8.4	9.8	4.9	5.3	4.0	4.0	7.1	10.2
7. Mid-sleep awakenings	26.2	13.8	24.4	15.6	10.7	9.8	9.8	12.0	13.3	10.2	5.3	17.3	10.7	21.8
8. Headaches on awakening	47.1	29.3	19.1	14.7	9.8	6.2	7.1	13.8	6.7	14.2	6.2	10.2	4.4	12.0
9. Excessive daytime sleepiness	32.0	15.1	19.1	5.3	12.9	9.3	9.3	11.6	7.6	13.3	7.6	18.2	12.0	27.6
10. Excessive movement during sleep	28.4	18.2	21.8	10.7	11.1	5.8	10.2	14.2	6.2	12.9	12.0	14.7	12.4	24.0

*bef: before the pandemic; dur: during the pandemic

Source: authors (2022).

In general, the evaluation of sleep using the MSQ showed that, before the pandemic, mean MSQ results were lower (2.44; sd = 1.36), showing that sleep quality was worse during the pandemic, in which case the mean MSQ was higher (3.10; sd=1.32). As table IV shows, we calculated the standard deviation and p-value of the mean scores of general questions, as well as the domains of UNILAB higher education students, finding a statistically significant result.

Table 4. General evaluation of sleep quality before and after the COVID-19 pandemic. Redenção, Ceará, Brazil, 2022.

	Mean	sd	p-value
Sleep quality before the pandemic	2.4	1.4	0.001*
Sleep quality during the pandemic	3.1	1.3	

Source: authors (2022).

DISCUSSION

Tables I and II show an increase in difficulties sleeping, a result similar to that found by Fontes, Jacinto, and Rocha⁽¹⁰⁾ when they applied a survey which generated important data regarding signs and symptoms of anxiety and sleep disorders in their participants. The survey from these authors indicated that 40% of respondents had trouble sleeping, insomnia, and/or less hours of sleep, which reflected on their levels of tiredness and sleepiness.

Another extremely important issue is related with mental health care and sleep quality. Findings from a research carried out in a Brazilian city suggest that mental disorders are associated with a 61% growth in bad sleep quality. This demonstrates the need for public authorities to consider a broader approach in the promotion of mental health policies, since treating these disorders is essential for the wellbeing of the collective, as it can remedy the damage caused by these disorders, especially in the university environment.⁽¹¹⁾

Lourenço and Viana⁽¹²⁾, through an interview with university students, found that, due to psychological disorders such as anxiety and stress, 69% of their population had trouble sleeping at least once a week. These difficulties are similar to those found in this study, as Table III shows. In addition, 14% of the students in said study were medicated according to medical prescriptions, or even self-medicating to be able to sleep.

It should be mentioned that self-medication using hypnotic and sedative medication, from one to two times every month or week, is inadequate, not to mention that medical prescriptions are important. Self-medication is already a public health issues, and, during the pandemic, it can be associated with anxiety, insomnia, social isolation, and even suicide, problems that affect a large part of the population.⁽¹²⁾

As students enter the academic routine, they adopt new habits, which can have a negative impact on the sleep they need to have a good productivity in daily life activities. This reiterates the findings by Seixas,⁽¹³⁾ according to whom good sleep quality can stabilize emotional and psychological aspects of an individual's life, while its absence can be harmful to their lives.

According with Duan,⁽¹⁴⁾ insomnia and depression became common problems among university students in Wuhan, China, where the first coronavirus cases appeared, and it would be necessary to intensify the sleep education of university students, in order to

deal with their sleep disorders and psychosomatic health.

In summation, current literature showed that, during the pandemic, there was a reduction in the sleep quality, as Table IV showed. The study also showed other issues that can be addressed regarding changes in the post-pandemic period, or even in the different stages of COVID-19. Therefore, associating the results of this study with other findings is essential to elaborate potential planning strategies, to intervene in the creation of affirmative policies in regard to university student health, especially in international institutions.

Furthermore, considering the fall in rates of morbidities and mortalities associated with the COVID-19 pandemic, and the gradual resumption of in-person educational activities, which are even being carried out without the mandatory use of masks, we suggest further investigations to be carried out, in order to update the data regarding not only quality of sleep, but also the quality of life of the population under study, considering their current situation.

CONCLUSION

This study showed that sleep quality became significantly reduced during the pandemic, which may also have had negative effects on student performance and productivity. Therefore, promoting affirmative policies and forms of prevention regarding the health of this public is essential. Furthermore, we should encourage further studies about sleep in the academic life of university students since studies on this topic are still scarce.

