





## Research Article

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# ASSESSMENT OF SLEEP QUALITY AND ANXIETY LEVELS OF INDIVIDUALS WHO ARE IN HOME ISOLATION DUE TO THE COVID-19 PANDEMIC

 Sibel Baktır Altuntaş<sup>1</sup>,  Güzin Zeren Öztürk<sup>2</sup>

<sup>1</sup>Department of Family Medicine, Başakşehir Çam and Sakura City Hospital, İstanbul, Turkey

<sup>2</sup>Department of Family Medicine, Şişli Hamidiye Etfal Research and Training Hospital, İstanbul, Turkey

### Correspondence:

Sibel Baktır Altuntaş (e-mail: drsibell@gmail.com)

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## Abstract

**Objectives:** This study aimed to evaluate individuals' sleep quality and anxiety levels in home isolation during the coronavirus disease 2019 (COVID-19) pandemic.

**Materials and Methods:** The study was planned in a descriptive cross-sectional design and was conducted between 01.07.2020–31.07.2020 with 186 individuals who were isolated at home due to contact with infected people and due to being infected with COVID-19. The subjects were asked to complete a sociodemographic data form, the Beck Anxiety Inventory and the Pittsburgh Sleep Quality Index.

**Results:** The mean Pittsburg Sleep Quality Index was 5.33, and the number of participants with poor sleep quality was found to be 92 (49.46%). A significant correlation was found between sleep quality and anxiety scores ( $r=0.705$ ;  $p<0.001$ ). Female participants who were infected with COVID-19 had higher anxiety scores (mean Beck Anxiety Inventory score: 8.93) and worse sleep quality (mean Pittsburg Sleep Quality Index score: 6.11,  $p = 0.002$ ).

**Conclusion:** The COVID-19 Pandemic affected anxiety and sleep quality in those isolated at home. This situation is more common among female participants and those confirmed as COVID-19 positive via RT-PCR (Reverse Transcription Polymerase Chain Reaction).

**Keywords:** Anxiety, COVID-19, sleep quality.

## Introduction

The World Health Organization declared the coronavirus disease 2019 (COVID-19) a pandemic on March 11, 2020.<sup>1</sup> To combat the pandemic, restrictions were imposed worldwide, and measures were taken to minimize contact with infected individuals.<sup>2</sup> One of these measures in Turkey is home isolation. Isolation is the segregation of patients with infectious diseases to protect uninfected persons. Depending on the patient's diagnosis and symptoms, it can be done in the hospital or at home. Home isolation is appropriate for patients with adequate facilities to be adequately cared for at home and who can recover without sharing an area close to uninfected persons.<sup>3,4</sup>

The pandemic period and associated restrictions, such as isolation, have undoubtedly affected people both financially and morally. Most "individuals isolated at home due to treatment" (IIDT) or "individuals isolated at home due to contact" (IIDC) suffer from anxiety and worry because there is no specific treatment for the disease.<sup>5</sup> In addition to these worries, the absence of loved ones and lack of social contact due to the restrictions can cause symptoms such as loneliness, hopelessness, stress, and anxiety. COVID-19-related mental health problems also affect sleep.<sup>6</sup>

Sleep is essential to our mental and physical health.<sup>7</sup> Sleep quality is an important indicator that affects a person's cognitive and physical abilities, as well as his/her social life. There are many factors that affect sleep quality; the most common are smoking, afternoon coffee consumption, alcohol consumption, sleep hygiene disorders, stress and anxiety, and additional illnesses.<sup>8</sup>

Because so many factors affect sleep quality, it is becoming increasingly important to study sleep quality and know the factors that affect it during the pandemic.

This study aimed to examine sleep quality and anxiety levels, as well as some influencing factors, in individuals isolated at home due to treatment (IIDT) or individuals isolated at home due to contact (IIDC) during the COVID-19 pandemic.

## Materials and Methods

### *Study population and sample*

Our study was planned as a descriptive cross-sectional study and was conducted between 01/07/2020 and 31/07/2020 in Istanbul Esenyurt Central Family Health Center and Sultangazi Family Health Training Center No. 1 and No. 2. Since the mean number of individuals isolated at home due to treatment (IIDT) and contact

(IIDC) between May and June was 298, the sample size was calculated to be 169 with a confidence interval of 95%.

