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The effect of COVID-19 pandemic on sleeping status

COVID-19 pandemisinin uyku durumu üzerine etkisi

Ülkü Figen Demir [1]

[1] Department of Neurology, Istanbul Yeni Yüzyıl University, Faculty of Medicine, Istanbul, Turkey

ORCID ID of the author(s)
ÜFD: 0000-0002-2546-216X

Corresponding author/Sorumlu yazar:
Ülkü Figen Demir
Address/Adres: Yeni Yüzyıl Üniversitesi Tıp Fakültesi, Nöroloji ABD, Merkez mahallesi, Çukurçeşme caddesi no:51, Gaziosmanpaşa, İstanbul, Türkiye
e-Mail: drfigendemir@gmail.com

Abstract

Aim: Sleep is a physiological condition that is needed by the animal organism and required for the regular function of organ systems and mental health. The recent COVID-19 pandemic caused widespread anxiety worldwide with health-related, economic, and social burdens. The aim of this study is to determine the sleep-related perturbances and the level of anxiety in a Turkish population and compare the outcomes between the genders and working status of the subjects during the COVID-19 pandemic.
Methods: We performed a phone-based cross-sectional semi-structured questionnaire on 100 adult volunteers in May 2020. Sociodemographic data, the responses for ten questions on sleep performance and their level of anxiety and life satisfaction were noted and reported.
Results: Male subjects reported a higher incidence of change in their waking hours, and an increased need for sleep during daytime ($P=0.008$). The anxiety level was significantly higher among female subjects, and the main causes of the anxiety were different between the two groups ($P=0.035$, $P<0.001$, respectively). Female subjects described a higher rate of change in their well-being ($P<0.001$), and the overall scores for well-being and life satisfaction were significantly lower among the females ($P<0.001$). The non-working group had an increased incidence of severe anxiety and an increased ratio of change in their lifestyle in comparison to usual ($P=0.006$, $P<0.001$, respectively).
Conclusions: To our knowledge, this report is the first survey analysis on anxiety and sleep performance following the COVID-19 infections in Turkey. We report a high incidence of impaired sleep status, change of lifestyle, satisfaction, and increased anxiety in the population independent from the gender and current working status.
Keywords: COVID-19, Pandemic, Sleeping status, Anxiety

Öz

Amaç: Uyku, organizma tarafından ihtiyaç duyulan ve organ sistemlerinin ve zihinsel sağlığın düzenli işlevi için gerekli olan fizyolojik bir durumdur. Son zamanlarda COVID-19 salgını dünya çapında sağlık, ekonomik ve sosyal sorunlar ile ilgili yaygın endişeye neden olmuştur. Bu çalışmanın amacı, Türk toplumundaki uyku ile ilgili sorunları ve kaygı düzeyini belirlemek ve katılımcıların cinsiyetleri ile COVID-19 pandemisi sırasında aktif olarak çalışma durumları arasındaki sonuçları karşılaştırmaktır.
Yöntemler: 100 adet yetişkin, gönüllü birey üzerinde telefon temelli kesitsel yarı yapılandırılmış bir anket uygulandı. Sosyodemografik veriler, uyku performansı, kaygı düzeyleri ve yaşam memnuniyeti ile ilgili on soruya verilen yanıtlar analiz edilerek raporlandı..
Bulgular: Erkek katılımcıların uyanıklık saatlerindeki değişim ve gündüz uykusuna artmış düzeyde gereksinimi daha yüksek oranda saptandı ($P=0,008$). Anksiyete düzeyi kadınlarda anlamlı olarak daha yüksekti ve anksiyetenin ana nedenleri iki grup arasında farklıydı (sırasıyla $P=0,035$, $P<0,001$). Kadın katılımcılar, sağlık durumlarında daha yüksek oranda bir değişim tanımladılar ($P<0,001$) ve sağlık durumu ile yaşam memnuniyeti için toplam puan kadınlar arasında anlamlı olarak daha düşük olarak saptandı ($P<0,001$). Pandemi döneminde aktif olarak çalışmayan grubun anksiyete oranı daha yüksek ve yaşam tarzında meydana gelen değişikliklerin oranı anlamlı olarak daha yüksek saptandı (sırasıyla $P=0,006$, $P<0,001$).
Sonuç: Bu çalışma, Türkiye'de COVID-19 enfeksiyonlarını takiben ortaya çıkan kaygı ve uyku bozukluğu üzerine yapılan ilk araştırma analizidir. Çalışmamız ile, Türk toplumunda cinsiyet ve mevcut çalışma durumundan bağımsız olarak uyku bozukluğu, yaşam tarzı değişikliği, memnuniyet ve artan kaygı insidansının yüksek olduğunu bildirmekteyiz.
Anahtar kelimeler: COVID-19, Pandemi, Uyku durumu, Kaygı

