



## ARAŞTIRMA / RESEARCH

# Effect of the anxiety to catch coronavirus (COVID-19) on bedtime procrastination

Koronavirüse (COVID-19) yakalanma kaygısının uyku ertelemeye etkisi

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### Abstract

**Purpose:** The novel Coronavirus (Covid-19) affects societies economically, socially, psychologically, and behaviorally. Sleep is one of the behavioral factors that affect the immune system. In this context, this study aims to examine the effect of the anxiety to catch the Covid-19 on bedtime procrastination.

**Materials and Methods:** The research is cross-sectional and quantitative research. The data were collected by questionnaire technique. In the study, "Athlete's Anxiety to Catch the Novel Coronavirus (Covid-19) Scale (AACNCS)" and "Bedtime Procrastination Scale" were used. The scales were distributed through online platforms, and a total of 768 individuals were included in the study

**Results:** The results of the research revealed that the anxiety to catch the Covid-19 affected bedtime procrastination positively. The study has concluded that women's anxiety and bedtime procrastination level is higher. The mean score of bedtime procrastination was higher for those who do not have to work outside. The findings exhibit that those with chronic diseases in their family are more anxious to catch the Covid-19.

**Conclusion:** It is possible to state that health communication efforts should be carried out to reduce the anxiety level of the society. Besides, activities should be carried out to protect the mental health of society through preventive mental health services.

**Keywords:** Covid-19, sleeplessness, Covid-19 anxiety

### Öz

**Amaç:** Yeni Koronavirüs toplumları ekonomik, sosyal, psikolojik ve davranışsal olarak etkilemektedir. Uyku da bağımsızlık sistemi üzerinde etkili olan davranışsal faktörlerden biridir. Bu bağlamda bu çalışmanın amacı Yeni Koronavirüse yakalanma kaygısının uyku ertelemeye etkisini incelemektir.

**Gereç ve Yöntem:** Araştırma kesitsel ve kantitatif bir araştırmadır. Veriler anket tekniği ile toplanmıştır. Çalışmada "Koronavirüse (Covid-19) Yakalanma Kaygısı Ölçeği" ve "Uyku Erteleme Ölçeği" kullanılmıştır. Ölçekler online platformlar aracılığı ile dağıtılmış, araştırmaya toplam 768 yetişkin birey dahil edilmiştir.

**Bulgular:** Araştırma sonucunda Yeni Koronavirüse yakalanma kaygısının uyku ertelemeyi pozitif yönde etkilediği tespit edilmiştir. Araştırmada kadınların daha fazla kaygılandıkları ve uyku ertedikleri sonucuna ulaşılmıştır. Dışarıda çalışma zorunluluğu olmayanların uyku erteleme ortalaması daha fazla çıkmıştır. Ailesinde kronik hastalığı olanların Yeni Koronavirüse yakalanma kaygısının daha fazla olduğu tespit edilmiştir.

**Sonuç:** Toplumun kaygı düzeyini azaltacak sağlık iletişimi çabalarının gerçekleştirilmesi gerektiği ifade edilebilir. Ayrıca koruyucu ruh sağlığı hizmetleri aracılığı ile toplumun ruh sağlığının korunmasına yönelik faaliyetler gerçekleştirilmelidir.

**Anahtar kelimeler:** Covid-19, uykusuzluk, Covid-19 kaygısı

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## INTRODUCTION

The New Coronavirus (Covid-19), which emerged in China at the end of 2019, initially caused an epidemic in Wuhan City of China, then it was defined as a pandemic by the World Health Organization (WHO) with its spread to the world from the first months of 2020<sup>1</sup>. Although Covid-19 is a member of the previously known coronavirus family, it has had more serious consequences than other outbreaks such as SARS and MERS that emerged as members of the coronavirus family. For example, in the SARS epidemic, the number of cases was reported as 8422 and the number of deaths as 916<sup>2</sup>. However, in the Covid-19 outbreak, the number of cases has approached 98 million and the number of deaths has approached 2.1 million<sup>3</sup>. The main symptoms of Covid-19 are symptoms such as fever, cough, and breathing hard. On the other hand, it is known that the elderly and people with certain chronic diseases have a higher risk of death<sup>4</sup>. Although the transmission ways of the disease have been identified, there is no exact information on how to treat the infection that causes the disease. Countries are trying different treatment methods and on the other hand, vaccine and drug development research continue<sup>5</sup>. WHO reports that the most important factor in protection from Covid-19 is having information about the disease. At this point, the most important practices are expressed as washing the hands frequently, using alcohol-based disinfectants, and not touching the face area<sup>6</sup>. Additionally, the importance of having a strong immune system against Covid-19 is known and frequently emphasized<sup>7-9</sup>.

