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The Effects of the COVID-19 Pandemic on the Anxiety Levels and Sleep among University Students

COVID-19 Salgınının Üniversite Öğrencilerinin Anksiyete Düzeyi ve Uyku Üzerine Etkisi

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Abstract

Objective: This study was conducted to examine the effects of the Coronavirus disease-2019 (COVID-19) pandemic on the anxiety and sleep levels of university students.

Materials and Methods: The population of this descriptive study consisted of students who studied in health departments. The data were collected with a questionnaire that consisted of the descriptive characteristics form, Beck Anxiety Inventory, and Pittsburgh Sleep Quality Index.

Results: A total of 70.5% of the students who participated in the study were female. 9.0% of the students use drugs and 38.4% of them smoke. The difference between anxiety score averages and having a chronic disease, continuous drug use, smoking, and being a disabled person in the living environment is significant. Sleep quality scores were found to be "elevated" and significant for those who constantly used drugs, had a family member with a disability and/or a person over the age of 65, and those who smoked. It also affected the sleep quality scores of those who were infected with the Coronavirus, those who had family members with Coronavirus in their family, and/or students who had a relative who died from the Coronavirus.

Conclusion: It can be argued that the anxiety frequency of the students increased and their sleep quality deteriorated during the COVID-19 pandemic period. Having a family member over the age of 65, having a disabled person, being infected with the Coronavirus and/or losing one of their relatives to the Coronavirus affected the anxiety and sleep quality scores of the students.

Keywords: University students, COVID-19 pandemic, anxiety, sleep quality

Öz

Amaç: Bu çalışma, Koronavirüs hastalığı-2019 (COVID-19) pandemisinin üniversite öğrencilerinin anksiyete ve uyku düzeyleri üzerine etkilerini incelemek amacıyla yapılmıştır.

Gereç ve Yöntem: Tanımlayıcı tipte olan araştırmanın evrenini sağlık bölümlerinde okuyan öğrenciler oluşturmuştur. Veriler öğrencilerin tanımlayıcı özellikleri ile Beck Anksiyete Ölçeği ve Pittsburg Uyku Kalitesi Ölçeği'nden oluşan bir anket aracılığıyla toplanmıştır.

Bulgular: Araştırmaya katılan öğrencilerin %70,5'i kadındı. Öğrencilerin %9,0'ı ilaç, %38,4'ü sigara kullanmakta idi. Anksiyete puan ortalamaları ile kronik hastalık öyküsü, sürekli ilaç kullanımı, sigara, yaşadığı ortamda engelli birey olması durumları arasında istatistiksel olarak anlamlı fark saptandı. Sürekli ilaç kullananların, ailesinde engelli birey ve/veya 65 yaş üstü birey olanların ve sigara kullananların uyku kalitesi puanları "yüksek" ve anlamlı bulunmuştur. Koronavirüse yakalananların, ailesinde koronavirüse yakalananların ve/veya koronavirüsten vefat eden yakını olan öğrencilerin uyku kalitesi puanları "yüksek" ve anlamlı bulunmuştur.

Sonuç: Öğrencilerin COVID-19 pandemisi döneminde anksiyete sıklığının arttığı ve uyku kalitesinin bozulduğu söylenebilir. Ailede 65 yaş üzeri bireyin olması, engelli bireyin olması, koronavirüse yakalanmış olması ve/veya yakınlarından birini koronavirüsten kaybetmiş olması, öğrencilerin anksiyete ve uyku kalitesi puanını etkilemiştir.

Anahtar Kelimeler: Üniversite öğrencileri, COVID-19 pandemisi, anksiyete, uyku kalitesi

Introduction

Pandemics and contagious diseases had been among the disasters that affected the social, political, cultural, scientific, and economic conditions of societies, as well as causing human deaths in every period of history (1). The Coronavirus disease-2019 (COVID-19) outbreak, which emerged in Wuhan, China in December 2019 and spread on a global scale in a short time, was declared a pandemic by the World Health Organization on March 11, 2020. Countries applied measures such as the closure of schools and workplaces, social isolation, quarantine of patients and contacts, and calls to stay at home to fight the disease. These and similar measures altered social

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life (2,3). It is estimated that approximately 1.5 billion young people had been out of education during the pandemic process all around the world (4). A study that was conducted among young people who were away from education and work-life showed that young people went to bed late and woke up later, spent more time in bed with lower sleep quality, and therefore, there were changes in the perception of time and the use of electronic devices. Higher levels of depression, anxiety, stress symptoms, and trouble sleeping were detected among these individuals (5).

