
Sleep and anxiety during the covid-19 pandemic: A systematic review

Sono e Ansiedade durante a pandemia da COVID-19: Revisão Integrativa

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RESUMO

Nesta presente revisão, unimos estudos que avaliaram a relação do sono durante a pandemia e o aumento da incidência dos distúrbios mentais, primordialmente, os transtornos de ansiedade, visto que, surtos de doenças infecciosas estão associadas no desencadeamento do sofrimento psicológico e alterações na qualidade e quantidade do sono. Método: O presente estudo utilizou-se de uma revisão integrativa, a fim de se analisar, crítica e coerentemente, as alterações decorrentes da COVID-19 no sono e na saúde mental. Para tanto, foi feita uma revisão, dos últimos 5 anos, nas bases de dados LILACS, Scielo, Pubmed utilizaram-se os descritores “sono”, “transtornos do sono”, “ansiedade”, “epidemias”, “pandemias” e “COVID-19”. Considerações Finais: Em suma, durante a pandemia, percebem-se sérias alterações do ritmo biológico, cronotipo dos hábitos de sono dos estudantes universitários, profissionais da saúde e da população em geral, com intensa prevalência de transtorno de ansiedade. Assim, este estudo sugere que o impacto psicológico da quarentena é amplo, substancial e pode ser duradouro. Além disso, ficou evidente a necessidade de mais pesquisas com foco nessa temática, para identificar os obstáculos e consequências da restrição social e assim desenvolver estratégias eficazes que melhorem a qualidade e quantidade do sono e a saúde mental da população.

Palavras-chave: Ansiedade; COVID-19; Distúrbios do sono; Distúrbios psicológicos; Sono; Pandemias.

ABSTRACT

In this review, we combined studies that evaluated the relationship between sleep during the pandemic and the increased incidence of mental disorders, primarily anxiety disorders, since outbreaks of infectious diseases are associated with triggering psychological distress and changes in the quality and quantity of sleep. Method: This study used an integrative review to critically and coherently analyze the changes resulting from COVID-19 in sleep and mental health. For this purpose, a review of the last 5 years was carried out in the LILACS, Scielo, and Pubmed databases using the descriptors “sleep”, “sleep disorders”, “anxiety”, “epidemics”, “pandemics” and “COVID-19”. Final Considerations: In short, during the pandemic, serious alterations in the biological rhythm, and chronotype of sleep habits of university students, health professionals, and the population in general, with an intense prevalence of anxiety disorder. Thus, this study suggests that the psychological impact of quarantine is broad, substantial, and can be long-lasting. In addition, the need for more research focusing on this theme was evident, to identify the obstacles and

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consequences of social restriction and thus develop effective strategies that improve the quality and quantity of sleep and the mental health of the population.

Keywords: Anxiety; COVID-19; Sleep disorders; Psychological disorders; Sleep; Pandemics

INTRODUCTION

Since the beginning of social isolation concerns about possible health problems were suggested and observed during the last two years (PEREIRA et al., 2020). The man is a social being that evolved into communication and learning across generations; therefore, human contact is an atavism necessary for a healthy life with an emotional scope (LURIA, 1999; SUGAHARA et al., 2021) and the absence of social contact could generate mental illness (MOREIRA et al., 2020) and psychological suffering (MONTEIRO et al., 2020).

In this way, the COVID-19 pandemic and the imposed social confinement have produced significant stress, anxiety, and health concerns, as well as fear and uncertainty about the future (MORIN et al., 2020), then, the expectation of mental health problems, indeed, were theoretical foreseen and confirmed by many studies for both genders; age range and countries (HUANG & ZHAO, 2020; CRUZ et al., 2021; MARELLI et al., 2021; MORIN et al., 2020) last two year, however, those problems are scarcely studied (MAIA & DIAS, 2020).

For instance, anxiety appears as a vastly cited problem linked to social isolation (BARROS et al., 2020; COELHO et al., 2020; MAIA & DIAS, 2020; PEREIRA et al., 2020; SALARI et al., 2020; WANG et al., 2020; CRUZ et al., 2021; SILVA et al., 2021) and as a very cited consequence the appearing of the sleep disorders (BARROS et al., 2020; HUANG & ZHAO, 2020; MONTEIRO et al., 2020; WANG et al., 2020; LIMA et al., 2021; MARELLI et al., 2021; MORIN et al., 2020).