Introduction

Sleep is a physiological state that is needed for the regular performance of daily activities, mental and physical health, and good life quality. Sleep disorders have been announced as a public health epidemic by the Centers for Disease Control and Prevention (CDC), and according to data, chronic sleep loss and disturbances in sleeping behavior have been related to serious metabolic, endocrine, and systemic diseases including obesity, diabetes mellitus, coronary heart disease, cancer, and stroke [1-3]. Also, the risk of developing Alzheimer's disease is 1.5 times greater in individuals with low sleep quality [4]. Short-term sleep deprivation leads to cognitive impairment, diminished concentration, and impaired intellectual capacity, which might lead to accidents, depressive symptoms, as well as psychotic behavior in individuals with a neuropsychological tendency [5].

As of May 12, 2020, more than 4 million cases with 200 thousand resulting in mortality have been reported globally. In Turkey, a total of 139771 COVID-19 cases were confirmed and 3841 individuals died from the disease [6]. The ongoing COVID-19 pandemic have led to widespread anxiety among the populations, and as the regular precautions are taken with increasing alarm levels, people experienced a great psychological pressure considering the health-related, economic and social outcomes of the process.

As the main point of view of the current reports are on the pathogenesis and treatment of the COVID-19 infection, there is limited data on the anxiety level and related conditions during the COVID-19 pandemic. The reports from the previous pandemics and epidemics suggested an increased rate of insomnia, anxiety, depression, and suicidality, as well as seizures, encephalitis, encephalopathy, and demyelinating diseases [7,8].

Besides the high-risk populations with chronic systemic disease, older age, prolonged use of immunosuppressive medications, health-care workers and disease survivors are also at-risk populations for anxiety and mental health problems [9]. In addition, inadequate amounts of sleep and rest impair the immune system, and COVID-19 has been reported to increase the infection and mortality rates in individuals with disturbed immune systems [10].

The aim of this study is to determine the sleep status and sleep-related perturbances in a selected population including healthcare professionals and compare the outcomes between the genders and working status of the subjects during the COVID-19 pandemics.

Materials and methods

Study design and participants

We designed a phone-based cross-sectional semi-structured questionnaire on one hundred adult volunteers. The study was conducted in May 2020. The participants with impaired sleep and increased level of anxiety were assessed with a neurological consultation and referred for psychological evaluation when necessary.

Sociodemographic data including age, gender, marital, accommodation and graduation status, occupation, presence of any chronic diseases, drug use, smoking status, and regular alcohol intake were collected from all participants.

In the second part, the subjects answered ten questions on sleep performance and their level of anxiety and life satisfaction. The participants were asked if they worked during the pandemic, and compared in terms of change in sleeping behavior, such as difficulty in falling asleep during bedtime, causes of difficulty of sleeping, presence of any trouble staying asleep, rested state at wake-up in the morning, the total amount of sleep, along with personal evaluation of anxiety and well-being, the main reasons of anxiety, and changes in the lifestyle during the COVID-19 pandemics.

This study was conducted in accordance with the Declaration of Helsinki. The ethical board approval was obtained from İstanbul Yeni Yuzyil University, Science, Social and Non-Interventional Health Sciences Research Ethics Committee (Number: 2020/04-05). Verbal informed consent was obtained from all participants.

