

# The Effect of preoperative anxiety levels on postoperative recovery in patients undergoing elective cardiac surgery during Covid 19

## Covid 19 sürecinde elektif kardiyak cerrahi girişim geçiren hastalarda ameliyat öncesi kaygı düzeylerinin ameliyat sonrası iyileşme durumlarına etkisi

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### ABSTRACT

**Background and Aim:** The aim of this study was to determine the effect of preoperative anxiety levels on postoperative recovery in patients undergoing cardiac surgery during Covid19. **Material and Method:** The population of the descriptive study consisted of patients in the adult cardiovascular surgery service of a training and research hospital. Data were collected from 235 patients who were planned to undergo cardiac surgery between April and August 2021, who met the inclusion criteria and agreed to participate in the study, using the Sociodemographic Characteristics Form, State-Trait Anxiety Scale and Postoperative Recovery Index, and the analysis of the data collected in the study was performed using SPSS 22.0 software. **Results:** The mean age of the patients who participated in the study was  $58.71 \pm 11.92$  years, 71.1% were male, 83% were married, 64.3% were primary school graduates, 65.5% had other diseases, 61.3% had a family history of heart disease and 19.6% had Covid 19. It was found that the patients had moderate anxiety according to the mean state-trait anxiety score in the preoperative period, and they had a lot of difficulty in recovery according to the Postoperative Recovery Index. A significant positive correlation was found between the Trait Anxiety Scale and the Postoperative Recovery Index. It was found that patients who were anxious due to the Covid 19 process had higher preoperative state-trait anxiety. **Conclusions:** It was determined that there was a positive and significant relationship between the preoperative trait anxiety levels of the patients and their postoperative recovery, and the Covid 19 process increased anxiety.

### Key Words:

Anxiety, Cardiac Surgery, Postoperative Recovery, Surgical Nursing

### Anahtar Kelimeler:

Kaygı, Kardiyak cerrahi, Ameliyat sonrası iyileşme, Cerrahi hemşireliği

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### ÖZ

**Giriş ve Amaç:** Covid19 sürecinde kardiyak cerrahi girişim geçiren hastalarda ameliyat öncesi kaygı düzeylerinin ameliyat sonrası iyileşme durumlarına etkisinin belirlenmesi amacıyla planlandı ve yapıldı. **Gereç ve Yöntem:** Tanımlayıcı nitelikte gerçekleştirilen araştırmanın evrenini, İstanbul Sağlık Bilimleri Üniversitesi Mehmet Akif Ersoy Göğüs Kalp Damar Cerrahisi Eğitim Araştırma Hastanesinin Yetişkin Kalp Damar Cerrahisi Servisindeki hastalar oluşturdu. Veriler, Nisan 2021- Ağustos 2021 tarihleri arasında, kardiyak cerrahi girişim planlanıp çalışmaya dahil edilme kriterlerini sağlayan ve araştırmaya katılmayı kabul eden 235 hasta ile, "Sosyodemografik Özellikler Formu", "Durumluk-Sürekli Kaygı Ölçeği" ve "Ameliyat Sonrası İyileşme İndeksi" kullanılarak toplandı ve araştırmada toplanan verilerin analizi SPSS 22.0 paket programı kullanılarak gerçekleştirildi. **Bulgular:** Araştırmaya katılan hastaların yaş ortalaması  $58,71 \pm 11,92$ , %71,1'i erkek %83'ünün evli, %64,3'ünün ilköğretim mezunu olduğu saptandı. Ayrıca %65,5'inin ek olarak başka hastalıklarının da olduğu, %61,3'ünün ailesinde kalp hastalığı olduğu ve %19,6'sının Covid-19 geçirdiği belirlendi. Çalışmaya dahil edilen hastaların ameliyat öncesi dönemdeki 'durumluk kaygı' puan ortalaması ve 'sürekli kaygı' puan ortalamasına göre orta düzeyde kaygı yaşadıkları saptandı. 'Ameliyat Sonrası İyileşme İndeksi' puan ortalamasına göre iyileşmede çok güçlü yaşadıkları bulundu. Ameliyat öncesi Durumluk Kaygı Ölçeği ile Ameliyat Sonrası İyileşme İndeksi toplam puanları ve alt boyutları arasında istatistiksel olarak anlamlı bir ilişki saptanmadı ( $p > 0,05$ ). Sürekli Kaygı Ölçeği ile Ameliyat Sonrası İyileşme İndeksi toplam puanları ve alt boyutları arasında pozitif yönde istatistiksel olarak anlamlı ilişki olduğu bulundu. **Sonuç:** Hastaların ameliyat öncesi durumluk kaygı düzeyleri ile ameliyat sonrası iyileşmeleri arasında anlamlı bir fark bulunmazken, ameliyat öncesi sürekli kaygı düzeyleri ile pozitif yönde ve anlamlı bir ilişki olduğu belirlendi.