Patients who were isolated at home between May and June were contacted by telephone and informed about the study. The survey included 186 individuals who agreed to participate in the study and completed the questions in full. Individuals with a known psychiatric disease prior to the pandemic and individuals being treated for sleep disorders were not included in the study.

#### *Data collection tools*

The questionnaire used in the study was designed by the researchers based on recent articles. In addition to questions on sociodemographic and background data and information on home isolation, the Pittsburg Sleep Quality Index (PSQI) was used to measure sleep quality, and the Beck Anxiety Inventory (BAI) was used to measure participants' anxiety levels.

#### *PSQI*

The PSQI questionnaire consists of 19 items with seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. It is used to assess sleep over a 1-month interval. Each component is weighted equally on a scale of 0 to 3. All components are summed to give a total score between 0 and 21. Higher scores indicate poorer sleep quality. A total score  $\geq 5$  indicates poor sleep quality. Agargun et al. have shown that the PSQI is valid in Turkish population samples.<sup>9</sup>

#### *BAI*

The BAI is used to assess the frequency of anxiety symptoms in individuals. It is a Likert (sum of degrees) measure. There are four options for each of the 21 symptom categories. Each item is given a score between 0 and 3. High scores on the scale indicate the severity of anxiety experienced by the person. The patient is asked to rate his/her symptoms in the "last week, including the same day." The total score ranges from 0 to 63. The suggested values are as follows: 0-7 represents minimal anxiety, 8-15 represents mild anxiety, 16-25 represents moderate anxiety, and 26-63 represents severe anxiety. Studies have shown that BAI is reliable and valid for Turkish population samples.<sup>10</sup>

### *Statistical analysis*

The SPSS program was used for statistical analysis. For descriptive data analysis, number and percentage (n, %) were presented for categorical variables, while mean, standard deviation and minimum and maximum values were presented for numerical variables. The chi-square test was performed to compare categorical data in independent groups, and Student's T-test was performed to compare numerical data in independent groups. Correlation values were determined using the Pearson correlation coefficient test. The statistical significance level of alpha was accepted as  $p < 0.05$ .

## **Results**

The study was conducted with 186 participants who were isolated at home due to treatment (n=96) or preventing contact (n=90). Analysis of sociodemographic and background data is shown in Table 1.

### *Sleep quality data*

The mean PSQI score of participants in this study was 5.33. In our study, we found that 94 (50.54%) individuals had good sleep quality (PSQI scores of 0-4), whereas 92 (49.46%) participants with PSQI scores more than 5 had poor sleep quality. PSQI subgroup scores are given in Table 2.

We investigated the effects of sociodemographic factors on sleep quality. There was a significant association between age and PSQI scores, and we observed an increase in PSQI scores with increasing age ( $r=0.17$ ,  $p=0.02$ ). While the mean PSQI score of single participants was 3.65, it was 5.92 for married participants. The sleep quality of single participants was better, and the difference was statistically significant ( $p<0.01$ ). The mean PSQI score in females and males was 6.11 and 4.45, respectively, and the difference was statistically significant ( $t=3.080$   $p=0.002$ ). It was also found that PSQI score did not differ by chronic diseases ( $t=0.16$   $p=0.98$ ), alcohol consumption ( $t=-1.490$   $p=0.13$ ), living alone at home ( $t=-0.546$   $p=0.4$ ), and whether participants had an active working life or not ( $t=-1.675$   $p=0.095$ ). Analysis of PSQI scores by reasons for isolation at home is presented in Table 3.



**Table 1.** The evaluation of the sociodemographic and background data (n=186)

Variables	Categories	% (n)
Age	18-64	95.16 (177)
	65 +	4.84 (9)
Gender	Female	53.23 (99)
	Male	46.77 (87)
Marital status	Not Married	25.81 (48)
	Married	74.19 (138)
Employment status	Working	47.85 (89)
	Not Working	52.15 (97)
Alcohol consumption	Yes	8.61 (16)
	No	91.39 (170)
Smoker	Yes	25.81 (48)
	No	74.19 (138)
Diagnosed with a chronic disease	Yes	22.04 (41)
	No	77.96(145)
Living alone	Yes	3.76 (7)
	No	96.24 (179)