REFERENCES

1. Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *Journal Autoimmunity*. 2020;109:1024-1033. Doi: 10.1016/j.jaut.2020.102433
2. Martins GS, Oliveira CM, Silva GS, et al. Contingency Plan, How the Brazil prepared itself for the arrival of COVID-19: Brief integrative review. *Revista Saúde e Inovação*. 2020;1(1):1-16. Doi: <https://doi.org/10.51208/saudeinovacao.v1i1.18>
3. Silva TVS, Vieira LM, Cardoso AMR, Oliveira RVD. Quality of life, anxiety and depression in Dentistry students in the COVID-19 pandemic and related. *Research, Society and Development*. 2021;10(8):1-13. Doi: <http://dx.doi.org/10.33448/rsd-v10i8.17481>

4. Ramos T H, Pedrolo E, Santana LL, Ziesemer NBS, Haeffner R, Carvalho TP. The impact of the sars-cov 2 pandemic on the quality of life of nursing students. *Revista Brasileira do Centro Oeste Mineiro*. 2020; 10:e4042. Doi:10.19175/recom.v10i0.4042

5. Gomes MM, Quinhones MS, Engelhardt E. Neurophysiology of sleep and pharmacotherapeutic aspects of their disorders. *Revista Brasileira de Neurologia [Internet]*. 2010;46(1):5-15. Available from: <http://files.bvs.br/upload/S/0101-8469/2010/v46n1/a003.pdf>

6. Ohayon M, Wickwire EM, Hirshkowitz M, et al. National Sleep Foundation's sleep quality recommendations: first report. *Sleep Health*. 2017;3(1):6-19. Doi: <https://doi.org/10.1016/j.sleh.2016.11.006>

7. Marelli S, Castelnuovo A, Somma A, et al. Impact of COVID-19 lockdown on sleep quality in university students and administration staff. *J Neurol*. 2021;268:8-15. Doi: 10.1007/s00415-020-10056-6

8. Evans S, Alkan E, Bhangoo JK, Tenenbaum H, Ng-Knight T. Effects of the COVID-19 lockdown on mental health, wellbeing, sleep, and alcohol use in a UK student sample. *Psychiatry Res*. 2021;298:113819. Doi: 10.1016/j.psychres.2021.113819

9. Falavigna A, De Souza Bezerra ML, Teles AR, Kleber FD, Velho MC, Da Silva RC, et al. Consistency and reliability of the brazilian portuguese version of the minisleep questionnaire in undergraduate students. *Sleep breath*. 2011; 15 (3): 351-5. DOI: 10.1007/s11325-010-0392-x.

10. Fontes BA, Jacinto PMS, Rocha RVS. Consumption of benzodiazepine anxiolytics during the COVID-19 pandemic: a remote study with university students. *Sapienza: Interdisciplinary studies and essays*. 2022;3(1). Doi: <https://doi.org/10.51798/sijis.v3i1.203>

11. Barros MBA, Lima MG, Ceolim MF, et al. Quality of sleep, health and well-being in a population-based study. *Revista de Saúde Pública*. 2019;53(82). Doi: <https://doi.org/10.11606/s1518-8787.2019053001067>

12. Lourenço MT, Viana ESM. Assessment of sleep quality and nutritional status of university students of a private higher education institution in Viçosa-MG, during the COVID-19 Pandemic. *Brazilian Journal of Health Review*. 2022;5(2): 6012-6021. Doi: <https://doi.org/10.34119/bjhrv5n2-177>

13. Seixas MP. Avaliação da qualidade do sono na adolescência: implicações para a saúde física e mental [Dissertação de Mestrado]. Universidade Fernando Pessoa; 2009. Available from: <<http://hdl.handle.net/10284/1256>

14. Duan H, Gong M, Zhang Q, Huang X, Wan B. Research on sleep status, body mass index, anxiety and depression of college students during the post-pandemic era in Wuhan, China. *J Affect Disord*. 2022;301:189-192. Doi: 10.1016/j.jad.2022.01.015

Financing source: No

Conflicts of interest: No

Date of submission: 2022/31/08

Accepted: 2022/16/11

Publication: 2023/04/03

Corresponding author:

Ana Lydia Costa Franco

E-mail: lydiapesquisas@gmail.com

How to cite this article:

Franco ALC, Desiderio GA, Martins FIS, Martins JAA, Morais JD, Felipe GF. The effects of the COVID-19 pandemic on the sleep of students from an African-Brazilian international cooperation university. *Rev Enferm UFPI [internet]*. 2022 [Cited: ano mês abreviado dia]; 11: e2974. Available from: DOI: 10.26694/reufpi.v11i1.2974