Sleep is expressed as a physiological rest and a diminished state of consciousness that serves many functions, including strengthening the immune system<sup>10</sup>. It constitutes approximately one-third of human life and has important functions in maintaining body balance. Therefore, it is one of the basic biological needs<sup>11</sup>. It is known to be an important regulator of the immune system<sup>12-14</sup>. As a result of many studies carried out in the 2000s, a great deal of evidence has been reached that sleep strengthens the immune system as well as its function of helping to heal<sup>15,16</sup>. Besides, there are studies in which insomnia is associated with various diseases such as chronic and metabolic diseases, cancer, and depression<sup>10,14,17</sup>. Also, it is known that insomnia increases the risk of getting sick, decreases attention, affects cognitive functions and memory negatively. In the International Classification of Sleep Disorders

book, insomnia is defined as “a state that manifests itself with problems in daily life, in addition to repetitive impairments in the initiation, continuity, integrity or quality of sleep, although the conditions are suitable for sleeping”<sup>18</sup>. On the other say, it is defined as difficulty falling asleep or staying asleep, waking up early in the morning, and sleep dissatisfaction<sup>19</sup>.

Sleep is also associated with the immune system and therefore it is stated that insomnia can cause changes in immune response<sup>11,20</sup>. Advanced levels of sleep deprivation are fatal. Besides, limited sleep deprivation can make people vulnerable to infections. Researchers state that sleep helps recovery especially in infectious diseases and the increase in the need for sleep in infectious diseases supports this knowledge<sup>21</sup>. On the other hand, researchers indicate that changes in the immune system for various reasons also cause changes in sleep patterns<sup>22,23</sup>.

Human beings stand out as the only species that voluntarily chooses bedtime procrastination<sup>11</sup>. For this reason, the effects of bedtime procrastination on the human immune system may also differ from other species. Sleeplessness is endemic in society and is one of the most common complaints of people who experience sleep loss, environmental or psychological stress during only part of the night, travel between time meridians, work shifts, or have a psychiatric disorder<sup>13</sup>. In recent years, there has been a significant decrease in average sleep duration and sleep quality in society. It is stated that a lack of sleep can decrease immunity in society<sup>24</sup>.

Many studies have been carried out to find out that how people are psychologically affected by the pandemic process<sup>25,26</sup>. Some of these studies also examined the effects of the pandemic on sleep<sup>27,28</sup>. For example, the findings of a study examining anxiety disorder, depression, and sleep quality during the pandemic period in China revealed that the participants experienced mental health problems at different levels. The findings of the same study also exhibited that 35% of the participants experienced anxiety, 20% experienced depression, and the quality of sleep was at the level of 18%<sup>29</sup>. The findings of another study showed that 55% of the participants experienced sleep disorder and reasons such as anxiety about Covid-19 and low perceived social support were related to sleep disorder<sup>30</sup>. Another study carried out by Stanton et al. (2020) revealed that negative changes in physical activity, sleep, smoking, and alcohol intake were found to be associated with

high depression, anxiety, and stress symptoms<sup>31</sup>. Another study has been conducted to compare sleep problems experienced during the pandemic process with the latest research results before the pandemic. The results showed that sleep problems, which were 49% in the latest research results carried out before the pandemic, were 74% in this study<sup>32</sup>.

Due to the pandemic and quarantine period, people have been exposed to high levels of stress. This situation can increase the levels of stress, anxiety, depression and disrupt sleep. Due to sleep's regulating effect on emotional state, it is a known fact that experienced sleep problems harm emotional functioning during the day. In the current state, sleep problems must be managed properly<sup>33</sup>. Although there are studies on the effect of Covid-19 on sleep, there is no study in the literature on the relationship of Covid-19 with bedtime procrastination. The findings of a study, which was conducted only on university students, exhibited that the time to go to sleep was fifty minutes later on weekdays and twenty-five minutes later on weekends during the Covid-19 pandemic<sup>34</sup>. The effect of sleep on the immune system is commonly known and it is also known that the immune system plays an important role in the fight against Covid-19. In this context, this study aims to determine the relationship between Covid-19 anxiety and bedtime procrastination. To the best of our knowledge, there is not sufficient quantitative study which examine Covid-19 and bedtime procrastination. Therefore, it can be estimated that the study fills a significant gap in the literature. Research questions are; Is there a statistically significant relationship between anxiety to catch Covid-19 and bedtime procrastination?; Is there a statistically significant difference in bedtime procrastination according to socio-demographic variables?; Is there a statistically significant difference in anxiety to catch Covid-19 according to socio-demographic variables?

