

# Anxiety Status of Patients Receiving Orthodontic Treatment in Sakarya University's Dentistry of Faculty During COVID-19 Pandemic

Sakarya Üniversitesi Diş Hekimliği Fakültesinde Ortodontik Tedavi Gören Hastalarda COVID-19 Salgını Süresinde Kaygı Durumu

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## Abstract

Objective	The present paper aims to determine the state and trait anxiety levels statuses of patients actively receiving orthodontic treatment during the COVID-19 pandemic.
Materials and Methods	For this study, 102 patients actively receiving treatment in the department of orthodontics were invited and all the patients accepted the participation. The parameters in the present study were examined using Spielberger's State and Trait Anxiety Inventory (STAI) depending on the age, gender, and educational status of participants. Independent samples t-test, One-Way ANOVA, and Tukey's test were used in the analyses.
Results	In state anxiety (STAI-S) and trait anxiety (STAI-T) inventories, it was determined that women had a higher level of anxiety when compared to men ( $p<0.05$ ). It was also determined that adult patients had higher anxiety levels in state anxiety (STAI-S) and trait anxiety (STAI-T) inventories ( $p<0.05$ ).
Conclusion	It was determined that, at the beginning phase, the COVID-19 pandemic has affected the state and trait anxiety levels of our patients actively receiving orthodontic treatment.
Keywords	COVID-19; anxiety; COVID-19 pandemic

## Öz

Amaç	Bu araştırmada COVID-19 salgını süresinde aktif ortodontik tedavisi devam etmekte olan hastalarda durumluk ve sürekli anksiyete durumlarının tespit edilmesi amaçlanmıştır.
Gereç ve Yöntemler	Çalışmaya ortodonti kliniğinde tedavisi devam etmekte olan 102 hasta davet edilmiş ve bütün hastalar çalışmaya katılmayı kabul etmiştir. Araştırmada değişkenler hastaların cinsiyet, yaş ve eğitim durumlarına göre Spielberger'in Durumluk- Sürekli Kaygı Envanteri (STAI) puanları ile değerlendirilmiştir. Analizlerde bağımsız örneklem için t testi, one-way ANOVA ve Tukey testi kullanılmıştır.
Bulgular	Hastalarımızda kadınların erkeklere göre durumluk anksiyete (STAI-S) ve sürekli anksiyete (STAI-T) ölçek değerlerinde yüksek kaygıya sahip olduğu görülmüştür ( $p<0.05$ ). Erişkin yaş gruplarındaki hastalarımızda durumluk anksiyete (STAI-S) ve sürekli anksiyete (STAI-T) ölçek değerlerinde yüksek kaygıya sahip olduğu görülmüştür ( $p<0.05$ ).
Sonuç	COVID-19 pandemisinin başlangıç süresinde aktif ortodontik tedavi süreci hastalarımızda durumluk ve sürekli kaygı düzeyini etkilediği görülmüştür.
Anahtar Kelimeler	COVID-19; kaygı; COVID-19 pandemi

## INTRODUCTION

In December 2019, scientists detected an atypical type of viral pneumonia in Wuhan city of China. In January 2020, the Chinese scientists identified the pathogen, which causes the disease, as COVID-19. The dissemination and communication of the identified disease occurred very rapidly and the disease concurrently spread in both China and the rest of the world and became an important public health concern. On January 30th of 2020, the World Health Organization (WHO) declared that this pandemic is an alarming international public health problem.<sup>1</sup> As of the date of March 11th of 2020, the WHO declared it as a pandemic. The first COVID-19-related death in Turkey was seen on March 17th of 2020.<sup>2</sup> Various measures have been taken in our country and the rest of the world in order to prevent the spread of the pandemic.<sup>3</sup> The image necessitated certain measures addressing the prevention of the spread of this pandemic in Turkey and, upon the detection of the first case, several measures have been taken in Turkey. Within this scope, the education process was paused, travel restrictions were imposed, the individuals coming from foreign countries were kept in quarantine for 14 days, lockdown was declared for specific age groups, social isolation was emphasized, lockdowns addressing all the citizens were declared on the specific days of the week, common-use areas were closed, and all the dental treatments (except for emergency cases) were delayed. These limitations that have been suddenly imposed caused individuals to have undesired psychological problems. Besides the risk of death because of viral infection due to COVID-19, the individuals also experienced a significant level of psychological pressure arising from the social isolation.<sup>4</sup>

In literature, there are many reports examining the psychological effects of COVID-19 pandemic on the society, patients, children, and adolescents.<sup>5-7</sup>

