

Insomnia and Influencing Factors in Non-hospitalized COVID-19 Patients

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ABSTRACT

Objective: Although there have been studies examining the frequency of insomnia in hospitalized COVID-19 patients, there have been no studies investigating insomnia in outpatients. The purpose of this study is to investigate the frequency of insomnia in non-hospitalized COVID-19 patients and the factors influencing the presence of insomnia.

Methods: The study included outpatients who were diagnosed with COVID-19 by PCR, without any hospitalization indication. The Hospital Anxiety and Depression Scale (HADS) and the Insomnia Severity Index (ISI) were applied to the patients included in the study. The factors influencing the presence of insomnia were examined with a logistic regression test.

Results: A total of 351 patients were included in the study. Insomnia was considered in 127 patients (36.2%) when the ISI score was ≥ 8 positive. When HADS scores were considered ≥ 8 positive, it was thought that 89 (25.4%) patients may have experienced depression and 66 (18.8%) anxiety. When the parameters influencing the presence of insomnia were evaluated by a logistic regression test, the presence of headache ($p < 0.0001$; OR: 2.9) and fever ($p = 0.043$; OR: 1.85) was found to be significant. It was found that the fact that anxiety ($p = 0.01$; OR: 3.36) and depression scores were ≥ 8 ($p = 0.018$; OR: 2.16) which have a significant effect on the presence of insomnia.

Conclusion: Our study shows that the COVID-19 pandemic, even in mild cases, may cause sleep disorders associated with anxiety and depression triggered by both the symptoms of the infection and its negative effects on the lifestyle of society.

INTRODUCTION

The virus COVID-19, which first appeared in China in mid-2019 and rapidly spread around the world, has infected over 760 million people as of July 2023.^[1] Although the mortality rate of this disease, in which SARS-CoV2 is active, is 2–3%, the prolongation of the symptoms called post-COVID syndrome is a common clinical phenomenon.

During the pandemic, health concerns, social isolation, and quarantine conditions altered sleep patterns in the general population and disrupted sleep hygiene. The definition of COVID-somnia has started to be used to identify these sleep disorders seen during the pandemic.^[2]

Many studies have been conducted to evaluate sleep disorders and the state of anxiety depression in both the general population and health workers during the pandemic pe-

riod.^[3,4] In a small number of studies evaluating insomnia in hospitalized patients with COVID-19, the Pittsburgh Sleep Quality Index or Insomnia Severity Index (ISI) was commonly used, and the frequency of insomnia in these studies varied according to the methods used and was found to be between 19 and 43%.^[5] In studies using the hospital anxiety-depression scale, 20–34% of patients were identified with high anxiety scores and 18–28% of patients were identified with high depression scores.^[6,7]

In the literature, there were studies evaluating sleep disorders in hospitalized COVID-19 patients, but no studies evaluating insomnia in outpatients have been found. The aim of this study was to evaluate the complaints of sleep disorders and concomitant depression-anxiety in outpatients without any hospitalization indication.

MATERIALS AND METHODS

Study Population

Patients over 18 years of age, who accepted to participate in the study, diagnosed with COVID-19 through PCR, who did not have a hospitalization indication, and who underwent outpatient treatment were included in the study.

Patients who have previously been diagnosed with sleep disorders; for example, patients with a psychiatric disorder such as insomnia, obstructive sleep apnea, restless leg syndrome, diagnosed depression, anxiety disorder, and patients taking anxiolytic, antidepressant, hypnotic, or sedative medicines were excluded from the study.

Study Method

The study was conducted between March and May 2021. First, age, gender, educational status, medical history, and disease-related symptoms of all patients were recorded. The Hospital Anxiety and Depression Scale (HADS) and the ISI were applied to the patients included in the study. Questionnaires were applied to the patients in the places where they were isolated by face-to-face interviews. These questionnaires were administered to the patients within the first 7 days after the PCR test was positive.

The HADS has long been used in the general population and its Turkish version has been validated.^[8,9] Anxiety is evaluated with an odd number of questions and depression with an even number of questions. In these tests, 0–7 points were rated as normal, 8–10 points as on the borderline range, and 11 and above points as abnormal. In studies evaluating COVID-19 studies, 8 and above were deemed positive.^[6,7]

The ISI is commonly used to evaluate insomnia/sleep disorders.^[10] Its Turkish validation was made by Boysan et al.^[11] In studies evaluating insomnia in COVID-19 studies, 8 and above were considered positive.^[12,13]

The study has been approved by both the local ethics board and the Ministry of Health. (Trakya University Dean's Office of the Faculty of Medicine, Scientific Studies Ethics Council: No: 03/09, Date: February 01, 2021). The consent form was received from each patient for the study.

Statistical Methods

Data were analyzed using SPSS 26.0 (SPSS). Continuous data following a normal distribution were present as the mean \pm standard deviation. Frequency analysis was performed for categorical variables. Comparisons between the insomnia disorder group and the non-insomnia disorder group were conducted using the Chi-square test and independent sample Student's t-test. The parameters found to be significant in the presence of insomnia were evaluated using a multivariate logistic regression test.