## MATERIALS AND METHODS

This research is cross-sectional and quantitative research. Strengthening the Reporting of Observational studies in Epidemiology (STROBE) check-list was used to report the research results<sup>35</sup>. Due to the extraordinary situation caused by the pandemic, the questionnaire forms were created online and distributed through social networks (Facebook, Instagram, LinkedIn and Whatsapp) in line with the researchers' networks. In this context,

the sampling method used in the research is the convenience sampling method. The research was conducted between 01/11/2020-15/12/2020. During this period, a total of 2 reminders were made every 2 weeks. As a result, 768 people who voluntarily accepted to participate in the study and filled out the questionnaire form completely were included in the study. Inclusion criteria was as follows; being over 18 years of age, using social media and being literate. Informed consent form was added to the questionnaire and individuals who voluntarily accepted to participate in the study were included in the study.

Ethical permission was obtained from the developers via email for the use of the scales. Ethical approval was obtained with the decision of Tarsus University Scientific Research and Publication Ethics Committee, dated 26/10/2020 and numbered 2020/41. In addition, informed consent was obtained from the participants.

## Measures

A questionnaire form consisting of three parts was used as a data collection tool in the study.

### General Information Form

In the first part, a general information form about the participants was used. There are 11 questions in the form and the questions included are as follows; gender, age, educational status, family income (monthly), chronic illnesses in the family, people sharing the same house, 65 years and older living in the same house, curfew in the place of residence during the pandemic, obligation to work outside during the pandemic, last time to contact outside during the pandemic, frequency of contact outside during the pandemic.

### Athlete's Anxiety to Catch the Novel Coronavirus (Covid-19) Scale (AACNCS)

In the second part, the 16-item "Athlete's Anxiety to Catch the Novel Coronavirus (Covid-19) Scale (AACNCS)" developed by Tekkurşun Demir et al. (2020) was used<sup>36</sup>. The scale is a 5-point Likert scale and is scored from I strongly disagree (1) to I completely agree (5). The scale consists of two dimensions as individual anxiety (11 items) and social anxiety (5 items). The Cronbach's alpha value of individual anxiety is 0.844, the Cronbach's alpha value of social anxiety is 0.811, and the Cronbach's alpha value of the scale, in general, is 0.872.

### Bedtime Procrastination Scale

“Bedtime Procrastination Scale” used in the third section is a 9-item scale developed by Kroese et.al. (2014) and adapted into Turkish by Dinç et.al. (2016)<sup>37,38</sup>. Scale expressions are scored as a 5-point Likert type item. The scale consists of a single subscale. 5 of the scale items are positive (1<sup>st</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, and 8<sup>th</sup> items) and 4 of them are negative items (2<sup>nd</sup>, 3<sup>rd</sup>, 7<sup>th</sup>, and 9<sup>th</sup> items). The Cronbach’s alpha value of the scale is 0.865. This value shows that the scale is reliable.

Construct validity indicates the “degree to which a test can accurately measure an abstract concept in the context of the desired behavior”<sup>40</sup>. Factor analysis (principal component analysis) was used to examine the construct validity of the scales<sup>39</sup>. To reveal the factor structure of the scales, exploratory factor analysis was performed first. Before the factor analysis, as a result of the Kaiser-Meyer Olkin (KMO) and Bartlett tests, which were conducted to examine the suitability of the data and the sample for the principal components analysis, observations revealed that the Kaiser-Meyer Olkin (KMO) coefficient was 0.914 for the AACNCS and the Barlett test was significant ( $p < 0.001$ ). KMO value for the Bedtime Procrastination Scale was found to be 0.888 and the Barlett test was significant ( $p < 0.001$ ). The fact that the KMO coefficient is above 0.60 and the Barlett test is significant ( $p < 0.001$ ) shows that the data set is suitable for principal component analysis, it is factorizable and the sample size ( $n = 768$ ) is sufficient<sup>40,41</sup>.

In a multi-factor scale, items with high load values in more than one factor should be removed from the scale. Since there was no item with a high load value (above 0.45) in both factors, no items were removed from the scales<sup>42</sup>. In the AACNCS, there are two factors with an eigenvalue above 1. The total variance explained by the two factors together is 50.7%. In the Bedtime Procrastination Scale, there is one factor with an eigenvalue above 1 and the explained variance of it is 48.8%.