Statistical analysis

GraphPad Prism v 8.0 was used for the statistical analyses. The data were presented as mean (standard deviation [SD]) and number and percentage. The qualitative variables were compared using the Student's t-test. Chi-square test ($\chi2$) or 2-sided Fisher's exact t-test were used to compare the categorical variables between the groups. A P-value of less than 0.05 was considered statistically significant.

Results

A power analysis was conducted with a Type II error rate of 0.05 and power level of 0.80. Thus, a total of 100 individuals with a mean age of 45.3 (12.6) years completed the questionnaire.

The participants consisted of 52 female and 48 male subjects. The comparison of the demographic data between male and female individuals are presented in Table 1. The ratio of the married participants was significantly higher among the female population ($P=0.038$), whereas the ratio of males residing in a family-based household was significantly higher than females ($P=0.006$). We also observed occupational differences between female and male populations ($P=0.025$). The ratio of regular alcohol intake was significantly higher among male subjects ($P=0.003$). On the sleep questionnaire, male subjects reported a higher incidence of change in their waking hours, and they reported an increased need for sleep during the daytime ($P=0.009$).

Anxiety level was significantly higher in the female subjects, and the main causes of anxiety were different between the two groups ($P=0.018$, $P<0.001$, respectively). Female subjects described a higher rate of change in their well-being ($P<0.001$), and the overall score for well-being and life satisfaction was significantly lower among females ($P<0.001$).

The overall prevalence of impaired sleep was 42.3% and 39.61% in the female and male populations, respectively. Among the participants who answered, the most common reason of difficulty falling asleep was "change of habits" and "All of the above" in both groups. The ratio of individuals who reported trouble staying asleep was 34.6% among females, and 22.9% among males (Table 2).

Table 1: Sociodemographic classification of the study population according to gender

	Female (n=52)	Male (n=48)	P-value
Age	46.6 (13.9)	43.3 (11.3)	0.71
Married/Single	26/26 (1.0)	39/9 (4.3)	0.038
Number of children	1.21 (1.18)	1.36 (1.07)	0.32
Accommodation			
Alone	5 (9.6%)	0 (0%)	0.006
Family home	47 (90.4%)	48 (100%)	
Graduation status			
Non-schooled	2 (3.8%)	0 (0%)	0.48
Primary school	5 (9.6%)	4 (8.3%)	
Elementary school	1 (1.9%)	2 (4.2%)	
High school	11 (21.2%)	8 (16.6%)	
University	33 (63.5%)	34 (70.9%)	
Occupation			
Lawyer	1 (1.9%)	0 (0%)	0.025
Own company-Private sector	5 (9.6%)	26 (53.8%)	
IT	0 (0%)	1 (2.1%)	
Health	25 (54.6%)	10 (21.0%)	
Teacher	1 (1.9%)	1 (2.1%)	
Architect/Engineer	5 (9.6%)	5 (10.5%)	
Finance	0 (0%)	3 (6.3%)	
House woman	10 (10.9%)	0 (0%)	
Retired	6 (11.5%)	2 (4.2%)	
Chronic disease			
DM	4 (7.6%)	2 (4.2%)	0.38
HT	12 (23%)	3 (6.3%)	
Thyroid cancer	1 (1.9%)	0 (0%)	
Ulcerative colitis	1 (1.9%)	1 (2.1%)	
CVD	3 (5.8%)	4 (8.4%)	
Breast cancer	1 (1.9%)	0 (0%)	
Thyroid disease	8 (15.4%)	0 (0%)	
Sarcoidosis	0 (0%)	1 (2.1%)	
Behcet's Disease	0 (0%)	1 (2.1%)	
Epilepsy	0 (0%)	1 (2.1%)	
Psoriasis	0 (0%)	1 (2.1%)	
Prostate cancer	0 (0%)	1 (2.1%)	
Hepatitis	0 (0%)	1 (2.1%)	
Migraine	1 (1.9%)	0 (0%)	
MS	1 (1.9%)	0 (0%)	
Drug use			
Yes	22 (42.3%)	16 (33.3%)	0.41
No	30 (57.7%)	32 (66.7%)	
Smoking status			
Yes	14 (26.9%)	22 (45.8%)	0.07
No	38 (73.1%)	26 (54.2%)	
Alcohol use			
Yes	2 (3.8%)	10 (21%)	0.003
No	50 (96.2%)	38 (79%)	