COVID-19 pandemic had deep effects on the psychological and physical health of individuals.<sup>8</sup> The physical isolation measures, which have been taken for social isolation

during the quarantine, posed a significant psychological problem risk.<sup>9</sup> Emphasizing that, as a negative result of the pandemic process, it is strongly related with lifelong anxiety (concern), depression, self-injury, and suicide attempts, it was reported that the sense of loneliness would increase together with the social isolation.<sup>8</sup>

The anxiety is defined as a reaction against an unknown danger. It can be also defined as extensive emotional reaction emerging against dangerous situations or events and aiming to adapt to current conditions.<sup>10</sup> The type of anxiety temporarily experienced by individuals in case of any danger is the "state anxiety". However, some people always experience a sense of restlessness. They generally experience a sense of unhappiness intensively. This type of anxiety that is not directly caused by external factors is intrinsic anxiety. In this case, the individual considers the current situation as stressful and it is called "trait anxiety".<sup>11</sup>

It was reported that the direct and indirect psychological and social effects of COVID-19 pandemic are very frequently seen and it might affect the mental health at this moment and in the future.<sup>8</sup>

Another problem seen in the pandemic process is the increasing unemployment. It should be understood that, together with unemployment, financial insufficiency would have negative effects on the mental health of individuals.<sup>12</sup> It was reported that the changes in household income level caused psychological and financial anxiety among the family members, especially among the students.<sup>13</sup>

Thus, the present paper aims to determine the state and trait anxiety scores of our patients actively receiving treatment in our orthodontic clinic during the COVID-19 pandemic and to reveal how the parameters influencing the anxiety vary depending on the gender, age, and educational status.

## MATERIALS and METHODS

The cross-sectional study is an online survey study conducted with 102 patients currently receiving orthodontic treatment in the Orthodontic Clinic of Dentistry Faculty of Sakarya University during the COVID-19 pandemic process. The study population, the study was conducted at dates (04.28.2020- 05.28.2020) active orthodontic treatment has been created from continuing individual. The survey was conducted upon the approval of the Directorate-General for Health Services (Ministry of Health) and the approval of Non-Interventional Clinical Researches Ethics Committee of Sakarya University (04.27.2020, 71522473/050.01.04/195). The principles of the Helsinki Declaration were followed and the consents of patients were obtained. The participation was on volunteer basis and the participation rate was 100% (all the patients invited responded to the survey).

Besides the sociodemographic questionnaire, Spielberger's STAI-S (state) and STAI-T (trait) anxiety scales were conducted with all the patients.

Developed by Spielberger et al. in year 1970, the inventory consists of 40 items and 2 sub-inventories measuring the state and trait anxiety levels.<sup>14</sup> Inventory's adaptation to Turkish language and validity-reliability study of Turkish version were carried out by Öner and Le Compte<sup>15</sup>.

Spielberger's State-Trait Anxiety Inventory is an easy-to-conduct scale that any patient can easily answer. In answering the Spielberger's State Anxiety Inventory, the responders are asked to specify the severity of their status as (1) none, (2) mild, (3) very much, and (4) completely, whereas the frequency of these feelings is specified as (1) almost never, (2) sometimes, (3) frequently, and (4) almost always in Spielberger's Trait Anxiety Inventory. There are "direct" and "reversed" statements in the scales. While determining the scores of "reversed" statements referring to the positive feelings, the ones having weight of "1" were turned into "4" and those with weight of "4" were turned

into "1". In direct statements indicating the negative feelings, the "4" answers indicate a high level of anxiety. In reversed statements, however, "4" answers indicate a low level of anxiety and "1" answers indicate a high level of anxiety. There are 10 reversed statements (1, 2, 5, 8, 10, 11, 15, 16, 19, and 20) in State Anxiety Scale and 7 reversed statements (21, 26, 27, 30, 33, 36, and 39) in Trait Anxiety Scale. Total scores calculated as the sum of sub-scales scores range between 20 and 80 points. Higher scores indicate a higher level of anxiety, whereas the lower scores indicate a lower level of anxiety. It is possible to conduct both scales at once. In the questionnaire conducted in the present study, the statements of State Anxiety Scale were listed at first and then the statements of Trait Anxiety Scale were added.

The data analysis was carried out using SPSS Statistics 17.0 package program's One-Way ANOVA, independent samples t-test, and Tukey's test. Independent samples t -was performed to determine gender differences. One-Way ANOVA and Tukey's test were performed to determine the education status, age groups, and gender from which group the difference originated. The level of significance was set to be  $p < 0.05$ .