Nevertheless, the problems are seen in most of the population in relation to social isolation (LIU et al., 2020; SHING et al., 2020; XIAO et al., 2020; ZHANG et al., 2020; SILVA et al., 2021), a range of population that is suffering also, are the students (MARELLI et al., 2021), in special the college's students, because the isolation generating a different study modality, as distance teaching and tasks form schools (AVERSI-FERREIRA et al., 2021), the stress in relation the time of the course conclusion for students of the final years, home isolation (MARELLI et al., 2021), the distance of

colleagues and teachers (AVERSI-FERREIRA et al., 2021), the concern about the pandemic and fear of contagious (SHING et al., 2020).

On the other hand, sleep plays a fundamental role in mental and physical health, requiring adequate duration and quality to recover and preserve the body's homeostasis (BLUME et al., 2020). Thus, sleep performs several actions to keep the body regulated, such as moderating the immune, inflammatory, endocrine response, and cognitive processes (ASIF et al., 2017; POE et al., 2010). If the quality of sleep is compromised, the ability to recover from health is impaired (ASIF et al., 2017). Therefore, when the necessary hours of sleep are not reached, whether due to psychosocial, organic, or environmental etiology, sleep disturbances occur, which currently have been exacerbated throughout the COVID-19 pandemic since exposure to stressful events intensified during this period (MONTEIRO et al., 2020).

Due to this, the incidence of sleep and psychological disorders has increased dramatically, especially among young people. In addition to the stressful events and anxiety that the pandemic period culminated, changes in daily life contributed to the higher incidence of circadian rhythm alterations, since the daily routine, from the work environment and social leisure, plays a decisive role in the rhythm of the circadian rhythm. sleep-wake cycle (MORIN et al., 2020).

Thus, there is a need for synchronized exposure of the day and night to keep the circadian rhythm regulated. Changes in synchronicity corroborate changes in chronotype since reduced exposure to daylight combined with stressful events and anxiety promote greater susceptibility to interrupt and change sleep rhythm (BARROS et al., 2020).

In addition, in the face of social distancing due to the pandemic period, fear and uncertainties that emerged in the daily lives of individuals made the population more psychologically vulnerable and this led to a drastic increase in the incidence of anxiety, depression, and stress disorders.

In this sense, at least hypothetically, social isolation is generating problems, mainly sleep disorders linked to anxiety and the increase in the incidence of mental disorders given that outbreaks of infectious diseases are associated with triggering psychological distress and changes in quality and amount of sleep.

In consequence, the goal of this review is to present the situation of the studies about the relation between sleep disorders and anxiety with some comments on the causes and possible preventions for college students, in specific.

METHODOLOGY

A systematic review was carried out, from the last 5 years (2016 to 2021), in the LILACS, Scielo, Pubmed databases, the descriptors “sleep”, “sleep disorders”, “anxiety”, “pandemic” and/or “quarantine”, “psychological disturbs” and “COVID-19” in a total of 20 texts. However, were used, some papers and one book to substantiate the epistemology and general information about the theme as a cognition basis. The inclusion criteria adopted by the present study were the publication of a theme that related to sleep, psychological disorders, and pandemic, publications classified as original articles published in English, Spanish and Portuguese, totaling 20 texts. Editorials, letters to the editor, and studies that did not address the topic of the review were excluded. Careful elaboration of the synthesis was made based on the evidence available in the works, showing the various consequences of sleep deprivation and its poor quality and the impacts of the COVID-19 pandemic related to mental health.

DISCUSSION AND RESULTS

The present study used a systematic literature review critically and coherently to analyze the changes resulting from COVID-19 in sleep and mental health, mainly anxiety.

After careful research, the works were selected for reading in full, leaving a total of 27 articles that met the inclusion criteria and were effectively selected and revised to compose the sample plus one paper and one book about cognition. Table 1 are described the included studies and a summary of their information. Figure 1 contains the percentages of themes represented in the graph and the intersections among the themes.