The pandemic caused not only the risk of death, infection but also psychological disorders. It can be argued that sleep quality deteriorated and the frequency of depression and anxiety increased during the COVID-19 pandemic (3).

Research has focused on COVID-19-related physical and mental health and sleep. Recent studies of the general population in China have found that female gender, being a student, is associated with suggestive COVID-19 symptoms and perceived lower quality of life, and higher rates of anxiety and depression (6-9). Another study showed that posttraumatic stress disorder symptoms were reported by 7% of Wuhan residents after the COVID-19 outbreak, especially by women. It has been reported that people younger than 35 who spend more than 3 hours on news about COVID-19 have higher levels of anxiety (10).

A recent study by the European Academy for Cognitive Behavioral Therapy for Insomnia on sleep problems during quarantine due to the COVID-19 pandemic has drawn attention to sleep and insomnia (11). In a study in which they evaluated changes in sleep patterns, time perception and use of electronic devices involving 1310 young adults, they found that digital media use increased before going to bed in the evening. They also stated that people go to bed and wake up later and spend more time in bed with lower sleep quality (12). In another study, they stated that the prevalence of insomnia increased significantly, the time spent in bed and total sleep time increased, and sleep efficiency decreased significantly during the COVID-19 outbreak (5).

In a study involving 400 students and academic staff in Italy, they found an increase in bedtime, delay in falling asleep and waking time, and worsening sleep quality and insomnia symptoms before and during the COVID-19 emergency. Especially during quarantine, the effect of delay in bedtime and waking up was more pronounced in students. While there was a 24% prevalence of insomnia in employees before COVID-19; this increased significantly during COVID-19, reaching 40%, compared to only 15% for workers who had trouble falling asleep, and this increased to 42%. In the same study, 27.8% of the students showed depressive symptoms, while 34.3% showed anxious symptoms (13). In a study conducted in athletes in Turkey, it was stated that the coronavirus anxiety state of the athletes was positively related to the sleep quality, and therefore, as the coronavirus anxiety levels increased, their sleep quality decreased (14).

Important work has been carried out regarding the fight against the disease since March 10, 2020, when the first case was detected in our country. Suspending face-to-face education in education and training institutions and starting distance education was one of these measures. In parallel with this, compulsory stay at home and curfews caused anxiety, depression, fear, stress and sleep problems, etc. in society. The present study was conducted to investigate the effects of the COVID-19 pandemic on the anxiety and sleep levels of university students.

Materials and Methods

The population of this cross-sectional study consisted of students (n=940) who studied in the health departments of Mardin Artuklu University. The sampling size was not calculated and it was aimed to contact the entire population. Before the study was commenced, the necessary permissions were obtained from the Ministry of Health, Mardin Artuklu University Faculty of Health Sciences Dean's Office, and Mardin Artuklu University Scientific Study and Publication Ethics Commission with the number 34233153-050.06.04 on 11.06.2020. People who studied in any of the healthcare departments of the university and had internet, e-mail addresses, computers, tablets, or smartphones were included in the study. The study was conducted between 20.06.2020 and 15.07.2020. The study was conducted on the students who studied in the health departments of Mardin Artuklu University and gave their consent by filling out the questionnaires sent over the electronic link. Repeated entries of the students were prevented. It was explained on the first page of the link that every question in the study was obligatory, there was no return to the answered question, and that no question would be left blank. The prevention of entering the data again from the same device was ensured by IP and cookie control, then the data increase was followed regularly and the data collection process of the study was terminated as the data increase stopped for one month. A total of 346 people were contacted. Responsiveness rate is 36.80%.

The study, along with its limitations of being a quantitative study, was limited to people who had internet access, used social networks, and agreed to participate in the study. The fact that the study was conducted in a certain period creates a common limitation, especially for such studies. One of the main limitations of the present study was that it is difficult to draw any conclusions regarding its long-term impacts because of the cross-sectional nature of the study. Also, there was the possibility of selection bias as the study was conducted with an online survey. Individuals who did not have internet, could not use smartphones or e-mail, or did not want to participate in the study were not included in the study.