## RESULTS

All patients demographic features (age, gender, education status) were recorded. Comparing the mean anxiety scores of STAI-S and STAI-T, it was determined that the mean STAI-T scores of both men and women were statistically significantly higher than their anxiety scores in STAI-S scale ( $p < 0.05$ ). Moreover, the mean STAI-S and STAI-T anxiety scores of women were found to be statistically significantly higher than those of men ( $p < 0.05$ ). (Table 1)

When comparing the mean STAI-S and STAI-T anxiety scores of women and men by the age groups, it was found that the mean scores of women were found to be statistically significantly higher than those of men in all the age groups ( $p < 0.05$ ). (Table 2)

Examining the mean STAI-S and STAI-T anxiety scores of the age groups among women and men, the statistically significant difference was found only in women's mean STAI-T anxiety scores. Tukey's test was conducted in order to determine from which age groups this difference arose and the difference was found between 21-30 and 31-40 age groups of women ( $p < 0.05$ ). (Table 3)

**Table 1: Mean STAI-S and STAI-T anxiety scores by gender**

Gender	n	STAI-S (x±SD)	STAI-T (x±SD)	
Female	54	41, 69±9,90	44, 76±5,60	t= -4, 990; p= 0,014
Male	48	39, 69±8,30	42, 49±8,45	t= -7, 350; p=0,035
P		t= 3,890; p=0,018	t=2,755; p=0,023	

State-Trait Anxiety Inventory State (STAI-S), State-Trait Anxiety Inventory Triat (STAI-T)  
 n=birey sayısı SD= standart deviation  
 Independent samples t-test  $p < 0,05$

**Table 2: Mean STAI-S and STAI-T anxiety scores of female and male by the age groups.**

Age	Gender	n	STAI-S (x±SD)	STAI-T(x±SD)
10-20	Female	24	39,10±10,34	43,80±6,56
	Male	18	36,46±7,65 t=1,450; p=0,031	40,10±10,34 t=4,230; p=0,026
21-30	Female	20	41,10±7,50	42,65±9,86
	Male	16	37,80±4,69 t=2,670; p=0,023	40,90±7,50 t=3,787; p=0,046
31-40	Female	10	40,20±10,34	45,60±7,64
	Male	14	36,10±4,67 t=1,560; p=0,012	41,76±7,45 t=6,990; p=0,011

State-Trait Anxiety Inventory State (STAI-S), State-Trait Anxiety Inventory Triat (STAI-T) n=birey sayısı SD= standart deviation  
 Independent samples t-test  $p < 0,05$

**Table 3: Gender rating according to age groups in their internal STAI-S and STAI-T mean scores of anxiety.**

Gender	Age	n	STAI-S (x±SD)	STAI-T(x±SD)
Female	10-20	24	39,10±10,34	43,80±6,56
	21-30	20	41,10±7,50	42,65±9,86
	31-40	10	40,20±10,34 f=0,059; p>0,05	45,60±7,64 f=2,059; p=0,023
Male	10-20	18	36,46±7,65	40,10±10,34
	21-30	16	37,80±4,69	40,90±7,50
	31-40	14	36,10±4,67 f=0,270; p>0,05	41,76±7,45 f=0,987; p>0,05

State-Trait Anxiety Inventory State (STAI-S), State-Trait Anxiety Inventory Triat (STAI-T), SD= standart deviation

Comparing the mean anxiety scores of genders by the educational status, it was found that women's mean STAI-S and STAI-T anxiety scores were statistically significantly higher than those of men in "undergraduate" and "postgraduate" groups ( $p < 0.05$ ). (Table 4)

**Table 4: Mean STAI-S and STAI-T anxiety scores by educational status between female and male.**

Education	Gender	n	STAI-S (x±SD)	STAI-T(x±SD)
Elementary school	Female	10	38,10±10,31	39,10±9,59
	Male	10	38,46±4,85 t=0,250; p>0,05	40,16±7,65 t=-1,450; p>0,05
High school	Female	15	40,87±3,95	41,10±5,64
	Male	12	39,96±4,21 t=0,950; p>0,05	41,46±5,95 t=-0,450; p>0,05
University	Female	18	41,98±9,34	43,80±6,34
	Male	16	39,46±7,65 t=2,450; p=0,043	39,86±3,69 t=3,450; p=0,021
Postgraduate	Female	11	41,80±5,84	44,10±9,36
	Male	10	38,46±6,15 t=0,540; p=0,036	42,24±4,25 t=2,760; p=0,039

State-Trait Anxiety Inventory State (STAI-S), State-Trait Anxiety Inventory Triat (STAI-T), SD= standart deviation

Comparing the mean anxiety scores by educational sta-

tus among women and men, it was found that the mean STAI-T anxiety scores were statistically significantly different among women and men. Using Tukey's test, it was determined that the difference originated from the difference between elementary school degree and undergraduate-postgraduate degrees among women and between elementary school degree and postgraduate degree among men. ( $p < 0.05$ ) (Table 5)

**Table 5: Gender rating according to different educational in their internal STAI-S and STAI-T mean scores of anxiety.**