## INTRODUCTION

Cardiovascular diseases are among the major life-threatening diseases in our country and in the world every year despite the increase in life expectancy and advances in medical-surgical diagnosis and treatment methods (Score working group ESC,2021; Ambrosetti et al.,2021). In Turkey, cardiovascular diseases ranked first among the causes of death with 36.8% in 2019 (Turkish Statistical Institute (TSI), 2020). 43.9% of women and 36.4% of men lose their lives for this reason (<https://tkd.org.tr>. Access date: 30.11.2023).

Open heart surgery is the most commonly used method in the surgical treatment of heart diseases. Open heart surgery is a basic form of surgery performed for coronary artery diseases, heart valve diseases, repair of congenital heart lesions and heart transplantation (Sahin and Cilingir, 2022; Bang and Parkı, 2020). It has been reported in the literature that problems such as anxiety, depression, sexual dysfunction, loss of role and status in home and work life are frequently observed in patients undergoing open heart surgery (Bang and Parkı, 2022, Zaini et al, 2022). It has been reported that individuals with high levels of anxiety in the preoperative period or individuals who deny anxiety are negatively affected by postoperative adaptation and recovery levels, and morbidity rates increase (Yuan and Wang, 2019). In this case, it affects the recovery processes of the patients.

In the literature, it is known that the hospitalisation process itself is a source of anxiety, and in patients hospitalised in surgical clinics, in addition to hospitalisation, worries such as bleeding, death, fear of the unknown, and inability to wake up due to anaesthesia are added, thus they experience more anxiety and this anxiety leads to negative reactions in the body (Friedrich et al, 2022; Kumar et al, 2019; Jiwanmall et al, 2020). The Covid-19 pandemic caused by the SARS-CoV-2 coronavirus caused a global crisis in 2020 with its impact on human life (<https://covid19.saglik.gov.tr>. Access date:05.07.2020). The Covid-19 process and the unknowns related to this process were also added to the fear of surgery (Schimmenti et al, 2020; Yigitoglu et al, 2021). Since the beginning of the pandemic, it has been determined that the patient group most affected by Covid-19 and with the highest mortality rate includes people with cardiovascular disease (Aktöz et al, 2020). It is stated in the literature that mortality is also high in cardiac patients infected with the virus due to the fact that chronic cardiovascular system patients postpone their hospital admissions with the fear of Covid-19 infection (Guan et al, 2020; Li et al, 2020). In this context, the study was planned and conducted to determine the effect of preoperative anxiety levels on postoperative recovery status in patients undergoing cardiac surgical intervention during the Covid-19 process.

## METHODS

The data of the descriptive study were collected in the cardiovascular surgery wards of a training and research hospital between April and August 2021. The population consisted of a total of 1484 patients who underwent elective cardiac surgery in the previous year. The sample calculation was made according to the simple random sampling formula. In this study, out of a total of 1484 elective operations performed in 2020, the minimum number of cases was determined as 211 to obtain 80% power at  $\alpha=0.05$  level. 235 patients constituted the sample. The sociodemographic characteristics form was prepared by the researchers with a total of 22 questions in the literature (Yilmaz and Aydin, 2013; Cengiz, 2018; Dirimese et al, 2016). The State Trait Anxiety Inventory developed by Spielberg et al. (1970) was used to determine the state and trait anxiety levels of the patients. The Postoperative Recovery Index consisting of 25 items, the validity and reliability of which was made by Butler et al. (2012) and the validity and reliability of which was made by Cengiz (2018) in Turkish patients, was used.

The data obtained in the study were evaluated using the Statistical Package for the Social Sciences (SPSS) 22.0 statistical programme. Frequency, percentage, mean, standard deviation, Kurtosis and Skewness values of the data were analysed.

The data were collected after obtaining scale permission, institutional permission, Ministry of Health permission for Covid-19, ethics committee approval, and verbal and written permissions from patients who agreed to participate in the study. The study included patients who were hospitalised for surgery in cardiovascular surgery preoperative and postoperative wards within a limited date range. It cannot be generalised for all cardiovascular surgery operations.

