



CHANGES IN SLEEP QUALITY IN PATIENTS OLDER THAN 60 YEARS, POST-COVID PANDEMIC

MANUEL R. RAMÍREZ-MEXIA, YAMILÉ MARTÍNEZ-RODRÍGUEZ, MAYOMI SIERRA-LARA,
ANDREA ESPINOSA-ARELLANO, AND IVETTE BUENDÍA-ROLDÁN*

National Institute of Respiratory Disease “Ismael Cosío Villegas”, Mexico City, Mexico

ABSTRACT

Background: COVID-19 is a disease that had a great impact in the world, generating lifestyle changes; among these are changes in sleep quality, with the elderly being one of the most affected age groups. **Objective:** To identify sleep alterations in Mexican people older than 60 years post COVID-19 pandemic. **Methods:** We performed a descriptive study on subjects older than 60 years from the aging cohort of the National Institute of Respiratory Diseases. Demographic data, sleep questionnaires (Pittsburgh), and quality of life (SF-12) were assessed pre-pandemic. During the period from June 2021 to August 2022, the questionnaires were repeated post-pandemic through telephone. Qualitative variables were analyzed with frequencies and percentages, whereas quantitative variables were analyzed with means and standard deviations. The groups were compared using the χ^2 test and Student's t-test. **Results:** We analyzed 279 subjects who completed two questionnaires. An alteration in sleep quality variables was observed post-COVID, including a decrease in sleep hours (7.33 h versus 7.17 h, $p = 0.03$), and a trend to a longer time to fall asleep (23 m vs 27 m, $p = 0.06$). In the questionnaire on toxicology, we found higher alcohol consumption (18% vs. 27%, $p = 0.01$) and vitamin ingestion (34% vs. 46%, $p = 0.003$). Subjects also described more nighttime awakenings, with more than 3 times per week (25% vs. 44%, $p < 0.0001$), generating a worse auto perception of healthy well-being (88.3 vs. 82.02 $p < 0.0001$). **Conclusions:** The COVID-19 pandemic affected sleep quality in different aspects, and it increased the consumption of alcohol and vitamins. (REV INVEST CLIN. 2024;76(6):239-42)

Keywords: Elderly. Sleep. Post-pandemic. Aging.

BACKGROUND

COVID-19 is an infectious, contagious respiratory disease characterized by fever, fatigue, cough, and/or dyspnea¹; declared a pandemic on March 11, 2020². Its presence made governments all around the world

to close their borders and begin confinement to decrease transmission, which caused a psychological impact on all populations, especially those with comorbidities. The changes in daily routines increased stress levels, anxiety, and depression during the day, as well as changes in sleep quality.

*Corresponding author:

Ivette Buendía-Roldán
E-mail: ivettebu@yahoo.com.mx

Received for publication: 02-09-2024

Approved for publication: 25-11-2024

DOI: 10.24875/RIC.24000180

Sleep is a physiological mechanism in the human being, essential for health and physical, emotional, and cognitive well-being. The circadian cycle, which regulates sleep, is influenced by solar exposure, as well as by environmental factors, meaning that people's routines, such as waking up at a particular hour, exercising, eating, and social activities, were all affected by confinement. The routine changes and the decreased solar exposure, were the probable causes of the circadian cycle deregulation^{3,4}. There are validated questionnaires to evaluate sleep health, such as Pittsburgh, SF-36, SF-12, and others.

It has been suggested that at least 8 hours of sleep in 24 hours are necessary for optimal efficiency. Compared to young people, older adults tend to have fewer sleep hours during night time and more awakenings⁵.

On the other hand, short duration sleep, i.e., less than 6 hours in 24 hours, is associated with unfavorable effects on health, such as cognitive deficit, memory loss, mood changes, and declining immune system function, as well as chronic illness, depression, and other mental health disorders⁶⁻⁸. Furthermore, alcohol is a stimulant and sedative substance that interacts with several neurotransmitter systems associated with sleep regulation and, in excess, can cause short, medium, and long-term effects⁹. Additionally, vitamins are essential micronutrients for the body's normal functioning, and Vitamin B12, D, and calcium deficiency have been found in the elderly, which can lead to diseases, although in excess, they can cause adverse effects on health¹⁰⁻¹².

In this context, this investigation aimed to identify sleep disturbances in Mexican individuals older than 60 years in post-pandemic COVID-19.

METHODS

We evaluated 350 individuals older than 60 years old from a cohort on aging from the National Institute of Respiratory Diseases (INER) Ismael Cosío Villegas. All participants were residents of Mexico City; did not have respiratory symptoms, and had answered the Pittsburgh Sleep Quality Index and SF-12 questionnaires before the pandemic as part of their routine care. For the present study, participants answered to

a post-pandemic questionnaire held via telephone calls from June through August 2022.