Gender	Education	n	STAI-S (x±SD)	STAI-T(x±SD)
Female	Elementary school	10	38,10±10,31	39,10±9,59
	High scholl	15	40,87±3,95	41,10±5,64
	University	18	41,98±9,34	43,80±6,34
	Postgraduate	11	41,80±5,84	44,10±9,36
			f=0,098; p>0,05	f=4,022; p=0,023
Male	Elementary school	10	38,46±4,85	40,16±7,65
	High scholl	12	39,96±4,21	41,46±5,95
	University	16	39,46±7,65	39,86±3,69
	Postgraduate	10	38,46±6,15	42,24±4,25
			f=0,038; p>0,05	f=3,075; p=0,041

State-Trait Anxiety Inventory State (STAI-S), State-Trait Anxiety Inventory Triat (STAI-T), SD=standart deviation

## DISCUSSION

COVID-19 pandemic, which has suddenly emerged and rapidly taken the entire world under effect and the effect of which still continues, unavoidably increased the anxiety level of all individuals. The present study aims to examine the parameters, which affect the state and trait anxiety levels of patients actively receiving orthodontic treatment in our orthodontic clinic during the pandemic period, by the genders.

It was reported that suddenly emerging pandemics affected the mental health of individuals and the lack of psychological support in medical service caused difficulties among the people. For instance, it was reported that HIV/

AIDS pandemic between 1980 and 1990, SARS (Severe Acute Respiratory Syndrome) pandemic between 2002 and 2003, H1N1 (influenza) virus pandemic in 2009, Ebola pandemic in 2013, and Zika virus pandemic in 2016 increased the psychological disorders in countries lacking in well-educated psychiatrists and psychologists.<sup>16</sup>

In the previous studies, the cut-off score of state and trait anxiety inventory STAI was found to be 39-40 points and the scores higher than this level were considered to be the clinically high level of anxiety.<sup>17-19</sup>

Given the mean state and trait anxiety scores in the present study, it was found that the scores were significantly high. In the studies carried out in China, the psychological changes of individuals during the COVID-19 pandemic were examined and it was reported that the anxiety level of individuals was at high levels in this period.<sup>20, 21</sup>

In the present study, it was determined that both of mean state and trait anxiety scores of women during the COVID-19 pandemic were higher than those of men. These results are similar to the result of a study reporting that women were psychologically affected by the pandemic more than men did and an increase was observed in the levels of stress, anxiety, and depression.<sup>20</sup>

Similar to the present study reporting that individuals having undergraduate and postgraduate degrees had high levels of state and trait anxiety, a previous study reported that, upon suspending the education in China in this process, the students intensively experienced the anxiety of degradation in their academic levels.<sup>20</sup>

It is thought that the high level of anxiety level among the adult patient is related with a high level of pandemic process perception. In a previous study, it was determined that the quarantine imposed for social isolation during the pandemic period increased the stress level of individuals. Moreover, the level of anxiety increased also because the

course of disease couldn't be projected, as well as the uncertainty of process and the false information.<sup>22</sup> In another study, it was emphasized that the patients infected by COVID-19 virus and their families, as well as the medical professionals, were risky in terms of mental health and they had a high level of anxiety.<sup>8</sup>

High level of trait anxiety among our patients suggests that we should consider that the individuals would need support in order to maintain their mental health. In Western countries (England and the USA), the procedures were prepared for psychological crisis interventions in emergency service departments in order to overcome the problems. It was reported that the infected patients need psychological support in the recovery period and after discharged from hospital and this point should never be ignored.<sup>23</sup>

Similar to the high level of state and trait anxiety levels of university students, who had to suspend their educational life and to stay at home during the pandemic period in the present study, another study examining the university students reported that the level of anxiety increased during the COVID-19 pandemic. The participants stated that their anxiety was related with their place of residence, income source of their parents, if they were living with their parents, and if any relative or friend has been infected by COVID-19.<sup>23</sup>

According to the results obtained in the present study and considering that we still are in a pandemic period, there may be changes in the anxiety levels of individuals in the long-term. Duan et al. stated that further studies are necessary especially in countries, where the psychiatric care service infrastructure is under-developed and the effect of pandemic is at higher levels.<sup>23</sup>

Revealing the exact long-term effect of COVID-19 pandemic on mental health may take months or even years. In the present study, it was determined that the level of anxiety increased in the short-term among the patients ac-

tively receiving orthodontic treatment. It is thought that it would be useful to conduct the same questions and to analyze the answers in the future in order to determine the long-term effect.

**The survey was conducted upon the approval of the Directorate-General for Health Services (Ministry of Health) and the approval of Non-Interventional Clinical Researches Ethics Committee of Sakarya University (04.27.2020, 71522473/050.01.04/195).**

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