Table 1 – Some Data of Articles Included in The Review

	Texts	Type of studies	Theme	Number of participants
1.	ASIF, N.; IQBAL, R.; NAZIR, C. F. Human immune system during sleep. American journal of clinical and experimental immunology , v.6, n.6, p.92-96, 2017.	Transversal	Psychological disturbs and sleep disorders	1210
2.	AVERSI-FERREIRA, T. A. et al. The perceptions of students and instructor in a graduate mathematical modeling class: An experience with remote education. Research, Society and Development , v. 10, n. 6, , p.	Participant	Psychological disturbs and COVID-19	8

e2310615223, 2021.

3.	BARROS, M. B. D. A. et al. Relato de tristeza/depressão, nervosismo/ansiedade e problemas de sono na população adulta brasileira durante a pandemia de COVID-19. Epidemiologia e Serviços de Saúde , v. 29, n. 4, p. e2020427, 2020.	Transversal	Psychological disturbs, sleep disorders, anxiety and COVID-19	45161
4.	BUME, C., SCHMIDT, M. H., CAJOCHEN, C. Effects of the COVID-19 lockdown on human sleep and rest-activity rhythms. Current Biology , v.30, n. 14, p. 795-797, 2020.	Transversal	Sleep disorder and COVID-19	435
5.	BROOKS, S. K. et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. The lancet , v. 395, n. 10227, p. 912-920, 2020.	Systematic review	Psychological disturbs and quarantine	-
6.	CELLINI, N. et al. Changes in sleep pattern, sense of time and digital media use during COVID-19 lockdown in Italy. Journal of sleep research , v. 29, n. 4, p. e13074, 2020.	Transversal	Sleep disorders and COVID-19	1310
7.	COELHO, A. P. S, et al. Saúde mental e qualidade do sono entre estudantes universitários em tempos de pandemia da COVID-19: experiência de um programa de assistência estudantil. Research, Society and Development , v. 9, n. 9, p. e943998074, 2020.	Case study	Sleep disorders and COVID-19	2
8.	COX, R. C.; OLATUNJI, B. O. A. systematic review of sleep disturbance in anxiety and related disorders. Journal of anxiety disorders , v. 37, p. 104-129, 2016.	Systematic review	Sleep disorders and anxiety	-
9.	DA CRUZ, L. M. C. et al. Prática de exercício físico, ingestão alimentar e estado de ansiedade/estresse de participantes do projeto MOVIP em meio à pandemia de COVID-19. HU Revista , v. 47, p. 1-6, 2021.	Transversal	Anxiety and COVID-19	140
10.	HUANG, Y.; ZHAO, N. Generalized anxiety disorder, depressive symptoms and sleep quality during	Transversal	Sleep disorders, anxiety and	7236