## Research Questions

- i: What are the levels of preoperative anxiety in patients undergoing elective cardiac surgery during Covid-19?
- ii: Does preoperative anxiety have an effect on postoperative recovery in patients undergoing elective cardiac surgery during Covid-19?
- iii: Is there a relationship between preoperative anxiety in patients undergoing elective cardiac surgery during the Covid-19 period and the Covid-19 outbreak?

## RESULTS

Findings Related to Descriptive Characteristics of Patients

The mean age of the patients who participated in the study was  $58.71 \pm 11.92$  years (min-max; 18-82), 71.1%

(n:167) were male, 64.3% (151) were primary school graduates, 83% (n:195) were married, 44.7% (n:105) were retired, and 51.1% (n:120) had an income equal to their expenses. It was found that 55.3% (n:130) of the patients underwent open heart surgery, 65.5% (n:154) had other diseases in addition, 77.4% (n:182) of these diseases were hypertension, 61.3% (n:144) of the patients had a family history of heart disease, and 51.9% (n:122) had undergone previous surgery. It was determined that 49.4% (116) of the patients lived with their spouses and children, 59.1% (n:139) did not smoke, 84.7% (n:199) did not drink alcohol, and 80% (n:188) were constantly taking medication for chronic diseases.

Some descriptive characteristics of the patients regarding the Covid-19 Process are given in Table 1.

### Descriptive Statistics Related to Scales

In the preoperative period, it was found that the patients experienced moderate anxiety according to the mean state and trait anxiety scores. In the postoperative period, it was determined that there was a lot of difficulty in recovery according to the Postoperative Recovery Index (PoRI). The sub-dimensions of the PoRI are shown in Table 2.

**Table 1:** Descriptive Characteristics of the Patients Regarding the Covid-19 Process

Descriptive Characteristics of Patients	Frequency (n)	Percent (%)
<b>Covid19 Passing Status</b>		
No	189	80,4
Yes	46	19,6
<b>Covid19 Hospitalisation Status</b>		
No	38	82,6
Yes	8	17,4
<b>Presence of Covid19 in the Family</b>		
No	144	61,3
Yes	91	38,7
<b>Presence of Health Workers in the Family</b>		
No	199	84,7
Yes	36	15,3
<b>Proximity of Health Worker in the Family</b>		
Nephew	8	22,2
Child	7	19,4
Bride	4	11,1
Grandchild	4	11,1
Other	13	36,1
<b>How it influenced by Covid19</b>		
I am very anxious	151	64,3
I'm a bit anxious	66	28,1
Not Anxious	18	7,7
<b>Postponing Controls Due to Covid19</b>		
No	174	74,0
Yes	61	26,0
<b>Postponement of surgery due to Covid19</b>		
No	217	92,3
Yes	18	7,7

**Table 2:** Scale Score Averages

	N	Mean	Ss	Min.	Maks.
State Anxiety	235	40,413	3,947	31,000	57,000
Trait Anxiety	235	47,349	5,593	36,000	66,000
Postoperative Recovery Index Total	235	3,304	0,303	2,640	4,280
Psychological Symptoms	235	3,287	0,338	2,670	4,330
Physical Activities	235	4,990	0,055	4,400	5,000
Bowel Symptoms	235	3,257	0,604	2,000	5,000
General Symptoms	235	1,940	0,848	1,000	4,200
Symptoms of craving desire	235	2,987	0,518	1,750	5,000

State Anxiety Scale, Trait Anxiety Scale, Postoperative Recovery Index Total and sub-dimensions

With the postoperative recovery index of 235 patients participating in the study, it was determined that 180 (76.6%) had a lot of difficulty in recovery and 55 (23.4%) had extreme difficulty in recovery.

**Findings on the Relationship between the Scales**

When the relationship between the scales used in the study was examined, it was found that there was a statistically significant positive relationship between the Postoperative Recovery Index total, Psychological Symptoms, Bowel Symptoms, General Symptoms and Trait Anxiety (Table 3).

The regression analysis performed to determine the cause and effect relationship between the state anxiety

and trait anxiety scales used in the study and the total postoperative recovery index was found significant (F=9,664; p=0,001). The total change in the total postoperative recovery index level was explained by state anxiety and trait anxiety at a rate of 6.9% (R2=0.069). The findings regarding the relationship between state trait anxiety and postoperative recovery index total and its sub-dimensions are presented in Table 4. According to this, it was seen that the postoperative recovery of people with high anxiety according to the preoperative trait anxiety scale was negatively affected, intestinal symptoms and general symptoms increased, and there was no effect on physical activities and desire symptoms.