Table 2: Evaluation of the questionnaire data according to genders

	Female (n=52)	Male (n=48)	P-value
Worked during pandemics			
Yes	20 (38%)	19 (39.6%)	0.92
No	32 (62%)	29 (60.4%)	
How would you describe the way you currently fall asleep in comparison to usual?			
Similar	28 (53.9%)	26 (54.1%)	0.98
Worse	22 (42.3%)	19 (39.6%)	
Better	2 (3.8%)	3 (6.3%)	
What is the main reason for your difficulty fall asleep?			
Thoughts	2 (3.8%)	3 (6.3%)	0.81
Fear	2 (3.8%)	1 (2.1%)	
Anxiety	5 (9.6%)	1 (2.1%)	
Change of my habits	7 (13.5%)	7 (14.6%)	
All	7 (13.5%)	7 (14.6%)	
Don't want to answer	1 (1.9%)	3 (6.3%)	
Would you describe trouble staying asleep?			
Yes	18 (34.6%)	11 (22.9%)	0.27
No	34 (65.4%)	37 (77.1%)	
If above question is answered as "Yes"; Would you describe difficulty in falling asleep again?			
Yes	8 (15.4%)	5 (10.4%)	0.86
No	10 (19.2%)	6 (12.5%)	
Did you experience a change in your waking hours?			
Yes	23 (44.2%)	31 (64.5%)	0.009
No	29 (55.8%)	17 (35.5%)	
If above question is answered as "Yes"; How would you describe your waking status in comparison to usual?			
Later than usual	20 (38.5%)	26 (54.2%)	0.94
Earlier than usual	3 (5.8%)	5 (10.4%)	
How do you feel when you wake up in comparison to usual?			
Similar	30 (57.7%)	29 (60.4%)	0.74
More tired	22 (42.3%)	19 (39.6%)	
Would you need for sleep during the day in comparison to usual?			
Yes	17 (32.7%)	25 (52.0%)	0.003
No	35 (67.3%)	23 (48.0%)	
Would you describe a change in total amount of your sleep in comparison to usual?			
Similar	33 (63.5%)	25 (52.0%)	0.12
More hours	10 (19.2%)	14 (29.2%)	
Less hours	9 (17.3%)	9 (18.8%)	
Would you describe anxiety in comparison to usual?			
Yes	42 (80.8%)	34 (70.8%)	0.16
No	10 (19.2%)	14 (29.2%)	
How would you score your anxiety?			
None	1 (1.9%)	5 (10.4%)	0.018
Mild	24 (46.2%)	19 (39.6%)	
Moderate	22 (42.3%)	21 (43.8%)	
Severe	5 (9.6%)	3 (6.2%)	
What is the main reason for your anxiety and disturbance in sleep?			
Health issues	36 (69.2%)	20 (43.8%)	<0.001
Social issues	14 (27.0%)	9 (18.8%)	
Financial issues	1 (1.9%)	13 (27.0%)	
None	1 (1.9%)	5 (10.4%)	
Would you describe a change in your well-being in comparison to usual?			
Yes	38 (73.0%)	24 (50.0%)	<0.001
No	14 (27.0%)	24 (50.0%)	
How would you score your well-being and life satisfaction? (0-Lower; 5-Highest)			
0	1 (1.9%)	0 (0%)	<0.001
1	1 (1.9%)	1 (2.1%)	
2	10 (19.0%)	5 (10.5%)	
3	23 (44.5%)	16 (33.3%)	
4	14 (27.0%)	20 (43.6%)	
5	3 (5.7%)	5 (10.5%)	
Would you describe a change in your lifestyle in comparison to usual?			
Yes	36 (69.2%)	38 (79.0%)	0.17
No	16 (30.8%)	10 (21.0%)	

The mean age of the working population during the pandemic was significantly lower than the rest (P=0.003). Among the subjects who worked during the pandemic, 71.1% were university graduates, and 21.0% had graduated from high school. Fifty percent of the working participants were health care workers, and 36% worked in the private sector or ran their own business.