### Statistical analysis

The data obtained within the scope of the research were first regulated in Microsoft Excel, then transferred to the SPSS 21 Package program and AMOS. Data were first summarized with descriptive

statistics such as frequency, percentage, mean, and standard deviation, and then subjected to normal distribution analysis. In the normality test, the Kolmogorov-Smirnov test was used, and the results of the analysis revealed that the data were suitable for normal distribution. Due to the normal distribution of the data, t-test, and one-way variance analysis (ANOVA) analyses were used in groups independent of parametric tests. The significance value was set at  $P < 0.05$ .

## RESULTS

Table 1 includes the socio-demographic characteristics of the participants. 65.9% of the participants are women, 63.4% are undergraduate and 39.4% have an income of 4001 TL and above. While 90.1% of those included in the study do not have a chronic disease, 50.4% of them have a chronic disease in their family. 88% of the participants live with their families and 84.1% of them do not have an individual aged 65 or over in their family. A curfew is imposed in the province where 92.6% of them live.

As is seen in Table 2, the comparison of the means of the Covid-19 anxiety and the means of delayed bedtime according to the demographic variables of the participants is given. Independent sample t test was used in the examination of gender, chronic illness, chronic illness in the family, a person or persons aged 65 and over living in the same house, lockdown in the province during the pandemic, and the obligation to work outside during the pandemic process.

A one-way analysis of variance (ANOVA) was conducted to evaluate the educational status of the participants and the income status of the family. No significant difference was found in the anxiety to catch the Covid-19 and bedtime procrastination status in terms of the education and income levels of the participants. ( $p > 0.05$ ).

As seen, in the Table 2, there is a statistically significant difference in bedtime procrastination and anxiety to catch Covid-19 in terms of the gender of the participants. The mean score of the women was higher than the men. Observations showed that women have more anxiety about catching the Covid-19 and delay bedtime more than men.

**Table 1. Socio-demographic attributes of the participants**

Variable		Number (n=768)	Percentage (%)
Gender	Male	262	34.1
	Female	506	65.9
Educational Status	Primary Education	16	2.1
	High School	86	11.2
	Associate Degree	97	12.6
	Bachelor Degree	487	63.4
	Graduate Degree	82	10.7
Age	18-25	467	60,8
	26-35	201	26,2
	36 and above	100	13
Family income (monthly)	TRY 0-2500	256	33.3
	TRY 2501-4000	210	27.3
	TRY 4001 and above	302	39.4
Do you have a chronic disease?	Yes	76	9.9
Is there anybody in your family with a chronic disease?	Yes	387	50.4
Whom do you live with?	My Family	676	88.00
	My Relatives	7	0.9
	My Friends	32	4.2
	Alone	53	6.9
Are there any people aged 65 years or over who live in the house with you?	Yes, there are	122	15.9
Have you had lockdowns during the pandemic process in the city you live in?	Yes	711	92.6
Do you have the obligation to work outside during the pandemic?	Yes	198	25.8

**Table 2. Comparison of the AACNCS\* means and bedtime procrastination means according to the Socio-demographic variables of the participants**

Independent Variable	n	AACNCS Scores (Mean $\pm$ S.D.†)	Bedtime Procrastination Scale Scores (Mean $\pm$ S.D.†)
Gender			
Female	506	4.25 $\pm$ 0.63	3.32 $\pm$ 1.15
Male	262	3.07 $\pm$ 0.74	3.08 $\pm$ 1.11
t		-3.446	-2.764
p		0.001	0.006
Educational Status			
Primary Education-High School	102	4.16 $\pm$ 0.66	3.31 $\pm$ 1.11
Associate Degree	97	4.26 $\pm$ 0.67	3.32 $\pm$ 1.14
Bachelor Degree	487	4.19 $\pm$ 0.68	3.23 $\pm$ 1.14
Graduate Degree	82	4.12 $\pm$ 0.68	3.09 $\pm$ 1.25
F		0.658	0.764
p		0.515	0.578
Income Status of the Family			
TRY 0-2500	256	4.26 $\pm$ 0.61	3.29 $\pm$ 1.16
TRY 2501-4000	210	4.16 $\pm$ 0.69	3.22 $\pm$ 1.09
TRY 4001 and Above	302	4.14 $\pm$ 0.72	3.24 $\pm$ 1.17
F		2.435	0.404
p		0.088	0.668
Do you have a chronic disease?			
Yes	76	4.23 $\pm$ 0.69	3.34 $\pm$ 1.12