The statistical significance level was set to 0.05 for a two-tailed test.

RESULTS

A total of 351 patients, 150 (42.7%) of whom were women, were included in the study. The mean age of the patients was 38.28 ± 13.4 (18–76). The average percentage of patients with an education level of high school or university degree was 56.1%. It was found that the most common complaints of patients related to COVID-19 were weakness and headache (Table 1).

The most common comorbidity was hypertension (n=40, 11.4%), while asthma and diabetes were diagnosed with equal frequency (n=21; 6%). Of the patients, 227 (64.7%) were non-smokers, 13 (3.7%) were ex-smokers, and 111 (31.6%) were smokers.

When patients were asked about their sleep complaints, it was found that 121 (34.5%) patients had difficulty in falling asleep. When the ISI score was considered ≥ 8 positive, 127 patients (36.2%) were found to have a high insomnia score. The mean insomnia score of the patients was 6.45 ± 5.19 (Table 2). When HADS score was considered ≥ 8 positive, high depression scores were found in 89 patients (25.4%) and high anxiety scores in 66 patients (18.8%). The mean depression score of the patients was 5.05 ± 4.11 , whereas the mean anxiety score was 4.12 ± 3.77 .

When the factors influencing the presence of insomnia were evaluated individually, the effect of age, sex, and concomitant diseases was not detected. The parameters found

Table 1. Complaints of patients

Complaints	n	%
Headache	167	47.6
Weakness	165	47
Muscle/joint pain	146	41.6
Cough	140	39.9
Chest/back pain	130	37
Sore throat	100	28.5
Loss of taste	87	24.8
Fever	84	23.9
Anosmia	83	23.6
Sputum	76	21.7
Rhinorrhea	72	20.5
Dyspnea	46	13.1
Diarrhea	44	12.5

Table 2. Complaints related to sleep and Insomnia Severity Index

Complaints	n	%
Difficulty falling asleep	121	34.5
Frequent waking	115	32.8
Difficulty staying asleep	93	26.5
ISI ≥ 8	127	36.2

ISI: Insomnia Severity Index.

to be significant from COVID-19-related complaints of the patients, such as cough, sputum, anosmia, dyspnea, joint pain, weakness, fever, and muscle/joint pain, were evaluated with a multivariate logistic regression test. Among the symptoms, headache ($p < 0.0001$; OR: 2.9) and fever ($p = 0.043$; OR: 1.85) were found significant for insomnia. The fact that anxiety ($p = 0.01$; OR: 3.36) and depression scores were ≥ 8 ($p = 0.018$; OR: 2.16) which were identified as significant risk factors for the presence of insomnia.

When factors influencing high anxiety and depression scores were evaluated by regression analysis, being a woman increased the risk of both anxiety and depression ($p < 0.0001$; OR: 3.01; $p = 0.03$; OR: 1.7).

DISCUSSION

Sleep is an important physiological activity for maintaining physical and cognitive functions. Lack of sleep can lead to numerous health problems, such as obesity, diabetes, and cardiovascular diseases, as well as a decline in physical and cognitive performance and quality of life.^[14]

Increased anxiety, social isolation, and widespread use of electronic devices during the COVID-19 have led to sleep disorders. Many studies have been conducted to demonstrate this reality, and insomnia has been found in one-third of the population.^[3]

In addition to general anxiety and insomnia in society, COVID-19 patients sometimes have insomnia as the first symptom at the onset of the disease and sometimes during the course of the disease.^[15] COVID-19 infection causes widespread systemic inflammation with the secretion of inflammatory mediators. While these mediators disrupt the sleep pattern, sleep deprivation can lead to susceptibility to infection. The term COVID-somnia is defined to express this interaction.^[2]

In a study, which included 85 inpatients, conducted in China in March 2020 to detect the frequency of insomnia in COVID-19 patients, and the rate of patients with ISI ≥ 8 was found to be 54.1%. It was found that female gender and disease duration were effective on insomnia scores.^[12]

In another study conducted in China in March 2020, involving 484 COVID-19 inpatients over the age of 14, ISI ≥ 8 was considered to be significant, and insomnia was detected in 42.8% of patients. The mean ISI score in the patients was found to be 7.24 ± 0.25 . Female gender and young age have been identified as factors influencing insomnia.^[13] In our study, patients over 18 years of age were evaluated. In our study, the mean ISI score and insomnia frequency were found to be lower than in these studies, and the influence of age and gender on insomnia was not found.