The Pittsburgh questionnaire consists of 19 questions in seven groups, each one being evaluated from 0 to 3; the 7 components are then added for an overall score from 0 to 21, the highest being the worst sleep quality¹³. The SF-12 questionnaire is an abbreviation of the SF-36 questionnaire, that evaluates the degree of well-being and functional capacity of people¹⁴.

Subjects with incomplete questionnaires, those who died, who had speech impairment, or who had difficulties in questionnaire completion were excluded.

All subjects signed a written consent approved by the research and ethics committees from INER, C39-14.

Statistical analysis

Data compilation was made in Excel. We analyzed frequencies and percentages for qualitative variables and mean and standard deviation for quantitative variables; group comparison was analyzed by χ^2 test for categorical variables.

RESULTS

We analyzed 279 subjects who had 2 questionnaires completed (pre- and post-pandemic), from whom 71 subjects were excluded. The medium age of participants was 68 + 5.5, with a female predominance (69%). Comorbidities were found: diabetes (22%), hypertension (33%), and gastroesophageal reflux (GERD) (35%); BMI had a standard deviation of 26 + 3.76.

There was no significant difference between the self-perceived sleep quality pre-pandemic versus post-pandemic; nevertheless, we found changes in sleep quality variables, such as a decrease in sleep hours (7.33 h vs. 7.17 h $p = 0.03$), and a trend of longer time to fall asleep (23 min vs. 27 min $p = 0.06$). In toxicology, variables observed were higher alcohol consumption (18% vs. 27%, $p = 0.01$), as well as more vitamins consumption (34% vs. 46%, $p = 0.003$). Subjects also described more night awakenings and sleep disturbance more than 3 times a week (25% vs. 44% $p < 0.0001$), generating a worse auto perception

Table 1. Questionnaire variables

Variable	Pre-pandemic (n = 279)	Post-pandemic (n = 279)	p
Sleep quality self perception			
Very good (%)	88 (31)	102 (36)	0.2
Fairly good (%)	159 (57)	141 (50)	0.1
Fairly bad (%)	20 (7)	27 (10)	0.4
Very bad (%)	12 (4)	9 (3)	0.7
Sleep quality			
Sleep hours ± SD	7.33 ± 1.2	7.17 ± 1.4	0.03
Minutes to fall asleep ± SD	23 ± 22	27 ± 36	0.06
Insomnia (%)	95 (34)	85 (30)	0.4
Sleep efficiency (%)	58 (21)	61 (22)	0.8
Nap (%)	89 (32)	91 (33)	0.9
Nap time in minutes ± SD	45 ± 35	43 ± 46	0.8
Snoring (%)	169 (61)	170 (61)	1
Apnea (%)	23 (8)	31 (11)	0.3
Toxicology			
Alcohol consumption (%)	51 (18)	75 (27)	0.01
Vitamins (%)	94 (34)	129 (46)	0.003
Sleep medication (%)	31 (11)	42 (15)	0.2
Sleep disturbance			
Not during the past month (%)	107 (38)	50 (18)	< 0.0001
Less than once a week (%)	45 (16)	33 (12)	0.1
Once or twice a week (%)	57 (20)	74 (26)	0.1
3 or more times a week (%)	70 (25)	122 (44)	< 0.0001
Subjective health quality			
Subjective health quality ± SD	88.36 ± 10.53	82.03 ± 13.46	< 0.0001
Enthusiasm problems (%)	53 (19)	68 (24)	0.1

SD: standard deviation. Significant statistical difference is marked in bold.

of health well-being post-pandemic (88.3 vs. 82.02 p < 0.0001) (Table 1). Psychotropics use in the pre-pandemic period was 31 patients (11%) versus 42 patients post-pandemic (15%) p = 0.2; however, we do not have the classification of the types of medication used by the patients.

DISCUSSION

In this study we found a decrease in sleep hours, as well as a trend to a longer time to fall sleep, between the COVID-19 pre-pandemic and the post-pandemic

periods in an elderly population. In addition, we found more night awakenings and consequently a worse self-perception of healthy well-being. In toxicology, increased alcohol and vitamin consumption were found.

COVID-19 is a pandemic that had a great impact in the world and our lifestyle with economic, social, and psychological consequences, affecting sleep quality in the population.