No	692	4.18±0.68	3.22±1.15
t		0.612	0.808
p		0.541	0.419
Is there anybody in your family with a chronic disease?			
Yes	387	4.25±0.65	3.27±1.18
No	381	4.12±0.70	3.20±1.11
t		2.703	0.957
p		0.007	0.354
Are there any people aged 65 years or over who live in the house with you?			
Yes	122	4.20±0.67	3.24±1.13
No	646	4.18±0.68	3.23±1.15
t		0.239	0.052
P		0.810	0.958
Have you had lockdowns during the pandemic process in the city you live in?			
Yes	711	4.19±0.68	3.23±1.15
No	57	4.16±0.67	3.35±1.10
t		0.285	-0.750
p		0.776	0.453
Do you have the obligation to work outside during the pandemic process?			
Yes	198	4.14±0.73	2.98±1.21
No	570	4.20±0.66	3.32±1.11
t		-1.138	-3.592
p		0.256	0.001

P <0,05 t >1,96; \*Athlete's Anxiety to Catch the Novel Coronavirus (Covid-19) Scale; †Standard Deviation

**Table 3. Comparison of the socio-demographic variables of the participants and the mean scores of the sub-dimensions of the AACNCS\***

Independent Variable	n	Individual Anxiety Scores (Mean ± S.D.†)	Social Anxiety Scores (Mean ± S.D.†)
Gender			
Female	506	4.11±0.75	4.04±0.69
Male	262	3.97±0.61	3.84±0.75
t		3.221	3.584
p		0.001	0.001
Educational Status			
Primary Education-High School	102	4.10±0.53	3.87±0.86
Associate Degree	97	4.10±0.56	4.02±0.70
Bachelor Degree	487	4.07±0.60	3.99±0.71
Graduate Degree	82	4.02±0.58	3.85±0.69
F		0.605	1.073
p		0.659	0.369
Income Status of the Family			
TRY 0-2500 <sup>1</sup>	256	4.10±0.57	4.09±0.65
TRY 2501-4000 <sup>2</sup>	210	4.04±0.60	3.93±0.74
TRY 4001 and Above <sup>3</sup>	302	4.05±0.60	3.90±0.75
F		0.826	5.516
p		0.438	0.004
Difference			1>4
Do you have a chronic disease?			
Yes	76	4.16±0.56	3.90±0.73
No	692	4.05±0.59	3.98±0.72
t		1.451	-0.860
p		0.147	0.390
Is there anybody in your family with a chronic disease?			
Yes	387	4.12±0.57	4.01±0.73

No	381	4.00±0.60	3.93±0.71
t		2.735	1.493
p		0.006	0.136
Are there any people aged 65 years or over who live in the house with you?			
Yes	122	4.061±0.57	3.973±0.77
No	646	4.069±0.59	3.976±0.71
t		-0.136	-0.033
P		0.892	0.975
Have you had lockdowns during the pandemic process in the city you live in?			
Yes	711	4.07±0.59	3.975±0.72
No	57	3.99±0.616	3.973±0.67
t		1.024	0.004
p		0.306	0.997
Do you have the obligation to work outside during the pandemic process?			
Yes	198	4.04±0.62	3.90±0.73
No	570	4.07±0.58	3.99±0.71
t		-0.730	-1.550
p		0.466	0.121

P < 0,05 t > 1,96; \*Athlete's Anxiety to Catch the Novel Coronavirus (Covid-19) Scale

**Table 4. Standardized regression weights on the Anxiety to Catch Coronavirus on Bedtime Procrastination**

			Estimate
Anxiety to Catch Coronavirus	<---	Individual Anxiety	0.761
Anxiety to Catch Coronavirus	<---	Social Anxiety	0.274
IA11	<---	Individual Anxiety	0.632
IA10	<---	Individual Anxiety	0.671
IA9	<---	Individual Anxiety	0.671
IA8	<---	Individual Anxiety	0.53
IA7	<---	Individual Anxiety	0.641
IA6	<---	Individual Anxiety	0.713
IA5	<---	Individual Anxiety	0.697
IA4	<---	Individual Anxiety	0.583
IA3	<---	Individual Anxiety	0.63
IA2	<---	Individual Anxiety	0.344
IA1	<---	Individual Anxiety	0.414
SA5	<---	Social Anxiety	0.691
SA4	<---	Social Anxiety	0.625
SA3	<---	Social Anxiety	0.641
SA2	<---	Social Anxiety	0.758
SA1	<---	Social Anxiety	0.713
Bedtime Procrastination	<---	Coronavirus Anxiety	0.137

IA: Individual Anxiety; SA: Social Anxiety

There is no significant difference in the anxiety to catch the Covid-19 and bedtime procrastination in terms of the presence of a chronic disease ( $p > 0.05$ ). However, a significant difference was found in terms of the state of having a chronic disease in the family in the mean of the anxiety to catch the Covid-19 ( $p < 0.05$ ). Observations revealed that the mean score of the anxiety to get the Covid-19 is higher in people with chronic diseases in their family. There is no difference in bedtime procrastination according to having chronic disease in the family ( $p < 0,05$ ).