A three-part questionnaire was used as the data collection tool in the study. In the first part, some questions covered the sociodemographic characteristics of the students, in the second part, the Beck Anxiety Inventory (BAI) that was developed by Beck et al. (15) was used. BAI, which was developed by Beck et al. (15) in 1988, is used to determine the frequency of anxiety symptoms. The validity and reliability study of the scale was conducted in 1988 by Ulusoy et al. (16) in our country. The validity and reliability of the scale were found to be Cronbach

alpha: 0.92 for all healthcare professionals. In the present study, the Cronbach alpha reliability coefficient was found to be 0.92. In this Likert-type 21-item scale, each item is scored between 0 and 3. The highest score that can be obtained from the scale is 63. Scores between 8-15 were classified as "mild anxiety", 16-25 points were classified as "moderate anxiety", and 26-63 points as "severe anxiety". BAI is a reliable scale that was prepared to distinguish between anxiety and depression with a high level of validity (16). The reliability of the anxiety scale was found to be high as Cronbach's alpha: 0.856 in the study.
The Pittsburgh Sleep Quality Index (PSQI) was used in the third part. PSQI, was developed by Buysse et al. (17) in 1989. The validity and reliability study for Turkey was done by Agargün et al. (18), and the Cronbach alpha coefficient was found to be 80. The PSQI was developed for several purposes; to establish a reliable, valid, and standardized measure of sleep quality, distinguish between good and poor sleepers, enable clinicians and studies to comment on the sleep of people to whom the scale is administered, and is also used to clinically evaluate and inform various sleep disorders that may affect sleep quality. The scale has a total of 24 questions 19 of which were self-evaluation questions. The remaining 5 questions were answered by the spouse or roommate of the individual. Questions answered by the spouse or roommate were not taken into account when calculating the index score. Each item is scored and evaluated between 0-3 points. The total score is between 0-21. A high total score indicates poor sleep quality. A total score greater than 5 indicates poor sleep quality. There were 7 components in the index; subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction. The PSQI score is obtained by summing the scores of all components. An increase in the score indicates a decrease in sleep quality.

Statistical Analysis

The data obtained in the study were evaluated in the computer with the Statistical Package for the Social Sciences (SPSS) 22.0 statistical program. Frequency and percentage analyzes were used to determine the descriptive characteristics of the participants, and mean and standard deviation statistics were used to analyze the scale. According to the relevant literature, to determine whether the sleep quality mean score shows a normal distribution, it is expected that Kurtosis is 0.109 and Skewness is 0.565, and to determine whether the anxiety score mean has a normal distribution, it is expected that Kurtosis is 0.831 and Skewness is 1.231, and if the results of the Kurtosis - Skewness values of the variables are between +1.5 and -1.5 +2.0 and -2.0, it is considered a normal distribution. A normal distribution is considered to be between 1.5 and -1.5 +2.0 and -2.0. The relations between the dimensions determining the scale levels of the participants were examined with correlation and lineer regression analyzes. T-test, one-way Analysis of Variance and post-hoc (Tukey, LSD) analyzes were used to examine the differences in scale levels according to the descriptive characteristics of the participants.

Results

A total of 70.5% of the students who participated in the study were women, 41.6% of their mothers were uneducated, those with equal income to expenses were 56.1%, 72.5% of them lived in a nuclear family, 54.3% of them lived in the city center, 9.0% of them had a disabled person in their family, and 22.5% of them had individuals over the age of 65, 10.4% of the students who participated in the study had a chronic disease, 9.0% used drugs, 38.4% smoked, 9.2% evaluated their health as bad, 28.6% had applied to a healthcare institution in the last

Table 1. Distribution of participants according to descriptive characteristics

Groups	Frequency (n)	Percentage (%)
Gender (n=346)		
Male	102	29.5
Female	244	70.5
Mother's educational status (n=346)		
Illiterate	144	41.6
Literate	50	14.5
Primary school	118	34.1
High school and above	34	9.8
Father's educational status (n=346)		
Illiterate	17	4.9
Literate	45	13.0
Primary school	149	43.1
High school	98	28.3
Undergraduate	37	10.7
Economic status (n=346)		
Income less than expenses	129	37.3
Income equal to expenses	194	56.1
Income more than expenses	23	6.6
Family type (n=346)		
Elementary family	251	72.5
Extended family	95	27.5
Number of individuals in family (n=346)		
1-5	93	26.9
6-10	220	63.6
10 and above	33	9.5
Residence (n=346)		
City	188	54.3
District	115	33.2
Village	43	12.4
Presence of chronic disease (n=346)		
No	310	89.6
Yes	36	10.4
Using continuous medication (n=346)		
No	315	91.0
Yes	31	9.0