In a study that used HADS as in our study, 144 inpatients with COVID-19 were evaluated. The mean anxiety score of the patients was found to be 6.35 ± 4.29 , and the depression score was 5.44 ± 4.32 . Anxiety and depression scores were high in 34.72% and 28.47% of the patients, respectively. As a result of regression analyses, gender, age, ox-

xygen saturation, and social support were found to be the factors related to anxiety. In addition, age, the presence of COVID-19 infection in another member of the family and the lack of social support were identified as influential factors in depression.^[6]

In another study conducted using HADS in China in March 2020, 296 inpatients with mild symptoms were evaluated and the anxiety score was found to be 5.22 ± 3.36 , and the depression score was 4.39 ± 3.65 . When the HADS score 8 and above was considered significant, anxiety scores were found to be high in 20.9% of the patients, while depression scores were found to be high in 18.6% of the patients.^[7] We think that the most important reason why the anxiety scores are low in our study when compared to these studies is that we conducted our study in outpatients. In addition, these two studies were conducted between February and March 2020. Our study was conducted between March and May 2021, and a year passed since the outbreak of the pandemic. The increase in our knowledge about COVID-19 and the initiation of vaccines may have influenced the level of anxiety depression and insomnia in patients and the general public.

In our study, symptoms related to COVID-19 and sleep disorders were sought in patients; headache symptoms were found to be more common in insomnia.

The main limitation of our study is that the questionnaires were applied only to people diagnosed with COVID-19, and therefore, there was no control group.

Conclusion

Although the COVID-19 pandemic is starting to lose its currency all over the world today, its effects will continue to be discussed. In our study, outpatients with mild COVID-19 were evaluated, and it was observed that sleep disorders were accompanied by both symptoms of the infection and depression and anxiety in patients during the disease. This situation was more pronounced in female patients. Sleep disorders, which occurred as a result of COVID-19 infection and isolation conditions that the society was not accustomed to, should also be one of the topics to be addressed when evaluating the consequences of the pandemic.

Ethics Committee Approval

This study approved by the Trakya University Medical Faculty Clinical Research Ethics Committee (Date: 01.02.2021, Decision No: 03/09).

Informed Consent

Retrospective study.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: İ.Y., B.S.K., E.Ç.E., H.T.E.M., Y.G.; Design: İ.Y., B.S.K., E.Ç.E.; Supervision: İ.Y., E.Ç.E., Y.G.; Fundings: İ.Y., B.S.K.; Materials: İ.Y., B.S.K., E.Ç.E., H.T.E.M.; Data: İ.Y., B.S.K., E.Ç.E.; Analysis: İ.Y., E.Ç.E.; Literature search: İ.Y.,

B.S.K., E.Ç.E.; Writing: İ.Y., E.Ç.E., Y.G.; Critical revision: İ.Y., B.S.K., E.Ç.E., H.T.E.M., Y.G.

Conflict of Interest

None declared.

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Ayaktan Takip Edilen COVID-19 Hastalarında İnsomnia ve Etki Eden Faktörler

Amaç: Hastane yatışı olan COVID-19 hastalarında insomnia sıklığını araştıran çalışmalar olmasına rağmen ayaktan hastalarda insomniayı değerlendiren bir çalışmaya rastlanmamıştır. Bu çalışmanın amacı, hastane yatışı gerekmeyen COVID-19 hastalarında insomnia sıklığını ve insomnia gelişimine etki eden faktörleri araştırmaktır.

Gereç ve Yöntem: Çalışmaya hastanede yatış endikasyonu olmayan PCR testkiki ile COVID-19 tanısı konulan hastalar dahil edildi. Çalışmaya alınan hastalara Hastane Anksiyete ve Depresyon Ölçeği (HADS) ve Uykusuzluk Şiddet İndeksi (ISI) uygulandı. Uykusuzluk varlığını etkileyen faktörler lojistik regresyon testi ile incelendi.

Bulgular: Çalışmaya toplam 351 hasta dahil edildi. ISI skoru ≥ 8 pozitif olduğunda 127 hastada (%36.2) insomnia düşünüldü. HADS puanları ≥ 8 pozitif kabul edildiğinde, 89 (%25.4) hastada depresyon ve 66 (%18.8) anksiyete varlığı düşünüldü. İnsomnia varlığına etki eden parametreler lojistik regresyon testi ile değerlendirildiğinde baş ağrısı ($p < 0.0001$; OR: 2.9) ve ateş ($p = 0.043$; OR: 1.85) varlığı anlamlı bulundu. Anksiyete ($p = 0.01$; OR: 3.36) ve depresyon puanlarının ≥ 8 ($p = 0.018$; OR: 2.16) olmasının insomniya varlığı üzerinde anlamlı bir etkisi olduğu saptandı.

Sonuç: Çalışmamız, COVID-19 pandemisinin, hafif seyirli olgularda dahi, enfeksiyona ait semptomlar ve toplumun yaşam tarzı üzerine olumsuz etkileri ile tetiklenen anksiyete ve depresyon ile ilişkili uyku bozukluklarına neden olabileceği sonucunu göstermektedir.

Anahtar Sözcükler: Ayaktan takip edilen hastalar; COVID-19; hastane anksiyete ve depresyon ölçeği; insomnia; insomnia şiddeti indeksi.