The ratio of having at least one chronic disease and prolonged and regular use of medications was higher in the non-working population (P=0.018, P=0.006, respectively). Smoking behavior was significantly lower in the working population (P=0.004) (Table 3).

The participants in home confinement reported a higher incidence of a change in their working hours, and they further stated that their waking hours were later than the usual (P<0.001, P=0.004, respectively). The need for sleep during the daytime and the total amount of sleep was also higher in the non-working population (P=0.022, P=0.009, respectively). The anxiety levels were different between the groups, and the non-working group had an increased incidence of severe anxiety (P=0.005). They also reported an increased ratio of change in their lifestyle in comparison to usual (P<0.001). The overall prevalence of impaired sleeping was 47.3% in the working population and 37.1% in the non-working population.

Among the participants who stated a reason for difficulty in falling asleep, the most common answer was "change of habits" in the working population, and "All of the above" in the non-working population. The ratio of individuals who reported trouble staying asleep was 36.8% in the working population, and 24.2% in the non-working population (Table 4).

All subjects reported a higher rate of fatigue when they wake up in the morning, an increased rate of anxiety, where approximately half of the participants in each study group reported a moderate level of anxiety. The most common reason for anxiety and sleep disturbance was health-related issues, followed by social and financial discomfort. More than half of the participants reported a change in their well-being in comparison to usual.

Table 3: Sociodemographic data of the study population according to working status during the pandemic

	Yes (n=38)	No (n=62)	P-value
Age	39.3 (9.51)	48.6 (13.3)	0.003
M/F	18/20	30/32	0.97
Married/Single	24/14	41/21	0.79
Number of children	1.16 (1.24)	1.36 (1.05)	0.86
Accommodation			
Alone	5 (13.2%)	6 (9.7%)	0.48
Family home	33 (86.8%)	56 (90.3%)	
Graduation status			
Non-schooled	0 (0%)	2 (3.2%)	0.72
Primary school	3 (7.9%)	6 (9.6%)	
Elementary school	0 (0%)	3 (4.8%)	
High school	8 (21.0%)	11 (17.7%)	
University	27 (71.1%)	40 (64.7%)	
Occupation			
Lawyer	0 (0%)	1 (1.6%)	0.32
Own company-Private sector	14 (36.8%)	20 (32.3%)	
IT	1 (2.6%)	0 (0%)	
Health	19 (50%)	16 (25.8%)	
Teacher	1 (2.6%)	1 (1.6%)	
Architect/Engineer	3 (7.8%)	2 (3.2%)	
Finance	0 (0%)	3 (4.8%)	
House woman	0 (0%)	10 (16.0%)	
Retired	0 (0%)	8 (12.9%)	
Chronic disease			
DM	2 (5.2%)	4 (6.5%)	0.018
HT	3 (7.9%)	14 (22.6%)	
Thyroid cancer	0 (0%)	1 (1.6%)	
Ulcerative colitis	0 (0%)	1 (1.6%)	
CVD	2 (5.2%)	5 (8.0%)	
Breast cancer	0 (0%)	1 (1.6%)	
Thyroid disease	3 (7.9%)	5 (8.0%)	
Sarcoidosis	0 (0%)	1 (1.6%)	
Behcet's Disease	0 (0%)	1 (1.6%)	
Epilepsy	1 (2.6%)	0 (0%)	
Psoriasis	0 (0%)	0 (0%)	
Prostate cancer	0 (0%)	1 (1.6%)	
Hepatitis	1 (2.6%)	0 (0%)	
Migraine	0 (0%)	1 (1.6%)	
MS	0 (0%)	1 (1.6%)	
Drug use			
Yes	17 (44.7%)	19 (30.6%)	0.006
No	21 (55.3%)	43 (69.4%)	
Smoking status			
Yes	14 (26.9%)	22 (45.8%)	0.004
No	38 (73.1%)	26 (54.2%)	
Alcohol use			
Yes	6 (15.8%)	6 (9.7%)	0.31
No	32 (84.2%)	56 (90.3%)	

Table 4: Evaluation of the questionnaire data according to working status during the pandemic

