ORIGINAL ARTICLE

Sleep quality during home distancing in the COVID-19 pandemic in the Western Amazon

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Abstract

Introduction: the COVID-19 pandemic incited unprecedented global restrictions on society's behavior. Home detachment and isolation measures applied during the COVID-19 pandemic can result in problems with sleep quality. It is an important measure to reduce the risk of infection from the COVID-19 outbreak.

Objective: to analyse the existence of a difference between the quality of sleep before and during the home distance imposed by the COVID-19 pandemic.

Methods: cross-sectional web-based survey was sent using different conventional social media to collect data from the study population. The evaluated group was composed of 124 subjects, 57 of whom were male and 67 were female from the city of Rio Branco / AC. For this study, the Pittsburgh Sleep Quality Index questionnaire (PSQI-BR) and a socio-demographic questionnaire were used. The volunteers received a link along with the description and purpose of the study. Finally, data analysis was performed using SPSS 22.0 software.

Results: sleep quality worsened significantly during home distance in four sleep components (subjective sleep quality, sleep latency, sleep drowsiness and overall PSQI score). During social distance, poor sleep was greater among respondents (OR = 5.68; 95% CI = 1.80–17.82; p = 0.70).

Conclusion: the results indicated that there was a significant difference between the quality of sleep before and during home detachment and sleep disturbance and the subjective quality of sleep before and during the period of the outbreak of COVID-19 were the components that most worsened in the state of sleep

Keywords: sleep apnea, COVID-19, Social isolation, quality of life.

Authors summary

Why was this study done?
Sleep-related disorders have been growing and affect millions of individuals around the world. Sleep is a basic function and an important biological phenomenon in the maintenance of human health. Problems related to sleep have destructive effects on psychomotor skills, memory, decision making and concentration, which can influence the occurrence of accidents and errors. The COVID-19 pandemic incited unprecedented global restrictions on society's behavior. Distance from home and isolation measures applied during the COVID-19 pandemic can result in sleep quality problems. It is an important measure to reduce the risk of infection in the COVID-19 outbreak. Therefore, we investigated the existence of a difference between the quality of sleep before and during the distance from home imposed by the COVID-19 pandemic.

What did the researchers do and find?
A web-based cross-sectional survey was sent through different conventional social media to collect data from the study population. The evaluated group consisted of 124 subjects, 57 males and 67 females from the city of Rio Branco, Acre, Brazil. For this study, the Pittsburgh Sleep Quality Index (PSQI-BR) questionnaire and a sociodemographic questionnaire were used. Volunteers received a link along with the description and purpose of the study. Finally, data analysis was performed using SPSS 22.0 software. Sleep quality significantly worsened during home distancing in four sleep components (subjective sleep quality, sleep latency, sleep drowsiness, and overall PSQI score). During social distancing, poor sleep was higher among respondents (OR = 5.68; 95% CI = 1.80–17.82; p=0.70).

What do these findings mean?
The results indicated that there was a significant difference between the quality of sleep before and during home distancing and sleep disturbance and the subjective quality of sleep before and during the period of the COVID-19 outbreak were the components that showed the most worsening in the state of sleep. Which leads us to warn the health authorities to look for ways to help the population in this silent disease.

INTRODUCTION

The COVID-19 pandemic has alarming implications for individual and collective health, including people's emotional and social functioning[1]. From the end of December 2019, the disease began to spread in central China. Outside of China it quickly spread across the world, where about 13,570 patients were diagnosed with infection and 270 patients died of infection with this new virus[2].

Home distancing has been recommended by the World Health Organization (WHO) to minimize the speed of disease spread[3]. In addition, due to COVID-19's long incubation period, ease of transmission, high mortality rate and lack of pharmacological interventions, governments had to implement physical distance interventions to slow the spread of the virus[4]. Although essential to contain the virus, these interventions can negatively affect mental health, as observed after previous epidemics, such as the SARS outbreak in 2003 and the H1N1 outbreak in 2009[5].

It is an important public health measure used to prevent the transmission of infectious diseases between individuals and communities. Conceptually, it aims to separate infected individuals from those who have not contracted the infection6. Although detachment is adopted to protect the physical health of individuals from infectious diseases, it is also essential to consider the implications of this measure for mental health for those who experience such restrictions[7].