**Table 2.** PSQI subgroup scores

PSQI subgroups	0 n (%)	1 n (%)	2 n (%)	3 n (%)	Mean Score
Subjective Sleep Quality	40 (21.51)	85 (45.69)	48 (25.81)	13 (6.99)	1.18
Sleep Latency	46 (24.73)	57 (30.64)	47 (25.27)	36 (19.36)	1.4
Sleep Duration	109(58.60)	52 (27.96)	18 (9.68)	7 (3.76)	0.59
Habitual Sleep Efficiency.	153(82.26)	26 (13.98)	7 (3.76)	0	0.22
Sleep Disturbances	33 (17.74)	119(63.98)	31 (16.67)	3 (1.61)	1.02
Use of Sleeping Medication	163(87.63)	9 (4.84)	9 (4.84)	5 (2.69)	0.23
Daytime Dysfunction	108(58.07)	34 (18.28)	33 (17.74)	11 (5.91)	0.72

**Table 3.** The evaluation of sleep quality according to the reasons for isolation at home

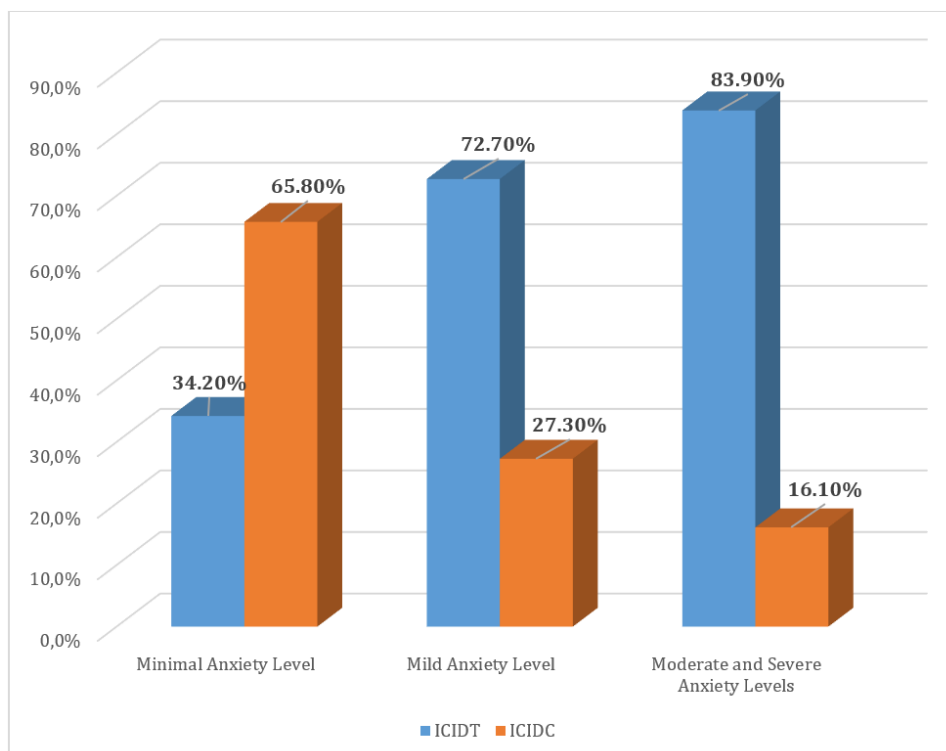
	Individuals who are confined to isolation at home due to treatment (ICIDT) n=96 Mean Score	Individuals who are confined to isolation at home due to contact with infected people (ICIDC) n=90 Mean Score	t	p
Subjective Sleep Quality	1.47	0.88	5.039	<0.001*
Sleep Latency	1.71	1.07	4.265	<0.001*
Sleep Duration	0.67	0.50	1.396	0.16
Habitual Sleep Efficiency	0.28	0.14	1.895	0.06
Sleep Disturbances	1.22	0.81	4.595	<0.001*
Use of Sleeping Medication	0.28	0.17	1.185	0.23
Daytime Dysfunction	1.00	0.41	4.390	<0.001*
PSQI total score	6.61	3.97	5.120	<0.001*