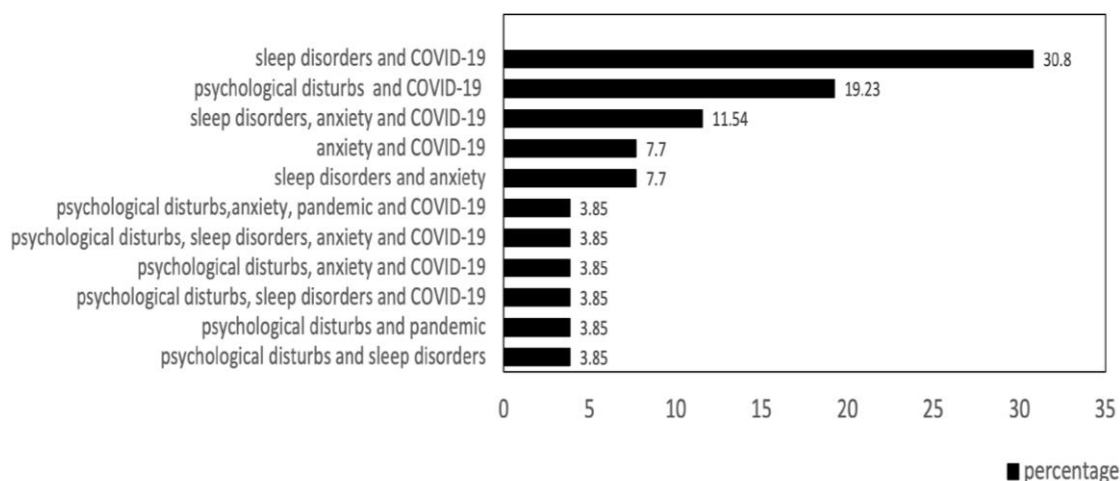
	COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry research , v. 288, p. 112954, 2020.		COVID-19	
11.	JAHRAMI, H. et al. Sleep problems during the COVID-19 pandemic by population: a systematic review and meta-analysis. Journal of Clinical Sleep Medicine , v. 17, n. 2, p. 299-313, 2021.	Systematic review	Sleep Disorder and COVID-19	54231
12.	LIMA, M. G. et al. Associação das condições sociais e econômicas com a incidência dos problemas com o sono durante a pandemia de COVID-19. Cadernos de Saúde Pública , v. 37, n. 3, p. e00218320, 2021.	Transversal	Sleep disorders and COVID-19	45261
13.	LIU, K. et al. Effects of progressive muscle relaxation on anxiety and sleep quality in patients with COVID-19. Complementary therapies in clinical practice , v. 39, p. 101132, 2020.	Participant	sleep disorders and anxiety	51
14.	LUIRA, A. R. Desenvolvimento Cognitivo : seus fundamentos culturais e sociais. 8ª ed. Martins Fontes: Editora Ícone, 1999.	Book	Cognition	-
15.	MAIA, B. R.; DIAS, P. C. Ansiedade, depressão e estresse em estudantes universitários: o impacto da COVID-19. Estudos de Psicologia (Campinas) , v. 37, p. e200067, 2020.	Transversal	Anxiety, psychological disturbs and COVID-19	619
16.	MARELLI, S. et al. Impact of COVID-19 lockdown on sleep quality in university students and administration staff. Journal of neurology , v. 268, n. 1, p. 8-15, 2021.	Transversal	Sleep disorders and COVID-19	400
17.	MONTEIRO, B. M. M.; NETO, C. N. S.; DE SOUZA, J. C. R. P. Sono e cronotipo em estudantes universitários na pandemia da COVID-19. Research, Society and Development , v. 9, n. 9, p. e632997688, 2020.	Literature review	Sleep disturbs and COVID-19	-
18.	MOREIRA, W. C. et al. Mental health interventions in times of COVID-19: a scoping review.	Systematic review	Psychological disturbs and	

	SciELO Preprints. p. 1-21, 2021.		COVID-19	
19.	MORIN, C. M. et al. Sleep and circadian rhythm in response to the COVID-19 pandemic. Canadian Journal of Public Health , v. 111, n. 5, p. 654-657, 2020.	Transversal	Sleep disorders and COVID-19	-
20.	PEREIRA, M. D. et al. A pandemia de COVID-19, o isolamento social, consequências na saúde mental e estratégias de enfrentamento: uma revisão integrativa. Research, Society and Development , v. 9, n. 7, p. e652974548, 2020.	Integrative review	Psychological disturbs and COVID-19	-
21.	POE, G. R.; WALSH, C. M.; BJORNESS, T. E. Cognitive neuroscience of sleep. Progress in brain research , v. 185, p. 1-19, 2010.	Review	Sleep	-
22.	SALARI, N. et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. Globalization and health , v. 16, n. 1, p. 1-11, 2020.	Systematic review	Anxiety, psychological disturbs and COVID-19	-
23.	SINGH, P. et al. Association between generalized anxiety disorder scores and online activity among US adults during the COVID-19 pandemic: cross-sectional analysis. Journal of medical Internet research , v. 22, n. 9, p. e21490, 2020.	Transversal	Anxiety, psychological disturbs pandemic and COVID-19	406
24.	SILVA, D. F. O. et al. Prevalência de ansiedade em profissionais da saúde em tempos de COVID-19: revisão sistemática com metanálise. Ciência & Saúde Coletiva , v. 26, n. 02, p. 693-710, 2021.	Systematic review	Anxiety and COVID-19	-
25.	SUGAHARA, C. et al. The role of the second brain functional unit II on the memory's process: A neuropsychological Luria's perspective. Research, Society and Development , v. 10, n. 9, p. e27010917957, 2021.	Systematic review	Cognition	-
26.	XIAO, H. et al. The effects of social support on sleep quality of medical staff treating patients with	Transversal	Pandemic, sleep disorder and COVID-	180