Table 1. Continued		
House type (n=346)		
Slum	26	7.5
Flat	210	60.7
Other	110	31.8
Smoking status (n=346)		
No	213	61.6
Yes	133	38.4
Presence of disabled person in family (n=346)		
No	315	91.0
Yes	31	9.0
Heath evaluation (n=346)		
Good	165	47.7
Moderate	149	43.1
Bad	32	9.2
Application to healthcare institution in the last few months (n=346)		
No	247	71.4
Yes	99	28.6
Regular exercise status		
No	271	78.3
Yes	75	21.7
Regular nutrition (n=346)		
No	181	52.3
Yes	165	47.7
Having sleep problems (n=346)		
No	180	52.0
Yes	166	48.0
Presence of individual over the age of 65 at home (n=346)		
No	268	77.5
Yes	78	22.5
Being infected with coronavirus (n=346)		
No	295	85.3
Yes	51	14.7
Being infected with coronavirus in family (n=346)		
No	131	37.9
Yes	215	62.1
Presence of relative dying due to coronavirus (n=346)		
No	261	75.4
Yes	85	24.6
Having undergone coronavirus quarantine (n=346)		
No	281	81.2
Yes	65	18.8

few months, 21.7% exercised regularly, 47.7% ate regularly, and 48.0% said that they had sleep problems (Table 1).

A total of 14.7% of the students who participated in the study were infected with the Coronavirus, the members of the family of 62.1% were infected with the Coronavirus, 24.6% of them had a relative who died from Coronavirus, and 18.8% stated that they had undergone Coronavirus quarantine (Table 1).

The mean "sleep quality" score of the students who participated in the study was found to be 7.370±3.665 (min=1; max=21), and the mean of "anxiety" was 12.725±12.794 (min=0; max=52) (Table 2).

The distribution of the students who participated in the study according to sleep quality scores was greater than 5, with 63.3% "bad sleep", 36.7% of them were 5 or below with "good sleep".

When the correlation analyses between sleep quality and anxiety scores were examined, a positive (r=0.51 89/*p<0.005) correlation was detected between anxiety and sleep quality (Table 3).

The regression analysis that was to determine the cause-effect relation between anxiety and sleep quality was found to be significant (F=124.106; p=0.000<0.05). The total change in sleep quality level was explained by anxiety at a rate of 26.3% (R2=0.263). Anxiety increases the sleep quality score (ß=0.148) (Table 4).

The difference between the mean anxiety scores of the students who participated in the study and the status of being a woman, mother's education status, having a chronic disease, using continuous drugs, smoking, having a disabled person in the living environment, and being 65 years old or older in the family was found to be significant (p<0.05) (Table 5).

The anxiety scores of the students who participated in the study and who perceived their health as "moderate" and "good" and those who applied to a health institution in the last few months were found to be high (p<0.05). The anxiety scores of those who did not exercise regularly, those who did not have regular eating habits, and those who had sleep problems were also found to be high (p<0.05) (Table 5).

The anxiety scores of the students who participated in the study and who were infected with the Coronavirus, who had Coronavirus in their family, and/or who had a relative who died from the Coronavirus were found to be high and significant (p<0.05) (Table 5).

No significant differences were detected between gender, mother's education, father's education, economic status, family

Table 2. The distribution of students' mean scale scores

	n	Mean	SD	Min.	Max.
Sleep quality	346	7.370	3.665	1.000	21.000
Anxiety	346	12.725	12.794	0.000	52.000

SD: Standard deviation, Min: Minimum, Max: Maximum

Table 3. The correlation analysis between scales

		Sleep quality
Anxiety	r	0.515*
	p	0.000

<0.05; *<0.01; correlation analysis

Table 4. The effect of anxiety on the prediction of sleep quality regression analysis							
Dependent variable	**Independent variable**	**ß**	**t**	**p**	**F**	**Model (p)**	**R2**
Sleep quality	Constant	5.493	23.006	0.000	124.106	0.000	0.263
	Anxiety	0.148	11.140	0.000			