No significant difference was found according to the condition of having a person or persons over 65 years of age living in the same house in terms of the means of the anxiety to catch the Covid-19 and bedtime procrastination ( $p > 0.05$ ). Likewise, no significant difference was found according to the lockdown in the province during the pandemic process in terms of the means of the anxiety to catch the Covid-19 and bedtime procrastination ( $p > 0.05$ ).

There is no significant difference in the mean scores

of anxiety to get Covid-19 according to the necessity to work outside during the pandemic ( $p > 0.05$ ). A significant difference has been found in bedtime procrastination according to obligation to work outside ( $p < 0.05$ ). The mean score of bedtime procrastination of those obligated to work outside is lower. As can be seen in Table 3, the comparison of the mean scores of the sub-dimensions of the AACNCS according to the demographic variables of the participants is given. Independent sample t test was used in the examination of gender, chronic illness, chronic illness in the family, a person or persons aged 65 and over living in the same house, lockdown in the province during the pandemic, and the obligation to work outside during the pandemic process.

Also, a one-way analysis of variance (ANOVA) was conducted to evaluate the educational status of the participants and the income status of the family. No significant difference has been found in the individual and social anxiety mean scores of the participants according to their educational status ( $p > 0.05$ ). There is also no significant difference in the mean scores of individual anxiety according to the income level of the family ( $p > 0.05$ ). However, there is a significant difference in social anxiety mean scores ( $p < 0.05$ ). The mean of those with an income of 0-2500 TL is

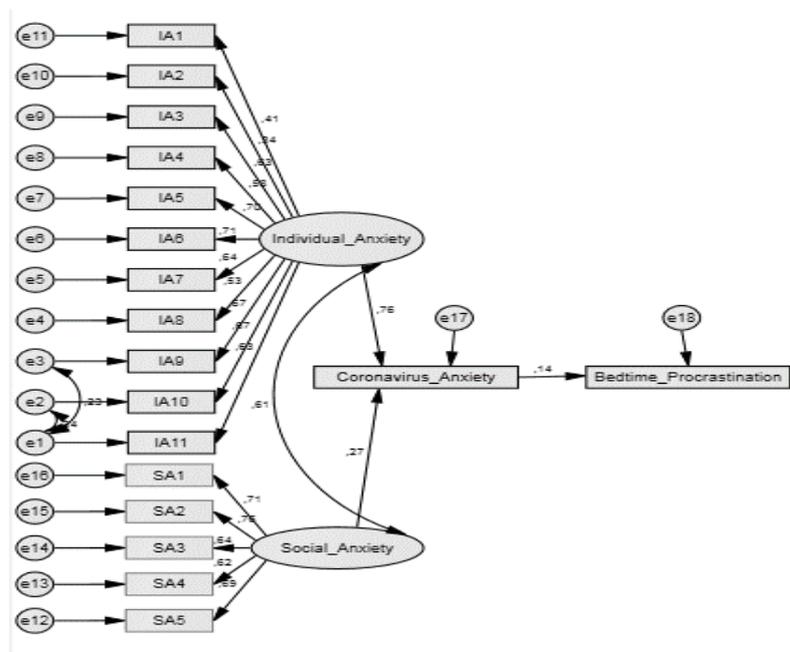
higher than the mean of those with 4001 TL and above.

When the t-test results in Table 3 were examined, a significant difference was found between the gender of the participants and their individual and social anxiety means ( $p < 0.05$ ). The mean score of the women was higher than men.

There is no significant difference in the individual and social anxiety mean scores according to the presence of a chronic disease ( $p > 0.05$ ). However, there is a significant difference in the mean scores of individual anxiety according to the status of a chronic disease in the family ( $p < 0.05$ ). Mean score of individual anxiety levels of the participants who have a chronic patient in the family is higher.

There is no significant difference in the individual and social anxiety mean scores according to the age of 65 and over living in the same house ( $p > 0.05$ ). Likewise, there is no significant difference in the individual and social anxiety mean scores according to the curfew in the province of residence ( $p > 0.05$ ).

There is no significant difference in the individual and social anxiety mean scores according to the necessity to work outside during the pandemic ( $p > 0.05$ ).