	coronavirus disease 2019 (COVID-19) in January and February 2020 in China. Medical science monitor: international medical journal of experimental and clinical research , v. 26, p. e923549-1, 2020.		19
27.	ZHAI, Y.; DU, X. Addressing collegiate mental health amid covid-19 pandemic. Psychiatry research , v. 288, p. 113003, 2020.	Transversal	Psychological disturbs and COVID-19 -
28.	ZHANG, C. et al. Survey of insomnia and related social psychological factors among medical staff involved in the 2019 novel coronavirus disease outbreak. Frontiers in psychiatry , v.11, p. 306, 2020.	Transversal	Psychological disturbs s, sleep disorder and COVID-19 1563
29.	WANG, C. et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. International journal of environmental research and public health , v. 17, n. 5, p. 1729, 2020.	Transversal	Psychological disturbs and COVID-19 1210

Source: Authors (2022)

Figure 1– Percentage of topics used in this work considering the intersection of the themes



Source: Authors (2022)

With the compilation of data from the works included in this review, it was noted that sleep problems and psychological disorders, especially anxiety disorders, are directly associated with the situation in the world per pandemic. COVID-19 contributed to the

increase in psychological disorders (anxiety, depression, and stress) and the worsening of sleep quality, evidenced in all the studies studied.

Given this aspect, the review developed by Brooks et al. (2020), who analyzed the psychological impact of quarantine in previous epidemics, emphasizes that epidemics have negative repercussions in different areas on individuals. This research showed that most studies found a higher prevalence of negative psychological effects, and the main factors that conditioned the psychological changes were the duration of the quarantine, the fear of being infected, feelings of frustration, and the stigma of the disease. Psychological symptoms reported in the reviewed studies were emotional and sleep disturbances such as depression, stress, anxiety, depressed mood, irritability, insomnia, and post-traumatic stress symptoms (BROOKS et al., 2020).

The relevance of emotional aspects during epidemic processes has led authors to identify, together with the occurrence of COVID-19, a “pandemic of fear” (BARROS et al., 2020). Research carried out in China has reported a high prevalence of depression and anxiety, as evidenced in the work of Wang, a cross-sectional study that included a sample group of 1.210 participants, carried out between January 31 and February 2, 2020, which revealed that 53.8% of respondents showed moderate or severe psychological changes, with 28.8% being detected with symptoms of anxiety (WANG et al., 2020). Furthermore, data from another longitudinal study with a robust sample of the UK population indicated that one month after the WHO declaration on the COVID-19 pandemic, the percentage of adults categorized as having mental health problems increased from 23% in 2017 - 2019 to 37% at the end of April 2020. This increase was particularly marked in young adults and women, a crossroads where risks for anxiety, depressive symptoms, and sleep problems are high (JAHRAMI et al., 2021; SALARI et al., 2020).

Considering the presence of an increase in psychological disorders, these same studies showed that there was an increase in sleep disorders. This becomes evident since anxiety predisposes to the development of sleep problems, as well as sleep deprivation or poor sleep quality corroborates the triggering of anxiety disorder and mood disorders (COX et al., 2016), starting a vicious cycle. Data that contribute to the correlation between sleep disorder and anxiety were observed in the study produced in Italy with a sample of 400 participants from the Universidad Vita-Salute San Raffaele. The results revealed the impact on the sleep and emotional health of the participants, with greater repercussions on academics. Among the changes in sleep, a worsening in the quality and symptoms

related to insomnia was found, in addition to delays in going to bed and waking up, more evident in young university students, since, in students, the problem of sleep onset is the more prevalent, being that before the pandemic it was 39% and during COVID-19 it increased to 55%. As for emotional aspects, 34.3% of the sample had moderate to severe anxiety symptoms. In the entire sample, psycho-emotional distress had a greater influence on academics, and they were also the ones who suffered the most from sleep-related problems (MARELLI et al., 2021).