**Table 3:** The relationship between scales

		State Anxiety	Persistent Anxiety
Postoperative Recovery Index Total	r	0,107	<b>0,277</b>
	p	0,101	<0,001
Psychological Symptoms	r	0,067	<b>0,177</b>
	p	0,309	0,007
Physical Activities	r	0,012	0,015
	p	0,858	0,825
Bowel Symptoms	r	0,070	<b>0,161</b>
	p	0,285	0,014
General Symptoms	r	0,056	<b>0,254</b>
	p	0,389	<0,001
Symptoms of craving desire	r	0,107	0,083
	p	0,101	0,202

Correlation Analyses

**Table 4:** The Effect of Preoperative Anxiety on Postoperative Recovery Index

Dependent Variable	Independent Variable	β	t	P	F	Model (p)	R <sup>2</sup>
Postoperative Recovery Index Total	Fixed	2,568	11,665	<0,001			
	State Anxiety	0,001	0,179	0,858	9,664	<0,001	0,069
	Trait Anxiety	0,015	4,054	<0,001			
Psychological Symptoms	Fixed	2,768	10,993	<0,001			
	State Anxiety	0,000	0,083	0,934	3,743	0,025	0,023
	Trait Anxiety	0,011	2,534	0,012			
Physical Activities	Fixed	4,980	120,622	<0,001			
	State Anxiety	0,000	0,108	0,914	0,030	0,970	0,008
	Trait Anxiety	0,000	0,170	0,865			
Bowel Symptoms	Fixed	2,366	5,241	<0,001			
	State Anxiety	0,002	0,230	0,818	3,098	0,047	0,018
	Trait Anxiety	0,017	2,242	0,026			
General Symptoms	Fixed	0,344	0,553	0,581			
	State Anxiety	-0,008	-0,539	0,591	8,129	<0,001	0,057
	Trait Anxiety	0,040	3,933	<0,001			
Symptoms of craving desire	Fixed	2,286	5,872	<0,001			
	State Anxiety	0,012	1,277	0,203	1,635	0,197	0,005
	Trait Anxiety	0,005	0,754	0,452			

Regression Analyses

### Findings Regarding the Examination of the Relationships Between Covid-19 Related Characteristics and Scale and Sub-Dimensions

As a result of the t test and anova test applied to determine the difference between the demographic characteristics of the patients participating in the study and the state-trait anxiety scale, when the state anxiety and trait anxiety scores of the descriptive characteristics of the patients related to the Covid 19 process are examined; the state anxiety scores and trait anxiety scores of the patients show a significant difference according to how they are affected by Covid 19 ( $F=9,767$ ;  $p=0<0.05$ ;  $\eta^2=0.078$ ), ( $F=6,476$ ;  $p=0.002<0.05$ ;  $\eta^2=0.053$ ). It was found that the state anxiety and trait anxiety scores of those who were very anxious and those who were somewhat anxious due to the Covid-19 process were higher than the state anxiety and trait anxiety scores of those who were not anxious ( $p<0.05$ ) (Table 5.).

Considering the relationship between the postoperative recovery index and its sub-dimensions according to the descriptive characteristics of the patients in Table 1 for the Covid-19 process; it was found that the psychological symptoms scores ( $x=3,271$ ) of those who did not postpone the surgery due to Covid-19 were lower than the psychological symptoms scores ( $x=3,482$ ) of those who postponed the surgery due to Covid-19 ( $t=-2,569$ ;  $p=0.011<0.05$ ;  $d=0.630$ ;  $\eta^2=0.028$ ). Other variables did not show a significant difference ( $p>0.05$ ).

### DISCUSSION

Although it is expected that the anxiety level of patients will increase before surgical intervention, it is important to keep it under control. Like all surgical interventions, patients who will undergo cardiac surgery experience a lot of anxiety before surgery.

When the sociodemographic data of the patients included in the study were examined, it was found to be similar to the literature (Bal, 2020; Dogrusoz, 2021; Melly et al., 2018; Kashif et al., 2022; Awaludin et al, 2021; Dogan, 2020; Balkaya et al, 2021). When we look at the characteristics of the patients who participated in the study, such as having Covid 19, hospitalisation status of those who have Covid 19, having Covid 19 in their family and having a healthcare worker in their family, our research results are higher than the literature when compared with the studies of Say and Cakir (2021) and Balkaya et al. However, since they constituted a small part of the patients participating in the study, they did not affect state trait anxiety and postoperative recovery.