\* Independent Samples T Test

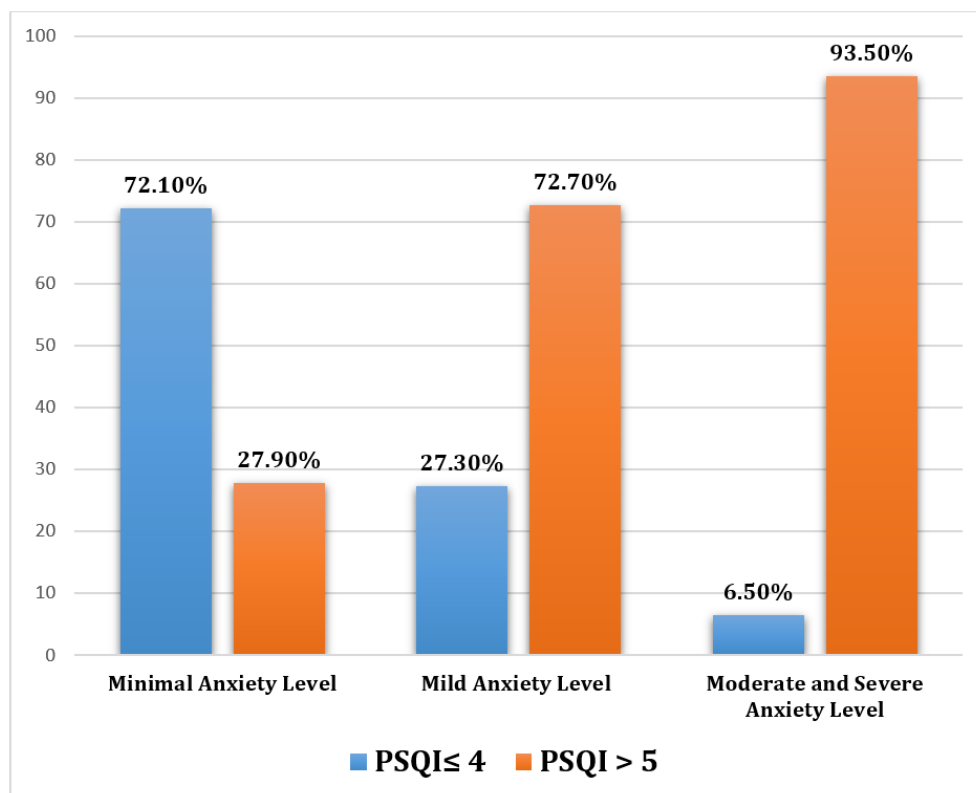
### Anxiety scale data

The proposed rating scores for the Beck Anxiety Scale are as follows: 0-7 represents minimal anxiety, 8-15 represents mild anxiety, 16-25 represents moderate anxiety, and 26-63 represents severe anxiety. The mean BAI score of participants was  $7.56 \pm 6.98$  (minimum: 0, maximum: 38), which corresponds to minimal anxiety. Of the participants, 59.68% (n=111) had minimal anxiety, 23.66% (n=44) had mild anxiety, and 16.67% (n=31) had moderate and severe anxiety. When examining the association between anxiety level and sociodemographic data, no significant correlation was found between age and anxiety level ( $r=0.11$ ,  $p=0.13$ ). However, female participants were found to have higher anxiety levels than males, with anxiety scores of 8.93 and 6.01, respectively, and the difference was statistically significant ( $t=2.901$   $p=0.004$ ).

The mean score of BAI was 8.19 for married and 5.77 for single; the difference was statistically significant ( $t=2.085$   $p=0.02$ ). The mean anxiety level of IIDT was  $10.49 \pm 7.23$  (minimum: 0, maximum: 38), and that of IIDC was  $3.85 \pm 4.41$  (minimum: 0, maximum: 21). The difference was statistically significant ( $t=-7.288$   $p<0.001$ ). The assessment of anxiety levels according to the reasons for isolation at home is shown in Figure 1. A significant correlation was found between sleep quality and anxiety scale ( $r=0.705$ ;  $p<0.001$ ). In addition, participants were divided into two groups according to their sleep quality. A PSQI score of more than 5 represents poor sleep quality, and a score of 0-4 represents good sleep quality. Anxiety levels were compared between the two groups (Figure 2). It was found that individuals with poor sleep quality had more moderate and severe anxiety symptoms ( $p<0.001$ ).