Table 5. The differences in sleep quality and anxiety scores according to descriptive characteristics of students			
Demographic features	**n**	**Sleep quality**	**Anxiety**
Gender		Mean ± SD	Mean ± SD
Male	102	7.167±3.820	9.922±10.215
Female	244	7.455±3.603	13.898±13.577
t=	-	-0.666	-2.659
p=	-	0.506	**0.003**
Mother's educational status		Mean ± SD	Mean ± SD
Illiterate	144	7.389±3.436	13.215±13.332
Literate	50	7.000±3.817	12.700±12.578
Primary school	118	7.458±3.711	11.263±11.395
High school and above	34	7.529±4.308	15.765±15.086
F=	-	0.214	1.227
p=	-	0.887	0.300
Father's educational status		Mean ± SD	Mean ± SD
Illiterate	17	6.824±2.834	9.471±13.068
Literate	45	7.111±3.582	15.889±14.573
Primary school	149	7.644±3.716	10.228±10.221
High school	98	7.347±3.888	15.429±14.325
Undergraduate	37	6.892±3.348	13.270±13.688
F=	-	0.515	3.598
p=	-	0.725	**0.007**
Post-hoc=	-	-	2>3. 4>3 (p<0.05)
Economic status		Mean ± SD	Mean ± SD
Income less than expenses	129	7.969±4.123	12.992±13.192
Income equal to expenses	194	7.016±3.328	12.773±12.435
Income more than expenses	23	7.000±3.357	10.826±13.921
F=	-	2.776	0.282
p=	-	0.064	0.755
Family type		Mean ± SD	Mean ± SD
Elementary family	251	7.534±3.676	12.976±13.260
Extended family	95	6.937±3.620	12.063±11.513
t=	-	1.354	0.592
p=	-	0.177	0.554
Number of individuals in family		Mean ± SD	Mean ± SD
1-5	93	7.602±3.557	13.247±13.419
6-10	220	7.377±3.746	12.868±12.763
11 and above	33	6.667±3.425	10.303±11.196
F=	-	0.794	0.681
p=	-	0.453	0.507
Residence		Mean ± SD	Mean ± SD
City	188	7.468±3.688	13.186±13.586
District	115	6.922±3.388	11.652±11.110

Table 5. Continued			
Village	43	8.140±4.178	13.581±13.523
F=	-	1.885	0.621
p=	-	0.153	0.538
Presence of chronic disease		Mean ± SD	Mean ± SD
No	310	7.277±3.615	11.994±12.119
Yes	36	8.167±4.039	19.028±16.471
t=	-	-1.380	-3.163
p=	-	0.169	0.017
Using continuous medication		Mean ± SD	Mean ± SD
No	315	7.178±3.566	11.565±11.564
Yes	31	9.323±4.134	24.516±18.024
t=	-	-3.149	-5.610
p=	-	**0.002**	**0.000**
House type		Mean ± SD	Mean ± SD
Slum	26	7.500±4.236	11.731±10.894
Flat	210	7.462±3.537	12.919±13.292
Other	110	7.164±3.789	12.591±12.320
F=	-	0.256	0.108
p=	-	0.775	0.898
Smoking status		Mean ± SD	Mean ± SD
No	213	7.009±3.567	10.864±9.953
Yes	133	7.947±3.758	15.707±15.943
t=	-	-2.330	-3.480
p=	-	**0.020**	**0.002**
Presence of disabled person in family		Mean ± SD	Mean ± SD
No	315	7.225±3.640	11.794±11.997
Yes	31	8.839±3.652	22.194±16.558
t=	-	-2.354	-4.434
p=	-	0.019	0.002
Heath evaluation		Mean ± SD	Mean ± SD
Good	165	6.436±3.427	9.164±10.144
Moderate	149	7.812±3.412	15.141±14.029
Bad	32	10.125±4.286	19.844±13.777
F=	-	16.904	15.151
p=	-	**0.000**	**0.000**
Post-hoc=	-	2>1. 3>1. 3>2 (p<0.05)	2>1. 3>1 (p<0.05)
Application to healthcare institution in last several months		Mean ± SD	Mean ± SD
No	247	7.117±3.582	11.866±12.413
Yes	99	8.000±3.812	14.869±13.526
t=	-	-2.034	-1.981
p=	-	**0.043**	**0.048**
Regular exercise status		Mean ± SD	Mean ± SD
No	271	7.620±3.572	13.458±12.885
Yes	75	6.467±3.874	10.080±12.177
t=	-	2.429	2.033
p=	-	**0.016**	**0.043**
Regular nutrition		Mean ± SD	Mean ± SD