The most affected age group was the elderly, the most vulnerable group, who have more comorbidities and

consequently were exposed to a more severe form of COVID-19 and worst prognosis. In addition, being older than 60 years is a risk factor for having sleep disorders due to changes in the sleep pattern, that is, shorter sleep hours with more night awakenings. However, the increase in patients with sleep disturbance and sleep loss more than 3 days a week, makes us question if there is another component modifying this result.

Public health disruption was considerable, to the point that individuals had psychological problems caused by the fear of becoming infected, in addition to restrictions imposed and routine changes. These disturbances resulted in poor sleep quality and poor subjective well-being, as revealed in our population, being the main factors, problems in falling asleep, insomnia, and less sleep efficiency^{8,15}.

A systematic study in 14 countries found that a high percentage of the population self-prescribed vitamins to prevent COVID-19. This practice has also been associated with better subjective healthy well-being, and in the last year, there has been an increase in the intake. Despite these previous observations, and studies in our population, the increase in vitamin consumption did not have an association with better subjective healthy well-being^{11,12}.

Alcohol in an initial form can promote sleeping insomnia; perhaps in the chronic form, it generates tolerance, and hence affecting the regular pattern of sleep, leading to a harmful cycle. This may have caused an increased number of subjects reporting alcohol intake in our population, with a consequent decrease in subjective healthy well-being. Besides its sedative component, alcohol intake can cause apnea, which has been observed in other studies, by relaxing dilator muscles in the upper airways and increasing nasal and pharyngeal resistance. However, we did not find a relationship with apnea in our subjects¹⁷.

ACKNOWLEDGMENTS

This study was supported by Secretaría de Educación, Ciencia, Tecnología e Innovación, grant number SECITI/115/2015 (Mexico City, Mexico).

I. Buendía-Roldán received research support.

REFERENCES

- Zhai P, Ding Y, Wu X, Long J, Zhong Y, Li Y. The epidemiology, diagnosis and treatment of COVID-19. *Int J Antimicrob Agents*. 2020;55:105955.
- Panamerican Health Organization. WHO Characterizes COVID-19 as a Pandemic; 2020. Available from: https://www3.paho.org/hq/index.php?option=com_content&view=article&id=15756:who-characterizes-covid-19-as-a-pandemic&Itemid=0&lang=en#gsc.tab=0
- Troynikov O, Watson C, Nawaz N. Sleep environments and sleep physiology: a review. *J Therm Biol*. 2018;78:192-203.
- Morin CM, Carrier J, Bastien C, Godbout R. Sleep and circadian rhythm in response to the COVID-19 pandemic. *Can J Public Health*. 2020;111:154-657.
- Neubauer DN. Sleep problems in the elderly. *Am Fam Phys*. 1999;59:2559-60.
- Mukherjee S, Patel SR, Kales SN, Ayas NT, Strohl KP, Gozal D, et al. An Official American Thoracic Society statement: the importance of healthy sleep. *Am J Respir Crit Care Med*. 2015;191:1450-8.
- Seok W. Review of sleep problems related to social distancing and home confinement during the COVID-19 pandemic. *Korean Acad Sleep Med*. 2021;3:87-91.
- Morin C, Carrier J. The acute effects of the COVID-19 pandemic on insomnia and psychological symptoms. *Sleep Med*. 2021;77:346-7.
- Colrain IM, Nicholas CL, Baker FC. Alcohol and the sleeping brain. In: *Handbook of Clinical Neurology*. Netherlands: Elsevier; 2014. p. 415-31.
- Turck D, Bohn T, Castenmiller J, De Hennauw S, Hirsch-Ernst KI, Knutse HK, et al. Guidance for establishing and applying tolerable upper intake levels for vitamins and essential minerals. *Eur Food Saf Assoc J*. 2022;20:e200102.
- Von Arnim CA, Dismar S, Ott-Renzer CS, Noeth N, Ludolph AC, Biesalski HK. Micronutrients supplementation and nutritional status in cognitively impaired elderly persons: a two-month open label pilot study. *Nutr J*. 2013;12:148.
- Ayosanmi OS, Alli BY, Akingbule OA, Alaga AH, Perepelkin J, Marjorie D, et al. Prevalence and correlates of self-medication practices for prevention and treatment of COVID-19: a systematic review. *Antibiotics (Basel)* 2022;11:808.
- Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. *J Psychiatry Res*. 1988;28:193-213.
- Tuesca R. The Life quality, its importance and how to measure it. *Salud Uninorte J*. 2005;21:76-86.
- Pinazo S. Psychosocial impact of COVID-19 on older people: problems and challenges. *Span J Geriatr Gerontol*. 2020;55:249-52.
- Stein MD, Friedmann PD. Disturbed sleep and its relationship to alcohol use. *Subst Abus*. 2005;26:1-13.