	Yes (n=38)	No (n=62)	P-value
How would you describe the way you currently fall asleep in comparison to usual?			
Similar	19 (50%)	35 (56.5%)	0.19
Worse	18 (47.3%)	23 (37.1%)	
Better	1 (2.7%)	4 (6.4%)	
What is the main reason for your difficulty fall asleep?			
Thoughts	2 (5.4%)	3 (4.8%)	0.14
Fear	4 (10.8%)	0 (0%)	
Anxiety	1 (2.7%)	5 (8.1%)	
Change of my habits	8 (21.6%)	6 (9.7%)	
All	5 (13.2%)	9 (14.5%)	
Don't want to answer	18 (47.4%)	39 (62.9%)	
Would you describe trouble staying asleep?			
Yes	14 (36.8%)	15 (24.2%)	0.08
No	24 (63.2%)	47 (75.8%)	
If above question is answered as "Yes"; Would you describe difficulty in falling asleep again?			
Yes	10 (26.3%)	9 (14.5%)	0.28
No	4 (10.5%)	6 (9.7%)	
Did you experience a change in your waking hours?			
Yes	14 (36.8%)	56 (90.3%)	<0.001
No	24 (63.2%)	6 (9.7%)	
If above question is answered as "Yes"; How would you describe your waking status in comparison to usual?			
Later than usual	11 (28.9%)	50 (80.6%)	0.004
Earlier than usual	3 (7.9%)	6 (9.7%)	
How do you feel when you wake up in comparison to usual?			
Similar	22 (57.9%)	37 (59.7%)	0.88
More tired	16 (42.1%)	25 (40.3%)	
Would you need for sleep during the day in comparison to usual?			
Yes	12 (31.6%)	30 (48.4%)	0.022
No	26 (68.4%)	32 (51.6%)	
Would you describe a change in total amount of your sleep in comparison to usual?			
Similar	26 (68.6%)	32 (51.6%)	0.009
More hours	4 (10.8%)	19 (30.6%)	
Less hours	8 (21.0%)	11 (17.8%)	
Would you describe anxiety in comparison to usual?			
Yes	27 (71.0%)	49 (79.0%)	0.26
No	11 (29.0%)	13 (21.0%)	
How would you score your anxiety?			
None	2 (5.4%)	4 (6.4%)	0.005
Mild	18 (47.4%)	25 (40.3%)	
Moderate	17 (44.7%)	26 (41.9%)	
Severe	1 (2.7%)	7 (11.3%)	
What is the main reason for your anxiety and disturbance in sleep?			
Health issues	21 (55.3%)	35 (56.4%)	0.42
Social issues	8 (21.0%)	15 (24.2%)	
Financial issues	7 (14.4%)	7 (11.3%)	
None	2 (5.4%)	5 (8.0%)	
Would you describe a change in your well-being in comparison to usual?			
Yes	24 (63.2%)	38 (61.3%)	0.83
No	14 (36.8%)	24 (38.7%)	
How would you score your well-being and life satisfaction? (0-Lower; 5-Highest)			
0	1 (2.7%)	0 (0%)	0.13
1	1 (2.7%)	1 (1.6%)	
2	7 (18.4%)	9 (14.5%)	
3	12 (31.6%)	27 (43.5%)	
4	14 (36.8%)	20 (32.2%)	
5	3 (7.9%)	5 (8.0%)	
Would you describe a change in your lifestyle in comparison to usual?			
Yes	18 (47.4%)	56 (90.3%)	<0.001
No	20 (52.6%)	6 (9.7%)	

Discussion

In worldwide epidemics such as the SARS outbreak in 2003 and Spanish flu in 1926, an increased incidence of anxiety and neuropsychological complications during and after the incident were reported. Recently, the World Health Organization (WHO) announced the status of a pandemic due to the worldwide spread of COVID-19 [11].

A dramatic change in the lifestyle during the pandemic and its consequences are expected. However, individuals had to cope with not only health-related but also financial and social disturbances during this period, worldwide.