No	181	8.403±3.537	14.934±13.922
Yes	165	6.236±3.473	10.303±10.969
t=	-	5.742	3.414
p=	-	**0.000**	**0.001**
Having sleep problems		Mean ± SD	Mean ± SD
No	180	5.511±2.723	9.739±11.224
Yes	166	9.386±3.491	15.964±13.613
t=	-	-11.558	-4.655
p=	-	**0.000**	**0.000**
Presence of individual over the age of 65 at home		Mean ± SD	Mean ± SD
No	268	7.116±3.635	10.160±9.900
Yes	78	8.244±3.658	21.539±17.089
t=	-	-2.409	-7.437
p=	-	**0.017**	**0.000**
Being infected with Coronavirus		Mean ± SD	Mean ± SD
No	295	7.000±3.495	10.661±11.218
Yes	51	9.510±3.921	24.667±14.794
t=	-	-4.648	-7.823
p=	-	**0.000**	**0.000**
Being infected with Coronavirus in family		Mean ± SD	Mean ± SD
No	131	6.733±3.739	9.840±11.809
Yes	215	7.758±3.573	14.484±13.076
t=	-	-2.544	-3.322
p=	-	**0.011**	**0.001**
Presence of relative dying due to Coronavirus		Mean ± SD	Mean ± SD
No	261	7.096±3.665	11.065±11.825
Yes	85	8.212±3.556	17.824±14.304
t=	-	-2.456	-4.338
p=	-	**0.015**	**0.000**
Having undergone Coronavirus quarantine		Mean ± SD	Mean ± SD
No	281	7.317±3.670	12.317±12.886
Yes	65	7.600±3.665	14.492±12.329
t=	-	-0.561	-1.236
p=	-	0.575	0.217
SD: Standard deviation			

type, being chronically ill, housing type, and sleep quality of the students who participated in the study (p>0.05) (Table 5). Among the students who participated in the study, the sleep quality scores of those who used continuous drugs, smoked, had a family member with a disability and a family member over the age of 65 were found to be high and significant (p<0.05). The sleep quality scores of those who evaluated their health as "moderate", applied to a health institution in the last few months, did not exercise regularly, and did not eat regularly were found to be "high" and "significant" (p<0.05) (Table 5). The sleep quality scores of the students who were infected with Coronavirus, those who had Coronavirus in their families, and/or those who had a relative who died from the Coronavirus were found to be "high" and "significant" among the students who participated in the study (p<0.05) (Table 5).

Discussion

In the present study, it was found that students experienced "severe anxiety" and had poor sleep quality during the pandemic process. In the study of Kabeloğlu and Gül (3), it was found that sleep quality deteriorated and the frequency of depression and anxiety increased during the COVID-19 pandemic. There were studies in the literature reporting that adults had high perceived stress levels because of the COVID-19 pandemic (19-21). In a study that was conducted by Yüksel Kaçan et al. (22), it was found that students experienced sleep

problems that affected their sleep quality negatively during the COVID-19 pandemic. In the study that was conducted by Kök Eren (23), it was determined that 65.3% of the participants had sleep problems at "bad sleep level" after COVID-19. It was found in studies conducted on the COVID-19 pandemic that the sleep quality of the participants was low (10,7). In the study of Aşılar et al. (24), it was reported that 60.4% of university students had poor sleep quality. It can be said that measures such as staying at home, distance education, mask, social distancing, hygiene, which were put into effect by the administrations of countries after the pandemic, the absence of a definitive cure despite the spread of the disease, information pollution, etc. increased mental disorders such as depression and anxiety and sleep disorders in students.