64.3% of the patients participating in the study stated that they were very anxious due to the Covid 19 process, so 26% of the patients postponed their controls related to their disease and 7.7% postponed their surgery. It was thought that the reason why most of the patients were very anxious during the Covid 19 process and the number of those who postponed their controls and postponed their surgery was low was because the disease was related to an important and vital organ such as the heart and some patients were newly diagnosed. In the study of Say and Cakir (2021), it was determined that 72.9% people were afraid of going to a health institution for the diagnosis and/or treatment of their disease due to Covid-19, and in the study of Balkaya et al. (2021), it was determined that 63.8% of patients who experienced uneasiness due to the Covid-19 process. These results are expected in the Covid 19 outbreak. It was determined that the data in our study were similar to the literature.

In the study, it was determined that the patients experienced moderate anxiety according to the state-trait anxiety scale in the preoperative period. In the studies of Dogrusoz (2021), Dogan (2020) and Bal (2020),

**Table 5.** Findings Regarding the Examination of the Relationships Between Covid-19 Related Characteristics and Scale and Sub-Dimensions

Demographic Characteristics	N	State Anxiety	Trait Anxiety
How Covid19 Affects		<b>Mean ± SS</b>	<b>Mean ± SS</b>
Much Anxiety	151	41,013±4,003	47,848±5,695
A Little Anxiety	66	39,985±3,644	47,409±5,239
No anxiety	18	36,944±2,363	42,944±4,080
F=		9,767	6,476
p=		<0,001	0,002
Post Hoc=		1>3, 2>3 (p<0.05)	1>3, 2>3 (p<0.05)

t test, Anova test

it was observed that patients experienced moderate anxiety before surgery. In the studies of Kashif et al. (2022) and Tai et al. (2021), it was found that patients experienced mild anxiety before surgery. The findings of our study differ from the literature, and it is thought that the negative effects of cardiac surgery, which is major surgery, on the psychology of patients may differ according to different countries and cultures.

In the study, according to the Postoperative Recovery Index, it was determined that patients generally had a lot of difficulty in recovery, and our research findings are similar to the scores of the total and sub-dimensions of the Postoperative Recovery Index applied to patients undergoing surgical intervention by Cengiz (2018). The fact that most of the patients participating in the study had comorbid diseases and cardiac surgery may be thought to affect the patients' difficulty in recovery.

It was found that there was a statistically positive relationship between the scales used in the study. According to the preoperative Trait Anxiety scale, patients with high anxiety increased the total level of Psychological Symptoms, Intestinal Symptoms, General Symptoms and Recovery Index after surgery. Looking at the literature, it can be seen that these results are similar to the complications caused by anxiety, encountered after surgery and negatively affecting the healing process. State Anxiety was found to have no effect on postoperative recovery.

The state-continuous anxiety of patients who stated that they were very anxious and somewhat anxious due to the Covid 19 process was found to be higher than those who stated that they were not anxious. In the study of Balkaya et al. (2021), the state anxiety of patients who experienced anxiety due to the Covid 19 process was found to be high. In the study of Say and Cakir (2020), most of the patients stated that they were afraid of going to the health institution related to their disease due to Covid 19. In the study of Ovalioglu et al. (2020), approximately half of the patients stated that they were worried about the Covid 19 pandemic. According to these findings, our study is similar to the literatures. According to these findings, the anxiety of the patients due to the Covid 19 outbreak was added on top of their normal or surgical anxiety and their anxiety increased.

It was determined that patients who postponed their surgery due to the Covid-19 pandemic had more difficulties in the recovery process. In this process, it can be thought that the progression of the disease that caused the surgery or the anxiety increases more while waiting and negatively affects the recovery. In the study by Say and Cakir (2021), the number of patients who

were afraid of going to the hospital for diagnosis and/or treatment of their disease due to Covid-19 was found to be considerably higher than in our study.

## CONCLUSION

In the study; It was observed that patients who were very anxious and slightly anxious due to the Covid 19 process had higher state-continuous anxiety scores than those who were not anxious in this process and this was related to Covid 19. It was determined that the anxiety experienced by the patients due to the Covid 19 pandemic did not show a significant difference on postoperative recovery.

## Limitations

When the state and trait anxiety scales were administered to the patients, explanations were necessary to understand the items of the scales.

## Recommendations

In line with the results obtained from the study, while it was determined that the anxiety level increased, it is thought that the anxiety levels of the patients can be reduced with patient-centred safe care to be applied to the patients, and it is recommended to conduct studies on evidence-based nursing practices in safe care and patient-centred care with larger samples.

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