**Figure 1.** The evaluation of anxiety level according to the reasons for isolation at home



**Figure 2.** Correlation between sleep quality and anxiety scale

## Discussion

Measures such as social distancing, travel restrictions, curfews, and home isolation were taken to control the COVID-19 pandemic.<sup>11,12</sup> Home isolation and quarantine due to COVID-19 may have different effects on sleep, which plays an important role in psychiatric disorders.<sup>13</sup> Patients with sleep disturbances are likely to have more symptoms during home isolation.<sup>14</sup> In a study examining the prevalence of mental health symptoms and related factors during the COVID-19 Pandemic in China, it was determined that nearly one-third of respondents suffered from anxiety and insomnia symptoms.<sup>15</sup> In another study, it was observed that exposure to uncontrollable or unpredictable stressors such as hurricanes, earthquakes, and tsunamis resulted in poorer sleep quality.<sup>16</sup> In our study, nearly half of the participants had sleep disorders, and their anxiety levels were mostly minimal.

There are studies showing that females are more likely to suffer from insomnia during the pandemic.<sup>17</sup> The sleep quality of the female participants in our study was also poor. This could be due to the fact that female participants in our study were more likely to suffer from anxiety, which is thought to affect sleep quality. There are studies reporting that symptoms related to anxiety, depression, and panic disorders resulting from social



isolation and long-term quarantine, which are part of pandemic measures, are more common in females.<sup>11,18,19</sup> Female reproductive hormones and associated cycles have been shown to play an important role in gender differences.<sup>20</sup> Living alone or being alone might negatively affect sleep quality; however, this association is often linked to depression and stress from loneliness.<sup>21</sup> Therefore, sleep quality might not be affected in people who live alone but do not feel lonely, causing less stressful changes in isolation and daily routines compared with people who live with a family or partner. In our study, this could explain the fact that people living alone have less anxiety and better sleep quality. In this study, married participants also had more anxiety and poorer sleep quality than single participants.

Sleep disturbances are common in patients with cancer and chronic medical conditions.<sup>22</sup> However, in our study, there was no difference in anxiety and sleep disturbances between people with chronic diseases and those without chronic diseases, which may reflect the intensity of uncertainty and problems caused by the pandemic. A study conducted in Canada suggested that demographic factors such as marital status, age, education, living with other adults, and having children are not associated with the psychological consequences of those quarantined due to the severe acute respiratory syndrome (SARS) epidemic; these findings support our study.<sup>23</sup>

There are also studies suggesting that home isolation reduces levels of physical activity and exposure to daylight and that social isolation increases stress levels, such as due to lack of social contact with family and friends, and disrupts nighttime sleep.<sup>18</sup> A study conducted in China found a significant difference in anxiety levels between those who were quarantined for COVID-19 and those who were not.<sup>24</sup> Another study conducted in China found that isolated individuals had high levels of anxiety and stress, and their sleep quality was low.<sup>5</sup> A study conducted in Italy reported that the deterioration in sleep quality was more pronounced in individuals with depression, anxiety, and stress symptoms.<sup>25</sup> Similarly, a study conducted in central China with people who were isolated at home for 14 days showed that worsening sleep quality was associated with an increase in anxiety and stress.<sup>5</sup> Similarly, in our study, we found that isolated people suffered from anxiety and sleep problems; however, the type of isolation is important in this regard. We concluded that IIDT had significantly more moderate and severe anxiety symptoms and poorer sleep quality. A previous study had shown that an early COVID-19 test is a risk factor for depression.<sup>26</sup>

The problems faced by isolated individuals, especially IIDT, are more frequent and may cause them to delay treatment, which can jeopardize both individual and societal health.

To prevent this situation, IIDC should be advised to continue their daily lives as much as possible and engage in enjoyable and relaxing activities and exercises that they can do at home.

The study has some limitations. Because the analyses were not conducted over a long period of time, it was not possible to determine the evolution of anxiety and insomnia during the different phases of the pandemic, which depended in part on which variables were affected. Because the pre-pandemic situation of the participants in terms of anxiety and sleep quality was not known, no comparison could be made.

The COVID-19 pandemic affected anxiety and sleep quality in those isolated at home. This situation is more common among female participants and those confirmed as COVID-19 positive via RT-PCR.

**Ethical considerations:** The local clinical research ethics committee approved the study (Approval No. 2865, dated 30/06/2020).

**Conflict of Interest:** The authors declare that there are no potential conflicts of interest related to the research, authorship, and/or publication of this article.

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