A positive and significant relation was detected between the anxiety and sleep quality of the students. Similarly, in the study of Kök Eren (23), anxiety levels were found to be higher in those who had sleep problems before and/or after COVID-19. In their study, Kabeloğlu and Gül (3) found a positive correlation between PSQI scores and BAI scores. Studies conducted abroad during the COVID-19 pandemic also reported that there was a significant relationship between sleep quality and anxiety (25,26). In their study, Başkan and Güneş (19) reported that as perceived stress increased, sleep quality decreased. A study that was conducted in China showed that reducing common stress could help improve the sleep quality of individuals (7). The stress caused by the COVID-19 pandemic has not only affected the mood of the students but also caused sleep disturbances.

It was found in the present study that female students experienced more anxiety because of the COVID-19 outbreak than male students, but gender did not affect sleep quality. Similar results were reported in the literature (19,23,27). This may be because women were more sensitive and focused more on details. There were also studies in the literature reporting that there were no relations between gender and sleep quality (23,10,28-30). The fact that anxiety was found to be higher in female students may be related to physiological conditions such as genetic predisposition, hormone, and cortisol levels of women. Gender may not affect sleep quality.

The economic situation does not affect the anxiety and sleep quality of students. Similar to the study found, the studies that were conducted by Ergün et al. (31) and Aşılar et al. (24) also found that there were no relations between economic status and sleep quality (24-31). Poor economic situation may not be a significant risk factor for students to experience anxiety.

The anxiety and sleep quality scores of the students who smoked were found to be elevated. Studies in the literature were also consistent with the results of this study (32,33). This can disrupt night sleep, difficulty and stress in falling asleep, and decrease in sleep quality with the stimulating effect of the nicotine in cigarettes.

In the present study, the mean anxiety and sleep quality scores of the students who had disabled individuals and individuals over the age of 65 in their living environment were higher. It can be argued that students were worried about their relatives because of the problems caused by COVID-19.

The anxiety and sleep quality scores of the students who had sleep problems were found to be elevated. In the study that was conducted by Kök Eren (23), it was determined that 183 people (78.9%) who had good sleep levels did not experience sleep problems after COVID-19, and 113 people (65.3%) who had poor sleep levels experienced sleep problems after COVID-19. A study that was conducted in Italy during the COVID-19 pandemic reported that 57.1% of individuals had poor sleep quality (34). Social isolation and other changes in life, which were applied to protect against the virus, affect sleep duration, sleep delay, bedtime and wake-up time, and impair sleep quality (11,35).

The anxiety and sleep quality scores of the students who were infected with the Coronavirus were found to be elevated. The complexity and uncertainties caused by COVID-19 may have affected students' anxiety and sleep quality directly. The anxiety scores and sleep quality scores of the students whose families were infected with the Coronavirus were found to be higher. The fact that a relative was infected with the Coronavirus may have increased the anxiety of the students decreasing their sleep quality. Anxiety scores and sleep quality scores of students who had a relative who died from Coronavirus were also found to be higher. The loss of a relative because of the disease may cause an increase in health concerns in students, and therefore, a decrease in sleep quality.

Conclusion

It can be argued that the anxiety frequency of the students increased and their sleep quality deteriorated during the COVID-19 pandemic period. Smoking affects sleep quality. Having an individual over the age of 65 in the family and a disabled individual affect anxiety and sleep quality scores. The fact that a relative or the students were infected with the Coronavirus and lost a relative because of the Coronavirus affects the anxiety scores and sleep quality scores of the students. Therefore, it is ensured that anxiety levels are controlled by organizing psychoeducational programs for situations identified as risky in sleep quality, and by planning trainings for effective coping methods in stressful situations that they may encounter in later life. In addition, it is recommended that the negative effects of insomnia on physical and mental health be added to the lessons within the scope of the curriculum. It is recommended that similar studies be conducted in larger populations in terms of evaluating the long-term results of COVID-19 with different studies to be done.

Ethics

Ethics Committee Approval: Ethics approval of the study was taken from Mardin Artuklu University Scientific Study and Publication Ethics Commission with the number 34233153-050.06.04 on 11.06.2020.

Informed Consent: The study was conducted on the students who studied in the health departments of Mardin Artuklu University and gave their consent by filling out the questionnaires sent over the electronic link.

Peer-review: Internally and externally peer-reviewed.

Authorship Contributions

Design: S.Ç., V.B.D., H.K., Data Collection or Processing: S.Ç., V.B.D., H.K., Analysis or Interpretation: S.Ç., V.B.D., H.K., Literature Search: S.Ç., V.B.D., H.K., Writing: S.Ç., V.B.D., H.K.

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