Research on distance between people shows substantial effects on emotional distress and mental health, including depression, generalized anxiety, insomnia and post-traumatic stress[8]. Recent analyzes suggest that the negative social and economic consequences of the current orders to stay at home and the COVID-19 pandemic itself may contribute to adverse psychological outcomes, including increased loneliness, reduced social support, depression, anxiety and financial concerns[9].

In this sense, during the distance, there is an increase in the use of computer screens and smartphones at night and the loss of usual routines can interfere with the biological clock with weakening or even desynchronization of circadian rhythms[10]. Exposure to light at night alters the biological clock, blocking secretion, melatonin, and waking up later in the morning[11]. Thus, the COVID-19 pandemic must be associated with worse sleep quality due to the increase in financial, dietary and health stressors that cause changes in sleep patterns[12].

Therefore, this research aims to analyse the existence of a difference between the quality of sleep before and during home distancing imposed by the COVID-19 pandemic.

METHODS

Population

Cross-sectional web-based survey was sent using different conventional social media to collect data from the study population. The research was carried out from August 1 to September 15, 2020, where 124 subjects were evaluated, 57 male and 67 female in the city of Rio Branco, Acre, Brazil. A brief presentation informed the participants about the objectives of the study and the electronic informed consent form (ICF) was asked for each participant to mark in the field "I accept to participate" or "I do not accept to participate" before starting the investigation. Due to the research objective, the only inclusion criterion adopted was to be at least 18 years old.

The research was approved by the Ethics Committee of the Cento Universitário FMABC/Fundação do ABC under number 4,184,251.

Instruments

For this study, the Pittsburgh Sleep Quality Index (PSQI-BR) questionnaire[13] was used. This questionnaire contains 18 items used to measure sleep quality. The PSQI includes items for assessing sleep quality, sleep duration, sleep latency, usual sleep efficiency, sleep disorders, use of sleeping medications and daytime dysfunctions.

Each dimension was scored between 0 and 3, with a total score ranging from 0 to 21. Higher scores indicate poor sleep quality. The overall PSQI score ≥ 5

points indicates poor sleep quality. Two sleep quality questionnaires (PSQI) were sent to obtain information on subjective sleep assessment before and during home distance. A semi-structured questionnaire containing the variables sex, age and income range was also used.

Inclusion criteria

Participated in this research over 18 years, literate of both sexes and who are in full mental health. People who were in social isolation caused by COVID-19.

Exclusion criteria

Minors, indigenous people and illiterate people, as well as mentally disabled people, could not participate in the research. Also people who were not in social isolation.

Procedures

Participants were recruited using the snowball sampling procedure. The volunteers received a link along with the description and purpose of the study. The questionnaires were sent through the Google Forms platform and to ensure the integrity of the results, each electronic device could only be used once by the participant. 2 questionnaires were sent simultaneously from the PSQI to be filled out with the intention of collecting data from before and during home distancing. The forms took approximately 20 minutes to complete. The respondents were informed that they could give up the research at any time without providing any justification and that no data would be saved. Only data from the questionnaires that contained a complete set of responses from the participants were considered. To preserve anonymity, no personal data was collected that would provide the identification of the participants.

Data analysis

Data analysis was performed using SPSS v.22 software where the variables were described as mean, standard deviation, absolute frequency and relative frequency for continuous variables. The differences between the components of sleep before and during isolation were performed using the chi-square test for Wilcoxon paired data defined with significance of p = 0.05. Fisher's exact test was used to analyze the statistical significance of the data. sleep classification. Significance was set at a value of p = 0.05. The odds ratio (OR) and 95% confidence intervals (CI) were also calculated to compare sleep quality before and during social isolation with an expected frequency greater than five.

RESULTS

The characteristics of the 124 individuals are shown in table 1. The absolute frequency for the gender variable was 57 males (46%) and 67 females (54%). The largest age group was between 18 and 30 years of age (n = 49; 39.5%). Most participants indicated having a family income between 1 and 2 minimum wages (n = 45; 36.3%).

Table 1: Sociodemographic characteristics of the sample

Variable	Absolute frequency	Relative frequency (%)
Sex		
Male	57	46
Female	67	54
Age group (years)		
8 - 30	49	39.5
31 - 40	40	32.3
41 - 50	40	18.5
51 - 65	12	9.7
Family income		
Up to 1 minimum wage	13	10.5
1 to 2 minimum wages	45	36.3
3 to 4 minimum wages	35	28.2
5 to 10 minimum wages	20	16.1
Above 10 minimum wages	11	8.9

Considering the seven components of the Sleep Quality Index (PSQI), sleep quality worsened significantly during home distance, as demonstrated by the increase in the subjective sleep quality score (p = 0.001), sleep latency score (p = 0.001), sleep drowsiness score (p = 0.001) and general PSQI score (p = 0.001) (table 2).