Our phone-based study shows a high prevalence of anxiety and impaired sleep in the adult Turkish population during the COVID-19 pandemic. Anxiety symptoms manifested in a higher degree among females than males, however, all subjects reported a higher level of anxiety and related symptoms compared to usual, irrespective of their gender. With the

increasing ratio of people losing their jobs due to lock-down and government policy related restrictions, a high number of people lack knowledge about their future working status and financial stability. Supporting this condition, in our study, we observed that almost half of the subjects reported increased impaired sleep, difficulty in sleeping and staying asleep, and more than moderate levels of anxiety.

The non-working population in our study group refers to individuals who were not working before the pandemic, owners of small businesses and those working in restaurants or other closed enterprises. The reported rate of life-style change, the total amount of sleep, and sleeping late hours were more common in the non-working population during the pandemic. Besides, being in home-confinement with children, home-schooling, managing to balance food supply, and house errands during the lockdown contribute to an increasing level of anxiety in the non-working population. Although a priority for financial issues would be an expected outcome for this group, we observed that financial instability was the third cause of their anxiety and disturbance in sleep after health-related and social insecurity.

On the other hand, 50% of the individuals in our study group were health care workers who continued working during the pandemic, and it is a known fact that they experience a close look at COVID-19 cases and related complications during the working hours. Reports from recent studies on healthcare workers during the pandemic stated increased anxiety for their potential role of the disease spread among their family members and people in contact.

A report from China showed that nearly one in four healthcare workers experienced sleep problems during the COVID-19 pandemic despite their long and intense working hours which would be exhausting [12]. A cross-sectional questionnaire survey among Chinese healthcare workers using the Pittsburgh sleep quality index (PSQI), Zung's self-rating anxiety scale (SAS) and self-rating depression scale (SDS) during the COVID-19 pandemic revealed that sleep disturbance was highly prevalent among the pediatric healthcare workers as well [13]. Another Chinese study with 1563 participants revealed that more than one-third of the medical staff suffered insomnia symptoms during the COVID-19 outbreak and that insomnia symptoms were associated with an education level of high school or below [14]. In our study, 33% of the participants were graduates of high school and below, and not having an academic degree might be a reason for the increased anxiety and sleep disorders in this population. Besides, uncontrolled information distributed through the mainstream and social media, and disagreement and conflict between the academics on the news and papers further contribute to increased anxiety due to the rising level of uncertainty about health-related issues and the future. Also, physicians defined a novel term in psychiatry literature, "Coronaphobia", which is an excessive fear of being infected by the novel coronavirus (2019-nCoV) [15]. There are several reports on the increasing ratio of obsessive-compulsive symptoms in the community, because of the preventive precautions including cleaning, washing hands, and regular use of disinfectants [16,17]. Although there are possible pharmacological treatment options for anxiety and sleep

disorders including benzodiazepines, benzodiazepine receptor agonists, and sedating antidepressants, their potential adverse effects on the mood, behaviors, and concentration during work should be carefully concluded [18].

It is a known fact that individuals with impaired immunity are more vulnerable to COVID-19 infection as well as other infectious diseases. Thus, impaired sleep and anxiety might be risk factors for being infected with COVID-19 due to their effect on decreasing the immune response.

Limitations

Our study has several limitations to report. First, our data is limited to the COVID-19 pandemic and there is a possibility of selection bias. Secondly, the psychological condition of the participants was not scored. However, the participants reporting a decline in their life satisfaction compared to usual might be a consequence of the recent pandemic status. Third, we did not subgroup the subjects depending on the sectors they are working in, thus the working conditions during the pandemic might be a cause of the increased rate of anxiety and impaired sleep among different occupational groups. One other limitation to report is that we used a semi-structured survey, and possible bias might be of concern due to the current nature of our questionnaire.

Conclusions

To our knowledge, this report is the first survey analysis on the anxiety and sleep performance following the COVID-19 infections in Turkey after the first observed case in the country in March 2020. We report a high incidence of impaired sleep, change of lifestyle, satisfaction, and increased anxiety in the population independent from gender and current working status. Further research on specific populations with a higher number of subjects using multiple evaluation questionnaires might yield a more thorough assessment of the situation and its neuropsychological effects on the Turkish community. However, as a result of cultural bias, reports from different countries might also contribute to better understanding of the effects of this pandemic.

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