**Figure 1. Path diagram showing the effects of anxiety to catch coronavirus on bedtime procrastination**  
 IA: Individual Anxiety; SA: Social Anxiety

As is seen in Figure 1, PATH analysis was performed to show the effect of the anxiety to catch the Covid-19 on bedtime procrastination. The results of the analysis exhibit that the anxiety to catch the Covid-19 affects bedtime procrastination. Goodness of fit index values showing the accuracy of this diagram were determined as follows: Chi-Square ( $\chi^2$ ) / Degrees of Freedom (df) = 2.87, Standardized Root Mean Square Residual (SRMR)=0.036, Comparative Fit Index (CFI) = 0.955, Goodness of Fit Index (GFI) = 0.947, Adapted Goodness of Fit Index (AGFI) = 0.931, Root Mean Square Error of Approximation (RMSEA) = 0.049, and Normed Fit Index (NFI)=0.933. These values of the goodness of fit index show a good fit and an acceptable fit<sup>43-49</sup>.

## DISCUSSION

Standardized regression weights are given regarding the effect of anxiety to catch coronavirus on bedtime procrastination in the Table 4. It has been found that Individual (0.761) and Social (0.274) anxiety affected anxiety to catch coronavirus positively. Anxiety to catch coronavirus, on the other hand, has been found to affect bedtime procrastination positively (0.137).

The results of the research reveal that women's individual and social anxiety to catch the Covid-19 is higher than that of men and that women also have a higher degree of bedtime procrastination behavior. However, the findings show that the anxiety to catch the Covid-19 is higher in individuals with chronic diseases in their families. On the other hand, the anxiety to catch the Covid-19 affects bedtime procrastination behavior.

In a study on the psychological effects of the Covid-19 pandemic and therapeutic interventions, the researchers stated that catching the Covid-19 caused serious fear and anxiety<sup>50</sup>. Researchers of another study emphasized that this anxiety level was higher especially in those with chronic diseases. This fear level was expressed as quite high in epilepsy patients<sup>51</sup>. In a study examining the relationship between the spiritual well-being of

elderly individuals and their concerns about the Covid-19 it was concluded that the spiritual well-being, meaning, and belief levels of elderly individuals were above the average. These individuals were found to have moderate concerns about the Covid-19. The study also found that the psychological and social fear levels of elderly individuals were above

average, and their somatic and economic fear levels were below average. A significant negative correlation was found between the meaning and peace levels of the elderly and their Covid-19 anxiety levels. The researchers concluded that as the Covid-19 anxiety levels decrease the spirituality of individuals increase<sup>52</sup>. The results of a study on Generation Z examining the effect of the Covid-19 anxiety on motivation exhibited that socialization anxiety caused by the Covid-19 pandemic was higher than individual anxiety. The results of the research provide evidence that the sociality level of the generation Z is high because observations showed that a serious pandemic such as the Covid-19 has increased the socialization anxiety of generation Z more than its individual anxiety<sup>53</sup>. A study examining the social reflections of the pandemic predicted that the fears and anxieties experienced by individuals, the detachment from social life, and especially being imprisoned in small apartments in metropolitan areas where the population is densely gathered will cause mental and physical health problems in the future<sup>54</sup>. In another study, it was determined that the social and economic impacts caused by the Covid-19 are related to the anxiety levels of the participants<sup>55</sup>. In another study examining the social-psychological appearance of epidemics, the researcher stated that such epidemics created a culture of fear, especially in this modern age. Considering the social functioning, it is known that in addition to the health problems caused by the epidemic, many social problems occur in the family with the process of staying at home. The study predicted that individuals' abnormal behaviors will become widespread due to the crisis with the lengthening of the stay at home<sup>56</sup>. The results of a study examining the effect of Covid-19 on the health anxiety levels of nursing students revealed a statistically significant relationship between students' states of being affected by staying at home due to the pandemic, feeling distressed, sad, overwhelmed, angry, tense-angry-enraged, states of fear of virus transmission and death, feeling anxious-worried about the future and the means of their health anxiety scores<sup>57</sup>. A study conducted during the Covid-19 pandemic process in Australia determined that 11% of the participants in the study experienced health anxiety<sup>58</sup>. Another study determined that nursing students experienced less psychological stress than nurses during the pandemic process, and this was due to working as nurses and the hospital environment<sup>59</sup>. In a study on fear of the Covid-19 and intolerance to

uncertainty on university students, the students' mean scores for fear of the Covid-19 did not show a statistically significant difference in terms of gender variable<sup>60</sup>. In the study conducted by Cao et al. (2020) on university students, no significant difference by gender was found in the stress and negative effect experienced as a result of the pandemic<sup>61</sup>. Bakioğlu, Korkmaz, and Ercan (2020) found in their research with 960 adult individuals that the fear of catching the Covid-19 was significantly higher in women<sup>62</sup>. As seen in the literature there are different results regarding gender and according to our study both individual and social anxiety scores of women is higher.