Another cross-sectional study, which analyzed the psychological effect of COVID-19 on academics, highlighted the increase in psychological disturbances in young university students, as in the study by Marelli et al. (2021) and Maia & Dias (2020). Other data obtained from a longitudinal study developed in Spain, with 207 nursing students, consolidate the relationship between the increase in sleep and psychological disorders with the COVID-19 pandemic.

According to the research, it was concluded that although students spent more time in bed, the overall quality of sleep was worse during quarantine (ZHAI & DU, 2020). According to the results, the most prevalent alterations were sleep latency, sleep duration, and sleep efficiency. During social distancing, students' usual bedtime was delayed by a little over half an hour, and their waking time was two hours later than usual. The average time academics spent in bed increased by about an hour during quarantine. In addition, there was an increase in the sample of poor sleep quality, which was previously 60.4%, and during quarantine, it increased to 67.1% (ZHAI & DU, 2020).

In this same context, given the impacts of COVID-19 on mental health and sleep efficiency, it is worth noting that a Brazilian cross-sectional study carried out by Barros et al. (2020), also reinforces the initial strand of negative repercussions during the pandemic period. The survey highlights that 52.6% of Brazilians say they feel anxious or nervous always or almost always. Among adult Brazilians who did not have sleep problems before the pandemic, 43.5% began to present the problem and among those who reported a previous history of sleep problems, 48% had the problem worsened (Barros et al., 2020).

In the same study by Barros et al. (2020), it was found that young adults, aged 18 to 29 years, were the most affected with the problems listed (nervous/anxiety and worsening sleep). In addition to young people having a higher incidence of sleep disorders, health professionals also fit into the scenario of intensification of these

disorders, since professionals in this area who worked on the front line tend to exacerbate the state of stress, which corroborates an increase in the prevalence of anxiety and sleep disorders in this population (SILVA et al., 2021; PEREIRA et al., 2020). There was also an increase in sleep disorders in the group of health professionals, with 36.1% having symptoms of insomnia during the COVID-19 pandemic, in addition to an increase in the prevalence of Generalized Anxiety Disorder (GAD) in this same group (ZHANG et al., 2020; HUANG et al., 2020).

Indeed, it is undeniable that during quarantine, individuals' sleep habits were challenged by various factors, such as reduced exposure to sunlight, reduced physical activity, and psychological distress, in addition to the absence of regular working hours and social activities, which contributed significantly to the development of irregular and insufficient sleep. According to results from this review, sleep-wake rhythms have changed significantly per pandemic, with people going to bed and waking up later, also spending more time in bed, but paradoxically reporting less efficient sleep. In addition, an increase in GAD was evidenced, with an increase in the prevalence of this disorder, especially in participants under 35 years of age (CELLINI et al., 2020; HUANG et al., 2020; MARELLI et al., 2021; ZHAI & DU, 2020).

Because of the problem and by the results of the studies included in this review, it is extremely important to emphasize that social restrictions and the uncertainties of COVID-19 have led to a great impact on the mental health of individuals. Given this analysis, an extreme increase in anxiety disorders was noted, and these, in turn, induce an increase in sleep disorders, since anxiety stimulates levels of vigilance about the environment and, consequently, reduces the quality of sleep. of sleep and its maintenance throughout the night (XIAO et al., 2020).

FINAL CONSIDERATIONS

The present study showed that during the pandemic there were changes in the biological rhythm, chronotype, sleep habits of university students, health professionals, and the general population, especially young women. In addition to sleep changes, there is an intense prevalence of anxiety disorder during the pandemic. Previous studies have found that during pandemic periods there are deficits in the mental and physical well-being of individuals, and these conditions are associated with reduced sleep quality and quantity.

In this context, it is also observed that the most prevalent sleep disorder is insomnia, whether of the initial, maintenance, or terminal type. Overall, this review suggests that the psychological impact of quarantine is broad, substantial, and can be long-lasting. In addition, the need for more research focusing on this theme was evident, for greater observation of the effects per and after the COVID-19 pandemic, to identify the obstacles and consequences in the face of social restriction and thus develop effective strategies that improve quality and the amount of sleep and mental health of the population.

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