Table 2: Characteristics of sleep components according to social distance.

Sleep components	Home distancing				
	Before		During		
	Average	Standard deviation	Average	Standard deviation	(p-value)
Subjective sleep quality	2.0	0.68	2.4	0.65	0.001*
Sleep latency	0.8	0.68	1.2	0.93	0.001*
Sleep duration	1.3	1.09	1.7	1.18	0.001
Sleep efficiency	0.9	1.11	1.1	1.24	0.136
Sleep disturbance	2.3	0.65	2.2	1.03	0.841
Use of medication	0.4	0.81	0.8	1.18	0.003
Sleep drowsiness	0.9	0.77	1.5	0.91	0.001*
Overall PSQI score	8.9	3.21	11.6	5.19	0.001*

* p=0.05; Wilcoxon test.

Table 3 shows the comparison of sleep quality by sex of the surveyed population. Of the total of 124 participants, 13.4% (n = 17) males had good quality of sleep before isolation and 8.1% (n = 10) classified as poor during home isolation. In addition, there is a predominance of poor sleep before (n = 40; 86.3%) and during (47; 91.9%) isolation in this gender. In the case of females, 14% (n = 20) were classified as good before isolation and 16% (n = 17) during isolation. The rating of bad remained high in the two periods in this genre, 86% (47) before and 84% (n = 50) during isolation.

Table 3: Distribution of sleep quality by sex of the population.

Sleep quality	Sex			
	Male (before)	Male (during)	Female (before)	Female (during)
Good	17 (13.7%)	10 (8.1%)	20 (14%)	17 (16%)
Bad	40 (86.3%)	(47) (91.9%)	(47) (86%)	(50) (84%)

The comparison of the general classification of sleep quality indicates a statistically significant difference between before isolation and during isolation. The results reveal that during the social distance there was a greater bad sleep among the interviewees (OR = 5.68; 95% CI = 1.80–17.82; p = 0.70).

Table 4: Overall sleep quality rating of the population

Home distancing	Good n (%)	Bad n (%)	Chance ratio	95% CI	p-value*
Before distancing	20(16)	104(84)			
			5.68	1.808-17.865	0.70*
During distancing	17(14)	107(86)			

*Fisher's exact test.

DISCUSSION

In the present study, the quantitative parameters of the sleep components and qualitative sleep quality parameters were investigated in 124 individuals who had been in household isolation for at least 1 month during the COVID-19 outbreak. The study was conducted using an online survey, which was reported to assess how the public perceives sleep quality before and during social distance. The study data showed evidence that there are differences in sleep quality before and during the analyzed period, with worse sleep quality during social distance. The worsening in sleep quality was similar between the men and women investigated. Consequently, poor overall sleep quality was observed in both groups. Studies in China showed that about a third of the participants slept poorly during the pandemic. Significant differences were also observed between perceived stress and sleep quality. In addition, the direct effect of perceived stress on sleep quality was moderated by self-esteem[14].

Sleep quality is more likely to worsen if an individual has pre-existing vulnerability to stressors, if their care responsibilities increase, and if their life has been adversely affected by COVID-19 or through social isolation. Sleep is the foundation of cognitive, mental and physical health, including the likelihood of resisting viral infections[15]. The COVID-19 pandemic imposed social distance, closing schools and working at home. In this sense, approximately 50% of adult participants in the USA showed improvements in their overall quality of sleep in longitudinal analyzes[16]. In China, the general prevalence of anxiety disorders, depressive symptoms and sleep quality of the public during the blockade period was 35.1%, 20.1% and 18.2%, respectively[17].

In this survey, most participants reported having at least one difficulty sleeping and sleep disturbances in the blocking period. People in home confinement without work have greater difficulty falling asleep, more frequency of waking up at night and waking up very early in the morning, while those who are normally working are more likely to report non-restorative sleep.