Although sources on bedtime procrastination are scarce, there are studies on sleep quality in the literature. The immune-enhancing effect of sleep has been mentioned in many studies. Among these studies, bedtime procrastination situations were also measured. In a study on students and administrative staff examining the effects of Covid-19 processes on sleep quality, the findings revealed that quarantine processes in Italy had effects on both sleep and psycho-emotional well-being. The effect is higher on students than employees and the researchers emphasized that the effect is also higher on working women than men<sup>63</sup>. Our study also supports this conclusion. Anxiety and bedtime procrastination rates are higher in women compared to men. The findings exhibited that students' problem of falling asleep was common before and during Covid-19 (39% and 55%). Increase in the time to fall asleep is a problem seen in more than half of the young student sample. In the category of employees, on the other hand, the sleep difficulty that had been the most common problem before Covid-19 was present in 24% of the sample but increased to approximately 40% during Covid-19. The researchers stated that the aforementioned situation stems from increased anxiety in general and worries before sleep. Observations in this study revealed that the duration of students falling asleep was affected more than the employees. Bedtime procrastination was calculated as 16 minutes for employees and 39 minutes for students<sup>63</sup>. In a study examining the sleep processes in preschool children during the pandemic process in China, the time to go to bed during the Covid-19 process was delayed by 57 minutes and 30 minutes, respectively, on weekdays and weekends. At the same time, the periods of staying asleep and awakening were also prolonged<sup>64</sup>.

In a study examining the effects of the quarantine on

sleep and chronotype during the Covid-19 pandemic process in Argentina, the findings showed that falling asleep was delayed only on weekdays. Although the sleep of those who did not work outside during the quarantine period improved, their chronotypes were delayed. The study emphasized that Covid-19 has a serious effect on sleep and chronotype parameters<sup>65</sup>. Our study also supports this conclusion. Those who worked outside had more bedtime procrastination.

This research is limited to its sample. Within the scope of the research, 768 participants volunteered to participate in the research and could be reached through online platforms. In this context, individuals who are literate and have internet access constitute the limitation of the sample. In the research, the relevant literature was reviewed in Turkish and English languages. Also, the research is limited to the measurement tools used and the answers given by the participants to these measurement tools.

In conclusion, the Covid-19 has had many different effects on societies, from working life to family relationships, from mental to physical conditions. All factors such as quarantine processes, deaths, risk groups, etc. have caused people to have anxiety about this virus. This has brought some problems related to social life and psychological problems. Therefore, this study examined the effect of the anxiety to catch the Covid-19 on bedtime procrastination. The main conclusion of the study indicates that the anxiety to catch the Covid-19 affects bedtime procrastination. Along with the above-mentioned reasons, it is possible to state that the stress caused by anxiety, uncertainties about the future, and uncertainties about the treatment of the virus can cause anxiety and this may cause sleep-related problems, especially delaying bedtime. The other results of our study reveal that women have higher levels of individual and social anxiety than men and their bedtime procrastination is higher than men. At the same time, the rate of anxiety about catching the Covid-19 is higher in people with chronic diseases in the family. The fact that people with chronic diseases are in the high-risk group and the statement that the Covid-19 has more negative effects on individuals with chronic diseases are considered to be effective in this situation. The findings exhibited that those who did not have to work outside had a higher bedtime procrastination.

The increase in the level of anxiety in society due to the Covid-19 can cause many other problems in addition to the bedtime procrastination behavior of

individuals. In this context, it is necessary to select the content of the public service announcements carefully, avoid messages that will increase anxiety and carry out health communication efforts to reduce the anxiety level of the society. On the other hand, it is important to consider the reasons that increase the state of anxiety and to take special measures for individuals suffering from these reasons. For example, it is necessary to carry out information and awareness studies on the Covid-19 for individuals who live in the same environment as people with chronic diseases and have to work or be outside. Also, it is important to develop policies for these people, to apply methods of working from home/flexible working if possible, and to provide and maintain financial support. It is an important issue in terms of protecting the mental health of both individuals and families by developing preventive mental health services efforts for the community and ensuring that community mental health centers take initiatives.

As a result, it is possible to indicate that political decision-makers, service providers, public administrators and centers that provide services for public health should work in cooperation with the society to overcome the pandemic process with the lowest possible damage.

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