Before the COVID-19 pandemic and blockade, the prevalence of sleep disorders, anxiety and depression in Morocco was 18.6%, 4.5% and 4.5%, respectively. There was an increase in sleep disturbance during this blocking period[18]. The association between sleep problems and depressive symptoms has been reported in low and middle income countries. This study confirmed that the coexistence of sleep problems and depressive symptoms increased the risk of expanding anxiety and stress among these populations[19]. A significant difference was also found in our study in the poorest quality of sleep in some sleep components and in the percentage of distribution by sex. Women tend to have worse sleep in the total PSQI score compared to men[20]. A German study of a community sample (aged between 18 and 80 years old) estimated that 36% of the general population had poor sleep quality (PSQI> 5)[21].

We have the COVID-19 pandemic as a global problem[22] and it has consequences for the population in a way where non-pharmacological measures, such as isolation, interfere with the population's quality of life and for that reason, there is the need for greater discussion so that public policies focused on health promotion can contribute to better longevity[23]. It is still perceived the need to provide means to help broaden the discussion of the topic with a focus on the production of knowledge in search of at least broadening the discussions with the objective that the health area seeks to work with better prevention[24].

Our study is the first to investigate the difference in sleep quality before and during the COVID-19 pandemic in the State of Acre and in the Western Amazon. In this sense, we chose to use an online form due to the specific conditions during the pandemic, since remote data collection using digital platforms is feasible and necessary in this moment of global pandemic. The use of these research tools is becoming increasingly common in health research. However, it is always desirable to carry out assessments in person, although this was not possible due to the special circumstances of the COVID-19 outbreak.

However, this study has limitations that need to be addressed. First, the reported sleep difficulties were composed only of self-reported questionnaires that are not as thorough as clinical and instrumental examinations. The second reason is that a cross-sectional study does not allow analyzing the quality of sleep over time away from home. Third, the questions used to access some of the questions in the questionnaire may be overlooked due to the remembrance character.

CONCLUSION

The results indicated that there was a significant difference between the quality of sleep before and during home distance. In addition, sleep disturbance and subjective sleep quality before and during the period of the COVID-19 outbreak were the components that most worsened in sleep status consequently affecting the overall PSQI score.

Author Contributions

Carlos Roberto Teixeira Ferreira, data collection, conducting the experiments and writing the manuscript; Maura Bianca Barbary de Deus, writing the manuscript, following the guidelines of the journal and reviewing the statistical analyses; Rejane Rosas Barbary de Deus, data collection and analysis; Mauro José de Deus Morais collects data, conducts the experiments and writes the manuscript.

Acknowledgments

Conflicts of interest

We declare no potential conflicts of interest.

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Resumo

Introdução: a pandemia COVID-19 incitou restrições globais e sem precedentes ao comportamento da sociedade. O distanciamento domiciliar e as medidas de isolamento aplicadas durante a pandemia COVID-19 podem resultar em problemas na qualidade do sono. É uma medida importante para diminuir o risco de infecção do surto COVID-19.

Objetivo: analisar a existência de diferença entre a qualidade do sono antes e durante o distanciamento domiciliar imposto pela pandemia de COVID-19.

Método: pesquisa transversal baseada na web foi enviada por meio de diferentes mídias sociais convencionais visando coletar dados da população do estudo. O grupo avaliado foi composto por 124 sujeitos, sendo 57 do sexo masculino e 67 do sexo feminino da cidade de Rio Branco/AC. Para este estudo, foi utilizado o questionário do Índice de Qualidade do Sono de Pittsburgh (PSQI-BR) e um sóciodemográfico. Os voluntários receberam um link junto com a descrição e o objetivo do estudo. Por fim, a análise dos dados foi realizada no software SPSS 22.0.

Resultados: a qualidade do sono piorou significativamente durante o distanciamento domicilia em quatro componentes do sono (qualidade subjetiva do sono, latência do sono, sonolência do sono e pontuação geral do PSQI). Durante o distanciamento social foi maior o sono ruim entre os entrevistados (OR = 5,68; IC 95% = 1,80–17,82; p=0,70).

Conclusão: os resultados indicaram que houve diferença significativa entre a qualidade do sono antes e durante o distanciamento domiciliar e o distúrbio do sono e a qualidade subjetiva do sono antes e durante o período do surto de COVID-19 foram os componentes que mais apresentaram piora no estado do sono.

Palavras-chave: apnéia do sono, COVID-19, Isolamento Social, qualidade de vida.